

BOOK REVIEWS

At home on the farm

D. M. Broom

Domestication: The Decline of Environmental Appreciation. By Helmut Hemmer. Cambridge University Press: 1990. Pp. 208. £45, \$69.50.

DOES domestication involve "a special kind of regressive evolution" and is the behaviour of domestic animals "weaker and less determined by environmental factors than that of wild animals"? Helmut Hemmer presents these arguments in this new edition of a book published in German in 1983 and adds a subtitle to the book to emphasize his opinion. It is widely accepted that one of the genetic differences between wild and domesticated forms of a species is a smaller propensity on the part of domestic animals to show adrenal responses to man as a source of danger. This difference has wide ranging consequences for the behaviour which we see shown by wild and domesticated strains, even when these have been reared in similar ways. But Hemmer's idea that perceptual abilities in general are less good in domesticated animals is not clearly supported by the evidence available in this book or elsewhere. The judgement about the direction of evolution is also questionable because domestic animals are among the most successful species of their classes in numerical terms and may be thought of as efficient exploiters of an ecological niche.

But Hemmer's thesis is intriguing and cannot be lightly dismissed. Comparative data on brain size shows that domestic forms have relatively small brains. There could have been some reduction in brain size in domestic forms, or man could have selected the forms with smaller brains, or domestication may have taken place in the warmer parts of the species' ranges where smaller-brained forms occur. A further proposal is that domestic animals can live in very large herds because they "are scarcely aware of food competition and the aggression it provokes". Shades of the captive rabbits described in Richard Adams' *Watership Down*, but evidence concerning the behaviour of domestic animals conflicts with this view. The complex social organization and impressive learning ability of several species of farm and companion animals makes the idea of overall degeneracy untenable.

Half of the book is a fascinating descriptive account of domesticated animals with especial emphasis on the evidence

for the derivation of the various species. For example, the domestic dog is convincingly argued to be descended from the southern wolf *Canis lupus pallipes* of Arabia and Northern India because of smaller canassial teeth, smaller coronoid processes on the lower jaw, different facial expressions, shorter vocalizations and connected pads on the third and fourth toes. In accounts of attempts to mimic domestication, the work done on silver foxes by Belyaev and Trut is quite well known, but a detailed account is also provided of research carried out by Hemmer's own group on the selection of fallow deer. The new forms produced are less readily alarmed, easier to handle,



Falling into line — the most domesticated animal?

faster in growth and more likely to be sexually active in the second year of life than unselected forms. Coat colour seems to have been a major factor in the selection of this and several other species mentioned. The author makes the provocative suggestion that coat colour is related to reactivity because pigments and catecholamine transmitters share a common biochemical synthetic pathway.

The ideas about the general characteristics of domesticated animals are put forward with frequent reference to stress. Contrary to the general idea that stress is an environmental effect which has adverse consequences for an animal, Hemmer defines it as "a mathematical function of the stimuli impinging on an individual and the information which it acquires by processing them". The definition is so wide ranging as to be almost meaningless but is accompanied by some perceptive comments on how domestic and wild animals are affected by difficult environmental conditions. Several of the concepts presented will stimulate controversy and research and all those interested in evolution or economically important animals will enjoy reading the book. □

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New environmental books

Along with increasing concern about the state of the planet has come an ever-expanding list of books on environmental and related issues. Needless to say, it would be impossible to review all such books within the pages of *Nature*, but what follows is a sample of some of the new books on offer.

■ *One Earth, One Future: Our Changing Global Environment* explains the many and varied ways in which the activity of mankind has so often led to detrimental changes in the global environment. In the first section of the book entitled 'The Earth as a System' coauthors Cheryl Simon Silver and Ruth DeFries discuss the interdependence of major ecological systems such as the atmosphere and the oceans in the context of the Earth's geological past. They go on in the second section 'The Faces of Global Environmental Change' to cover such problems as global warming, ozone depletion, acid deposition and biodiversity. The book is published by the National Academy of Sciences, price \$14.95 (\$18 overseas).

■ Global climate change and the greenhouse effect have attracted a good deal of attention recently. Two books of particular interest are *Climate Change and World Agriculture* by Martin Parry (Earthscan: 1990; pbk price £9.95, \$19.40), and *Climate Change and Plant Genetic Resources* edited by M. Jackson, B. V. Ford-Lloyd and M. L. Parry, both of which assess the likely impact of global change on our ability to feed the world's hungry. Published by Belhaven; price £27.50, \$49.00.

■ Several recent books have attempted to explore possible solutions for thorny environmental problems. Of special note are the following books, each of which is in its way highly critical of present-day policymakers: *Making Peace with the Planet* by Barry Commoner published by Victor Gollancz Limited, price £16.95 (also published in the United States by Pantheon Books, price \$19.95); *Barriers to a Better Environment: What Stops Us Solving Environmental Problems?* by S. T. Trudgill and published by Belhaven — price £25.00 (also published in the United States by Columbia University Press, price \$54.50).

■ The relationship between the environment and human health is addressed by two new books. In *Health and the Global Environment* Ross Hume Hall argues that by failing to take into account environmental issues when designing policies on a wide range of issues the powers that be are endangering human health in the long term. Published by Polity Press, price £29.50, \$44.95. *Environmental Health* edited by J. Rose assesses the impacts of pollutants on health. The book is published by Gordon and Breach price £45, \$90.

■ In *A Year in the Greenhouse: An Environmental Diary* published by Victor Gollancz, environmental writer John Elkington sets out to give an insider's view of the Green movement at a time when world leaders are discovering the electoral benefits of environmental friendliness, price £16.95.