

## EDITORIAL

When this journal was first produced in January 1992, the intent was to publish scientific and technical papers that would have a direct benefit on the welfare of animals kept on farms, in laboratories, as companions, in zoos or as managed by man in the wild. The submitted *Articles* in this fourth part of the fourth volume certainly span man's use of animals and they also, I believe, demonstrate that the knowledge and understanding gained during technical studies can often be used to improve the well-being of the animals themselves.

There are three papers on farm animals. The first by Raj and Gregory is on the welfare implications of stunning pigs for slaughter with carbon dioxide and argon gas. It appears that pigs show aversion to a high (90%) concentration of carbon dioxide but not to an equivalently high concentration of argon; few pigs show aversion to low (30%) concentrations of CO<sub>2</sub>. There is much dispute over the humaneness (or otherwise) of CO<sub>2</sub> stunning in pigs, allowed in the UK as long as the CO<sub>2</sub> concentration is over 70 per cent. It seems that argon might be a much better 'stunning' gas in terms of animal welfare, but there would need to be a change in legislation before it could be used commercially. The study by Pollard and Littlejohn on the effects of lighting on confined farmed red deer in New Zealand suggests that stress during restraint is reduced by providing darkness. This is in conflict with the ideas recently put forward by some farmers that deer should be handled in good lighting conditions. The third farm animal paper is by Geers *et al* and is on the effect of prior human contact on heart rate in pigs (a measure of stress) during transportation. The results demonstrated how complex the human/pig/transport interaction was, but the authors still believe that increasing animal-man interaction during housing, may improve the coping capacity of the pigs when placed in a new environment eg transit.

Laboratory animals are represented by a paper by Reinhardt, Liss and Stevens on the social housing of previously single-caged macaques. This review-type article shows that it is both possible and desirable to house socially, previously isolated non-human primates. Juvenile animals can readily be transferred to permanent group-housing situations and safe pair-formation techniques have been developed for adult males and females. There is an improvement in the animals' behavioural health as their need for social interaction can now be satisfied, and this can usually be done without compromising their physical state.

A study by Skandakumar, Stodulski and Hau on salivary immunoglobulin A as a possible stress marker in dogs lies in the companion animal field. It was concluded that dogs under stress (undergoing selection and training for police/army use) had low levels of immunoglobulin A in their saliva, and that this non-invasive measurement could be a useful indicator of dog well-being. It appears that it is the first time this technique has been applied to animals.

The wild animal section is covered in two consecutive papers by Robertson and Harris on the behaviour, condition and survival after release of captive-reared fox cubs. It is concluded that, contrary to most people's predictions, captive-reared fox cubs face severe problems when released into the wild. The released animals in this study had a relatively low initial body-weight due to the stress associated with captive-rearing, they moved and behaved

in a markedly abnormal manner and their survival rate was low. It was concluded that they are not easy to rehabilitate to the wild. Finally there is a zoo paper by Powell on environmental enrichment techniques for captive African lions. The provision of enrichment devices (frozen balls of ice containing fish, or various scents, or hanging logs) resulted in positive changes in lion behaviour with an increased use of the space available to the animals.

There are several *Reports and Comments*, a number of signed *Book and Video Reviews*, a list of *Books Received* and a contributed *Letter* commenting on a report published in the previous issue of the Journal. There is also the *Index* for this volume.

I must finish the editorial to this fourth issue of the year by thanking the Section Editors, the Editorial Advisers, the many Referees, the Typesetter and especially the Editorial Assistant – Lesley Diver – for all the work put in over the year.

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Roger Ewbank  
Editor-in-Chief