Is there nothing new in primatology?

Robert A. Hinde

The Social Life of Monkeys and Apes, 2nd Edn. By S. Zuckerman. Pp.511. ISBN 0-7100-0681-8. (Routledge & Kegan Paul: 1981.) £17.50, \$55.

IN 1932, Zuckerman's *Social Life of Monkeys and Apes* was far ahead of its time. It contained scholarly reviews of animal sociology and of the physiology of the oestrous and menstrual cycles. It was remarkable in attempting to integrate physiology with behaviour. Several chapters reviewed the author's own pioneering observations of baboons in South Africa and Hamadryas baboons in the London Zoo. From these he drew conclusions about monkey societies, and about the nature of social and sexual responses, which stimulated much research. Re-reading it now one marvels at the scope of the data synthesized, at the keen critical sense of the author and the number of issues, now the subject of detailed research, which appear there in embryonic form. To mention just one, the importance of "contact comfort" for non-human primates, re-discovered by Harlow in 1959, was discussed by Zuckerman in 1932.

The book stands as a landmark because it helped usher in a new way of studying monkeys. Of course we now know much more about both endocrinology and non-human primates, and new theoretical perspectives have developed. This unrevised re-issue of Zuckerman's book (the addition of a postscript and seven appendices containing reprinted essays or reviews hardly justifies the label of "Second Edition") provides an opportunity to assess the progress that has been made. Three generalizations may serve as examples. First, Zuckerman held that the nucleus of all primate societies is "the family party, consisting of an overlord and his harem" (p.314). Whilst true of hamadryas, recent field studies have shown that some species are monogamous (e.g. gibbons, marmosets), and that superficially polygynous ones show a great diversity of structural types. Whilst in some species there are close relationships between particular males and particular females, in others male-female liaisons are much more temporary (e.g. baboons, macaques).

Second, in 1932 Zuckerman regarded sex as the main force that holds groups

together (e.g. pp.59, 314). But whilst the primary bonds in some polygynous species are between male(s) and females (gorilla), more usually they are between mothers and their daughters. In the latter case, each troop may consist of one or more matriline (a matriarch, her daughters and their daughters) to which males become temporarily attached (macaques, baboons), or are quite peripheral (patas). Zuckerman's emphasis on sexual bonds as paramount seems to stem from a view that single sex groups do not have bonds (pp.58-59), perhaps based on a presupposition that the "family", containing male(s) and females, is necessarily central to any society. The third issue is Zuckerman's emphasis on male dominance as the major principle determining social structure. Dominance is of course important, but we now know that females can be dominant to males for at least some of the time (talapoin, squirrel monkey), and that social structure depends also on other issues, including a correlate of genetic relatedness. Indeed field primatology is now in an exciting stage, with new theoretical insights matched by field data revealing new subtleties in social structure. Primatology, for long lagging behind other branches of biology, is now generating important general principles.

That the book now needs amendment is no reflection on the first edition: we see further now in part because we stand on the shoulders of giants, and for a related reason must also acknowledge that some of our own conclusions may later need extension or correction. But the unfortunate postscript to this re-issue brings no such feeling of humility about the progress of science. It conveys instead the impression of an attempt to discredit not only whole areas of research developed since 1932 but also the contributions of young workers within those fields, and to show that primatology has made little progress in 50 years. In doing so, Zuckerman goes to rather remarkable lengths. He attacks quantification and in particular the field workers' practice of stating the extent of their data base (p.363) and use of statistical techniques (pp.370-371), apparently in part because he mistakenly perceives monkey behaviour to be almost infinitely variable (pp.371, 375-377, 403). He ignores most experimental work, and descends to describing most field workers as "novices with little experience of scientific research or method", incidentally distorting a semi-popular review of a sketchy article on the problems they face (p.366). Some of his criticisms are based on citations which inaccurately represent the original source (e.g. p.371, lines 33-39). He misunderstands functional questions, rejecting research into ultimate causes as ending "either in

empty statement or in tautology" (p.404) and, although earlier regretting the lack of ecological data on primates (p.31), he labels most subsequent research as "tortuous and intellectually unrewarding" (p.375). His emphasis on the variability of monkey behaviour leads him almost to deny inter-species differences (pp.375, 379): he ignores most modern evidence on the diversity of social systems, and tries to discredit the rest. He seems unaware of the advances consequent upon the kin selection hypothesis.

Now of course not all primatology (nor indeed all endocrinology) has been of the highest quality, and apparently promising theoretical alleys can prove unrewarding. Some criticisms, especially those directed at the popular writing of Morris, Ardrey and sometimes Lorenz, are justified. But Zuckerman's postscript gives the impression of being almost wholly destructive, and contrasts with the original book in not attempting a synthesis. This is a pity: the re-issue of this once influential book might have been accompanied by a constructive appraisal so that it, like the original, facilitated future progress. □

Robert A. Hinde is a Royal Society Research Professor and Honorary Director of the Medical Research Council Unit on the Development and Integration of Behaviour, Madingley, Cambridge.

Star of the Galaxy

D. Lynden-Bell

Oort and the Universe: A Sketch of Oort's Research and Person. Edited by Hugo van Woerden, Willem N. Brouw and Henk C. van de Hulst. Pp.210. ISBN hbk 90-277-1180-1; ISBN pbk 90-277-1209-3. (Reidel: 1980.) Hbk \$29, Dfl.55; pbk \$12.95, Dfl.25.

OORT was the heir of a great Dutch tradition in astronomy but under his guidance it has flowered to an extent unforeseen by his predecessors. In this book we have a sketch of Oort's major contributions to galactic and cometary astronomy and catch a glimpse of a man whose foresight and quiet insistence gave Holland the world's most powerful radio telescope at Westerbork.

The book is an eightieth birthday tribute to Oort from 25 leading astronomers who have worked with him or have been close colleagues. Some concentrate on Oort's scientific influence, some on the political difficulties that Oort overcame to get the money for a major instrument and some on the science that it opened to exploration.

However, this is not a *Festschrift* in which leading scientists contribute samples of their work in honour of the recipient; rather, it is a survey of history in the making, concentrating on Oort's period

Journals supplement

On October 1 *Nature* will publish a review supplement devoted to new journals which have appeared between January 1978 and May 1980. Publishers and societies are invited to submit sample copies for consideration for review; for details see *Nature* 291, 599.

and his interests. Here we have some basic material from which a historian might begin his study of the way the character of a great scientist allows him to further science through his influence as well as his own research. Anyone who has studied galactic astronomy, radio astronomy or cometary astronomy will find here some fascinating pieces of history. B. Lindblad's picture of galactic rotation was that the stars with greater velocity dispersion had slower rotation about the galaxy because of their greater pressure support. Each such subsystem was originally considered to rotate uniformly. It was Oort who saw that stars of very low velocity dispersion must rotate differentially and who then went on to show that this motion could already be seen in the observed proper motions.

Later, it was Oort who saw the importance of finding spectral lines in the radio region and sent van der Hulst on the search that led to his great discovery of the 21 cm line. Until reading this book I had always regarded it as a sad irony of fate that the Dutch, with that prediction but with no wartime experience of radar, just missed being the first to observe the line. Much credit goes to Muller for bringing the techniques up to date so quickly, but the gap was too great and, as he points out here, his task was made quicker by learning of the techniques used in the US which led Ewen to the first detection. However, Oort knew what should be done with the line to probe the astronomy of the Galaxy and so it was the Dutch who won the next round. It is sad that G. W. Rougoor who collaborated with Oort in some striking papers died when so young, but I am sure he would too have been a contributor.

However, if I may choose a favourite among Oort's discoveries, it is his determination of the total density of visible and invisible matter in our region of the Galaxy through his work on the gravity field. As Blaauw describes, this work opened the door to the astronomy of the invisible which has grown to be a major subject over the past ten years and in which the Westerbork telescope has played a major part. Some of the highlights of the discoveries are described in the well-illustrated contribution by Allen and Ekers, while van der Laan describes Oort's part in the use of Westerbork observations in his new role as Professor Emeritus.

I give the last word to van Bueren who contributes a well-written and perceptive article on Oort's role in Dutch astronomy: The kind and courteous Oort holds fast to his opinions with unbelievable firmness. He therefore finally always wins his argument, with colleagues as well as with research-financing organisations and government officials.

Perhaps this has been Oort's secret of success, which has helped him to put Holland in the forefront of modern astronomy. □

D. Lynden-Bell is Professor of Astrophysics at the Institute of Astronomy, Cambridge.

Rheology from Russia

J.J. Hermans

Rheology of Polymers: Viscoelasticity and Flow of Polymers. By G.V. Vinogradov and A. Ya. Malkin. Pp.467. ISBN 3-540-09778-3. (Springer-Verlag: 1981.) \$57.90, DM 98.

THIS translation of a revised Russian text published in 1977 contains an admirable treatment of the rheology of polymers. It begins with a comprehensive introduction to the mathematics of deformation and flow, which covers both linear and nonlinear constitutive equations.

More than 30 pages on linear viscoelasticity are followed by rather brief, but pertinent, coverage of nonlinear theories. There are excellent sections on the newtonian and the non-newtonian viscosity of polymers in relation to molecular weight, polydispersity, branching, concentration and entanglements. A remarkably extensive discussion of about 40 pages covers normal stresses. There are further chapters on birefringence, rubber-like behaviour in flow (i.e. large recoverable deformations), the effect of fillers and the rheological properties of polymer blends.

The authors have wisely decided to emphasize concentrated solutions and melts, these being the systems of greatest practical interest. The well-known molecular models and theories that have been developed for very dilute polymer solutions are mentioned, but play no great role in the discussion of either the theory or the experimental data. In other words, the treatment is mostly phenomenological. Many empirical equations are discussed but, when at all possible, these are related to the phenomenological theory.

Particularly praiseworthy is the balance between theory and experiment. This is perhaps best illustrated by the fact that Chapters 2-7 contain about 180 figures showing experimental results.

Inevitably, in a book which covers such a vast field, one will notice omissions. For example, whereas empirical relations between non-newtonian viscosity and shear stress are mentioned, there is nothing on the requirement of zero slope at the limit of zero shear stress. To mention another example, in the chapter on uniaxial extension the investigator will find that many literature references are missing; conversely, it can be said that the value of the book is enhanced by some references with which the English, and even more so the North American reader is often unfamiliar.

The book will be a good introduction for anyone wishing to learn about this field. At the same time it will be a valuable reference work to scientists already experienced in the subject. □

J.J. Hermans is Emeritus Professor of Physical Chemistry at the University of North Carolina.

SCIENTIFIC BOOKSHOP

H.K. LEWIS can supply works in all branches of Pure and Applied Science. Catalogues on request. Please state interests.

SCIENTIFIC LENDING LIBRARY

Annual Subscription from £7.50.
(Available in U.K. only)

Reduced rates for multiple subscriptions.

Prospectus post free on request.

Quarterly List of New Books and new editions added to the Library sent post free to subscribers regularly.

**H.K. LEWIS
& Co. Ltd.**

136 GOWER STREET,
LONDON, WC1E 6BS

Telephone: 01-387 4282
Telegrams: "Publicavit,
London, WC1E 6BS."

Circle No. 14 on Reader Enquiry Card.

**Bring Your
Library Up-To-Date
With This ANS Edition...**

**J.M. Cleveland
MONOGRAPH**

The Chemistry Of Plutonium

Approx. 680 pages 6" x 9"
Hardbound \$49.00

**American Nuclear Society
555 North Kensington Avenue
La Grange Park, IL 60525 USA**

Please take my order for _____ book(s).

- ☐ Payment in full enclosed.
☐ Bill me and I accept postage and handling charges.

Name _____

Organization _____

Street _____

City _____

State _____ Zip _____

Circle No. 02 on Reader Enquiry Card.