

same height in the same time" (attributed to Galileo, p. 18); in vortex flow generated by a long cylinder spinning steadily in a viscous fluid, "the periodic times of the parts of the fluid are as their distances from the axis of the cylinder" (Newton's "proof" is quoted in full on pp. 68-70, with no mention of Stokes's correction); the viscosity of all fluids is a decreasing function of the temperature (p. 70); Borda flows are not "in harmony" with classical hydrodynamics (p. 83); Lagrange's velocity-potential theorem is "more general" than Helmholtz's theorems, and a potential flow is free of the "distortions implied by the Cauchy-Helmholtz theorem" (pp. 110-111); all three normal pressures in a Navier-Stokes fluid are equal ("a simple but important fact, which made Navier's task easier", p. 90), that task being to put the "buttons of viscosity" on the "beautiful trousers" tailored for hydrodynamics by Euler (p. 88).

Examples on the history of fluid mechanics: the work of d'Alembert, Euler, and Lagrange was limited to potential flow (p. 105), Laplace gave us "the mighty equation" of potential theory (p. 106), Lazare and Sadi Carnot were one person (pp. 101-104). Among interesting sidelights are the fact that Dante, whose importance in fluid mechanics has been overlooked until now, was "the last great poet of the Dark Ages" (p. 31), that Leonardo da Vinci wrote in misspelled modern German (p. 47), and that in 1890 Tsiolkovsky, "the acknowledged father of rocketry", arrived all by himself at the Newton-Euler impact theory "in a typically Tsiolkovsky manner" (p. 129). Some readers may find interesting the author's enthusiasm for rotor ships and his anecdotes about various engineers, mainly Russian and German, whom he has known. Just to keep our feet on the ground of real science, the author closes with the obligatory tribute to Einstein and "the universal matter-energy continuity." C. TRUESDELL

Molten Salts

Advances in Molten Salt Chemistry. Vol. 1. Edited by J. Braunstein, Gleb Mamantov and G. P. Smith. Pp. xii+284. (Plenum: London and New York, 1971.) £8.20.

MOLTEN salt chemistry may be judged to have "come of age" or at least achieved general recognition by the publication of the first volume of a series of "Advances". Greater appreciation of this most interesting, yet at present little known, field is certainly to be desired and the series is to be welcomed as a most useful step towards this aim.

The volume comprises five articles; that on vibrational spectroscopy by R. E. Hester will doubtless supersede the

well known review of this topic by D. W. James in Blanders's *Molten Salt Chemistry*. Y. Marcus gives a detailed account of liquid extraction from molten salts which should stimulate study of distribution coefficients for the many systems at present unexamined. C. R. Boston gives an interesting review of haloaluminate melts which occasionally digresses and suffers by making no mention of the numerous interesting low oxidation state species recently found by Bjerrum and Corbett with tellurium and selenium, G. P. Smith with titanium, and Mamantov with mercury. D. A. J. Swinkels follows with a more technologically orientated discussion of molten salt batteries and fuel cells which makes mention of economic factors and even devotes a few pages to solid electrolyte cells. The volume concludes with a treatment of the somewhat specialized topic of the mass spectroscopy of molten mixed halide systems by J. W. Hastie.

These reviews raise the not uncommon problem of how far it is desirable to recapitulate a necessarily brief and unrigorous account of theory and experimental procedures, very similar to those which have appeared in earlier reviews. With the advent of a regular series, however, it should be possible to achieve a decrease in size and cost of future volumes by including references to earlier articles.

Since all these articles are concerned with areas in which other reviews have been published 2 to 7 years earlier, some repetition has occurred, accentuated by the inevitable time lag of publication (hardly any references, except those of the authors, are dated 1970). Whilst some updating of reviews is clearly necessary it is to be hoped that the editors will be courageous and deal with less familiar areas in later volumes, such as the reaction chemistry of specific melts, for example acetates or thiocyanates, the vexed question of the acidic-basic species in molten nitrates, or the industrially important borate, phosphate and silicate melts.

Purists must be warned that they may wince at certain colloquialisms, such as "free Li sloshing around". There is also a fair number of misprints (fortunately mostly not serious) with the heaviest concentration in Chapter 2. The indexes seem good, but the binding is rather flimsy for a work of reference.

All practitioners of molten salt chemistry, and also those interested, will need to regard this series of reviews as obligatory reading, at least until the creation of a primary journal devoted to this branch of chemistry, for at present original papers are necessarily scattered through a considerable range of journals and therefore not fully appreciated by workers on other aspects of the field. D. H. KERRIDGE

Chimpanzee Sociology

In the Shadow of Man. By Jane van Lawick-Goodall. Pp. 256. (Collins: London, October 1971.) £2.50.

THIS book tells the story of a remarkable research project; it is written in popular terms and has been widely reviewed in the daily press. In spite of its popular nature, the account which Dr van Lawick-Goodall presents here of the chimpanzees at the Gombe Stream National Park, Tanzania, is of considerable scientific interest. She has already presented a detailed scientific account of much of her work in a monograph published in 1968, and that account is of great value to the specialist in the field of animal, and particularly of primate, behaviour. It is, however, a relatively formidable document for the non-specialist, and there must be many who, while not inclined to tackle the wealth of detail in the earlier report, are interested in obtaining a general account of the author's chimpanzee work. This book answers just such a need. Written in an easy, chatty style, and illustrated with magnificent photographs taken by her husband, Hugo van Lawick, it tells of the author's first visit to Gombe in 1960, of her early difficulties in getting close enough to the chimpanzees to observe them, of her later successes and more recently of the setting up of a research station manned by several research students.

The fact that the author carried out her work under such conditions of isolation and over such a long period of time is a tribute to her persistence. The result of this persistence is one of the most detailed longitudinal descriptions of a primate's behaviour yet produced. While not presenting the detailed data from which the author draws her conclusions, the book contains the main features of chimp life which she discovered. It describes the social organization of the chimp group, with its relatively loose knit structure and with the dominance hierarchy and complicated dominance relationships that exist between adult males. Perhaps, though, the most valuable feature of this book is the way in which it describes the chimps as individuals, each with its own quirks of behaviour. At first this individuality is a little difficult to stomach. One comes across descriptions of behaviour involving Flo, Mr McGregor or Leakey and one wonders if one is leaving the world of objective observation and entering that of Beatrix Potter. But the feeling soon disappears. In one of the key sentences early in her book, the author writes that she is interested in the differences between individuals as much as anything else, and the subsequent pages show just how greatly the individuals of the groups do differ in their behaviour.