

Before Bakewell

Julian Wiseman

Like Engend'ring Like: Heredity and Animal Breeding in Early Modern England. By Nicholas Russell. Cambridge University Press: 1986. Pp.271. £27.50, \$42.50.

THE agricultural revolution in Britain, which gathered momentum during the eighteenth century, was characterized in part by the rise in use of cropping techniques based upon sophisticated and flexible rotations of roots, grasses and legumes. Improved cropping provided more fodder, which in turn encouraged livestock husbandry. The additional manure that was produced increased soil fertility, and the process was complete — thereby breaking the vicious circle of declining crop yields, impoverished soils and limited raising of livestock typical of farming in mediaeval times.

During the preceding 200 years there had been some interest in animal breeding, but it was generally confined to species of military or social value, principally the warhorse and, later, the thoroughbred. Although farm animals were of undoubted economic importance, they came lower down the animal hierarchy and were largely ignored by professional breeders and chroniclers. But there were developments in their breeding ("improvement") before the late 1700s and the emergence of Robert Bakewell, the Leicestershire farmer often regarded as the founder of modern breeding practice. In this well-researched, stimulating and informative book, Nicholas Russell seeks to illuminate the work of Bakewell's forerunners.

It was not until the late 1600s that writers on breeding broke free of the influence of classical texts. These were often the inspiration for Renaissance authors, and contemporary debates on reproduction were in consequence mixtures of philosophy, astrology and mythology, and were singularly unhelpful to the practical breeder. The concept of heredity was ill-defined, certainly quantitatively, and the confusing effects of environment on animal structure and form was an added complication. If the appearance of stock could be dramatically altered merely by changing feed inputs, then parental roles in influencing sibling characteristics must have seemed haphazard and unpredictable. Location was considered an important determinant of breed appearance which, it was thought, could thus be altered simply by moving stock from one region to another.

There was too a fashion for anthropomorphic features such as "character" and "beauty". Russell cites writers on breeding

in early modern England who attempted to relate the latter to more readily identifiable features, including coat colour. Markham, however, a Tudor, considered ancestry, pedigree and lineage to be more important, and the breeding of the thoroughbred horse and the origins of the stud book owed much to such opinions. Anomalies arising from this obsession — many thoroughbreds were demonstrably useless and full siblings often dissimilar — were conveniently ignored.

Breeding policy for cattle and sheep frequently followed similar patterns, although most practical graziers were concerned more with numbers fattened than appearance and lineage, suggesting that selection was not a high priority. Rudimentary attempts to improve breed output for these animals were recorded early in the eighteenth century, particularly in those lowland regions of the Midlands already regarded as innovative — in the uplands, survival rather than improvement was the issue. Heterogeneity of stock was troublesome, and farmers often inbred their cattle and sheep in an attempt to concentrate quality. This

unfortunately led to degeneration and reinforced the notion of pedigree as a key determinant of quality.

Robert Bakewell's prominent role in the development of animal breeding is undoubted, but Russell argues that the evidence that his animals were biologically superior is dubious, citing their poor fecundity and excessive carcass fat — views which verge on the heretical amongst many modern animal breeders but which accord with the limited information available. Bakewell, however, was an extremely able farmer. He identified the importance of economic and biological criteria in judging an animal's value, as opposed to subjective assessment of fancy points. Despite his reservations, Russell concludes that Bakewell can be regarded as a pioneer in the popularization of the idea of animal output as a key to selection policy. Agriculture's loss is that such ideas were not incorporated into general breeding policy until well into this century. □

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Mixed messages

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Arctic Air Pollution. Edited by B. Stonehouse. Cambridge University Press: 1987. Pp.328. £30, \$49.50.

MANY people still see the Polar areas as being the Earth's final frontiers. This may explain some of the public's anxiety over pollution of these distant and uninhabited regions. But while it is true that the air of the Arctic and Antarctic is no longer pristine, little public attention is drawn to the extremely low level of contamination or to the point that, as yet, air pollution around the Poles appears to have had no effect on human health or the sensitive ecosystems.

Still, pollutants are reaching the remotest parts of the Earth. It is appropriate that governments, such as the State of Alaska, support research and sponsor conferences like that held in Cambridge, UK, in September 1985. This book is one result of the symposium. The thoughtful reviews can be read with profit by students and scientists generally concerned with the environment. Many of the papers stray well beyond the confines of Polar pollution; there are reviews of low-level exposure to ionizing radiation, indoor pollution and source apportionment by trace element enrichment in aerosols, for example, that will stimulate and inform those with no particular interest in the Arctic at all.

Naturally, the important research using

ancient ice to establish long-term trends in atmospheric composition receives ample attention. Chapters on the climatic implications make it clear that much work needs to be done to understand the effects of Arctic haze and blackened snow on the radiation balance of the Earth. I was particularly fascinated by C. S. Benson's argument that the habitation haze of Fairbanks, Alaska, is a new type of urban air pollution, differing significantly from the smoke-fogs of London and the photochemical smogs of Los Angeles. While seemingly unable to show any significant effects in the Arctic, a number of papers on the health and ecological issues are excellent accounts of their subjects.

In the introduction, Professor Glenn Shaw advises us against being over-pessimistic about Arctic air pollution. However some authors still seemed to feel the need to make bold comments about the situation in their particular area of study. Statements such as "... only international cooperation and speedy resolution will lessen the social costs of Arctic haze" serve to confuse lay people and fuel the spectacular media stories that so frustrate scientists in Polar research.

However this disagreement with the mood of some of the reviews is very much a personal judgement. The book itself is a high-quality production, which feels good to hold and bears a striking grainy cover photograph. And it contains a remarkably good collection of articles. □

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