

widespread incidence of fire has a degrading effect which should be readily apparent, though usually ignored; the incalculable harm caused by overgrazing is rarely appreciated; and wild life if reasonably conserved can be profitably cropped.

Darling claims that as most of Northern Rhodesia's 287,640 square miles are unsuitable for domestic stock, the wild ungulates if properly farmed are of priceless value. The uncontrolled African exploitation of the "game" animals is a disaster. In the past thirty years there has been an appalling decrease in all Northern Rhodesia's wild animals, but it is not too late to apply the remedy. The author's "Conclusion" and "Recommendations" summarize the whole complex problem and its solution. Let us hope that those who are in a position to act will take heed of what has been written.

The book includes three maps showing respectively the author's itineraries, the human population and the Game Reserves and Controlled Areas. In an Appendix there is a valuable "Present-day status of ungulates in Northern Rhodesia".

C. R. S. P.

**ZULU JOURNAL: FIELD NOTES OF A NATURALIST IN SOUTH AFRICA.** By RAYMOND B. COWLES, University of California Press. 1959. \$6.

Raymond B. Cowles, Professor of Zoology in the University of California, was born in 1896, the son of pioneering missionaries stationed on the Amanzimtoti river in eastern Natal. Hunting and fishing, collecting and observing in the unspoilt wilds that were his home, and learning skills and bushcraft from his Zulu friends, the young naturalist had opportunities that others, less fortunate, may well envy. Everything fresh and new, curious and wonderful, made its deep impression on the boy's roving eye and receptive mind—an early contribution to knowledge, made at the age of ten, was his remarkable discovery that the Nile monitor lays its eggs in the nests of termites.

In the opening pages we read the account of a way of life that has now vanished. The author has twice returned to the scenes of his childhood, in 1925–1927, and in 1953: and his story, based on early memories and on notes from his field journals, includes not only a wealth of original observations on the country, its large game animals and lesser wild life, and on the characteristics, customs, fears and folklore of its human inhabitants, but also a revealing survey of the rapid and drastic

changes—environmental, ecological and social—which have taken place during half a century.

The author's lucid style reflects not only the objective approach of the scientific observer, but also sensitivity and poetic insight. And with a rare skill he captures the true atmosphere of the country. His observations on the large mammals embrace a wide range of topics: for example, the protective value of obliterative coloration in zebra and bush-buck, and in the black man himself; the movements of game across the boundaries of the Hluhluwe reserve; the hazards of close-range photography of black rhinoceros. He goes on to present a fund of information on the habits of smaller creatures. There is a graphic account of the nuptial flights of termites and of the gathering of birds of many species to feast upon the insect swarms in "a merry-go-round of gluttony." Equally revealing are his accounts of the interdependence of the rhinoceros and the tick birds which warn their short-sighted patron not only of the presence but, apparently, of the general direction of an intruder; of the relationships between termites and aardvark, whose nests and earths also fulfil varied ecological requirements of many other animals including warthogs, swallows, snakes, frogs and bees; of behavioural thermal control in lizards and mousebirds; and of the fruit-bat's toilet.

Professor Cowles has done well to compare the life as it was—far away and long ago—and as it is today. His careful observations, made over widely-spaced intervals of time, reveal progressive and accelerating changes in the habitat and its wild fauna, and decay in living standards on the native-reserve lands. The nature of these changes and the many and complex factors responsible for them (all of which are directly or indirectly linked with an exploding human population) are discussed in a final chapter which will be of special interest to readers of *Oryx*, and which could and should be studied with advantage by all students of African affairs.

The book is illustrated with decorative line drawings, and with a fine set of photographs, that range in subject matter from black rhinoceros to *Dasypeltis* the egg-eating snake, from a Zulu musician in traditional attire to hammerkop and hornbill. The quaint picture of monkeys warming themselves on railway lines is fascinating; and among the many pictorial records of scientific interest are studies of monitor's eggs in the termite nest that serves as their incubator; of the lizards emerging, newly-hatched; and of the *Breviceps* toad's inflated defensive display.

In all, the result is an informative and delightful volume,

which will be read with nostalgia by those familiar with this part of Africa, and which will long live to give genuine pleasure to a much wider public.

H. B. C.

**WILDLIFE CONSERVATION.** By IRA N. GABRIELSON. Second Edition. The Macmillan Company, New York. \$5.50.

Whether we like it or not, and some of us like it little, conservation of natural resources for the use of man, including conservation of wild life, has come to take the place of simple preservation. If we try merely to protect wild animals from man, we shall be beaten by the hard fact of spreading humanity and increasing populations. Moreover, if we are beaten in our task of nature conservation, then not only will wild animals disappear but plants, water, and soil will in many places be irreparably damaged. In this book, Dr. Gabrielson convincingly shows us that all are inextricably woven together into a beautiful pattern for the benefit of each. This unity is indeed his theme but he necessarily separates the constituents of conservation, dealing separately with soil, water, forests, grasslands, and wild life. Wild life again he sub-divides into game, other birds and mammals, fur animals, migratory birds, and vanishing species. Chapters are devoted to predator relationships, wildlife refuges and the obstacles to conservation.

The book is related entirely to America where Dr. Gabrielson was Director of the United States Fish and Wildlife Services until his retirement in 1946 to become President of the Wildlife Management Institute. So, though very conscious of the beauty of living things, Dr. Gabrielson is a practical man who deals with his subject in an unsentimental way, and wisely so—though I wish that in his chapter “Life of the Waters” he could have felt moved to condemn what to me seems abominable, the practice of poisoning all fish in a lake, so that they may be replaced by those game fish which the angler prefers.

In stressing the need for management of wild life even within sanctuaries, Dr. Gabrielson mentions the deer of the Kaibab which is the classic example of the destruction of a habitat through over-protection of herbivorous animals, but he might I think have pointed out that before Kaibab was made a reserve there was a Government campaign to destroy all carnivores, and in eighteen years 674 pumas, 3,000 coyotes and many wild cats were killed. No wonder the deer became unmanageable!

Dr. Gabrielson tells us that in the United States all state wild