

Cambridge University Press

978-0-521-31984-3 - *Reproduction in Mammals: Reproductive Fitness*, Second Edition

Edited by C. R. Austin and R. V. Short

Frontmatter

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Reproduction in mammals

*Book 4: Reproductive fitness*

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SECOND EDITION

# *Reproduction in mammals*

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BOOK **4** *Reproductive fitness*

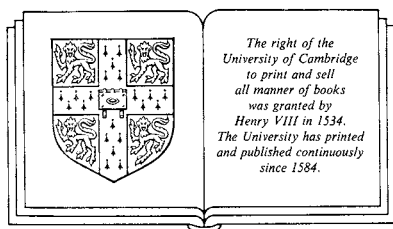
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DRAWINGS BY JOHN R. FULLER



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<b>2 Species differences in reproductive mechanisms</b> <i>R. V. Short</i>	24
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*PREFACE TO THE SECOND EDITION*

In this, our Second Edition of *Reproduction in Mammals*, we are responding to numerous requests for a more up-to-date and rather more detailed treatment of the subject. The First Edition was accorded an excellent reception, but the Books 1 to 5 were written 12 years ago and inevitably there have been advances on many fronts since then. As before, the manner of presentation is intended to make the subject matter interesting to read and readily comprehensible to undergraduates in the biological sciences, and yet with sufficient depth to provide a valued source of information to graduates engaged in both teaching and research. Our authors have been selected from among the best known in their respective fields.

Book 4 pays particular attention to genetic, environmental, behavioural and immunological mechanisms that can contribute to an animal's overall reproductive fitness, through which natural selection must ultimately operate. Mammals have developed a spectacular array of reproductive adaptations in order to meet the demands of a wide variety of different environmental settings, from ocean depths to arid deserts and snow-capped mountain peaks. The reproductive system has had to obey certain design constraints imposed by the animal's body size: small species with short lifespans can reproduce extremely rapidly, whereas the long-lived large animals must reproduce slowly. This fact has had profound repercussions on the development of the entire reproductive system, and is reflected also in the phenomenon of reproductive ageing.

*From the Preface to the First Edition*

*Reproduction in Mammals* is intended to meet the needs of undergraduates reading Zoology, Biology, Physiology, Medicine, Veterinary Science and Agriculture, and as a source of information for advanced students and research workers. It is published as a series of eight small textbooks dealing with all major aspects of mammalian reproduction. Each of the component books is designed to cover independently fairly distinct subdivisions of the subject, so that readers can select texts relevant to their particular interests and needs, if reluctant to purchase the whole work. The contents list of all the books are set out on the next page.

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*BOOKS IN THE FIRST EDITION*

**Book 1. Germ cells and fertilization (1972)**Primordial germ cells *T. G. Baker*Oogenesis and ovulation *T. G. Baker*Spermatogenesis and the spermatozoa *V. Monesi*Cycles and seasons *R. M. F. S. Sadleir*Fertilization *C. R. Austin***Book 2. Embryonic and fetal development (1972)**The embryo *A. McLaren*Sex determination and differentiation *R. V. Short*The fetus and birth *G. C. Liggins*Manipulation of development *R. L. Gardner*Pregnancy losses and birth defects *C. R. Austin***Book 3. Hormones in reproduction (1972)**Reproductive hormones *D. T. Baird*The hypothalamus *B. A. Cross*Role of hormones in sex cycles *R. V. Short*Roles of hormones in pregnancy *R. B. Heap*Lactation and its hormonal control *A. T. Cowie***Book 4. Reproductive patterns (1972)**Species differences *R. V. Short*Behavioural patterns *J. Herbert*Environmental effects *R. M. F. S. Sadleir*Immunological influences *R. G. Edwards*Ageing and reproduction *C. E. Adams***Book 5. Artificial control of reproduction (1972)**Increasing reproductive potential in farm animals *C. Polge*Limiting human reproductive potential *D. M. Potts*Chemical methods of male contraception *H. Jackson*Control of human development *R. G. Edwards*Reproduction and human society *R. V. Short*The ethics of manipulating reproduction in man *C. R. Austin***Book 6. The evolution of reproduction (1976)**The development of sexual reproduction *S. Ohno*Evolution of viviparity in mammals *G. B. Sharman*Selection for reproductive success *P. A. Jewell*The origin of species *R. V. Short*Specialization of gametes *C. R. Austin***Book 7. Mechanisms of hormone action (1979)**Releasing hormones *H. M. Fraser*Pituitary and placental hormones. *J. Dorrington*Prostaglandins *J. R. G. Challis*The androgens *W. I. P. Mainwaring*The oestrogens *E. V. Jensen*Progesterone *R. B. Heap and A. P. F. Flint***Book 8. Human sexuality (1980)**The origins of human sexuality *R. V. Short*Human sexual behaviour *J. Bancroft*Variant forms of human sexual behaviour *R. Green*Patterns of sexual behaviour in contemporary society *M. Schofield*Constraints on sexual behaviour *C. R. Austin*A perennial morality *G. R. Dunstan*



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*BOOKS IN THE SECOND EDITION*

**Book 1. Germ cells and fertilization (1982)**Primordial germ cells and the regulation of meiosis *A. G. Byskov*Oogenesis and ovulation *T. G. Baker*The egg *C. R. Austin*Spermatogenesis and spermatozoa *B. P. Setchell*Sperm and egg transport *M. J. K. Harper*Fertilization *J. M. Bedford***Book 2. Embryonic and fetal development (1982)**The embryo *A. McLaren*Implantation and placentation *M. B. Renfree*Sex determination and differentiation *R. V. Short*The fetus and birth *G. C. Liggins*Pregnancy losses and birth defects *P. A. Jacobs*Manipulation of development *R. L. Gardner***Book 3. Hormonal control of reproduction (1984)**The hypothalamus and anterior pituitary gland *F. J. Karsch*The posterior pituitary *D. W. Lincoln*The pineal gland *G. A. Lincoln*The testis *D. M. de Kretser*The ovary *D. T. Baird*Oestrous and menstrual cycles *R. V. Short*Pregnancy *R. B. Heap and A. P. F. Flint*Lactation *A. T. Cowie***Book 4. Reproductive fitness (1984)**Reproductive strategies *R. M. May and D. I. Rubenstein*Species differences in reproductive mechanisms *R. V. Short*Genetics and reproduction *R. B. Land*The environment and reproduction *B. K. Follett*Reproductive behaviour *E. B. Keverne*Immunological factors in reproductive fitness *N. J. Alexander and D. J. Anderson*Reproductive senescence *C. E. Adams***Book 5. Manipulating reproduction (in Press)**Increasing productivity in farm animals *K. J. Betteridge*Today's and tomorrow's contraceptives *R. V. Short*Contraceptive needs of the developing world *D. M. Potts*Benefits and risks of contraception *M. P. Vessey*Alleviating human infertility *J. Cohen, C. B. Fehilly and R. G. Edwards*Some reproductive options *A. McLaren*Barriers to population control *C. R. Austin*