CURRENT AND FUTURE RESEARCH ON AFRICAN MAMMALS

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(*Concluding Address by President, Z.S.S.A.*)

It would be presumptuous for a non-mammalogist like myself even to attempt a critical evaluation of the various papers that have been read at this symposium. All that I can venture to do, in broad outline, is to take stock of the present, to indicate the main advances that have been made in the various fields of mammalogy and to suggest to what end, and in which directions future research should be done.

Ever since man came into being he has lived in close association with his near relatives, the subhuman mammals. He was dependent on them, more than on any other group of animals, for a large, if not for the major portion of his food supply and it was their skins and furs that protected him against the rigours of the climate which he often had to endure. In the beginning, and for a fairly long time afterwards, this association was comparatively harmless, and primitive man was probably not directly responsible for the eradication of any species of mammal. But as man increased in numbers and slowly spread over the face of the earth, as he acquired the skills of toolmaking, trapping and hunting, he gradually, but inevitably, came into serious competition with certain other members of his class. For a variety of reasons of which palatability is an obvious one, but which might be purely incidental, the ungulates had to bear the brunt of man's hunger for meat. Owing to inefficient methods of hunting, large numbers of mammals, far in excess of man's food requirements, were slaughtered and are still being slaughtered. These facts are known so well that they need no further elaboration, but it is clear that the continued existence of many groups is being threatened. If man had not succeeded in domesticating certain mammals the effects on the life of the mammals of the world and those of Africa in particular would have been catastrophic indeed.

During the last couple of centuries the world's population has increased at an alarming rate and it will probably continue to do so for a long time to come. Although the universe is expanding, the planet earth is not, and as one species demands more living space for itself, the others must of necessity do with less. We all know that the larger game animals have all but disappeared from the southern tip of Africa, and as time goes on, as the standard of living rises in the other African states, ever bigger demands will be made on the available living space; and, unless something is done about it, the game animals in the central and northern parts of our continent might easily share the fate of those that once lived happily in what are now the thoroughfares of Cape Town. Man is a most demanding being, for in addition to mere living space in the restricted sense of the term, he needs large tracts of land for the practice of agriculture and for the development of industries. By the time man arrived on the scene habitats had already assumed their definitive characters and biocoenoses had become established. In order to carve out a niche for himself, man had no choice but to modify and destroy

habitats, to interfere with the balance of nature and to upset the biocoenotic equilibrium. This to my mind is the crux of the whole complex of problems with which we are concerned. In many cases man has benefited from this destruction of habitats and biocoenoses. It has given him the land he requires for agricultural and industrial development and has created conditions reasonably free from disease. In other cases, however, man lost out hopelessly, and, paradoxically, many of the smaller mammals have become his greatest adversaries. If we are to continue living in Africa and if we are to preserve our rich and varied mammalian fauna our most urgent and most important task is the preservation of habitats and biocoenoses in their existing form wherever possible, and the intelligent modification and regulation of others. It might even be necessary to establish new biocoenoses, if that is possible. But whether our aim is the perpetuation of biocoenoses in their present form, or in a modified form to make life more amenable to man and beast, we require an intensive knowledge of a variety of subjects.

An intimate knowledge of systematics and anatomy is, and I think will always remain, basic to all biological studies. The papers presented at this symposium have once again stressed the necessity for reliable and complete faunal lists and the efforts that are being made to standardise the methods of collecting the necessary data, and of presenting them in an unambiguous form are highly commendable. Many doubtful points have been clarified and significant advances have been made in our knowledge of the systematics of some of the groups of smaller mammals in particular, and at the same time the gaps still to be filled have been indicated.

There has been a tendency—and I say "has been", for I think it is rapidly disappearing—for those engaged in the more modern biological disciplines to look down upon systematists and to regard them as an obsolescent, if not obsolete, type of scientist. At the time when systematics consisted mainly of the compilation of faunal lists there might have been some justification for this attitude, but modern systematics is in an entirely different category. The modern systematist should not only be acquainted with the gross anatomy, the life histories and the behaviour patterns of the group he is studying, but he should also have an elementary knowledge of statistics in order to do his collecting in a scientific way; and he should, moreover, have a good understanding of the species concept and a fair knowledge of population genetics.

I would not dare to arrange the various subdivisions of mammalogy in order of merit and I have dealt with systematics and anatomy first merely because they are the oldest disciplines. The study of systematics is closely linked with that of zoogeography, or rather with that of biogeography, for unless the vegetational environment is taken into account the study of distribution patterns and of biocoenoses becomes all but meaningless. It is therefore gratifying to note that at this symposium, as well as at the previous one (The Causes and Problems of Animal Distribution, 1962), the authors who read papers on distribution patterns gave due weight to the importance of the physical and the biological environmental factors in the interpretation of their results.

We have had some interesting and important contributions in the section dealing with physiology and behaviour. The physiology of game animals is a difficult field of study and it is therefore important that we have had several papers dealing with techniques of capturing game animals either for the purpose of translocation or for the study of their physiology.

The perfection of these techniques will offer new possibilities for research which could be of the utmost importance.

The study of animal diseases *per se*, and in their relation to man, is so important that it requires no emphasis. However, much more should be done in this field. What we need, amongst other things, is a Pan-African survey of trace elements in the soil. It has been shown that there is a correlation between trace elements and the incidence of certain diseases in a given area. Information of this kind is urgently needed for the proper management of game ranches. Research in this, as in other fields, should be intensified if we wish to attain our ultimate goal of regulating biocoenoses to the mutual benefit of man and beast.

The regulation of biocoenoses presupposes an intimate knowledge of the relations of the animal to its physical and biological environment. It is obvious, therefore, that our research efforts should be concentrated on ecological studies. The ecology of game animals is still in its infancy and it will be no easy task to lift it out of the sphere of superficiality. It is an exacting science often requiring long periods of sustained observation besides presupposing a sound knowledge of the animal, its life history, its behaviour patterns, as well as of the host of environmental factors influencing its life. The essays on the ecology of game animals have on the one hand enlarged our knowledge and on the other hand they have heavily underscored the difficulties with which the ecologist will have to cope. I believe it is a fact that we have no clear picture of all the facets of the ecology of any single mammalian species. We are badly in need of a monograph on the ecology of a mammal.

If intensified research yields the results which will help us to regulate biocoenoses we should be able to do two things. Firstly, we should be able to perpetuate the existence of that part of our fauna which cannot be used to augment our food supply, but which is nevertheless important in a purely scientific and in an aesthetic sense. Secondly, we should be able to engage in game ranching. The experiments which have been done so far strongly indicate that game ranching could become an economic proposition. The attainment of these two objectives will not be easy, but they are vital steps towards the realisation of our ultimate goal, the preservation of the mammalian fauna of the African continent.

REFERENCE

The causes and problems of animal distribution, with special reference to Southern Africa, Zoological Society of Southern Africa Symposium, ed. T. H. Barry, B. I. Balinsky, M. K. Rowan. 1962. *Ann. Cape Provincial Museums*, 2: 1–317.