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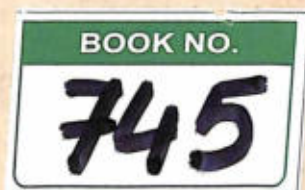
Between the Sunlight and the Thunder



Between the Sunlight and the Thunder

The Wild Life of Kenya

NOEL SIMON



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FOR CLAIRE AND VIVIENNE

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Foreword

THE CONTINENT OF AFRICA is in turmoil, and tragedy deepens. It is fashionable for western nations to persuade themselves that despite momentary "growing pains" inevitable when "the wind of change" is blowing, everything is set right for a bright future of "development." Such self-delusion by politicians, whatever their race, is plain irresponsibility, but surely most reprehensible in those of all parties sitting in the British Parliament, who are allowing a situation to slip out of control, even with the example of the *quondam* Belgian Congo before them.

Economic and cultural structures are falling, but these are not all. There is a tragic irony in the fact that when ecological understanding of the idiosyncrasies of the African terrain is growing, the possibility of enlightened land management is waning. Venture capital is leaving many parts of Africa, and I am doubtful whether the large sums of so-called development and rehabilitation capital coming in from altruistic international sources will as effectively take its place. Much of this money will have to learn the lessons of Africa all over again, a gruelling experience.

Meanwhile, the habitats of Africa will continue to suffer—forests, plains, the arid lands and the mountain slopes. How soon can it be realised that Africa has endured an accelerating pace of habitat destruction through wrong land usages during sixty years? How soon will it be realised that Africa is a poor continent, not the ripe plum of the developers, waiting to be plucked?

Habitats are the environments of animals, their home places, each to its kind. If the habitats deteriorate their carrying capacity for animals is reduced. In other words, wealth is

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squandered. But the animals have not met this hazard alone; they have been hunted and slaughtered to danger point for survival. No race is free from this stigma of wasting the animate resources of Africa, but more blame rests with the European peoples, the British not least. It is almost inconceivable that in Kenya within the last twelve years official sanction should have been given for the slaughter of a thousand rhinoceros for a settlement scheme which has pushed another large area of good bush towards aridity.

Within the European peoples in Africa there have always been individuals and small groups who have deplored the wastage and the killing. They have spoken and written from the heart and given of their time, money and convenience to make operative some policy of conservation. They spoke from the heart, I say, knowing right from wrong, but they lacked the scientific knowledge which could have given good practical reasons for their way of thought. That scientific knowledge is now being gained when it is almost too late, but in this field of conservation there is now a much brighter outlook for co-operation between the races.

The Arusha Conference of 1961 was a phenomenon. Black and white sat down together, accepting what science could offer to conservation in Africa. There had been nothing like it before. The statement of policy and faith from the Tanganyika Government, now known as the Arusha Manifesto, was brave and fine, more understanding of the place of habitat and wild-life conservation in government than had previously come out of Africa.

This small minority of Europeans and Africans who have worked so unselfishly for the welfare of the African terrain has included Noel Simon. His conviction, backed by his powers of organisation, has resulted in the growth of the Kenya Wild Life Society which has now become, very properly, the East African Wild Life Society. His capacity to get things done is subtle: for example, the establishment of the Nature Reserve of 105,000 acres in the Mau Forest, a fact which has passed almost unnoticed.

This book of Noel Simon's is an important piece of historical research which needed to be done, and it is a plain vector of the

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newer ideas in conservation. Those of us who know him and cherish his friendship are proud that he could communicate these ideas so admirably in the sterner discipline of a book.

F. Fraser Darling

The Conservation Foundation, New York

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Preface



THIS BOOK is designed as essential background material for the large and constantly increasing number of people who, in recent years, have become interested in the fauna of East Africa and who wish to be better informed of the causes of the present situation and the problems involved in conserving wild life in Africa to-day. For this reason I have tried to avoid burdening the book with technicalities.

In order to give the book as wide an appeal as possible, I have deliberately departed from normal practice in presenting the subject. References, for example, are not always given in the text, but great care has been taken to ensure that statements are historically, technically and factually authentic. Wherever possible scientific names have been excluded from the body of the text and have been relegated to a glossary at the end of the book. Exceptions to this rule have been made only where no common name exists, as for many of the plants and shrubs, or where the absence of the scientific name might cause uncertainty or confusion.

The spelling of proper names in the vernacular is subject to a wide degree of variation. The system adopted here has been to use the most generally accepted form, except when quoting from early records, when the original spelling has been retained. Over the years a number of words from Swahili and the various tribal languages have been brought into everyday use in East Africa and are used in preference to the English equivalent. This practice has been followed throughout the book. Vernacular words appear in italics but anglicised words, such as *moran*, *Laibon*, *boma*, etc., have not been italicised.

It is necessary to mention briefly that in the Swahili language the prefix alters from singular to plural, not the suffix as in

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English. Thus, for example, Ndorobo in the singular becomes Wandorobo in the plural, and I have adhered to this practice wherever tribal names are used, except when they have become anglicised.

A further language difficulty, which still remains unresolved, confronts anyone writing about the fauna of Africa: the question of the correct plural for many of the indigenous animals. Sir Charles Eliot was not alone in being tormented by the problem of finding a plural for rhinoceros. "The conversational abbreviations 'rhino,' 'rhinos,' seem beneath the dignity of literature, and to use the sporting idiom by which the singular is always put for the plural, is merely to avoid the difficulty . . . but whatever the plural of rhinoceros may be, most people are quite satisfied with meeting only one of them." This is almost as neat a way of side-stepping the issue as the method adopted by the Oxford professor who contented himself with the cryptic marginal annotation, "Hippopotamus is not declined like ignoramus." I have felt compelled to shelter behind Eliot's "conversational abbreviations." This may be beneath the dignity of literature, but possesses the advantage of being the form most generally used in East Africa and is, therefore, more in keeping with the book's environment.

The story of the inter-relationship of human beings, wild animals, land, vegetation and water is such a huge and complex subject that there is a risk of becoming so submerged in detail that one may finish up with nothing but generalities. As I have attempted to outline the whole picture, I have adopted an organisation which separates the various components—land, wild life, historical events, and so on. The book is divided into six parts and is presented in a way that a person not acquainted with the country can follow: a web of many differing strands which I have tried to weave into a coherent whole. Gaps in the narrative are unavoidable when covering such a wide range of subject matter, but I have tried to bridge them sufficiently to enable the reader to cross from one section to another without losing the way.

Part I is intended as a broad back-cloth to the present-day position. It assesses the reasons why the wild life situation has deteriorated, in some regions more than in others, and describes

the measures taken by some of the early administrators and naturalists to safeguard at least representative samples of wild populations for posterity. The man/land relationship is the most weighty element influencing the African fauna and a proper consideration of this factor is essential to an appreciation of the present position.

Part II examines the history and current status of some of the most important faunal regions in Kenya. These are in effect areal studies of three places which hold, or have held, dominant positions in the story of conservation in Kenya.

Part III concentrates on setting forth some of the most conspicuous problems facing the conservationist in Kenya to-day. The widespread use of arrow poison and extensive illegal hunting are major contributory factors in the spectacular decline of wild fauna. Of equal significance is the failure to appreciate the multiple values of the wild life resource.

The status of individual species to-day, relative to the position before the days of European influence, is considered in Part IV. There are approximately 57 major mammalian species in Kenya. This figure does not include the lesser mammals or the numerous sub-species. It has not been easy to decide which to include and which to omit. I have, therefore, confined the list to those species which, in present circumstances, appear to me to be especially significant and whose future it is particularly important to safeguard in any long-term conservation planning. This admittedly arbitrary selection excludes duiker, reed buck, bush buck, dikdik, wart hog, bush pig and many other species. Not only are they of less immediate importance to the main conservation structure than the more gregarious animals, but many of them appear to have adapted themselves successfully to the hazardous conditions prevailing on the fringes of the settled areas and are not, therefore, in the same category as some of the species listed. I must, however, stress that exclusion of a particular species from this short list does not imply that it is of no importance or interest.

For simplicity I have as far as possible avoided mentioning sub-specific forms but, in certain instances, such as when discussing the hartebeests and Grant's gazelles, it has been necessary to include the sub-species to ensure clarity. The

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spotted and the striped hyaenas, which are two entirely separate genera, have been bulked together solely for convenience and to avoid duplication.

Parts v and vi consider the question of the future of wild life in Kenya. Ways in which the serious numerical decline can be arrested are discussed and suggestions made for positive measures which, if adopted, would go some way to ensure the survival of the territory's wild life under prevailing conditions.

It only remains to give a word of explanation concerning the diverse currencies mentioned in the book. The Maria Theresa dollar, sometimes called the "German Crown", was used throughout the Middle East from the Persian Gulf to Northern Nigeria for more than 150 years. Even as recently as 1940-41, Maria Theresa dollars to the value of £3 million were minted in England and sent to Abyssinia. In 1949, a further 500,000 were struck to the order of a British banking house. In 1952, the Maria Theresa dollar was still in circulation in the Red Sea basin, the Persian Gulf, Arabia, Abyssinia, the Sudan and Zanzibar. It may seem strange that the Austro/Hungarian Empire, which had no overseas possessions, should have issued coinage for this region. The explanation is that in the reign of the Empress Maria Theresa (1717-1780) an Indian trading company was founded in Trieste and introduced the then current coinage into the East. The *Kolonialblatt* of 1st July, 1896, noted that "as a proof of the conservatism of the Orientals, the coins are not accepted unless stamped with the date 1780." Even after the rupee had become the official currency of Zanzibar, calculations continued to be made in the Levantine coin. The reason was that the Maria Theresa dollar was made of almost pure silver (833 fine), whereas the rupee and other local currencies were of a higher face value than their true silver worth.

In 1888, the Imperial British East Africa Company introduced its own coinage—rupees and pice—into East Africa. Seven years later, following the declaration of the East Africa Protectorate, the Government adopted the Indian rupee as the Protectorate's monetary unit. The Currency Order-in-

Council, 1905, established 15 rupees as equivalent legal tender to one golden sovereign, thus fixing the value of the rupee at 1s. 4d. in terms of sterling. In 1920, the ruinous exchange settlement¹ replaced the rupee with the florin, thereby moving the currency to a sterling basis. The shilling, in turn, superseded the florin in 1921, since when it has remained the official currency of East Africa. In summary, the pound sterling is equivalent to $4\frac{1}{4}$ — $4\frac{1}{2}$ Maria Theresa dollars, 15 rupees, 10 florins or 20 shillings.

¹ A detailed account of this disastrous transaction is given in Elspeth Huxley's *White Man's Country*. (Vol. II, pp. 71-81.)

PART ONE

The Background



I. Introduction

“SO YOU’RE FROM EAST AFRICA?”

The negro chauffeur nosed the big Cadillac into the main stream of traffic and accelerated on to one of the broad highways leading out of Los Angeles. My host had thoughtfully sent his car to meet me and, after the long journey, it was pleasant to sit back in such unaccustomed comfort. The conversation was disjointed as I watched, rather anxiously, the unending stream of cars surge forward at breakneck speed.

“D’ye have any coloured folks out there?”

For a moment I wasn’t quite certain how to regard this remark, but a glance at my companion indicated that it was intended in all seriousness; so I replied—somewhat cautiously I admit—that, yes, there were a fair number of coloured folk in Kenya, in fact they tended to outnumber the likes of me by about a hundred to one. There was a lengthy pause while this piece of intelligence was assimilated. Then . . .

“Say, where ’n away did all those coloured folks come from? America?”

This entirely refreshing incident served to emphasise as never before the almost uncanny aura of prejudice and ignorance concerning East Africa; but was certainly no worse a *gaffe* than when, on my first day in the New World, I unthinkingly addressed the negro waiter in Swahili. The look of undisguised astonishment on his face had to be seen to be appreciated.

Such lamentable ignorance of Kenya is even more apposite when related to Kenya’s wild fauna. Times without number visitors to East Africa have expressed surprise and alarm at the rapid deterioration in the wild life situation. “If only we had

known . . ." "Can nothing be done to stop the rot?" "Is there anything we can do to help?"

There is no doubt that the fauna of East Africa can only hope to survive through the influence of world public opinion. But it is expecting altogether too much for public opinion to be effective unless the true facts are known as widely as possible and more fully understood.

This, then, is the objective of the book—to attempt to describe and demonstrate some of the reasons for the decline in wild life populations; to give a broad indication of what remains of Kenya's once prolific fauna, and to suggest possible means by which the remnants of the great herds can be retained for the benefit and enjoyment of future generations.

Only since I commenced this work have I come to realise why it has not been attempted before. There is an abundance of literature relating to the early days of the Protectorate, but the majority of the books of that period were written by individuals who either wrote in general terms or who, understandably, were primarily concerned with describing their skill with a rifle and the record bags they obtained. Very few indeed could be classified as naturalists and, even if they had been, they would have had difficulty in providing the type of information needed by ecologists to-day. By what means, for instance, could any of them have gauged the total number of any species? Everywhere they looked were uncountable numbers of wild animals in immense herds, "far surpassing legend," which entirely dominated the landscape, "surging back and forth across the Continent like a dark tide." There is no lack of information on distribution, but precious little on population densities, except in rare cases, and the few examples that exist serve to emphasise the overall deficiency. This is hardly surprising, because even with the aid of aircraft and modern census techniques, serious attempts at accurate numerical assessments of wild population in defined areas were not commenced in East Africa until as recently as 1954.

It might be thought that official documents would provide the required information, but a disastrous fire in the Kenya Secretariat during the last war destroyed many of the early

official records. In any event, it is doubtful whether they would have contained the information we seek.

The number of individuals who can recall the early days of the East Africa Protectorate is few indeed. Only those who actually witnessed the great concourse of wild life in those bygone days could tell the real story and bear witness to the almost incredible truth. No doubt the arrays of wild animals, at first so breathtaking, soon became commonplace, so that those who lived in constant contact with them ceased to regard them as anything out of the ordinary. The sight of the huge herds was perhaps such an everyday occurrence that they were merely accepted as part of one's life and, like any other familiar episode, hardly seemed worthy of committing to writing. Unusual hunting episodes were in a different category. An enthralling tale of the chase or stalk; the rigours of foot safaris and of going after big game with weapons less efficient and less reliable than modern firearms, were events out of the ordinary, interesting and exciting, and therefore worthy of record.

Part of the traditional struggle of the pioneer in opening up any new country has always been directed against the wild places and wild animals with which he found himself in conflict. It is not, therefore, altogether surprising that the act of fighting and eventually triumphing over Nature and the elements came to be chronicled in preference to the less spectacular achievements of recording numbers of animals and details of their lives.

The breed of watcher had not evolved at that time, and would probably have been frowned on as slightly odd, if not downright eccentric. Big game represented a challenge, and a person was judged by the size and variety of the heads mounted on his wall and the tales he was able to tell. Any other consideration was slightly beyond the pale. This attitude may account for the fact that although many books were written about hunting and safari life, with lavish details of all the hazards of the wilds, few records were made that would be of value to modern naturalists.

Those who have not been privileged to see Africa's multitudes of wild animals in all their former grandeur have diffi-

culty in visualising how East Africa must have appeared half a century ago. A person whose previous experience has been limited to seeing a handful of animals behind bars will naturally be impressed by his first glimpse of half a dozen giraffes or a pride of lions in the Nairobi National Park, and may wonder why the conservationists are fussing. To his fresh eye this may represent abundance, whereas to the man on the spot it is quite the reverse. Similarly, when delving into the records of early naturalists such as Jackson and Percival, it is necessary to bear in mind that what strikes our generation as a wealth of wild life would have appeared comparatively insignificant to them. Clearly numbers are relative, but of one thing we can be sure; when Percival spoke of large numbers of animals, the figure must indeed have been immense by present-day standards.

My own knowledge of East Africa goes back only to 1942, when my squadron had the good fortune to be stranded in Kenya for a few brief weeks, so I cannot write from personal experience about the situation before the war. Even at that time, in the Rift Valley, for example, there were literally thousands of Thomson's and Grant's gazelles, kongoni and zebra, to name but four of the more common species. During the course of a drive from Kijabe to Nakuru the great herds occupying the floor of the Rift were rarely out of sight. It was the same when one drove across the Kinangop. Five years later, when I returned to live in Kenya, they had almost entirely vanished, and a glimpse of an occasional giraffe or ostrich, a tiny herd of Thomson's gazelles, or perhaps a distant view of a few zebra was sufficient to excite comment. Five years sufficed to almost eliminate the Rift Valley fauna. All across the length and breadth of East Africa the same story could be told. "Useless" wild animals were being exterminated to make way for Progress and Development. It is doubtful whether more than a handful of people even paused to consider whether such headlong destruction was in the real interests of Kenya. The one exceptional asset that the country possessed in greater abundance and greater variety than any other country in the world was being needlessly squandered in the mistaken name of Progress. All too often development involves the elimination of the indigenous and its replacement

by something exotic, to conform to preconceived and alien standards. In the process, much that is valuable and irreplaceable is sacrificed at the altar of Development.

In these days, when it is so fashionable to decry colonialism, the British in Kenya—both administrators and settlers—can look back with pride on sixty years of achievement. A few thousand Europeans have created by their devotion and patience a thriving and prosperous country out of the wilderness. The same cannot be said regarding our attitude towards Kenya's unique heritage of wild life. This may be because of the erroneous, but widely held, view that wild animals are attractive but otherwise of no account. The aesthetic, cultural and economic values of wild life and wild lands are, even now, scarcely appreciated.

We British have long prided ourselves in our attitude towards dumb creatures, but I wonder how many of the people who participated in the protest march through the streets of London, when Laika was rocketed into space in 1957, realised that each year about 150,000 wild animals suffer an unpleasant death in traps, snares and pitfalls in and around the Serengeti National Park *alone?*

In the words of Professor Baer, "Future generations may castigate 20th century man who, in the 1960's, was too pre-occupied in reaching for the moon to bother about saving one of the richest and most precious inheritances of his earth."

2. Basic Essentials

THE FUNDAMENTAL PROBLEM facing the conservationist in East Africa at the present time results from a rapidly expanding human population. The indigenous population of Kenya has more than doubled since the 1890's, and it is estimated that it will double itself again within the next twenty years.

Coupled with this is the fact that every African regards a plot of land as part of his birthright. The result is that the African population is now moving into land which was previously unoccupied by humans, and settlement schemes are spreading at an ever quickening pace into places which, until recently, were occupied only by wild animals. This process has led to the destruction of large numbers of wild animals and the constriction of the remainder into fewer and smaller areas.

The concept of *individual* ownership of most commodities, including land, is foreign to the African; communal or tribal ownership has been the accepted order of things since time immemorial. In Kenya it is only during the last few years, since the commencement of the Swynnerton Plan, designed to consolidate the widely scattered small-holdings into economic agricultural units with individual title, that long-established tribal land practices have begun to be modified.

The deeply ingrained concept of communal ownership applies to wild life as much as anything else. In the opinion of the African in the bush every wild animal is regarded as Nature's bounty, fortuitously placed on the good earth for the use of the tribe; a convenient source of free meat provided by a benevolent Deity. One of the innate characteristics of the bush African is a disinclination to make provision for the future. It is enough to think of to-day. The notion of conserving the

creatures of the wilds to ensure their continuance into the future is alien to the African. This attitude is well summarised by Elspeth Huxley. Her remarks are equally apt when applied to wild life. "Africans in the tribal state never, so far as I know, plant the seed of trees. For trees are something put there by God; they are His business, not ours; if they vanish, that is His affair; there is plenty of bush for shade and firewood, and of what other use is a tree? As to the notion that, in twenty years' time, trees can be sold for money, that is all too remote and problematical. In twenty years we shall be old, perhaps fire will have destroyed the trees, and why should we work to help a future generation? Rather it is their task to help us when we are old."

It should also be remembered that the present day African is anxious to be regarded as a civilised being and many of the more sophisticated Africans consider it essential to cut right adrift from the primitive past. Therefore, to their way of thinking, it logically follows that wild animals should be eliminated along with other relics associated with the past. This attitude can be countered only by demonstrating that national parks and similar sanctuaries are maintained in all the most civilised countries and are, in fact, regarded as a hallmark of civilisation.

A combination of these factors has led to a situation whereby constantly increasing pressure on the land has resulted in the great herds of wild animals being drastically reduced or, in some instances, entirely eliminated. This in turn has led to greater intensity of predation by Africans on the few herds remaining. The smaller the number of wild animals remaining in a given area, the greater is the effort made by tribesmen to hunt what remains before others succeed in doing so. It does not require much imagination to visualise the fate of Kenya's wild fauna outside established national parks and other preserves unless some system of proper conservation which is acceptable to the African can be devised and implemented before it is too late.

This is not as simple as it may sound. Prejudices and suspicions of long standing must first be allayed, and the African must be enabled to see for himself the material advantages to

be derived from realistic conservation of the wild life resource. Indirect benefits, such as revenue accruing to the territory through the tourist industry, while impressive to a European, will clearly not appeal to more than a small number of Africans, and certainly not to those living in the remote bush and still largely unaffected by contact with civilisation.

It is equally unrewarding to explain that wild animals are the country's biggest potential revenue earner or to talk of wild fauna as a cultural or aesthetic heritage, for the average African has little idea of even the most elementary principles of economics, beyond the desire for immediate needs, and he suspects that such talk merely camouflages a plan to deprive him of his birthright. The primitive bush African must be approached with the kind of scheme that will directly give him a fuller belly and more money in his pocket.

It was with this in mind that schemes were proposed for game management among the Waliangulu and for setting up Masai-owned parks or game reserves. Both these pilot projects were specifically designed for African participation, and to serve tribal interests by conserving wild life for their own material improvement. The Waliangulu Scheme, now called the Galana River Game Management Scheme, has recently begun operations through the generosity of the Nuffield Foundation, who donated £10,000 for the purpose. Similarly, the Kenya Government showed faith in the Masai park proposal by offering the Masai an annual subsidy in return for retaining the *status quo* in the Mara, a region which, owing to the prevalence of tsetse fly, the Masai could not use for their cattle. The Masai, fearing there was an ulterior motive, rejected the proposal but, as will be shown in a later chapter, have more recently reconsidered their decision.

The Meru tribe, however, took a positive step and East Africa's first African owned and controlled wild life sanctuary has been proclaimed on the foothills of Mount Kenya. The tribal authorities have appointed a European warden to administer the reserve, and it is to be hoped that the establishment of this African District Council Game Reserve will lead to other tribes following the commendable example set by the Meru people.

No country which has to base its economy exclusively on agriculture can hope to achieve a reasonably high standard of living without a large measure of external aid, and Kenya, unlike some of its neighbours, has not so far succeeded in locating mineral deposits or other sources of wealth. In view of this, it seems paradoxical that the potential wealth of the country's wild fauna has been so neglected. For Kenya's wild animals and open spaces, both in increasingly short supply in most other parts of the world, constitute her greatest natural asset, as a tourist attraction, particularly now that Africa is only a two-day flight from America and a mere twelve hours from Europe.

But if the wild animals were eliminated and replaced with domestic livestock, as is happening in so many parts of Africa, it would be only a matter of time before the naked landscape itself lost its attraction for visitors. It is unlikely that tourists seeking solitude and beauty would continue to be interested in a country where the beauty of the pristine had given way to a haggard landscape, scarred by erosion and populated by hordes of scrawny, scrub cattle, sheep and goats.

The great majority of the indigenous peoples of East Africa suffers from a deficiency of protein. The huge herds of domestic livestock, which dominate the scene in almost all the Native Land Units, might at first give the impression that the protein shortage is apocryphal. However, in this part of Africa domestic animals are not kept primarily for food but rather as a source of wealth and prestige. This has led to gross overstocking and consequent land devastation, almost invariably followed by demands that the wild animals should be eliminated because they are devouring grazing which should be consumed by domestic stock.

Fifty years ago the Administration and the Veterinary Department estimated the total number of cattle possessed by all the Kenya tribes at barely $\frac{3}{4}$ million. To-day the cattle total more than $6\frac{1}{2}$ million. Sheep and goats have shown an even more pronounced increase, but the African pastoralist would no more consider his land overstocked than a normal European could ever conceive his bank account overstocked. On the contrary, the more that can be crammed into it the

better. The European often finds it incomprehensible that the African does not concern himself more with quality and less with quantity, but numbers are paramount; quality is some peculiar foreign idiosyncrasy and, therefore, to be discouraged. Does a European bother unduly if his bank notes are somewhat tattered or disreputable? A new note has no greater value than one that has been in circulation for some time. It's not the appearance of the thing that counts but the number of units. The African looks at his livestock from precisely the same point of view and, until such time as he adjusts his standards and goes over to a money economy, it will not be possible to persuade him to alter his ways.

There are still a few remote places in northern Kenya where the only acceptable coinage is the Maria Theresa dollar which, when threaded on a string, makes a most handsome necklace or similar adornment. Coins and notes are so easily lost or burnt and such cumbersome things to carry around; nor do they increase nearly so prolifically as cattle, goats or camels. In any event, is there any necessity of life in the wilds of the Northern Frontier Province which cannot be acquired through barter? Honour and pride, camels and water, these are the things that count. As for money, it is far more satisfying to watch one's wealth walking around on four legs, and be able to admire it whenever one feels inclined. Livestock provide most of the needs of the pastoralists: milk and, on special occasions, meat; hides and skins for clothing and mats; sinews for weapons, thongs and harness; wealth with which to pay the bride price; and, above all else, a *raison d'être* for existence, a focal point for tribal activities, without which life itself would be largely devoid of meaning and therefore intolerable.

Thus the question of overstocking in native areas is one of the thorniest in East Africa, particularly as the most interesting areas, faunally speaking, are, with few exceptions, in those regions most likely to suffer from overstocking. It is simple to talk of remedying the situation by destocking, but a Government inspired and enforced destocking policy would be about as popular with the pastoralists as would the introduction of capital levy in Great Britain.

The problem of overstocking is of recent origin. Before the

advent of Pax Britannica, any tendency towards overstocking was promptly remedied by Nature through a visitation of a variety of diseases which quickly restored the situation by reducing the numbers of domestic animals to within the carrying capacity of the land. An extremely efficient Veterinary Service has changed all that through subjugating one of the great scourges of Africa—uncontrolled disease. It is tragic and ironical that, through their very competence, the Department of Veterinary Services has helped to unleash an even bigger menace—large scale devastation through gross overstocking. The blame, however, lies not with the Veterinary Department but with the Government for not having adopted compulsory destocking measures in the long-term interests of the pastoralists themselves. Governmental reluctance can be appreciated for the reasons already given, yet it is clear that to avoid the issue by turning a blind eye to awkward facts is merely going to lessen the chances of ever finding an equitable solution.

It is depressing to realise that in the opinion of the pastoral African, scrub cattle, sheep and goats represent wealth, while the exquisite antelopes and gazelles are frequently execrated because they are thought to compete for grazing with domestic animals. There is a further reason why certain tribes, particularly the Masai, do not look with favour on wild animals. They consider that European interests, notably the National Park Authorities, are casting envious eyes in the direction of the tribal lands in order to obtain control over the wild animals which abound. The Masai realise that there is no question of Europeans acquiring tribal land for its own sake, but at the same time they are afraid that in the process of extending adequate protection to wild life the tribe might be required to relinquish control over some of its land. The simplest solution in their view would be to eliminate the wild animals, so that nothing remained for Europeans to covet.

If carried to its ultimate conclusion, this attitude of mind would have the dual result of causing extermination of wild life and of introducing widespread devastation of the soil and its vegetative cover, culminating in the spread of desert into areas of which some are only a few steps removed from barren wastes even now.

If wild life is to survive it is necessary to convince the African that wild animals are of at least as much value to him as his domestic animals. But it is easier to state the policy than to translate it into action. The only approach that can possibly succeed is one which takes into account the legitimate needs and aspirations of the African, and gives him a better or more attractive return than he achieves through his existing economy. However conservative Africans may be, they are not slow to adopt new ideas which are directly beneficial to them.

3. Initial Endeavours

AS EARLY AS 1894, Sir Harry Johnston had expressed concern at the decline in the numbers of wild animals during the previous decade, and his belief that special measures would be necessary to safeguard certain species. "It would be melancholy to think that such glorious creatures as the eland, the kudu, the sable antelope and the zebra were passing into extinction when they might be saved and perpetuated by our making a little effort in the right direction."

The formal declaration of the East Africa Protectorate was made on June 15th, 1895, yet, less than a year later, voices were already being raised at the excessive destruction of wild life. Johnston's predictions were evidently justified. The earliest official correspondence that it has been possible to trace on this subject appears in the form of a letter from the Marquess of Salisbury—then Foreign Secretary—dated 27th May, 1896, and addressed to Mr. A. Harding and Mr. Berkeley, Commissioners in the East Africa Protectorate and Uganda respectively.

My attention has recently been called to the excessive destruction, by travellers and others in East Africa, of the larger wild animals generally known as "big game." There is reason to fear that unless some check is imposed upon the indiscriminate slaughter of these animals, they will, in the course of a few years, disappear from the British Protectorate.

I am not aware how far the enclosed Regulations¹ for sporting licences, issued by the Imperial British East Africa Company have ever been applied, and it is

¹ The Regulations mentioned in this letter, and issued by IBEA under the title "Sporting Licences," are included in Appendix A.

obviously difficult to ensure the observance by parties inland of regulations affecting the killing of game. It is eminently desirable, however, that some steps should be taken, and I have, therefore, to request that you will furnish me with a report on the subject. It will be for your consideration whether it would be advisable to deal with the question to some extent by establishing a close time, by specifying reserved districts, and by limiting the number of any particular class of game to be shot by an individual sportsman.

In any case a regulation should be issued, if not already in force, requiring persons, intending to shoot big game for sporting purposes, to take out a licence, the fee for which should be sufficiently high to serve as a check. In British Central Africa the cost of a licence is £25.

The Germans had also issued a set of regulations for the protection of game, but prior to 1896 these had applied "for the Moschi district (Kilimandjaro) alone." They were extended to include the whole of German East Africa by notice in the *Kolonialblatt* dated 15th June, 1896, issued by Major von Wissmann, the Imperial Commissioner who, in a circular to district authorities, observed that the regulations might be difficult to enforce with the natives, although he drew attention to the fact that at Moshi the natives were "cheerfully paying 500 rupees for permission to hunt elephants."

Von Wissmann agreed that the new regulations would "diminish existing sporting rights" but considered that sportsmen had a duty to think of succeeding generations. He was already thinking of forming game sanctuaries which would be of especial interest to science, as well as a means of saving the rarer species from extinction. In inviting local officials to indicate regions suitable for game reserves, the German Government issued instructions for the immediate establishment of two sanctuaries. The first was "bounded on the north by the Rubehobebo country, on the west by the ascent to the Khutu Plateau, on the south by the River Rufiyi as far as Mtemese, and on the east by a line including the Steppe Lakes as far as Mserakera."

The second reserve constituted "the district lying to the

west of Kilimandjaro Mountains as far south as the Meru Mountains, west through the Ololboro and Matiom Hills, and north through the Anglo-German frontier." These were East Africa's first official game reserves.

The Imperial Commissioner also made the suggestion that attempts should be made to domesticate "zebras, especially when crossed with Muscat and other asses or horses, ostriches, hyaena-dogs when crossed with European sporting dogs, and 'gepard's' (sporting leopards)." Mr. Sharpe, the acting Commissioner, British Central Africa Protectorate, writing from Zomba, stated that efforts had already been made to domesticate zebra but, in spite of offering a reward of £100 to anyone who succeeded, there had thus far been no claimants.

The German law differed from any previously enacted in East Africa in that it provided for (a) the creation of defined preserves or sanctuaries, and (b) the special, though not necessarily absolute, protection of certain species. But in commenting on the German regulations, the British Colonial Office noted that no specific proposals were made for the provision of "game keepers," and observed that without them "it is doubtful whether any large game preserve would be safe from poachers unless very special protection were given to it." The Colonial Office also considered that "even in the game reserves it would be necessary to permit the shooting of carnivorous animals, otherwise the antelope, etc., would merely be preserved for the benefit of the lions and tigers." (*sic*) The author of this paper was evidently puzzled because although secretary birds were afforded special protection because they killed snakes, "wild pigs are able to kill snakes and it is not clear why these animals may be shot without licence."

The Colonial Office considered the worst enemies of wild animals to be: "(1) the skin hunters, who seek and kill game solely for their skins, leaving the carcasses, when skinned, to the vultures; (2) the natives who cannot be made to understand the advantages of a closed season; (3) the wanton sportsmen, who shoot females and who kill large numbers of males on the chance of securing a single good specimen head." The recommendation was, therefore, made that all permits

should be for a specified number of "large game" which were to be defined in the permit. Finally, the Colonial Office made a most penetrating and far-sighted observation: that "the native chiefs should also be given a pecuniary interest in the preservation of game as well as in the enforcement of the game laws." If this recommendation had been accepted and implemented, the situation to-day might well give less cause for concern.

Many of the British officials living in tropical Africa at that time deplored the wholesale killing, particularly of elephants, which were the principal target of hunters, but it was thought that the creation of sanctuaries would not alleviate the problem to any extent, owing to the great difficulty and expense of controlling illegal activities in remote regions. There was, however, general agreement that in exceptional circumstances small sanctuaries for specific purposes might prove a practical proposition, even though they would have little effect on the broader question of the elimination of wild life in tropical Africa.

There was another consideration. Because many East African species migrated over large distances, it was important for all the territories to agree on a common game policy, or there was a possibility that certain species might be endangered. Elephants, for instance, wandered between German and British East Africa during the course of their annual migratory movements. Similar examples could be given concerning the Uganda/German border and the Uganda/Congo border. Preventing their destruction in one district or territory would not necessarily be adequate unless neighbouring territories also accorded them proper protection.

In the conditions prevailing at that time, sanctuaries were thought to be impracticable and the opinion was expressed that because elephants were to be found, and were being slaughtered, throughout Africa, the mere setting aside of a few isolated reserves, however extensive in themselves, and even if they could be effectively administered, would not do more than touch the fringe of the problem. Perhaps not unreasonably, it was suggested that the best hope for long-term preservation of wild animals lay in regions such as the Congo forests, which

could be regarded as vast natural sanctuaries, well able to give adequate protection to large numbers of animals. Declaring a sanctuary on paper, without the expenditure of considerable sums of money in looking after it, would be useless, or worse than useless, because it would give an entirely false impression that the fauna was being effectively preserved. Furthermore, it was recognised that in certain areas Nature provided her own close season because, for several months of each year, parts of the country were rendered almost impassable owing to the heavy rains making foot travel exceptionally difficult. Nature also imposed a close season when hunting became very difficult with the growth of dense, high grass. During this period the young animals were born and attained sufficient growth and strength to enable them to follow their parents. For these reasons some administrators thought that there was no necessity to establish reserves: Nature would safeguard her own. On the other hand, the reverse applied during the dry season, especially after the grass had been burnt. There was then little protective cover for the wild animals and large numbers were killed at that time of the year.

The general consensus of opinion was that elephants would be exterminated in most parts of Africa within a relatively few years except in those areas which were naturally difficult of access. Although there was a number of professional ivory hunters operating in Central Africa, it was quite erroneous to attribute the heavy reduction in the herds to them. The tally of elephants they shot was "trifling compared with the vast numbers which are constantly being mobbed and followed and killed by natives."

Major von Wissmann held the opposite opinion, and cited examples of Europeans on the Congo River steamers firing in the most wanton manner at almost anything that moved, with neither prospect nor intention of possessing any animal thus killed. Moreover he did not agree that it was impracticable to set aside game sanctuaries. He appreciated the great difficulty of "preventing infraction of the game reserves by natives," but he did not consider that to be an adequate reason for shelving the idea. He emphasised his argument by explaining that in 1887, when he made his third journey to the Upper

Congo (Lualaba), he was unable to persuade the natives to show him fresh elephant tracks. The reason was that this region was under the firm control of the slave-trader, Tippu Tib, who effectively controlled the shooting of elephants by the local tribesmen through imposing conditions whereby half the ivory had to be surrendered to him. Von Wissmann therefore concluded that it would be perfectly feasible to regulate the slaughter of elephants very effectively through the simple expedient of making the tribe, through its chief, responsible for prevention of hunting by any outsider. He thought that the tribe should be compensated by some special privilege or, alternatively, that only a selected and strictly limited number of men of the tribe concerned should be authorised to undertake controlled cropping of the elephant herds. Von Wissmann's ideas were considerably in advance of the times so, unfortunately, nothing came of this fertile proposal.

More orthodox individuals thought that the only practical method by which the indiscriminate killing of elephants could be prevented was to prohibit the export of tusks of less than 15 lb. weight. By enforcing this regulation and confiscating any small tusks found, it was hoped that the killing of small elephants would cease, since the ivory would no longer be of value to the natives, and "they would not waste their powder on anything but the larger bulls."

A striking illustration of the need for this regulation was afforded by figures of ivory purchased by the Niger Company from January to June (inclusive), 1899:—

Over 10 lb.	444 pieces
Of 10 lb.	645 pieces
Under 10 lb.	3,535 pieces

The measures taken by the authorities aimed at preventing the slaughter of immature elephants, but there was one serious loophole. Zanzibar was not barred to small ivory, consequently there was an incentive to smuggle, and the prohibition, although enforced on the mainland, was not entirely effective. This was confirmed by figures showing that in spite of the prohibition having been in force for several years, the value of immature ivory sold at the end of 1902 in German East Africa was Rs. 17,700, estimated to correspond to approxim-

ately 1,300 to 1,400 young elephants illegally killed during the previous two to three years, and either confiscated or purchased by the German authorities.

On 1st June, 1904, the Zanzibar Government finally introduced regulations which made the possession of immature ivory an offence, thus, theoretically at any rate, coming into line with the other East African territories.

The suggestion that the export of tusks beneath a certain weight should be prohibited, instituted in order to attempt to control the indiscriminate destruction of elephants, found favour with the Marquess of Salisbury and, on 19th January, 1897, he issued instructions to the British representative in Berlin to approach the German Government and endeavour to ascertain whether they would be prepared to support an international agreement along these lines, the agreement to include a close season for hippopotami as well as elephants, together with the enforcement of a system of sporting licences, or permits, for Europeans.

The German Government sought the advice of Major von Wissmann. He strongly supported the idea of an international consortium with Brussels as the venue (Lord Salisbury thought London would be preferable) and considered that the French and Belgian authorities would look favourably upon the proposal. Von Wissmann suggested the Belgian capital because at that time ivory constituted the greatest natural wealth of the Congo, and he believed that the immense, almost impenetrable, primeval forests of the Congo Basin, "sparsely inhabited and infested by the dreaded aboriginal tribe of the Batwa," were the only elephant haunts in Africa still untouched by elephant hunters and likely to remain so. German East Africa, on the other hand, he held to be the poorest territory in terms of elephants.

From all accounts, Hermann von Wissmann, who was one of the prime movers in the creation of German East Africa, stands forth as a great administrator and perhaps the most far-sighted conservationist of that period. It was due to him, more than to any other individual, that the London Conference took place, and he attended as the German representative. Colonel Grogan, who had known him well since 1897, and

described him as "one of the great men of East Africa," met him again in London at the time of the conference. Grogan recalls von Wissmann saying: "I cannot understand your people. You have a virtual monopoly of the big game specialists of the world and yet you send, as your representative, a young gentleman who has once been on a diplomatic mission to Zanzibar. His contribution to the debate is that we should concentrate on the protection of hyaenas because they pull down the old males and thus help in the improvement of the breed."

Sir John Kirk, writing from Sevenoaks, Kent, on 31st July, 1897, after his retirement from Zanzibar, recommended that the British representatives should press for large defined areas to be set aside wherein no shooting would be allowed. He emphasised that such reserves should preferably cover a variety of habitats, but should exclude areas which might, at some future date, be required for agricultural purposes. He suggested the Tana, the "Kikuyu or Kenia region" and the "Mau heights and plateau" as suitable areas, although he recognised that additional reserves would undoubtedly be required at a later date. In 1899, a game reserve was, in fact, declared over "the whole of the Kenia district of the Province of Ukamba, except the area within 10 miles around the Government Station at Kikuyu." In addition, "the areas comprised within a radius of 10 miles round each of the Government Stations at Naivasha, the Eldoma Ravine and Nandi" were similarly declared game reserves under the Uganda regulations.

The advice of Dr. Sclater and Mr. F. C. Selous was also sought. Selous, writing from Montreal on the 15th August, 1897, gave as his opinion "that the destruction of game in South Africa had been brought about by three agencies: firstly, by Europeans (principally Boers of Dutch and French descent) who killed immense numbers of antelopes, quaggas, etc., for the sake of their hides, and large numbers of elephants and ostriches for their tusks and feathers; secondly, by native Africans possessed of firearms, who have been the principal factor in the destruction of game between the Limpopo and the Zambezi; and, thirdly, by the rinderpest which has been altogether beyond human control." Selous therefore strongly advocated laws which would curb the indiscriminate destruc-

tion of wild animals by Europeans, but he agreed that slaughter by natives (which, in the parts of Africa to which he was referring, was almost entirely by Africans possessed of fire-arms) would be exceptionally difficult to control. He considered that "at the present moment, it is hardly too much to say that 997 out of every 1,000 elephants, whose tusks come to the London market, are killed by African natives." Selous recognised the absurdity of introducing laws to control European hunting unless there was also effective control over Africans, and he believed that this could be done only through disarming the tribesmen or preventing them from obtaining ammunition, much of which originated from Portuguese settlements on the West Coast. Selous reinforced his argument by emphasising that in his time "the white rhinoceros has been exterminated in northern and north-eastern Matabeleland entirely by native hunters," and added that game along the Upper Zambezi was also being ruthlessly destroyed by natives who were well armed with guns and rifles.

This argument was supported by Mr. A. Sharpe, Commissioner of the British Central Africa Protectorate, writing from Zomba on 12th February, 1900, who stated that "the cause of the cessation of the wholesale slaughter of game (in Nyasaland) has not been so much that Europeans have been controlled but that the natives of the Protectorate have been stopped from shooting. The native gun tax, although a small one, has deterred natives from carrying guns . . . and we have thus been able to keep the killing of game within reasonable bounds."

A glance at figures showing the importations of guns and ammunition at that period indicates that there was adequate cause for concern. Returns made from the Custom House showed the quantities of arms and ammunition imported into Zanzibar, from 1st January to 23rd June, 1888, to have been:—

Firearms of all sorts	37,411
Pistols	188
Bullets	1,000,000
Caps	3,100,000
Cartridges	70,650
Gunpowder	69,350 lb.

In addition to the above, large consignments were "daily expected, especially one of 800 revolvers, 5,000 rifles and some 200,000 lb. of gunpowder. No English powder . . . was to be obtained at Zanzibar, as it was found to be too expensive for that market. It was estimated that from 80,000 to 100,000 firearms of all kinds found their way annually into Africa through the eastern ports, and weapons of precision (breech-loading rifles) were rapidly supplementing the inferior and old-fashioned guns."

From Mombasa, Hardinge drew attention to the difficulties of enforcing regulations in remote parts of the country, such as the Lake Rudolf region, where it would be quite simple to "evade subsequent detection" by sending illegal ivory into German or Italian territories. This was a valid consideration. For example, most of the ivory exported from the Gold Coast (where there were very few elephants) was at that time brought in "by caravans from the Western Soudan." In 1892, this amounted to no less than 32,003 lb., then valued at £5,417 10s. In passing, it is also of interest to note the enormous quantities of monkey skins, mainly the handsome colobus, which were also exported from the Gold Coast, to the extent that the species was rapidly being exterminated. These figures graphically illustrate the point. They afforded an example of what could be anticipated in East Africa:¹

YEAR	MONKEY SKINS	
	Number	Value
1892	188,646	£34,807 19 5
1893	181,059	46,813 15 0
1894	168,405	41,001 14 10
1895	90,548	14,220 3 0
1896	67,660	8,662 8 6
1897	14,438	811 5 0
1898	1,067	75 11 6

(first six months only)

Mr. Berkeley, replying from Port Alice, agreed that the regulations aimed at protecting Uganda's fauna were "undoubtedly

¹ The same process involving the same product is being repeated in Ethiopia to-day. Kenya Game Department records of colobus skins imported from Moyale alone, during 1960, are as follows:—

needed," and sought the assistance of Mr. F. J. Jackson in drawing them up. Notable among the proposals, which give an interesting insight into conditions prevailing at that time, was that "no licence shall be issued in any circumstances to professional elephant hunters." Ivory was the principal objective of most hunters and it was evidently (and possibly erroneously) considered that professional elephant hunters were the greatest danger to the preservation of wild life. He also proposed that it should be compulsory for all "sportsmen or others shooting game under licence" to make adequate arrangements for all African employees to receive "their full allowances of usual food" when on safari. Previously, safaris had invariably lived off the country and, as there was nothing out of the ordinary in employing several hundred porters and other personnel on protracted foot safaris, which often lasted for months and, occasionally, for a year or more, the destruction of game for the pot could easily reach staggering proportions.

Twelve elephants, three rhinoceroses and six wildebeest were to be allowed on a licence, of which no more than two could be issued to any one party, and which cost Rs. 1,000 for a Protectorate licence and Rs. 500 for a District licence. The latter form of licence was favoured by the Administration as it enabled individual District Commissioners to exercise more efficient control over caravans entering their districts. Giraffe and buffalo were, however, limited to one of each, because "the cattle disease of 1890 has rendered these very scarce." Government officials were exempt from licence fees but were expected to conform to the regulations.

It was compulsory to shoot on foot and horses were only to be used when running down wounded animals which might otherwise be lost. This excellent regulation was introduced

January, 1960	130 colobus skins	September	9,282 colobus skins
February	2,086	October	107
March	111	November	5,104
April	636	December	191
May	3,541		
June	302	Total	26,529
July	4,566		
August	473		

because of experience in South Africa where the practice of riding down or "browning" herds, as it was termed, had led to the extermination of animals in a number of regions. In point of fact, there were practically no horses in the Uganda Protectorate at that time¹, so this regulation was introduced solely as a precaution against their future importation. Furthermore, shooting within 25 miles of any Government Station was prohibited without special authority, and H.M. Commissioner was authorised to close any district he saw fit in order to allow wild animals to increase.

In framing the regulations, the British Government sought advice from "well-known African travellers and men of great practical and scientific knowledge of natural history" but, as was to be expected, there were several anomalies in the schedules of protected animals. Sir Charles Eliot thought that since the Protectorate was "positively swarming with game," some of the regulations were unnecessarily severe. He took puckish exception to the rhino bird being fully protected. "It is true that it relieves the rhinoceros of ticks from which, as your Lordship is aware, that animal suffers, but it also pecks the skins of horses and cattle. The excavations which, for the pachyderm, produce merely an agreeable titillation become wounds and ulcers in less thick-skinned beasts."

So extensive were the tick birds' ravages at Kitui that Mr. Hinde wrote to Professor Lankester inquiring how he could eliminate the pest but "after posting the letter he took up the last copy of the *Mombasa Gazette* and read with some astonishment that the creature's life was sacred. . . ."

The humour of the situation apparently altogether escaped the Marquess of Lansdowne who replied, somewhat tartly, that in view of the fact that the Powers had agreed on the regulations, "it was obviously undesirable" that they "should be materially altered without the strongest reasons and it is not apparent from your despatches that such reasons exist."

¹ The precise position is difficult to ascertain but it would appear that there were a few horses in the fly-free parts of Uganda. Bishop Tucker mentions the Katikiro "galloping in on his horse to Kampala" in 1893. Again, in 1895, he talks of "the Katikiro who had just met us on his white horse." In 1898 he records meeting messengers from the Kangawo with a horse which had been sent to his assistance.

Eventually, Sir Charles Eliot, who in Grogan's judgement was "the one really brilliant ruler of our destinies," had his way and emphasised his minor triumph by having a special notice issued in the *Mombasa Gazette* which briefly, emphatically and victoriously stated that "with the authorisation of the Secretary of State the name of the rhino bird, or buphaga, is removed from Schedule 1 of the Game Regulations."

The Administrator of Gambia, for his part, urged the fullest protection of birds of bright and gay plumage. Huge numbers were being destroyed at that time owing to the demands of fashion. France was the principal market, and plume hunters frequently issued natives with guns and dust-shot cartridges and sent them off "to shoot small birds for the milliners in Paris." It was thought that unscrupulous persons might attempt similar operations in East Africa.

The British Museum¹ emphasised the need for protection by drawing attention to, and citing examples of, species which could have been saved had they been adequately protected, including the blau-bok—exterminated about 1799—and the true quagga, which became extinct during the 1870's. The white-tailed gnu was to be found on only one farm in the Orange Free State at that time, and the bonte-bok would have been included on the list had it not been for the almost single-handed endeavours of the owner of Bredasdorp at the Cape.

Towards the end of 1899, Sir Harry Johnston, the Special Commissioner in Uganda, requested authority to proclaim a temporary reserve, to be known as the Sugota Game Reserve, which would commence at the mouth of the Turkwel River (sometimes known as the "Weiwei River") where it entered Lake Rudolf, and extend to Mount Nyiro, the western flank of the Laikipia Escarpment, Lake Baringo and the source of the River Oron in the Kamasia Mountains; thence to the Elgeyo Plateau.

This region contained large herds of elephants and plains game and Johnston was much concerned at the increasing number of caravans entering the area ostensibly for sport but, in reality, intent on securing as much ivory as possible. He

¹ Letter from Professor E. Ray Lankester to Sir Clement Hill, dated January 11th, 1900.

considered that with many of the men who came to East Africa for sport "there is often a very practical purpose lurking." He also made the accurate observation that the shooting of wild animals must be effectively controlled because of "the value of what may prove to be an important asset in the productions of this Protectorate." In January, 1900, the Foreign Office gave formal approval to the proposal.

Mr. Ainsworth held the opinion that if the regulations were to be enforced, it might prove necessary to have "a force of special police continually on the move in game country." That this depressing prophecy was justified was shown when a short while later, in June, 1900, Sir Harry Johnston found it expedient to despatch "a Mr. H. H. Baker with a large force of police" to the Baringo District to safeguard the newly created Sugota Reserve.

The idea of an International Conference was favourably received in most quarters and, on 11th November, 1899, the Marquess of Salisbury was able to address himself to the British Ambassadors at Paris, Rome, Constantinople, Cairo, Lisbon, Madrid and Brussels as follows:

Her Majesty's Government have for some time past been in communication with the Government of Germany as to the best methods to be adopted for the preservation of the wild animals, birds, and fishes in the African Continent.

The two Governments have agreed that it would be desirable to establish the principles to be followed, on the subjoined bases:—

1. The prohibition of the killing of wild animals under one year old and females with their young, except noxious animals and beasts of prey.
2. The creation of reserves within which it shall be unlawful to hunt, capture, or kill any wild animal or bird not excepted from protection under 1.
3. The prohibition of wholesale trade in the hides, skins, horns and tusks of wild animals, and in the skins and plumage of birds.
4. The prohibition of the use of dynamite or other explosives and of poison in streams, lakes, or ponds, for the purpose of taking fish.

5. A close season for certain kinds of animals and birds and the complete protection of some kinds.
6. The prohibition of export of elephants' tusks of less than 10 lbs. weight, and the imposition of a higher rate of duty on tusks between that weight and 30 lbs. than on those above 30 lbs.
7. The introduction of a system of licences to individuals, not natives, desiring to kill, hunt, or capture wild animals, birds or fishes, and of tribal or other licences to natives.
8. The rigorous enforcement within the zone to which the Act will apply of a strict supervision over the sale of firearms and ammunition.
9. The zone to which the Act shall apply to be that defined in Article VIII of the General Act of the Brussels Conference of 1889-90, except that its southern limit shall be the northern boundary of the German possessions in South-Western Africa from its western extremity to its junction with the River Zambezi, and thence the right bank of that river to the Indian Ocean. The Act to apply also to Madagascar and the Aldabra Islands.

Her Majesty's Government, in accord with that of Germany, propose that representatives of the different Powers, which by virtue of their African possessions are interested in the question, should meet in Conference at London in the first week in January next to endeavour to arrive at an agreement on the bases above enumerated.

I have to request you to ascertain and report to me whether the Government is disposed to take part in the proposed Conference.

I am etc.,
SALISBURY

The Conference convened by the Governments of Great Britain and Germany, and attended by representatives of other Great Powers, was held in London in May, 1900 with the express object of endeavouring to protect the fauna of Africa, in those territories controlled by the signatories, "from the destruction which has overtaken wild animals in Southern Africa and in other parts of the globe." The Convention agreed

that each of the Powers must preserve complete freedom of action in the precise administrative measures to be applied in its own Possessions, but it succeeded in laying down certain principles which aimed to "secure from molestation the rarer and more valuable animals now threatened with extermination."

The British plenipotentiaries, Lord Hopetoun, Sir Clement Hill and Professor E. Ray Lankester, while pleased with the outcome of the Conference, nevertheless did not conceal their conviction that much would depend "on the formation of a sound public opinion to discountenance the wanton destruction of large numbers of harmless and useful animals."

Although some of the Governments concerned ratified the London Convention, some did not admit to being bound by its provisions until the ratification of all the other signatories had been received. This led to strenuous efforts being made to obtain the agreement of Emperor Menelik of Abyssinia in conforming to the recommendations of the Convention, but these attempts were unrewarding and were finally abandoned. On 6th June, 1903, Lt.-Colonel Harrington reported from Addis Ababa that "His Majesty has invariably expressed his sympathy with the objects of the Convention, but added that the conditions of Abyssinia would make it impossible for him to carry out the terms implied by his accession to it."

Later, the Emperor Menelik appeared to change his mind and on 31st October, 1903, the British Agency in Addis Ababa was able to inform the Marquess of Lansdowne that the "Emperor Menelik is sending orders to the officials of the Southern Provinces to seize all tusks under 20 lb. weight and to ascertain, as far as possible, the names of merchants from whom the Abyssinian traders have purchased them . . . His Majesty . . . has further ordered that all persons found trading in immature ivory are to be arrested and sent to Addis Ababa."

However, this does not appear to have been done; no doubt owing to "the special conditions of the country." The fact that, in 1903, ivory in Abyssinia was valued at £42 per cwt. made illicit ivory trading a particularly lucrative proposition.

By 1909, all the Powers concerned had expressed their willingness to ratify the instrument, with the exception of



Kajiado District in Kenya Masailand with Kilimanjaro on the Tanganyika side of the border

Germany and Portugal. The Portuguese Government would not do so until they received notice that the provisions of the Convention had been extended to all the South African territories. The Cape Government had enacted legislation designed to give practical effect to the Convention, but considered it could not be enforced until the Natal Government, Mozambique, Manica, Sofala and German South West Africa had taken similar steps. Lord Crewe, Secretary of State for the Colonies, thought that "almost any form of agreement" between the European Powers with Possessions in Africa "would be preferable to the present chaotic state of affairs."

Any attempt at uniform standards or uniformity of regulations was most unsatisfactory unless universally applied. Prohibition of the export of tusks beneath a certain size or weight was of little avail if they could be smuggled across the boundary of some neighbouring territory. On the contrary, this served to enhance their value and, as in the later days of Prohibition, made the trade even more lucrative.

Yet, there were practical difficulties in the way of uniformity. The East Africa Protectorate, for example, recognised the minimum weight of tusks legally allowed as 30 lb. Such a regulation inevitably affected neighbouring Uganda, since legal ivory from Uganda had, of necessity, to be exported through Kenya; so the Kenya regulations forced compliance on Uganda whether they wished it or no. But it was undeniable that conditions in the two territories were entirely different. The relative scarcity of elephants in Kenya placed them in need of proper protection but, in Uganda, where herds of several hundred—or occasionally a thousand or more—were to be found, the problem was to regulate numbers. If the only elephants to be killed were those with tusks exceeding 30 lb. it would be almost impossible to make an impression on the immense herds.

At the same time, the fact that some measure of agreement on standardisation was necessary, was illuminated by a comparison of figures from the different African territories. In British East Africa, the standard minimum weight of 30 lb. a tusk did not prevent £15,820 worth of ivory being exported in the 12 months ending March, 1908. During the same period,

Uganda, where the minimum weight was only 11 lb., exported no less than £61,497 worth of ivory. Similarly, Zanzibar recognised a minimum of 11 lb. and, in 1907, 85,744 lb. of ivory valued at £57,502 were imported into the island. It seems probable that much of this was obtained illegally from British East Africa. In Somaliland, the Gold Coast, Sierra Leone and Southern Nigeria, the standard was 25 lb.: in Northern Nigeria, 10 lb.; in British Central Africa, it was 11 lb.; in the Cameroons 5 lb., while in Gambia, although elephants were "fully protected" and none allowed to be killed there was, paradoxically, no limit on the weight of ivory which could be exported.

That this question was important is illustrated by the size of the ivory trade. Board of Trade figures show that imports of ivory into the United Kingdom for the year ending March, 1908, were 10,787 cwt., which is equivalent to 1,208,144 lb., valued at £560,552. Of this total, only £35,000 worth originated from India. The remainder came from Africa and could hardly have represented less than 30,000 elephants. These figures showed an increase of 932 cwt., to the value of £153,000, over the previous year (1907) and were a clear indication that the slaughter of elephants was being stepped up illegally, probably because of the ease with which Africans were able to obtain firearms. Prohibition of the sale or possession of firearms and ammunition by natives might have been more effective in protecting elephants than any other measure.

4. The Impact of Settlement

UNTIL 1903, the Athi Plains ranked as some of the finest game country in East Africa, and the immense herds must have been an unforgettable sight. Unfortunately, the plains, so conveniently close to Nairobi, first attracted large numbers of shooting safaris and, later, were rapidly absorbed by settlement. In 1906, Percival noted; "You see tens where there were formerly thousands" of wild animals. Precisely the same could be said of the Rift Valley, Laikipia and the Uasin Gishu Plateau. All these regions stood out as carrying spectacular herds of game, but all were attractive for settlement so the wild life had to go. There must have been many instances of a man coming to Kenya to shoot and staying on as a settler. Such individuals generally liked to retain wild animals on their land, but the herds were invariably drastically thinned out.

During the frequent droughts, when grazing was desperately short, few farmers could afford to watch with equanimity while their pastures were invaded by swarms of wild animals. Neither was the farmer likely to remain philanthropical as herds of zebra broke down his fences, or hartebeest calmly soared clean over the top of a five foot boma, as though it scarcely existed. A game-proof fence, if indeed such exists, is an expensive undertaking and a herd of wild animals can do many hundreds of pounds' worth of damage in a remarkably short period. Probably the only fence effective against game is one consisting of a ditch with a wire fence on top of the bund, preferably interlaced with withes to give an appearance of solidity, as most animals seem reluctant to jump anything they cannot see beyond; but no farmer could afford to construct it.

Zebra were particularly destructive to fences, which led to

large numbers being shot by farmers but, as zebra comprised one of the principal foods of lions and the lesser predators attendant on them, the shortage of natural prey compelled the lions to turn to other sources of food, notably domestic cattle. So the lions had to be eliminated in turn.

The advent of the motor car, and the ease with which it enabled people to enter previously inaccessible parts of the country, was a further factor in the decimation of the wild herds. Percival records that, in 1902, an expedition to Meru and the Uaso Nyiro River took him nearly three months and he had, incidentally, to take an escort of 30 rifles with him; whereas, twenty years later, it was possible to drive around Mount Kenya to Archer's Post and Marsabit "all within four days."

The earliest large-scale application for land in Kenya was made in April, 1902, when the East African Syndicate applied for and obtained a concession of 500 square miles. The following year witnessed the arrival of the first large influx of settlers, chief of whom was Lord Delamere, although a few individuals had settled in the country some years previously.

By the middle of the first decade of the century, a number of settlers, with the support of the Government, had taken up land in British East Africa. Numerically they were few, but they were distributed over a wide area and Government was actively encouraging Europeans to take up land with the principal object of making what Colonel Grogan once described as "those two ribbons of rust running from the Coast to the Lake" into a paying concern. Little imagination was required to realise that, as the number of settlers increased, the question of taking proper precautions of a long-term nature, aiming at effective preservation of the East African fauna, would become increasingly important.

On 2nd February, 1905, a deputation from the Society for the Preservation of the Fauna of the Empire, which had been founded some eighteen months previously, saw the Secretary for the Colonies, the Right Hon. Alfred Lyttelton.

The deputation drew his attention to the deterioration in the wild life situation in almost every part of Africa, and pointed out that game provided a considerable revenue in East Africa—

far more than was spent on preserving it—and urged the British Government to incur a modest expenditure to preserve the wild herds while wild life was still abundant, as well as enforcing a strict administration of the game laws, stressing that if the situation was allowed to deteriorate until “the species had become so thinned out as to be impossible permanently to preserve,” it would be necessary to spend much larger sums in protecting them.

The delegation emphasised the need to establish adequate game reserves “before the whole country is settled up,” or the opportunity might be lost for ever. Such reserves should “be capable of being easily watched” as, for example, the Southern Reserve in British East Africa which ran with the Railway for a considerable distance, or along navigable rivers, although of course the delegation may have overlooked the fact that these were the very regions most likely to be required for development purposes. They also considered it important that reserves should “cover the migrations of the animals” and that, in so far as was possible, boundaries should be drawn up to include “the migrations of those species that are most important to be preserved.”

The delegation thought the Southern Reserve in British East Africa “more or less effective” but pointed out that other reserves in the northern part of the territory “have a very fine appearance on the map” but little else to commend them. “They rather tend to calm people perhaps at home but they are of no use at all for the preservation of the game unless adequate means are taken to secure them.” They drew attention to the fact that while the great Sugota Reserve covered a large expanse of territory, little was being done to really safeguard it. “If it is worth while establishing a reserve at all, it is worth while spending a little money to see that it is properly watched.”

The delegation was of the opinion that the recommendations of the International Convention had only been effectively enforced in British territories but, even there, the regulation governing the possession of under-sized ivory had been temporarily relaxed to enable ivory “which had been in stock before the rule was made” to be sold. The “Indian traders . . .

who are willing to encourage natives and others to go on killing" were not slow to take the utmost advantage of this relaxation.

Mr. Edward Buxton thought that "the danger of tsetse fly is used to justify wholesale destruction of game" without adequate knowledge of all the factors involved. "Who knows which species of animals are the 'hosts' of the bacillus which is carried by the tsetse fly? It seems unjust that you should bring them in all guilty before you know, and kill them all because some of them may harbour the bacillus. Science has not yet arrived at the point that you can justly condemn all the species, and we deprecate its being used as an excuse for the destruction of game generally. . . . We ask that the total destruction of the game should not be encouraged on this ground until it is proved . . . whether this particularly dangerous bacillus is present in all the species."

The attention of the Colonial Secretary was also drawn to the urgent necessity to keep modern firearms out of the hands of natives, "on the grounds of the claims of the game, if on no other. . . . Once they do there is an end to the game."

With regard to the cost of proper administration of the game reserves, which a poor colony might find an intolerable financial burden, the suggestion was made that the expense should be regarded as an "Imperial interest" and "some of the charges" should be borne by the Home Government in precisely the same way that the cost of the Uganda Railway was met by the United Kingdom.

By 1906, much of the Rift Valley had been taken up for settlement and, with this in mind, the Society for the Preservation of the Fauna of the Empire, again urged the Colonial Office to recognise the increasing importance of the Northern Reserve. Although a reserve on paper, little had been done to prevent illicit shooting and considerable numbers of elephants were still being poached. Not only did this great stretch of country contain as rich and varied a fauna as any other part of the Protectorate, but it had the inestimable advantage of being largely unsuited for settlement. Zoologically and geographically it was almost ideal, and the Society asked "that the area now known as the Northern Reserve, with such

modifications as further study on the spot may prove desirable, be henceforth . . . maintained as an inviolable national sanctuary for African fauna; and that such a sum of money be at once allotted from the revenues derived from game licences as will suffice to provide and maintain an adequate staff of European and native watchers under the general supervision of the Government Game Ranger and H.M. Commissioner."

The Society considered this suggestion to be "the duty and the interest" of Great Britain, and concluded by impressing upon the British Government "the fact that they have, in the fauna of East Africa, an asset of large and pecuniary value." "The direct revenue from licences, etc., now amounts to between £8,000 and £10,000 a year; the indirect annual revenue from the visits of sportsmen has been estimated at over £20,000. It cannot be doubted that the creation of state preserves, as opposed to reserves, would not only tend to protect animals from wholesale destruction but would, if properly managed, bring in large and constantly increasing sums to the Protectorate exchequer."

The laws and regulations were strong enough but it was essential that the reserves should be maintained under conditions which would make them effective. There were numerous arguments advanced against the establishment of reserves both by men on the spot and others who were sometimes in positions of influence. There were those who thought that protection of game animals necessarily involved the increase of tsetse fly and disease; there were others who advanced arguments that it was a complete anachronism in this day and age to even attempt to preserve wild life, and that the agricultural and economic growth of the country would suffer in consequence; or that the natives required protection from the ravages of wild animals.

These arguments carried some weight and it would have been foolish merely to thrust them aside as worthless. Those who stated them were convinced of their validity. A balance had to be struck between extreme views in either direction. In the event the idea of establishing reserves found general favour in that, providing the preservationist was assured that proper

reserves would be created, catering for at least the major species, and adequate in size and extent to contain the migratory movements, he would be far less likely to oppose measures designed to eliminate game in regions earmarked for settlement or development. Similarly, the "eliminationist" could reasonably be expected to tolerate the reserves so long as they were situated in regions where they were unlikely to interfere with the proper administration or orderly development of the infant territory.

Lord Curzon¹, with accustomed skill, expressed the case admirably when he said: "Although I hope I may regard myself as a keen sportsman . . . I do not think you ought to simply defend these reserves in order to provide shooting. . . . Nor, again, do I think one ought to defend them mainly from what I may call the naturalist's point of view. . . . There is another argument . . . that we owe the preservation of these interesting and valuable and sometimes disappearing types of animal life as a debt to nature and to the world. I have seen enough . . . to know not merely that many of these types have irretrievably gone, but that owing to the scandalous neglect of our predecessors, there are others which are tending to dwindle and disappear now. . . . We are the trustees for posterity of the natural contents of the Empire, and among them I do undoubtedly place these rare and interesting types of animal life. . . . As regards reserves, be as careful as you can where you allocate them: put them in places suitable for their purpose and not inconvenient or unsuitable to the needs of others; then, when you have got them, have an efficient body of watchmen sufficiently large in order to make the reserves effective. . . . In a word . . . the reserves . . . ought to exist not for the gratification of the sportsman, but for the preservation of interesting types of animal life."

One of the difficulties then, as now, was the fact that in a young country in the process of development, the revenue was scanty and the needs very great. Local revenues were invariably inadequate, so the authorities were compelled to fall

¹ During an interview as member of a deputation from the Society for the Preservation of the Fauna of the Empire to the Secretary of State for the Colonies, the Right Hon. the Earl of Elgin, June, 1906.

back on the Imperial Treasury, but that august institution, with so many calls on its purse, required an immense degree of persuasion—more than could usually be induced—to agree to take up a position whereby they were bound to divert the funds necessary for making adequate provision for anything quite so quaintly eccentric as the preservation of wild beasts.

The delegates explained that a somewhat similar situation had arisen earlier in the United States where, goaded on by the shock to the national system of a sudden realisation that the once prolific buffalo had practically ceased to exist, the Americans had adopted a system corresponding to the expenditure of Imperial funds. The sanctity of the American national parks was emphatically underlined by the provision of Federal funds. The expenditure was accepted as a Federal, not a State, commitment because it benefited all United States citizens and not just those in the State concerned.

Sir Henry Seton Karr emphasised the need for effective administration by explaining that in Wyoming the United States Government had found it necessary to instal a military post and the park was “carefully guarded by a troop of Cavalry and Game Wardens. It is enforced in the most absolute way. . . .”

He explained that these far-reaching powers were of course strongly supported by American public opinion, which was determined “not to allow the same fate to befall the other game as has unfortunately befallen the buffalo.” No such public opinion existed in East Africa and if, in the future, it did arise “it will arise too late.”

With this example before them, the Society’s arguments that money should be allocated from revenues derived from game licences towards providing and maintaining an adequate staff in both the Northern and Southern Reserves, reinforced the recommendations put forward earlier by Jackson and led to the establishment of a “Game Rangers’ Department.”

In February, 1906, Mr. F. J. Jackson, His Majesty’s Deputy Commissioner, had decided that “an adequate and properly organised Game Rangers’ Department should be established without further delay.” He came to this conclusion on the ground that there was a widespread feeling in the Protector-

ate that the question should "be taken up seriously with a view to preserving the game from extinction within the next decade or two, more particularly the rhinoceros, greater kudu, roan and sable antelopes, the buffalo and eland, all of which have steadily decreased in numbers within the last 16 years either through diseases (rinderpest) or the advance of civilisation . . ."

Prior to that year, the "Department" consisted of Mr. Blayney Percival, the Ranger, and four to six African scouts. Percival, who was described by Jackson as being "young, active and keen, a fearless rider, inured to hardships, a complete stranger to all idea of comfort, a good sportsman and a naturalist," was originally appointed an Assistant Collector in June, 1900, and Game Ranger in May, 1901, although he did not actually take up his duties in that capacity until October. He received the princely salary of £250 a year and an average of about £100 a year for expenses.

The steady increase¹ in revenue from game licences and fines for breach of the game regulations appeared to justify an increase in expenditure for protection of wild life. Entirely through lack of funds, Percival was reluctantly tied to his desk in Nairobi for 8 months of each year but, even if he had been able to get out and about, he would have been powerless to deal with "poaching, shooting without licences and other breaches of the regulations which are of daily occurrence" and which were likely to continue unless adequate staff were provided.

It was, for example, quite impossible for Percival to deal with the Wakamba, who raided the Southern Reserve at different points, usually by night. Percival estimated it would take him "eight, or even more days to cross from Nairobi, even if I could get news in time."

It was considered that a proper Game Department would

¹	1903	£3,650
	1904	£5,990
	1905	£7,140
	1906	£9,000 (estimated)

Over and above this, customs dues on rifles, ammunition, camp outfits, Railway fares, etc., "cannot be less than £20,000, probably more" (F. J. Jackson). Expenditure in 1904 was £354, including Percival's salary.

be able to effect adequate control over the Wakamba, who were causing immense inroads into game populations. There was no question of preventing hunting by those "wild tribes" which were dependent on indigenous animals for their very existence and who were simply human predators; but the Wakamba did not come into this category as they possessed substantial herds of cattle and sheep as well as cultivating the land. Another source of concern was the considerable quantity of firearms still in the possession of the Arabs, Swahilis, Indians and Somali traders. This was not a simple matter with which to deal, and it was apparent that effective control could only come about when administrative authority was capable of being exercised in outlying districts. As an interim measure, steps were taken to limit the amount of arms and ammunition allowed to traders visiting remote regions, but this was not wholly effective. Later, a police officer was given the special duty of preventing the illicit running of arms into the unadministered areas lying to the north of Baringo and Mount Elgon. Appreciable quantities of illegal ammunition were obtained from African gun bearers, who found it extremely profitable to pilfer from sportsmen and sell to traders.

Jackson therefore recommended that the Ranger should have his headquarters in Nairobi; an Assistant Ranger should be placed in charge of the Southern Reserve, based on either Makindu or Kiu, at a point where he could prevent poaching from German territory, while a second Assistant Ranger should be appointed to the Northern Reserve, with his headquarters at Rumuruti or Baringo. A third assistant would then be available with the Ranger "to move about from place to place as occasion required." The assistant rangers would each receive a salary of £250 a year and a horse allowance of £36. Quarterly reports would be submitted giving details of the estimated numbers of each species in the different districts. It would then be possible for the Ranger to "submit recommendations to the Commissioner in regard to the closing of a district for a limited period or to prohibit a particular species of game from being killed in a specific district."

Expenditure on the new department was estimated to be:

BETWEEN THE SUNLIGHT AND THE THUNDER

1 Ranger	£600
1 senior assistant	£300
2 assistants at £250 each	£500
Horse and travelling allowances	£325
Native scouts	£200
Rewards and incidental expenses	£500
	<hr/>
Total	£2,425
	<hr/>

The cost was about a quarter of the estimated revenue.

Percival thought that the question of the settlers' attitude towards game did not present any major difficulty. He considered the country was "fortunate in having, on the whole, a good type of settler and I fully believe that if the preservation of game was properly enforced, every assistance would be given by the majority and once good public opinion was started, it would do more to preserve game than all laws. I hear a good deal of talk among the settlers of a game preservation society¹ to be formed among themselves. . . . This, I consider, should have every assistance from Government and we should be prepared to entertain any suggestions that they may bring forward. . . . Among the better class of settler, there seems to be an inclination to preserve game on and around their land and in several districts land holders have combined to preserve game on adjoining farms. On the other hand, there are, unfortunately, a number of men, mostly from South Africa, whose only desire is apparently to kill off as much game as possible. . . ."

At that time game reserves were really shooting preserves, wherein certain species were fully protected. It was not until 1906 that Jackson and Percival appear to have put forward the first official suggestion that a reserve should be established in which the killing of wild animals should be absolutely prohibited, although Delamere had unofficially stressed the need for such a course seven years previously.

No doubt the suggestion gained stature because of the ever-mounting number of settlers and hunting parties arriving in

¹ Nothing came of this suggestion until December, 1955, when the Kenya Wild Life Society was founded.

the country. The proposal for the establishment of a completely protected reserve came to nothing. The official policy was to regard game reserves as sanctuaries, in which shooting was carefully regulated according to prevailing conditions, but that outside the reserves the preservation of wild animals must not be allowed to stand in the way of the economic development of the country.

Throughout his life, Lord Delamere took the greatest interest in wild life conservation. Indeed his first visits to Africa were with the purpose of hunting in Somaliland. From there, on his third hunting trip in 1897, he trekked across the forbidding wastes of the Northern Frontier, entering what is now Kenya through Marsabit and Laikipia.

More than two years before he settled permanently in Kenya, Lord Delamere had evidently given serious thought to the future of Kenya's wild fauna, and he reflected the attitude of the majority of early settlers. As early as 17th July, 1900, he had written to the Foreign Office from his English home, Vale Royal:

"May I give a suggestion of a reserve which includes all the finest game in East Africa in large quantities, and where there are no natives with the exception of a few very small villages of Wanderrobbo (who could easily be persuaded to move to any country where they would get a living) who interfere with game. It comprises the only country I have seen or read of at the present time where there are giraffe in very large numbers, the finest tusked elephants in the world, the rhinoceros with the finest horns in Africa besides greater koodoo, lesser koodoo, ostrich, oryx beisa, Granti, walleri, Thomsoni, Jackson's, Topi, and Neumann's hartebeestes—Grevii and Burchell's zebra—and many smaller antelopes.

"It has another great advantage as a reserve, that the greater part of it is incapable of being permanently settled by Europeans, as it is too hot. Also, it is naturally bounded on two sides by waterless country, and on the others by mountains or rivers.

"It has the advantage of being large—small reserves do not allow for migrations of game after grass—and it is, a great deal of it, worthless for any other purpose.

"The boundary on the west would run from where the Kerio River runs into Lake Rudolph, along the western boundary of the new Sugota Game Reserve to Lake Baringo. . . .

"With this joined to the Kenia district, which is already reserved, you have the finest game reserve possible. The Kenia district by itself has disadvantages. It is short of giraffe, as there are only very few on the Athi Plain which keep crossing the Athi River and getting killed one by one. On the north there are only few between Kenia and the Waso Nyiro, and they continually cross the river.

"In the reserve marked out as above on no side do giraffe ever go away and there are hundreds and hundreds.

"With the exception of Mount Marsabit, the actual slopes of Kenia and little bits of Lei Kipia and the Loroghi Range the country would hardly be taken up, as it is worthless for settlers.

"The only way to save the fine East African game animals from extermination is to have the game reserve large enough, naturally bounded, and which is only crossed by few roads for the present.

"This one can only be approached from north-east, north or east by two roads. One of these is four days without water.

"It also seems to me to be essential for success that there should be an officer in charge as gamekeeper, who would gradually mark out boundaries, and absolutely prevent people from shooting.

"The north-eastern or northern slopes of Kenia or Mount Marsabit or Lei Kipia any of them would make good headquarters, and he would always have plenty of native helpers to acquaint him with the fact when any expedition entered the reserve for the present, later, perhaps, a small force of native gamekeepers.

"The present reserves and their regulation will not, in my opinion, prevent the extermination of many species of the game.

"If this was carried out it would be quite unnecessary to have all the small reserves which now annoy both settler and traveller."

The attitude of the Foreign Office was not, however, as far-seeing as Lord Delamere in this matter. They considered the

existing regulations, involving partial protection, to be adequate for the purpose and were not convinced that absolute protection was necessary. Lord Delamere followed up his suggestion with a further letter to the Foreign Office, elaborating his thesis but many years were to pass before the principle came to be accepted of establishing sanctuaries in which wild life enjoyed absolute protection. Forty-six years elapsed before Lord Delamere's original proposal was finally acted upon and the first national park in Kenya was gazetted.

In 1908, the Governor, Sir James Hayes-Sadler, considered that "a revision of the principles relating to the shooting of game in East Africa was called for, and that the time had arrived for removing certain restrictions under the present Regulations," which were originally drawn up when there were practically no European residents and "which are held to be incompatible with the present conditions of the Protectorate and the assistance the settlers have a right to expect from the State in securing immunity to their estates from the depredations of wild animals."

This attitude was fully supported by the Colonists' Association and led to a number of measures being taken; among them the "re-arrangement of the system of shooting licences with freer conditions for the settlers and more equity between official and non-official classes." In the very early days, certain privileges had been extended to public officers at a time when there were hardly any Europeans in the country other than officials, although Jackson considered that "by far the greater majority never have a chance from one year's end to another" to take advantage of them.¹ There was to be a "reduction of the area of the Northern Game Reserve to workable size and slight modification of the Southern Reserve," and it was decided that forest reserves should not be considered as game reserves.

One interesting innovation was the introduction of a special

¹The wording of the 1899 Regulations to the effect that "public officers may be specially authorised to kill. . ." was interpreted to mean "are authorised to kill." Some Protectorate and Railway officials took advantage of this defect in the Regulations to shoot large numbers of animals within the reserve.

"Traveller's Licence" costing £1 a month, which entitled the holder "to shoot 5 head of game and 4 zebras," and was designed to meet the requirements of "ostrich farmers when away from their own farms looking for eggs and chicks on Crown Lands for a period of one or two months in the year."

The new game regulations were intended to ensure that wild animals would be shot only in moderate numbers and that the export of hides, or the making of a business of animal products, and the entirely indiscriminate slaughter through the killing of wild animals for monetary gain, which had taken place in so many other countries, should not occur in East Africa.

There was also cause for alarm at the influx of Boers into Kenya. They arrived in large parties and were granted certain privileges which were not extended to other settlers. The attitude of the Boers to wild life was certainly different from most other settlers and, as Sir Clement Hill explained, "they shoot, with very great freedom, very large quantities of game which they do not require but simply for the sake of practising at them." Within five years of the commencement of settlement of the Uasin Gishu Plateau, the Game Department commented in their 1909-10 Annual Report: "To the south of the Nzoia River is now largely settled by Boers. Game has suffered severely and there is little doubt that in a year or two it will be very scarce."

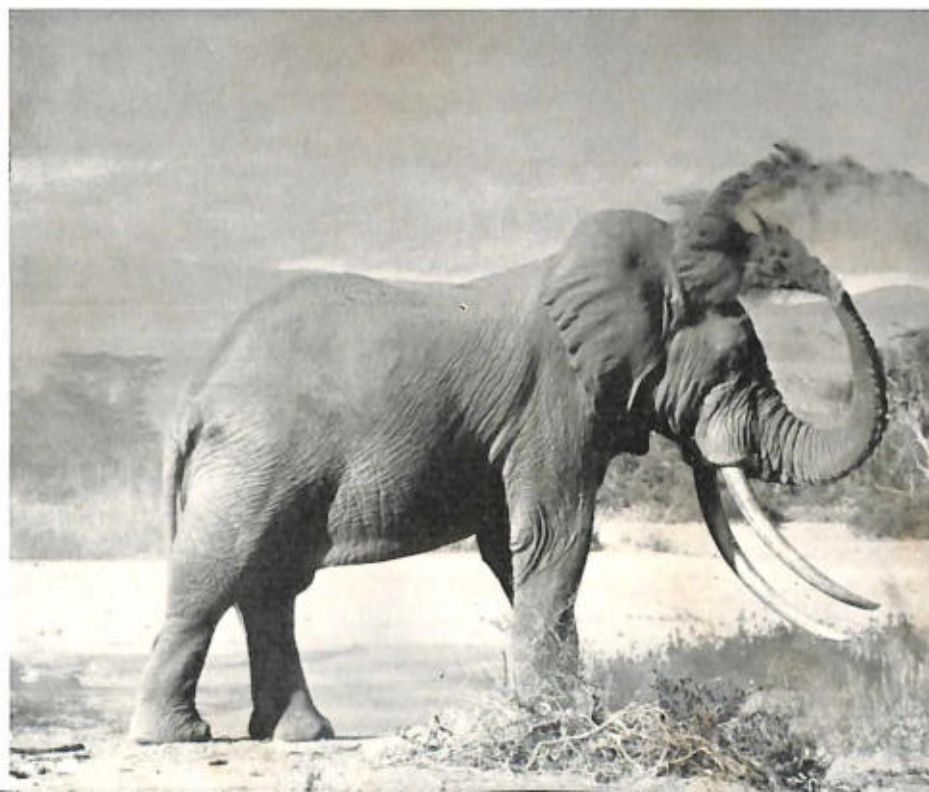
Before the Uasin Gishu Plateau was settled it was a superlative wild life region. Cecil Hoey was among the very first to recognise its potentialities and he considered it the finest shooting ground in Africa. Large herds of elephants were seen daily and, on one occasion, when accompanied by another sportsman, Hoey bagged three elephants within half an hour, one of which carried tusks weighing 131 lb. and another 128 lb.

In 1902, several years before the arrival of the Boers, Sir Harry Johnston described the Plateau as a place . . .

. . . where the traveller must beware of following any presumed native path, since it is only a cunning device leading up to a game trap (an oblong pitfall hidden with sticks and cut grass) . . . roam countless wild animals at the present day. . . . Here may be seen large herds of giraffe as one might see cattle peacefully standing about



The two principal targets of the poacher. *Above*, black rhinoceros with its attendant egret and 'tick-bird' (red-billed ox-pecker). *Below*, an Amboseli elephant, taking a dust bath



in an English park. These giraffes are the finest development we yet know of the northern form. . . . The male of this particular variety . . . develops an extra pair of horns on the base of the skull. . . .

But giraffes are not the only large game on these glorious downs. Elephants may be seen in great herds close by, but they affect rather more the scattered forests than the open plains. Where you see the giraffes you see also numerous rhinos in couples. . . . It is a glorious sight, say an hour after the sun has risen . . . to traverse this grass country and see this zoological gardens turned loose. Herds of zebras and Jackson's hartebeest mingle together, and in face of the sunlight become a changing procession of silver and gold, the sleek coats of the zebras in the level sunlight mingling their black stripes and snowy intervals into a uniform silver grey, whilst the coats of a hartebeest are simply red-gold.

Dotted about on the outskirts of this throng are jet black cock ostriches with white wings, a white bob-tail and long pink necks. Red and silver jackals slink and snap, grotesque wart hogs of a dirty grey, with whitish bristles and erect tails terminating in a drooping tassel, scurry before the traveller till they can bolt into some burrow of the antbear. Males of the noble water buck, strangely like the English red deer, appear at a distance browsing with their hornless, doe-like females. . . . Grey-yellow reed buck bend their lissom bodies into such a bounding gallop that the spine seems to become concave as the animal's rear is flung high into the air. The dainty *damaliscus*, or sable antelope, with a coat of red, mauve, black and yellow satin bordered with cream colour, stands at gaze, his coat like watered silk as the sunlight follows the wavy growth of the glistening hair. Once black buffalo would have borne a part in this assemblage, but now alas! they have all been destroyed by the rinderpest. The eland still lingers in this region, but seems to prefer the scattered woodland to the open plain. Lions and leopards may both be seen frequently in broad daylight. . . .

To-day, with the whole of the Uasin Gishu Plateau given over to farming, scarcely any wild animals remain in this erstwhile faunal Garden of Eden. A few forest-dwelling species still roam the forest reserves but they are tolerated only in comparatively small numbers, and are likely to be shot if they set foot outside. Plains game has been virtually eliminated, except for a small herd of Rothschild's giraffe which wanders from farm to farm. Along the banks of the Nzoia River, a few hundred Thomas's kob have contrived to survive in the riverine habitat but, since they cannot resist the temptation of invading standing crops they, too, are likely to be eliminated. Attempts are being made to capture them with the aid of narcotic drugs in order to transfer them to a fresh habitat but, so far, these efforts have met with little success. Perhaps a hundred sitatunga remain in a swamp on private land. It is doubtful whether any would be alive to-day had it not been for the enthusiasm of a small number of interested land-owners.

True, the upper reaches of Mount Elgon have been proclaimed a sanctuary, but, even there, the elephants, buffaloes and other species are subjected to constant poaching, mainly by tribesmen from across the Uganda border: but the immense assemblage of plains game is now only a fading memory. The thunder of the hooves has ceased and the roar of the lion no longer reverberates across the plateau. Little more than an occasional timid duiker remains to remind one of the glory that has passed beyond recall.

In 1903, few parts of East Africa were better endowed with wild life than the Rift Valley, especially in the vicinity of the three lakes, Naivasha, Elmenteita and Nakuru. Not only was the climate pleasant but the grass never became excessively long; game was plentiful and varied, and the whole region was covered with "burr clover" which appeared to attract large numbers of Thomson's and Grant's gazelles. This was particularly true in the region between lakes Elmenteita and Nakuru.

According to Chapman, one of the very best places for seeing concentrations of wild animals in the Rift Valley was close to the confluence of the two Nderit rivers with Lake Nakuru. A small area, perhaps no more than 500 acres in extent, dotted

with trees, either singly or in clumps, and with thick riverine forests along the stream banks, literally swarmed with herds of ungulates, and mere words could hardly do justice to the profusion. There were crocodiles in the Nderit River and lions abounded on the plateau. Francolin and guinea fowl were more plentiful than grouse on a Scottish moor, while quail were so numerous that "half a dozen would spring up at every (*sic*) step."

In the broken bush country, lying to the north-west of Nakuru, rhino, lion and buffalo were common. Percival considered the horns carried by rhino in this area to be the biggest he had seen.

This zone was also the common boundary of two races of hartebeest—Jackson's and the Nakuru hartebeest. They could be seen in separate herds within a few hundred yards of each other. A herd of eland lived in and around Menengai Crater, while in the higher country to the north game was very plentiful.

During the course of a pre-dawn march from Nakuru to Elmenteita, Percival passed through herds of zebra which extended for miles. "It was too dark to see them but we could hear the half bark, half neigh, of the old stallions and the rush of hoofs as a herd got our wind and went off. As dawn broke, the sight was wonderful; for miles one could see troop after troop of these pretty beasts. They were massed together in this way as all had been down to drink during the night and were just returning to their feeding grounds. . . . Zebra bones were strewn all over the country. They are most likely killed by lions of which there are considerable numbers. . . . At first the only game seen was zebra, but some few miles further on, game in general was plentiful—hartebeest, Grant's and Thomson's gazelles; ostrich were also very numerous, particularly in the Elmenteita District. Jackal are far too plentiful and do great damage to young fawns. . . . Both Thomson's and Grant's gazelles will chase jackal off their feeding ground if they have young about."

In both lakes, hippos were numerous and well able to fend for themselves, particularly in Lake Elmenteita, where the many small grass-covered islands afforded adequate shelter.

Lake Nakuru, being more open, was more vulnerable. Near both lakes, waterbuck, impala and reedbuck were to be found as well as duiker, steinbok and dikdik.

Percival correctly assumed that the Rift Valley would be the first game district to suffer, because "the country is so suitable for settlers that the game is sure to be driven out." He thought that all might be well, providing the land was utilised for large-scale ranching enterprises but, if split up into numerous small-holdings, the game would have "absolutely no chance." If the herds of wild animals were forced to vacate the Rift, the high bush and forest country (through which the Great Rift Valley runs) was entirely different from the undulating grass plains of the valley floor, and would not constitute a suitable alternative habitat. He hoped that the floor of the Rift could be turned into a Masai reserve "as, owing to the fact that the Masai did not kill game, they would do well together."

On the Mau Plateau, Percival reported game as numerous, "though, owing to long grass, not easy to bag." The more common species were Jackson's hartebeest, topi and oribi while, in the higher parts of the Mau, there were elephant, buffalo, eland and bushbuck. Several herds of roan were also reported in this region: on the "Guaso Ngishu" Plateau, roan "are quite numerous."

In the Baringo District game was plentiful, although very wild near the caravan route, and there were some fine impala heads "obtained by nearly every hunting party." Away from the caravan route rhinoceros were "extremely numerous."

Percival's forebodings were amply justified, and the Rift Valley went the same way as the Uasin Gishu Plateau.

In spite of the impact of settlement game, though considerably reduced, was still relatively abundant in most of the settled areas of Kenya until 1939. When in that year the youth of Kenya joined the Forces, they left behind them a prosperous fauna. When they returned, six years later, the game in many areas had generally ceased to exist.

From the plains around Lake Ol Bolossat to Thomson's Falls; from Ndaragwa to Nyeri, Nanyuki and beyond; and indeed all the country sandwiched between the Aberdares and Mount Kenya carried, until 1939, an abundance of wild life.

Part of Kenya's war effort was to act as a holding ground for thousands of prisoners-of-war captured in Abyssinia and North Africa, and their camps were distributed across the face of the Highlands. Teams of hunters were employed in shooting game to provide meat for the camps. Each party of hunters was accompanied by lorries which collected the carcasses and ferried them to their destination. Day after day, month after month, for several years the slaughter went on. At night there was scarcely a pause and a constant fusillade went on with the aid of spotlights. The demand was so great that the Railways were called in to assist and carcasses were carted away by the train load.

The demands of war outweighed every other consideration, and an attempt was even made to grow cereals on a large scale on the Athi Plains. Giant ploughs cut through the virgin veldt, but the appearance of the first green shoots served only to entice thousands of wild animals to the cultivated land. Hundreds were shot, but this did not deter others from coming forward to take their place. The Athi wheat-growing scheme was eventually abandoned. No doubt it was necessary in the circumstances prevailing, but it resulted in a heavy loss of wild life.

The immediate post war period witnessed a concerted drive to develop Kenya's agricultural potential. Many of the isolated pockets of game which had managed to survive the war were ruthlessly eliminated. On the Kinangop, for example, thousands of acres of new land were broken and sown to cereals. All game was classified as vermin and treated as such. It was considered to be in the country's interests to destroy everything on four legs, and there were no rules. Amateur hunters sallied forth each morning, their pockets filled with ammunition, and returned in the evening having exhausted it all. Horsemen rode down the herds, shooting at anything within range and, after dark, spotlights were again brought into use. The carcasses were far too numerous to move, so were merely left where they fell, and the hyaenas, bloated to capacity, were unable to compete with the carrion. Where a few years before the plains had been white with zebra and Thomson's gazelles, and kongoni had roamed at will, there

were now acres of crops rippling in the breeze. Progress had used her scythe with devastating effect.

Until the beginning of the Second World War, there was little necessity for the Game Department to be conservation minded. The main function was "control work," and if several thousand animals of any of the dominant species were destroyed, it made little difference to the overall picture as there were immense reservoirs from which to replenish losses. The main function of the Game Department was controlling the numbers of wild animals in areas where they conflicted with agricultural development. This distasteful task led to the unreasonable assumption that game departments kill while national parks preserve. That may have been true with regard to a few individual officers but it is only right to remember that the Department was obliged to implement the Government's policy.

During the last few years the Game Department has been able to relegate "vermin control" to a subordinate departmental obligation and concentrate on constructive conservation

5. Rinderpest

RINDERPEST is a severe disease of ruminants, especially cattle, characterised by fever and diarrhoea. Being contagious, it is transmitted when sick and healthy animals come in contact. The mortality in fully susceptible animals may be high—up to 90 per cent—but the reaction to it varies widely among different species. Buffalo, eland, wildebeest and wart hog frequently die in outbreaks, while other animals, such as Thomson's gazelle, may show little or no signs of ill-health even when they are infected. The latter do much more to spread the disease than the more susceptible species, which die spectacularly. The age pattern of the infection in a given species reveals the extent of the disease. If animals of all ages are attacked a new epidemic can be suspected but, if the disease is confined to the young, it is an indication that it is endemic.

Rinderpest was introduced into Africa with cattle imported into Egypt in 1840 and during the Nile Expedition of 1884-85, but the pandemic which swept the Continent began during the Italian campaign in Somalia about 1887. The disease spread along the major cattle trade routes of the coast hinterland and possibly down the Nile Valley, reaching Uganda and Masailand about 1890. The first outbreak in the interior of Kenya occurred in 1890¹ among the Loitokitok Masai, at the base of Kilimanjaro. Precisely how it arrived is not certain but from contemporary reports it appears probable that the Masai, who at that time raided as far as Malindi on the Coast, returned from one such foray with infected cattle. Within a very short time their cattle succumbed and the disease spread rapidly to

¹ Chanler, who visited Lamu in August, 1892, states that the "cattle plague" destroyed many thousands of cattle in the vicinity of Witu and Lamu in 1889.

neighbouring districts and tribes. In the same year the Laikipia Masai raided their brethren near Nairobi and carried off their cattle. The stolen stock was infected with rinderpest and, as a result, most of the Laikipia cattle died. By July, 1892, the plague reached to the north of Lake Nyasa and, by 1896, had penetrated as far south as the Cape.

Percival quotes estimates that "Rhodesia alone lost 100,000 head of horned stock, while Khama and his people lost upwards of 800,000." More than $2\frac{1}{2}$ million cattle were said to have died in South Africa. In so far as Kenya is concerned no reliable figures exist, but it is known that the Masai and other tribes lost the great bulk of their herds. Referring to the heavy mortality in Masailand, Lugard (1893) stated that "never before in the memory of man, or by the voice of tradition, have cattle died in such numbers; never before has the wild game suffered." A few isolated localities, such as Marsabit and Mount Nyiro, were by-passed by the disease, and it was from these regions that many of the depleted herds were later restocked.

Hobley mentions that when exploring the Tana River in 1891, he encountered a severe outbreak of rinderpest. At that time, wild animals possessed no natural resistance to the disease and buffalo "came down to the river in thousands only to die; dead giraffe, waterbuck and kudu were also seen. When we reached Mumoni the mortality among the cattle of the A-kamba was phenomenal, for only a small herd of about 20 had survived out of what we estimated, from a survey of the desiccated carcasses, at an original strength of some 40,000 head." This observation was confirmed by Sir Gerald Portal. For many years afterwards the skulls and horn bosses of thousands of buffalo and wildebeest littered the river banks.

Cattle were the first animals to be affected by rinderpest, followed by buffalo. Eland were next to contract the disease and wart hog were considered to have been particularly susceptible. Subsequently giraffe, greater and lesser kudu, roan and bushbuck were affected. Wildebeest appear to have been the last species to contract rinderpest, and the Masai maintain that it was only after their cattle had been almost wiped out that wildebeest went down to the disease. Of these species all but

the greater kudu made surprisingly complete recoveries. Elephant, rhino, hippo, zebra and many other species were not affected, but some of the gazelles may have carried infection without visible symptoms.

Giraffe appeared less susceptible to rinderpest than most species but some of those affected were observed to be blind, although not necessarily permanently. In this helpless condition they fell an easy prey to the predators. During the 1960 rinderpest outbreak, reticulated giraffe in the Northern Frontier Province were again observed to be blind. Blindness, however, is not an expected sign of rinderpest and this observation merits closer investigation, particularly as this symptom has occasionally been reported in other animals, such as lesser kudu.

Bongo were thought to have been almost exterminated by rinderpest in the 1890's. Owing to the inaccessible and inhospitable high bamboo terrain which they usually frequent, and the fact that at that time the presence of the bongo in East Africa was not known to Europeans, these reports might at first sight be treated with reserve but the Wandorobo, who were the only human beings to inhabit bongo country have proved, over the years, to be exceptionally reliable and observant witnesses of natural phenomena.

This may explain the delay in the discovery of the East African bongo. If Wandorobo reports were true, the species may have suffered such heavy losses from rinderpest that for a time bongo were exceptionally scarce, but this is only conjecture.

The heavy destruction of wild life by rinderpest in the last decade of the nineteenth century can be matched by the extraordinary recuperative powers of certain of the affected species. Reading through the earliest records, these two factors are at once apparent. Immense numbers of animals—the dead were to be counted in tens of thousands—were carried off by the plague and some species seemed on the verge of extinction. The plains were littered with carcasses to the extent that the vultures and other scavengers were unable to dispose of the carrion. Jackson estimated that at least 90 per cent of Kenya's buffalo succumbed.

"Buffalo died in immense numbers in 1890-91 during the worst epidemic of rinderpest." "Warthogs, lesser kudus and elands also died in considerable numbers as well as a few giraffe. No other of the long list of species of game contracted the disease. Since 1891 there were two less virulent outbreaks of rinderpest; and several of pleuro-pneumonia and Texas fever and now East Coast fever." (F. J. Jackson, 1906.)

In 1890 Lugard observed that from the summit of Elgeyo to the edge of the Kavirondo country he did not meet a living soul. "Through all this great plain we passed carcasses of buffalo . . . the breath of the pestilence had destroyed them as utterly as the Winchesters of Buffalo Bill and his crew, and the corned beef factories of Chicago have destroyed the bison of America."

The 1897 rinderpest epidemic began in Harrar in Abyssinia, and Somaliland was the next territory to suffer, the cattle being almost wiped out. The hartebeest in the western part of Somaliland suffered severely, as did the kudu inhabiting the hills. Brigadier-General E. Swayne said that at certain times of the year Somalis went out daily on foot and with their hands pulled down the sick animals in order to get the hides. Between 1899 and 1901, the plains were littered with bones, and Africans were constantly bringing in kudu heads from the hill country.

Jackson recorded that the 1897 rinderpest epidemic broke out in Kikuyu and carried off the whole of the Uganda Government transport oxen plying between Kikuyu and Kakamega. Dead oxen were to be seen scattered all along the road for a distance of 250 miles, but only at Naivasha, Ravine and Nandi Stations were the carcasses burned. Having received adequate warning of the outbreak the Masai, Nandi and Il-Uasin Gishu were informed and urged to drive their stock away from the vicinity of the main road, and they did so. Lenana moved his herds to the south of Ngong and, at the same time, organised a system of standing patrols of moran whose function was to ensure isolation of his cattle from Ukamba. The Nandi lost no cattle and the Masai and Il-Uasin Gishu very few. Jackson considered that the two latter tribes suffered some losses because the Masai at Naivasha and the Il-Uasin Gishu at Ravine were known to have carried off meat from the dead

oxen to their manyattas, ate it there, and thus infected their cattle, but it is far more likely that it was carried there by live animals.

Percival stated that "eland were so scarce we resigned ourselves to the conviction that the rinderpest had made an end of them altogether," and extensive regions were almost denuded of game. Yet within ten years or so, buffalo had recovered to the extent that, in certain districts, they had become a serious nuisance and measures had to be taken to reduce their numbers. Such are Nature's powers of recuperation, and it is this fact which appears to indicate that now, when only scattered remnants of the once great herds have survived, a concerted and imaginative conservation programme could, even at this late hour, reconstruct the wild herds. As soon as proper protective measures can be introduced and enforced, recovery can be surprisingly rapid.

Percival cited several examples of the ability of the buffalo to recover. Referring to the Ol Donyo Sabuk herd he stated: "When in 1901 I visited the place I could not count more than 40 head, though I searched with all the eagerness of a game ranger new to his job. . . . In 1917 I took another census and, in spite of the shooting which had been going on, I counted nearly 400. The same thing was to be observed in the Kapiti Swamps; there in 1901 I saw perhaps 30 head; 16 years later there were not less certainly than 200."

Pleuro-pneumonia later took a further heavy toll—there was an extensive outbreak in 1911—and Percival observed: "What was practically an entire herd (of buffalo) lay dead in a bend of the Athi River. . . ."

Several early naturalists noted, in seeming contradiction to what has just been said, that certain species, greater kudu and roan, for example, appeared unable to recover from the effects of the epidemics. However rigidly they were protected, they seemed unable to increase and to have passed beyond the point of no return. Fraser Darling has given examples from Alaska and Africa showing that with certain gregarious species, small herds, particularly when coupled with deterioration of habitat, are an indication of serious decline. So long as the animals remain in small herds they appear unable to increase in

numbers but, by creating conditions whereby several of these small groups are brought together, as was done when additional watering points were constructed on the Mbuyuni Plains in the Tsavo Park, the animals appear to breed far more prolifically than before. This, as Fraser Darling points out, is a biological phenomenon of widespread significance.

In the past when wild animals had unrestricted range, they were free to move away from affected areas and remnants at least survived. To-day, however, when the herds are largely confined within specified areas, it is not inconceivable that an outbreak of a particularly virulent epidemic disease might reduce a species below the threshold numbers necessary for survival.

Rinderpest was one of the dominant factors in the heavy reduction of the East African fauna and periodical epidemics continue to exert a great influence on population dynamics. The fact that several species of wild animals, notably the buffalo, harbour and transmit the disease does not endear them to the Veterinary Department or stock-owners.

Mention has already been made of the most recent outbreak in 1960 which the Senior Game Warden, Isiolo, considered to have been the worst in his experience and perhaps the most severe since the 1890's. The disease appears to have originated in Abyssinia and was first reported in the Isiolo District in February, 1960. Losses among certain species were heavy. 70 per cent of the greater kudu, lesser kudu and wart hog in the areas affected were estimated to have died and among eland, buffalo and giraffe the mortality was estimated at 40 per cent.

Recently rinderpest has been implicated as being partly responsible for the heavy annual mortality of wildebeest calves between the ages of seven and ten months in the Serengeti and Narok areas. Losses commence following the short rains and consequent flush of green grass in October or November and continue through to January, by which time up to 40 per cent of the total calf crop may have succumbed. The new-born calves derive a colostral immunity to the disease from their mothers but this is only temporary and the calves are exposed to the disease at a time when their resistance is drastically

lowered through prolonged drought and a combination of other factors, resulting in a high mortality.

The precise role of wild animals in the dissemination of rinderpest is still controversial. Some authorities believe that the part that game plays in the spread of the disease is insignificant, while others consider that wild animals are the principal vectors. Lowe (1942) makes the significant observation that rinderpest cannot be maintained in wild animals for long unless the infection is supported by a bovine link. Scott, Cowan and Elliott (1960) are of the opinion that "probably all members of the Order Artiodactyla are susceptible to rinderpest. Nevertheless the only species regularly incriminated in outbreaks are buffalo, eland and wild pig. The disease has allegedly been observed sporadically in many other species. Confirmation by isolation and identification of the pathogens restrict the list, however, to about 15 species." Only six of these species are East African wild animals—buffalo, greater kudu, eland, wildebeest, impala and wart hog.

6. The Masai

A CHAPTER concerning the history of a particular tribe may, at first sight, seem irrelevant in a book of this nature. It is included because human ecology and wild life ecology are so closely inter-related that an understanding of the historical background and the man/land relationship is necessary for a proper appreciation of the present wild life situation, and a comprehension of the special status of the Masai in the sphere of fauna conservation. Faunally speaking, Masailand is the most important region remaining in East Africa, and contains the greatest numbers and variety of plains game anywhere in the three East African territories.

The Nilo-Hamitic Masai are believed to have originated from the vicinity of the Nile Valley, following the course of that mighty river to the country lying west and north-west of Lake Rudolf where they established themselves some four hundred years ago. Linguistically they appear to be allied to the Bari and Lotuka from the neighbourhood of Gondokoro and are apparently related to the Dinka and Shilluk, who inhabit the country on the Sobat River, north of Gondokoro. They are tall, slender people with features more Caucasian than Negroid. During the first half of the seventeenth century, they migrated to the fertile country situated farther south where, like many another virile and determined people, they quickly assumed a position of dominance.

Fosbrooke relates the tale of their exodus from the country in the Lake Rudolf region, called *Kieru*. They had previously been prevented from moving south by a formidable escarpment. Maasinda, an elder who has since come to be regarded as an almost legendary figure, built a ladder to the top of the escarpment and found the water and grazing to be excellent.

He and his six sons, followed by the Laikipiak and Kwavi clans, successfully negotiated the climb but, when the remaining tribesmen rushed to emulate them, the ladder broke and thus prevented them from following.

According to legend, the first Laibon, or hereditary medicine man who directs the destinies of the tribe, was a youth who was found on the highest point of the Ngong Hills, *Ol Doinyo Lamuya*. This event is believed to have occurred about 1640.

Until Joseph Thomson's epic journey in 1883, no European had succeeded in traversing Masailand, which lay astride the route to Lake Victoria. The previous year Fischer, the German naturalist, penetrated as far as Lake Naivasha but, in spite of having 300 armed askaris under his command, was forced back by the hostility of this fierce warrior tribe.

From the Coast to Lake Victoria and from north of Mount Kenya to south of Kilimanjaro the Masai dominated the plains. Only in the depths of the forests were their enemies secure. For many years they were the scourge of the whole East African hinterland, and it is astonishing to realise that at the peak of their supremacy in the latter half of the nineteenth century, the total Masai population probably did not exceed 45,000, including women and children. To see this figure in better perspective it is necessary to appreciate that at the same period Mutesa, Kabaka of Buganda, could deploy a force of 150,000 warriors, in addition to a fleet of war canoes on Lake Victoria.

At the climax of their power in the latter half of the last century the Masai, under their great Laibon, Mbatian, occupied a large region extending some 500 miles from north to south and 150 miles wide. The northern limit of territorial expansion was Lake Sugota, 20 miles south of Lake Rudolf, and the Masai occupied the floor of the Rift Valley as well as a considerable expanse of territory on either side of this great cleft, ranging from the foothills of Mount Elgon, embracing Mount Meru and Kilimanjaro, and extending far to the south; some 80,000 square miles altogether. Their southward advance was checked by the Wagogo and the Wahche.

The Masai have always been held in high regard for their fearlessness, courage and straightforwardness. Notwithstanding

their understandable initial reluctance to allow foreigners to enter their territory, and in spite of their blood-curdling reputation, the Masai treated the majority of European travellers with commendable restraint. The same could not always be said of their attitude towards some of the unscrupulous Swahili caravans which attempted to pass through the Rift Valley. In 1881, a battle occurred at the northern end of Lake Elmenteita between a large Swahili caravan and a band of Masai warriors. The fight went on all day until the Swahilis' ammunition was exhausted and they fled. Only three of the 300 Swahilis survived to tell the tale.

Karl Peters said that the Masai were quick to discover the ineffectiveness of the muzzle-loading firearms carried by the caravan askaris. The fact that a caravan included 400 or 500 guns failed to deter them. The Masai evolved a technique of attack which amounted to drawing the fire by a sudden charge, throwing themselves on the ground to avoid the fusillade of bullets, then charging again immediately following the first volley and spearing the askaris before they could reload.

In November 1895, a large caravan of about 150 Swahilis and 1,200 Wakikuyu was in camp near Kijabe Hill. The Swahili headman instructed some of his armed retainers to kidnap two young Masai girls from a nearby manyatta. A party of Masai warriors demanded and obtained their release but, early the following morning, the headman again ordered his men to seize the two women and a Swahili even attempted to drive away a cow. The Masai, incensed by the incident, swooped on the caravan, killing 546 Wakikuyu and 98 Swahilis, including the individual responsible for the provocation. The Masai lost fewer than 40 men.

Shortly afterwards, an English trader, Andrew Dick by name, who was once Chief Accountant to IBEA, came upon the scene of the massacre and, without attempting to ascertain the cause of the trouble, decided to attack the Masai. Three French sportsmen, one of whom was the M. Sporck mentioned by Jackson (see page 102) were persuaded against their better judgement to render support, although they played little part in the fight. Dick killed more than 100 moran before his rifle jammed and he was speared by the Masai. The Masai admired

his reckless bravery and, for many years afterwards, any moran passing the scene of the fight threw a stone on the site of Dick's last stand until a sizeable cairn was formed.

There was a further sequel to the story. Lenana and other Masai elders happened to be at Fort Smith at the time of the massacre, where they were detained, pending instructions from Mr. Ainsworth, the Sub-Commissioner of Ukamba Province. The impartial nature of the official inquiry so impressed the Masai that it resulted in an amicable agreement with Lenana which marked the beginning of his friendship and loyalty to the British Government. From then onwards, all travel in Masailand became safe, even for small parties.¹

Caparisoned in full martial regalia the Masai warrior was an awe-inspiring sight and no doubt had cause to regard himself as superior to his foes. The warriors possessed a remarkable discipline based on pride and self-confidence, added to which was a great respect for their Laibon and innate fear of ridicule or disgrace. Male prisoners were seldom, if ever, taken, although captured women and children would sometimes be adopted into the tribe.

The Masai Race is split into two main divisions, the pastoral Masai and the agriculturalists. The latter are known as the *I-Lumpua* (Lumbwa) and the *Il-Oikop*, and are often referred to as the Wakwavi by the early explorers. They include those sections of the original tribe who have adopted an agricultural mode of life after losing their cattle through disease or defeat and, in the process, earned the lasting contempt of the pastoral Masai. The agriculturalists were almost annihilated by the pastoralists and scattered remnants exist only in a few localities, principally in areas reserved for other tribes. Among the surviving groups of agriculturalists are the *Il-Arusa* (Wa'arush); perhaps the best known being the *En-jemusi* or Njemps living near Lake Baringo. Most of the agricultural Masai supplement their diet by hunting or fishing and all still retain the ambition to possess cattle.

The constant fighting within the tribe was disastrous to the

¹ Several different versions of this incident have been published. This account is based on Mr. John Ainsworth's official report—Africa, No. 6 (1905).

race as a whole. The Il-Uasin Gishu, for example, attacked their kinsmen near Naivasha about 1860 and, after defeating them, were in turn defeated by a combination of clans from Naivasha and others from Kilimanjaro. Some survivors from the Uasin Gishu fled to Kavirondo, some perished at the hands of the Nandi, and others settled near Eldama Ravine. Their descendants now live in Trans-Mara. About 1883 a peace treaty involving the exchange of cattle and children, was solemnly concluded between the agricultural and pastoral divisions at Sangaruna Ford, on the Pangani River, but the treaty does not appear to have been observed for long and in any event did not bring about a cessation of hostilities between the different sections of pastoralists. Thomson recorded having come across two rival bands of Masai warriors encamped close to each other near Lake Elmenteita in 1883. Like a scene from the Old Testament each side sent out its champions who, to the cheers and encouragement of their women-folk, fought a pitched battle in front of the assembled hosts. The winning faction took over the cattle of the vanquished. The frequent wars between different sections of the tribe was one of the principal factors leading to the disintegration of the Masai Race towards the end of the last century.

Raids were made against almost all the neighbouring tribes and extended over an immense region. Speke (1863) states that one of his men claimed to have been present when Seyyid Said, Sultan of Zanzibar, sent an army to assist the Wagunya against Masai incursions near Lamu. During a two-day battle "the Masai brought a thousand spears against the Arabs' cannon" but the outcome is not recorded. This battle must have occurred before 1856, the year of Seyyid Said's death, and marks what was probably the northerly limit of Masai raids in the coastal belt. Vanga, on the Coast 80 miles south of Mombasa, was sacked in 1858 or 1859 and Mambroi and Malindi were attacked in 1867. Sadaani, on the Coast opposite Zanzibar, was raided in 1883 and Thomson mentioned Masai war parties having entered Mombasa itself. In 1888 they killed a headman of Teleki's at the Mwachi River only a day's march from Mombasa, while Gregory stated that in 1889 they again raided within sight of Mombasa harbour.

Willoughby and Eliot give evidence of Masai attacking the Galla at Golbanti on the Tana River, within 50 miles of Lamu in 1886. Willoughby also informs us that the mountain-dwelling tribes near Taveta and Kilimanjaro kept their cattle in huts from birth, never allowing them to graze for fear of attracting the attention of the Masai. Women cut grass for fodder and carried it to the beasts each day.

During the course of an 800-mile foot safari to Uganda in 1892, Bishop Tucker saw evidence of Masai raids. Two mail parties—one going north and the other south—were attacked and destroyed within a short distance of his camp and, a few days later, he saw where a Masai raiding party had crossed the Athi, close to its confluence with the Tsavo River, with the intention of attacking the Galla. He noted that: "It is no uncommon thing for these ubiquitous warriors to be in a certain place one day and the next to be sixty or seventy miles away—burning, slaying and ravaging the whole country side."

"Two days' march from Kibwezi at a place called 'Kambi ya Kiboko' we came upon fresh traces of the Masai. Some ten days before they had overwhelmed and looted a Swahili caravan as it lay encamped on the river bank. It was a shocking sight which met our gaze as we came unexpectedly upon the scene. Here were skulls and bones—telling of the slaughter of the sleeping coast-men . . . signs of destruction and death were to be seen on every hand."

Even with these scenes fresh in his mind the Bishop could not refrain from a gasp of admiration when he met his first Masai near Lake Naivasha a few weeks later. "They were magnificent specimens of humanity. Some of them were certainly 6 ft. 3 in. and more in height. Their limbs shining with grease, looked like burnished bronze. They were savages—but noble-looking savages—as they stood there questioning us in all the assurance of physical power. . . ."

After a raid the looted cattle were divided. The Laibon was first given his share. Next recipients in order of priority were those warriors who had particularly distinguished themselves. The rest were divided among the remaining warriors. In the event of the booty being too small to divide equitably, the warriors arranged themselves into two age groups, referred to

as "the black and the red oxen" and fought for the cattle. Thomson says that "there were more warriors killed over the division of the spoil than in the original capture of it." To kill a man in quarrelling over the plunder was not considered discreditable.

The decline of the Masai coincided with the establishment of British and German administration in East Africa, although it cannot be attributed to that cause. The catastrophic outbreaks of rinderpest in the 1890's almost exterminated the herds of cattle on which the economy and culture of the Masai were based and on which their whole existence depended. This was followed by famine and smallpox which devastated the tribe.

To add to their difficulties the Masai were split asunder following the death of their powerful and respected Laibon, Mbatian, in 1890, and the violent internal dissension consequent upon the rival claims of his two sons, *Ol-enana* (Lenana) and Sendeyo, each of whom regarded himself as rightful successor to his father.

In 1890, for example, the Purko attacked and almost wiped out the Laikipiak clan (*Il-Aikipiar*). The Purko took over their cattle but their success was short lived since in 1891 rinderpest devastated the captured herds. The Purko then withdrew southwards and the whole of Laikipia remained unoccupied and unused for several years. When Chanler visited Laikipia in 1893 he "was struck by the fact that the vast plains . . . were deserted by all but a few bands of Wandorobo, who wandered over them in search of game." Delamere crossed the plateau in 1898 but saw no sign of human occupancy between Naivasha and the fringes of the Samburu country beyond Leroghi.

At first the Loita from Kenya under Sendeyo defeated in turn the *Il-Laitaiyok*, *I-Serenget* and *I-Salei*. Eventually the northern Purko and the southern *Il-Kisongo* joined forces against the Loita. In one battle between these factions the Purko/*Il-Kisongo* combination fought the Loita at Embagai Crater and forced the Loita warriors to their deaths over a cliff in the south-east wall of the crater. For a number of years Sendeyo, who for a while established himself at Ngorongoro, appeared to be more than holding his own but, by a

clever move, the younger son, Lenana (the Gentle One), finally brought about his defeat.

This calamitous period during which the entire Masai mode of life disintegrated and almost everything they possessed was lost, resulted in unparalleled adversity for the tribe. Almost every present-day tribal elder must have suffered extreme hardship in his youth and Fosbrooke attributes their intense conservatism and unwillingness to accept change as a legacy of those dark days. Even as long ago as 1905 Hollis considered that the Masai would have to alter their way of life or cease to exist; a question which is even more apposite to-day.

The protracted feud between Lenana and his brother, Sendeyo, was finally resolved in 1902 when, after overcoming his rival, Lenana acknowledged British rule.

The establishment of British administration effectively restricted the predacious activities of the Masai and, in 1904, steps were taken to contain the tribe within defined boundaries. This led to the creation of two Masai reserves. The northern, some 4,500 square miles in extent, was in Laikipia, and the southern, of 4,350 square miles, lay between the Anglo/German border, the railway line and Mount Suswa. A half-mile wide corridor connected the two reserves. For their part the Masai agreed to abandon all claim to grazing land in the Rift Valley.

On 10th August, 1904, the Laibons, with Lenana at their head, signed a formal agreement with the Government, an agreement which was designed to endure "so long as the Masai as a race shall exist." However, the 1904 agreement proved unsatisfactory, in spite of two extensions to the Northern Masai Reserve. The corridor became so infected with disease that the Veterinary Department was compelled to impose a quarantine, thus severing the umbilical cord between the two reserves, and being interpreted by the Masai as a breach of the agreement.

The division of the Masai into two separate sections led to a deterioration of tribal discipline and Lenana, residing in the Southern Reserve, found it almost impossible to control his people in the north.

These considerations resulted in a proposal to re-unite the two sections in an enlarged Southern Reserve and, in view of

his declining influence over the northern Masai, Lenana's dying wish was that this should be done. After various tribulations, the Second Masai Agreement was signed on 4th April, 1911. The withdrawal from Laikipia was finally completed in March, 1913.

The area selected for expansion was the Loita/Mara region, amounting to 9,210 square miles, more than twice the size of Laikipia. The Europeans who had settled along a portion of the west bank of the Southern Uaso Nyiro River and in the Lemek Valley vacated their land, which Sandford described as "some of the best stock country in British East Africa." An additional 920 square miles in Trans-Mara and 327 square miles on the Mau Escarpment were added later, and a further 370 square miles given to the Loitokitok Masai. Subsequent boundary adjustments have given Kenya Masailand a total area of 15,296 square miles (1959).

The lives of the Masai revolve entirely around their cattle and they despise people who labour for any other purpose. Only cattle and warfare are recognised as befitting their interest and manual labour is held to be unworthy of a warrior race. Part of the tribal tradition is that all the cattle in the world were assigned to them by God. In their view no one else, therefore, has a right to possess any. Cattle not only give the Masai an almost spiritual driving force but also provide them with the bulk of their food requirements; milk, blood and meat. Many beasts are slaughtered ceremonially and the moran have always consumed substantial numbers of oxen, although other members of the tribe generally eat the meat of sheep and goats.

In pre-European times their herds incurred very heavy losses through disease. During the course of his epic journey through Masailand, Thomson saw the results of one such visitation when he witnessed the 1883 "cattle plague," which he attributed to rinderpest though it was more probably pleuro-pneumonia. The plague was still raging when Teleki passed through Masailand in 1887. These were the reasons why in the past the Masai took to such large-scale cattle raiding, for the reproductive rate of their own herds was insufficient for their purposes.

Custom ordains that milk may not be consumed on the same

day as meat, but may be mixed with blood, which is obtained by tying a leather thong around a cow's throat and shooting a blocked arrow into the jugular vein. Sheep are also bled. The blood is caught in gourds and drunk hot from the beast. No cereals or vegetables of any sort were eaten in the old days by the warriors, although children and married people partook of vegetable food. Eland and buffalo were considered to be related to cattle and their meat was, therefore, consumed, but no other species of wild animal was regarded as fit to eat. Cattle which died from natural causes were, however, evidently thought to be suitable for consumption by children and married people.

Lions and leopards were attacked and killed because of the damage they inflicted on the cattle, and ostriches were slaughtered for their feathers. Ivory, which was obtained from the Wandorobo, was bartered for beads, wire and cloth from the Swahili caravans which periodically skirted the borders of Masai territory. Such trading was conducted mainly by the women. Thomson said that although the Masai and the Kikuyu were in a perpetual state of conflict, each apparently respected the others' women, who moved in absolute freedom and safety even when their men-folk were engaged in fighting each other.

Until he reaches his middle teens the young Masai is occupied in herding, while the women and young girls milk the cows and generally make themselves useful to the warriors. The girls undertake the household chores until such time as they are of an age to become the warriors' concubines. Thus, the main tasks fall to the lot of the older women. In the old days the primary function of the warriors was fighting, which occupied much of their time, but in between wars and raids they were not expected to do more than feast, dance and enjoy the company of the young girls.

The literal translation of the term *ol-murrani*, or warrior, is "one who is circumcised." The circumcision ceremony is the most significant occasion in the life of a Masai youth and marks the end of boyhood, his acceptance as a full member of the tribe, and the commencement of his term as a warrior. All youths undertaking the ceremony are usually 16 to 20 years old

and belong to one age grade. Each age grade is given a distinctive name and is referred to alternatively as the left hand and right hand circumcision.

While recovering from the ceremony, which is usually performed by an Ndorobo, the young man employs himself shooting birds with whose feathers he decorates himself. He also uses his bow for firing blocked arrows at the girls. When fully recovered, he is presented with the raiment and weapons of a warrior and becomes *ol-barnoti* (the shaved one) or junior warrior. From that time on he lives a communal life with others of his age grade in the manyatta and associates with the unmarried girls but, contrary to popular belief, access to the young women is not as free as is generally supposed. Each man has his own concubine whose selection is strictly regulated by formalised rules. Any pre-marital relations outside the framework of these rules can only be achieved by stealth, as sisters, mothers and grandmothers are present in the manyatta to ensure observance of the traditional code.

The junior warriors serve for 3 to 7 years or so. Then follows the *e-unoto*, or promotion ceremony, after which they become accepted as fully fledged senior warriors. Only then are they allowed to marry. A few years after the *e-unoto* follows the *olngesherr* ceremony which marks the termination of the senior warriors' period of active service, which usually lasts at least 10 years. They then receive a new and final name for their age grade and become junior elders.

Discipline was formerly very pronounced and great respect was shown to elders and senior age grades. Warriors were forbidden to consume intoxicants but they were accorded many privileges. They had the right to demand milk from anyone as well as oxen for feasting. Nowadays their responsibilities have changed and the herding of cattle is usually undertaken by the warriors.

The traditional everyday warrior garb consists of a calf or goatskin cape draped toga fashion over one shoulder, with a small black apron attached to a belt in which is inserted a narrow-bladed sword in a red leather sheath. Battle dress is an elaborate uniform distinguished by a horn clamp on the upper arm, together with ear, neck, arm and leg ornaments; the last

named consisting of the long white hair of the colobus monkey suspended from leg bells. A cape of vultures' feathers is worn around the neck, while the face and body are daubed with liberal quantities of red ochre and sheep's fat. A cap made from a goat's bladder encases the hair which, in turn, is surmounted by a head-dress of ostrich plumes or, more rarely, of lion's mane.

Like many scantily clad tribes, the Masai more than make up for their lack of clothes by the attention they bestow on their hair. Perhaps the hair style is the most distinctive feature of the tribe. There are a number of variations but the basic technique remains the same. The hair is allowed to grow to the level of the shoulders and is then parted in a line from one ear to the other. The hair at the rear of the parting is twisted into numerous thin plaits, the ends of which are brought together round a special stick to which they are carefully bound with thin sheepskin, thus forming a long pigtail.

The front hair is divided into three parts and plaited. The two side plaits are kept fast against the face by a cord passing under the chin, while the central plait, which hangs in the middle of the forehead, is tipped with a metal clasp. The whole coiffeur is then liberally daubed with sheep's fat and red ochre.

The women, on the other hand, shave their heads and eyebrows, but their ornamentation is as elaborate as their men-folk's. Legs, arms and necks are festooned with beads and coiled wire, to the extent that movement is sometimes quite difficult. In early childhood the lobe of the ear is pierced and a small sliver of wood forced into the hole. This is slowly enlarged by introducing larger pieces of wood until eventually a stone ball, encircled by a groove, is employed. Hollis saw one of these stone ear-plugs which weighed no less than 2 lb. 14 oz. Ear ornaments have great social significance among both men and women of the tribe.

Spears and swords are the prerogative of the warriors, who also carry a club of wood or rhinoceros horn, while bows and arrows are the weapons of elders and uncircumcised boys. The latter use them to obtain plumes and feathers for the adornment of the warriors. Arm rings, either of buffalo horn

or ivory, are worn only by elders and are an indication of wealth.

The spears are of three distinctive types, the long-bladed war spear being the most important. The colour of the shaft is significant, black shafts being the privilege of the senior warriors, while others have to be content with red. The junior warriors' desire to be accorded the privilege of the black shaft leads to frequent tension and often fighting with their seniors.

The oval-shaped shields, some three feet long and painted with the appropriate heraldic insignia of the owner, indicating age grade, clan and rank, are made from buffalo or giraffe hide stretched on a wooden frame. An idea of the slender proportions of the Masai can be gauged from the fact that few Europeans are able to insert their hands into the grip of a warrior's shield. Its substantial weight makes conveyance over long distances an extremely arduous performance, particularly when moving at a jog-trot.

Although the undulating plains of Masailand contain the largest concentrations of wild animals anywhere in East Africa, the attitude of the Masai towards the wild creatures with which they share their domain has, until recently, been one of indifference. In the past they did not hunt wild animals and despised anybody who did. This traditional toleration of wild animals is probably because the pastoral Masai never cultivate the land and therefore have nothing to lose from the presence of wild ruminants. Their flocks and herds suffice to provide all their nutritional requirements, so they have little cause to hunt. At the time of the wildebeest calving they take the precaution of keeping their own cattle clear of the calving zone, as experience has taught them to associate malignant catarrh with the placentae of the wildebeest. Hinde recorded that "formerly the great Masai Race domesticated thegnu and used the milk of tame herds both as food and for rearing the calves of their cattle," but it has not proved possible to obtain confirmation of this interesting statement from any other source.¹ Mention has already been made of the Masai consum-

¹ Mr. Edward Buxton also states that "the Masai are said to catch females of this species (wildebeest) to nurture their tame calves," but it

ing eland and buffalo meat but, apart from these examples, they have always been perfectly content to exist side by side with the creatures of the wild and have justifiably been acknowledged as the greatest preservationists in Africa. Lion, however, are regarded quite differently and, in order to prove their valour and acquire prestige, the warriors match their skill against an adversary considered worthy of their courage.

Clad in the full panoply of war and armed with shields and glittering spears, a small band of moran fan out into a crescent formation. As they sight their quarry the line of chanting warriors quickly encircles him. Crouching behind their shields, their faces peering over the rim, the ring of warriors gradually closes. With bared fangs and lashing tail the lion, uttering ferocious growls, turns first one way then another but, finding himself surrounded, suddenly charges the nearest spearman. Dropping on one knee, the moran braces himself for the shock of impact, catching the full weight of the enraged beast on his shield and at the same time thrusting hard with his razor-edged spear. Instantly the remaining warriors spring forward to aid their fellow and attack the lion in flank. As the stricken lion rears up, roaring defiance, striking out with fang and claw, spear after spear impales him. Then, with shields raised high about their heads and to the accompaniment of a deep-throated dirge, the near-delirious warriors enact a wild triumphal dance around the corpse.

The honour of the kill is not, as might seem proper, accorded to the warrior who initially transfixes the lion but to whoever first succeeds in seizing hold of the lion's tail. Fierce arguments, frequently leading to blows, ensue between the rival claimants and whoever is finally awarded the coveted trophy is entitled to wear the mane in place of the normal ostrich feather head-dress.

Although lion hunting is now illegal, bands of young moran occasionally defy the law and resort to their traditional sport when opportunity occurs. This is no longer a very common

must be presumed that he obtained this information from Captain Hinde, Commissioner of the Masai, since it was recorded at a time when the two were encamped close together at Lukenia in 1899.

occurrence as, in recent years, lions have become relatively scarce in Masailand. As a means of blooding their spears they now have to be content with spearing elephants, rhinos or buffaloes and this they do with increasing regularity.

The *Il-Kunono*, a separate and inferior Masai clan, who may be the remnants of some other tribe which was conquered and forced into a subservient position, serve as smiths, smelting and making spears and arrow heads although, in keeping with their natural reticence, they are extremely reluctant to divulge the secrets of their craft. The Masai regard the helot *Il-Kunono* with unconcealed contempt and no Masai will take anything from a smith without first coating his hands in oil. The status of the smiths can perhaps be better appreciated when it is realised that in a case of homicide a number of "blood cattle," varying from as many as two to three hundred for a Masai man, to nineteen plus a similar number of sheep or goats in the case of a woman, are forfeited; but no such compensation is payable for the murder of a smith. On the other hand, if a smith kills a Masai a number of warriors promptly slaughter several smiths.

Although the Wandorobo and the Masai are entirely separate tribes, there is a close affinity between the two and, in return for Masai patronage and protection, the Wandorobo perform many valuable services for their more powerful masters. In the 1890's, following smallpox, famine and rinderpest, the surviving Masai were forced to hunt and even cultivate in order to live. The close relationship of the Wandorobo and the Masai to-day may be due to the assistance the Wandorobo gave the Masai at that time of tribulation.

Evidence of the scale of the adversity which befell the Masai was given by Bishop Tucker in describing a place which must have been close to present day Nairobi. "We came upon a scene sad and sickening in its tokens of accumulated misery. Hundreds of skeletons of Masai were lying about in all directions. Deserted kraals were dotted about here and there, and around them skins, broken calabashes and household utensils of all kinds covered the ground. Their homes had been broken up by smallpox and starvation. The cattle plague had carried off vast numbers of the flocks and herds of the Masai, and as

they are not cultivators of the soil their only means of subsistence was gone—and starvation claimed its victims by the thousand.”

The series of disasters which struck the Masai in rapid succession during the last decade of the nineteenth century broke the power of the Masai and demolished their unity. Their attitude towards the British Administration has invariably been honourable and they have always observed their pledge. This is generally ascribed to the influence of Mbatian who, on his death bed, foretold the epidemics which would destroy both cattle and men, and that white men would come with whom he recommended the Masai to enter into friendly relations. This advice may well have been accentuated in the minds of the Masai by the realisation that the rapid sequence of calamitous events had extinguished their supremacy and that among the surrounding tribes their earlier activities had turned every neighbour's hand against them. The Masai no longer dominate the interior of East Africa but it is entirely due to them that substantial herds of plains game still exist in southern Kenya and northern Tanganyika. We owe an immense debt of gratitude to the Masai for being the only East African tribe to adopt an indulgent attitude towards wild animals. This brief historical account is necessary for a fuller appreciation of the present status of Masailand in the faunal context, and should be considered in conjunction with Chapter 15.

PART TWO

The Setting

7. The Northern Reserve

THE NORTHERN FRONTIER holds a particularly important place in the story of wild life conservation in Kenya. The rapid development of the more favoured parts of Kenya led a few far-sighted individuals to realise that wild life would have the best long-term chance of survival in areas too poor or too remote to be required for development purposes. For this reason they naturally turned to the Northern Frontier region, contending that the establishment of a large game reserve in this remote and desolate realm would ensure the protection of substantial numbers of wild animals, without in any way conflicting with the lives and interests of the native inhabitants or impeding development, for development was hardly a practical proposition in such a sterile region.

The Northern Frontier Province, including Turkana District, extends over an area of 126,765 square miles, and thus covers more than half Kenya. Bordering Abyssinia and the Sudan, it is one of the few parts of Kenya remaining unaffected by the encroaching tide of civilisation. For many years the Northern Frontier remained almost divorced from the rest of Kenya and, even to-day, entry into the area cannot be undertaken lightly. Such maps as existed were notorious for their inaccuracy, and the only routes were camel tracks vanishing into the harsh desert wastes. Landmarks were scarce and the only shelter from the blistering sun and dust and searing wind was an occasional sand lugga, where umbrella thorns gave scant but welcome shade. Except for the brief wet seasons, water was always scarce, and the few precious water-holes were separated by many weary miles. If the fierce tribesmen were in a congenial frame of mind, the traveller might have

obtained a refreshing draught of camels' milk and *buni*—dried wild coffee berries. They had little else to offer.

To the north of this wild country lay the mountainous regions of Abyssinia, where dwelt the sadistic and treacherous Habash. East were little-known Jubaland and Tanaland, while westwards stretched the desolate lava-strewn country peopled by the Suk and Turkana. In the distant south, where snow-capped Mount Kenya reached up to touch the sky, were the fertile green uplands and rolling forest country of the Meru and Kikuyu peoples.

Towards the end of the last century a few intrepid explorers began to penetrate the blank spaces of the Northern Frontier. The first European to set foot there was Count Teleki who, in 1888, took the western route through the Frontier. It is believed that Teleki first saw Marsabit Mountain from Mount Nyiro and, a few days later, on 6th March, 1888, discovered Lake Rudolf. He was followed by Arthur Neumann, who spent several months hunting elephants near the lake in 1894. In 1895, Donaldson-Smith trekked down from Berbera and, two years later, in 1897, Lord Delamere and his companion, Dr. Atkinson, traversed the country from north to south, the first Europeans to do so. Lord Delamere camped by the spring from which the Marsabit water supply is now obtained and which is still known as "Delamere's Njoro." The mountain was swarming with elephants and it is said that he used to sit on the hill above and shoot them as they came down to drink. Dr. Atkinson shot 21 elephants in as many days.

Travel in those days was difficult in the extreme. All provisions, stores and equipment had to be carried by porters and, although game meat was plentiful, there was the ever present problem of water and the constant threat of attack by sullen and suspicious tribesmen.

Early in 1907, Captain G. H. Riddell was granted permission to purchase mules and donkeys from the Samburu, Rendille and Boran. He formed the Boma Trading Company and opened up a route from Harrar, in Abyssinia, down the Juba River to Kismayu, trading in sheep, goats, ponies, ivory, hides, bees-wax, ostrich feathers and other marketable goods. A second route went from Marsabit to the Highlands of Kenya

via Rumuruti, and the Company owned a series of depots under European management. Horses and mules were very expensive in the settled parts of Kenya and a good supply of cheap, hardy animals from Abyssinia proved both popular and profitable. At that time the newly introduced rupee was contemptuously ignored by the northern tribesmen and the Maria Theresa dollar was the only acceptable coinage, although the barter system was more commonly recognised.

In the same year, Mr. Zaphiro, the Frontier Inspector, was responsible for building Fort Harrington at Moyale. For several years he was the only European official between the Abyssinian border and the Uaso Nyiro River. In view of the unsettled condition of the Frontier, the Governor, Sir James Hayes-Sadler, thought it advisable to establish a station at Marsabit with the object of protecting the trade routes and strengthening administrative control. The Company's post, situated in Sogorte Guda Crater, was therefore purchased by Mr. G. F. Archer on behalf of Government for £100 and used as a boma, or administrative headquarters, with detachments of the King's African Rifles stationed there to preserve law and order. (The Crater Station was transferred to its present site in 1915.) This development was warmly supported by the British Minister in Addis Ababa, Mr. T. B. Hohler, who suggested establishing additional stations at Golbo and Dolo in an attempt to check the indiscriminate slaughter of elephants in the country by Abyssinian raiders. This was done in 1908. Supplies for the stations had to be fetched from Meru, while caravans threading their way from the Coast occasionally penetrated into the eastern fringes of the Frontier.

The sole means of transport was by pack donkey and baggage camel or teams of oxen. The mails took eight days to Archer's Post from Nairobi and twice a month were carried to Marsabit by donkey or camel. A letter from Moyale took some five weeks to reach Archer's Post. Ox waggons from Archer's Post followed a chain of water-holes, Kauro, Kinya, Lengaia, Merille, Laisamis and on to Ret on the slopes of Marsabit Mountain, reaching the boma itself in about ten days.

Barsaloi, situated in the long valley between the Karissia Hills and the Matthews Range, was at first an important post

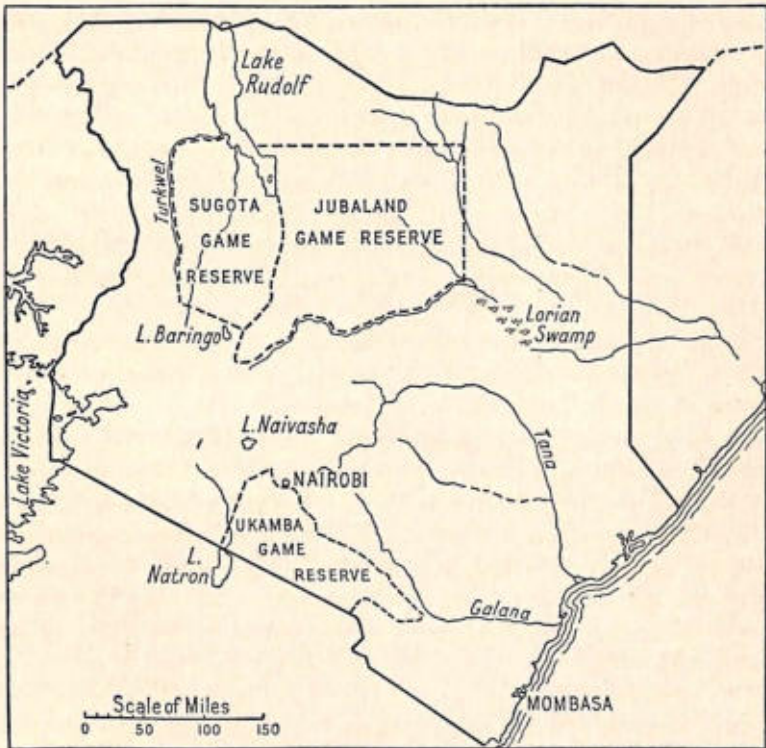
but in 1929 it was abandoned in favour of Isiolo, which is now the Provincial Headquarters. The stone foundations of the King's African Rifles' lines and houses can still be seen on the hillside overlooking the great sand lugga. A small garrison was also stationed at Loiungalani on the inhospitable shores of Lake Rudolf. This area suffered from frequent raids by Abyssinian poachers who, armed with spears and primitive firearms, swooped down during the rainy season, with the result that the greater part of the region was eventually almost denuded of game. At one time large herds of buffalo and elephant could be seen drinking by the open lake, but the herds were finally driven away by the activities of the armed poacher gangs intent on ivory, rhino horn and skins.

During the time when the Naivasha Province still formed part of the Uganda Protectorate¹, the Jubaland Reserve, some 25,000 square miles in extent, was established with the principal object of protecting elephant. This did not appear to deter traders passing Baringo Station and proceeding northwards into the Suk and Turkana countries from entering the reserve from the west in the vicinity of Leroghi and destroying a great many elephants.

On 21st November, 1899, Sir Harry Johnston, Her Majesty's Special Commissioner in Uganda, requested the authority of the Marquess of Salisbury, then Foreign Secretary, to "proclaim (temporarily) as a Game Reserve, the area comprised within the following limits:

"Starting from the mouth of the River Turkwel where that river enters Lake Rudolf, the boundary of the Sugota Game Reserve shall follow the coast of Lake Rudolf southwards until it reaches the south-eastern-most point of the lake. From this point the boundary shall be carried south-eastwards to the western flank of Mount Nyiro, and thence shall continue southwards along the western face of the Laikipia escarpment

¹ In 1902, the Provinces of Naivasha and Kisumu were taken over from Uganda. The East Africa Protectorate then consisted of seven provinces, apart from the unadministered territories towards the Abyssinian border. These were Jubaland, Tanaland and Seyidie on the Coast; Ukamba and Kenya to the east of the Rift Valley; Naivasha, comprising the Rift Valley and parts of the Mau; and Kisumu on the shores of Lake Victoria including Nandi and Lumbwa



The Sugota, Jubaland and Ukamba Game Reserves in 1900

until it reaches the source of the small stream which flows into the north-eastern-most gulf of Lake Baringo. Following this stream, down stream, the boundary of the said game reserve shall continue along the north coast of Lake Baringo, and shall thence be drawn north-westward to the western-most source of the River Oron in the Kamasia Mountains. From this point the boundary shall be carried in a north-westerly direction along the northern flanks of the Kamasia and Elgeyo plateau till it reaches the right bank of the River Weiwei or Turkwel, and thence shall follow the right bank of the Weiwei or Turkwel downstream to where the said river enters Lake Rudolf.”

In January, 1900, approval was given and the Sugota Game

Reserve was established. Sir Harry Johnston wrote this brief description of the region in 1902: "Along the valleys of great rivers, like the Turkwel, which seldom wholly dry up in their lower courses, there are forests of the tall acacia. . . . The only certain feeder of Rudolf is the mighty river Omo which flows all the way from southern Abyssinia into the northern end of the Lake. Along the lower course of the Omo the vegetation is of tropical luxuriance and in places there are huge stretches of papyrus swamp. With this exception the whole of the Rudolf region is almost as un-prepossessing as the Sahara."

Some years later, Johnston, in explaining his reason for hurriedly proclaiming the reserve, stated that he had learned that a very large "so-called sporting expedition under a Frenchman named Sporck" was reported to be coming to East Africa en route for Abyssinia via Baringo and Lake Rudolf. The caravan included "a number of armed Somalis and it was said . . . by my predecessor that in a previous expedition, a great deal of damage had been inflicted. As a sudden precaution . . . I therefore hurriedly pronounced all that region to be a game reserve, merely to gain time."

This area, known as the "Sugota Reserve of the Uganda Protectorate," covering 13,300 square miles, included much of the Suk and Turkana country. Together with the Jubaland Reserve, which it adjoined, the total area of both reserves was approximately 38,300 square miles.¹ Later, part of this large region became known as the Northern Game Reserve. However, it was entirely beyond the limits of effective administration and, until 1906, continued to be a happy hunting ground of "Somali, Baluch and other traders who killed large numbers of elephants without let or hindrance."

F. J. Jackson, then acting Commissioner of the E.A. Protectorate, considered that "at least eight-tenths of the ivory obtained in this Protectorate (Kenya) as well as all the ivory from Manimani and Dodosa in the Uganda Protectorate,

¹ In addition to the Sugota and Jubaland reserves the Uganda Game Regulations listed the Toro Reserve (2,500 sq. miles) and the Budongo Forest Reserve (2,000 sq. miles) as well as "a circle 9 miles in diameter round the following places, the centre of the circle being the Collector's house:—Naivasha, Eldama Ravine, Mumia's, Iganga, Entebbe, Mbarara, Fort Portal, Hoima and Wadelai."

comes from countries north of our chain of stations," which formed a line stretching from Kitui to Kisumu.

Percival (1905) agreed that the Northern Reserve "might, with advantage, be reduced in size, but the country comprising this reserve is hardly under Government control and is so little known that it would be difficult to decide at present on which to keep as reserve and which to throw open." He thought there might be considerable advantage in including "the Masai Reserve on Likipia a game reserve, and throw open the old Sugota Reserve, retaining part, at any rate, of the Jubaland Reserve."¹

In April, 1906, the boundaries of the huge Northern Game Reserve were re-defined as follows:

- (1) On the north by the third parallel of latitude;
- (2) On the east by the thirty-ninth meridian of longitude;
- (3) On the south by the Guaso Nyiro from the point at which it is intersected by the thirty-ninth meridian of longitude to its junction with the Guaso Narok, and then by a line drawn from the said point of junction to the source of the small stream (Mungatan) entering the north-easternmost bay of Lake Baringo, following this stream down-stream, the boundary line continues along the north shore of Lake Baringo and thence is drawn north-westward to the western source of the River Oron in the Kamasia Mountains, from this point the line is carried in a north-westerly direction along the northern flanks of the Kamasia and Elgeyo Plateaux till it reaches the right bank of the River Weiwei or Turkwell.
- (4) The River Weiwei or Turkwell on the west by following the right bank thereof down-stream to Lake Rudolph. The aforesaid area shall be known as the Northern Game Reserve.

¹ Until 1924 the Juba River was the boundary between Kenya and Italian Somaliland. Colonel Grogan recalls that, at the Paris Peace Conference after the 1914/18 War, Lord Milner, then Secretary of State for the Colonies, called him to a map of Africa hanging on the wall and said: "The Chief (Lloyd George) has given the Juba River to the Italians. Where is it, and has it any significance?" "Thus," commented Grogan, "are Empires made and unmade."

In 1908, it was agreed to reduce the Northern Reserve "from its present unwieldy size." It was proposed to "cut out the Rift Valley portion north of Lake Baringo and make the Laikipia Escarpment and Mount Nyiro the western boundary, and reduce the eastern portion by one degree of longitude." This still left an area of approximately 13,000 square miles as a sanctuary. This decision followed a visit by Colonel Patterson, the newly appointed Game Warden, and after the opinions of the various Provincial Commissioners concerned had been obtained.

Colonel Patterson's visit was very necessary because until that time practically nothing was known of the Northern Reserve. Unfortunately, he was content to confine himself to following the proposed eastern boundary instead of traversing the entire reserve from east to west as was really required. His report was therefore "far from satisfactory." Nevertheless, a decision had to be made, even though Jackson considered "our information is scanty."

Although time has served to remedy, to a great extent, earlier complaints that the region was beyond effective administrative control, the administration of such widely dispersed tribesmen as the Boran, Turkana, Rendille and Samburu and their cherished herds of domestic animals requires considerable patience, understanding and discernment.

In the harsh desert terrain, where the monotony of the unending lava wastes is only occasionally relieved by thorn scrub or, more rarely, by the luxury of a shady clump of acacia trees, water is the very life-blood of the community and all living things must conform with Nature's relentless laws if they are to survive.

With the advent of the rains, the desert is miraculously transformed almost overnight as if by an invisible multitude of scene shifters. Trees and shrubs which, yesterday, were but wizened and emaciated sticks, burst forth in all their finery, the more splendid when contrasted with their normal drab apparel. The bare boards of the desert stage become carpeted with a gay profusion of multi-coloured flowers and plants. On the damp sand and along the edges of pools, a gay harle-

quinade of painted butterflies restlessly display their dainty costumes, making the most of their fleeting appearance. From dawn to dusk, the ceaseless song of exquisite birds proclaim the brief occasion, their sustained music accompanied by the discordant trumpeting of elephants as they congregate near the waterholes. As the curtain of dusk descends, a pride of lions voices its approval, and the maniacal laugh of the hyaena echoes across the stage as it goes its scavenging rounds.

For a brief period, following the rainy season, the pools and rain-filled depressions, scattered at random over the desert, enable the nomads to graze their livestock far afield. But such affluence is only briefly bestowed and as quickly withdrawn. As these temporary water pans dry out, man and beast are compelled to withdraw to the more permanent sources in the mountain ranges; the Uaso Nyiro (the only permanent river in the reserve), to one of the rare desert wells or, perhaps, beneath the beds of sandy water-courses.

This weary annual retreat of all living things, resignedly falling back before the relentless assault of the elements, is philosophically accepted as a part of life and, because the nomad holds his domestic animals in such regard that they represent everything that is most precious to him, it can be said that the tribesman fares no better than his beasts. At the height of the dry season, it is not uncommon for livestock to water only every fifth day. When the rains fail, the nomad may be forced to exist at bare subsistence level on such bulbs and roots as the desert provides. Perhaps that is why the Boran have named the desert rose, with its extensive system of drought resistant tubers, "*buta warabessa*," or "the gourds of the hyaenas."

The life of the tribe revolves around the scattered watering-points. Over the years these have been supplemented by wells, some of which are a legacy from the remote past, traditionally excavated by a race of extinct giants. Hobley has given a brief account of these semi-mythical people.

In the Somali hinterland there are also evidences of a much greater population and it is highly probable that they were a great pastoral people, for the country is not an agricultural area, but pre-eminently a stock country. Around

Wajheir, in Jubaland, to-day large numbers of artificial mounds are to be found, many of them as much as 30 feet in height, and these are it is believed the funeral mounds of an extinct race . . .

These mounds are so numerous, and in addition the large number of well-excavated wells—often over 40 feet deep—and the traces of artificial dams, all go to prove that this area, which is now practically a desert, once carried a large and organised population. It is now only inhabited by a limited population of nomad Somalis . . .

The Somalis say that the wells and the mounds were made by the Ma'anthinle people. This name in the Somali language means the "Tall People."

The wells are for ever being deepened, for each year the water table declines. The precious liquid is still brought to the surface through the age-old system of a team of young men and girls who perch precariously, one above the other, on narrow footholds cut in the vertical sides of the shaft. Giraffe-hide vessels are tossed nonchalantly from hand to hand and the contents poured into an earthen furrow. The monotony of this endless fatigue is rendered more tolerable by the tedious, throaty dirge which accompanies the task while, all around, thirst-crazed beasts wait with astonishing discipline for their turn to be summoned to the trough.

As in all primitive pastoral communities, the compelling temptation to possess the maximum number of domestic animals has led to gross overstocking and the devastation of what was, in any event, an extremely delicate habitat. Attempts have been made to introduce controlled rotational grazing but most forms of restraint are foreign to the nomad temperament, and even beneficial controls are all too often resented as unwarranted interference with the traditional life pattern.

The serious decline of the Northern Frontier Province fauna during the recent past has been brought about by a combination of factors. Extensive and unchecked poaching by local tribesmen and armed bands from across the Abyssinian border has been a major contributory factor. Sir Harry Johnston, writing in 1902, had this to say:

This is (or rather was) a sportsman's paradise, but three things seem to have diminished the game in Rudolf Province:

1. The continued and appalling drought which is killing all the vegetation not growing near permanent water;
2. Reckless attacks by Swahili caravans coming from Mombasa;
3. The ravages of Abyssinians.

Drought and the Abyssinian have depopulated nearly all the east coast of Rudolf, and even the camels have died of drought, and strew the country with their whitened bones. The late Captain Wellby, who visited these regions two years ago (1900) wrote to me that the aspect of much of the east coast of Rudolf was the most desolate he could conceive, like a picture of a dead world, strewn with the whitened bones of huge mammals and of men, no vegetation to be seen within reach of the eye.

These factors alone do not entirely account for the severe reduction of faunal populations. The essential reason—and it is not restricted to the Northern Frontier—has been the great increase in the numbers of domestic animals. With the possible exception of the numerical increase in the human population, overstocking is probably the most pressing single problem facing the Administration all across Kenya to-day.

The Government has been fully aware of the problem of overstocking, but has been consistently reluctant to adopt restrictive practices which alone could hope to restore the situation. Contrary to widely held opinion, the Kenya Government has steadfastly refused to compel tribesmen to conform to a policy involving the limitation of the quantity of domestic animals they may maintain, unless the tribesmen themselves voluntarily agree to the proposition. This attitude is all very fine as an example of benevolent rule, but when assessed against a more practical yardstick—nothing less than the long-term welfare of the tribes concerned—it is a policy which is patently misguided. The official attitude is well summarised by Elspeth Huxley when she asks: "Why? Because the people want it and the land is, after all, their own."

The Government can show them how to get a bit of flesh back on its bones and how to nourish it, but in the long run cannot force its owners to treat it in this or in that way."

The Administration regards its mission in the light of an adviser or guide, and while it will help all it can to persuade tribesmen to adopt new and better methods of husbandry, it will never use force or compulsion. This is the dilemma and this the weakness, for it is expecting a great deal for nomadic tribesmen to look with anything but suspicion and resentment on any radical departure from their accepted traditional methods. So the deserts continue to advance.

Great Britain might almost have joined with the amiable Colonel Gould, "who loves to lie abed dearly and gently grumbles at the thought of undergoing the fatigue of dressing," when Boswell inquired if he was severe on the men. "No," was his reply, "I have too great an aversion at trouble myself to give them any."

For many hundreds of years the forbidding desert has been a haunt of surprising numbers of wild animals. The unbroken monotony of the lunar scenery was relieved only by the impressive herds of wild animals constantly moving across the shimmering landscape in their unceasing search for grazing and water. On the plains there were numerous antelopes and gazelles, including the giraffe-necked gerenuk, and their attendant predators, while elephants, rhinos and buffaloes preferred—but were by no means restricted to—those regions more favourably endowed with water and forest cover. In the Northern Frontier Province, several forms are found which do not occur elsewhere. The imposing reticulated giraffe, resplendent in his distinctive polygonal markings, and probably the most handsome of the family Giraffidae: Grevy's zebra who, standing some 14 hands, is larger than the more common Burchell's, and whose notable features are finer markings than his cousin, as well as prominent rounded ears; the Somali ostrich,¹ self-consciously strutting across the scene, the better to display his elegant light blue stockings; *Oryx beisa* and, finally, Hunter's antelope, although the last named is restricted to the

¹ Both the Somali and the Masai ostrich are to be found in the eastern section of the Tsavo National Park.

eastern regions outside the areas which, at various times, have been included in the Northern Reserve.

Marsabit Mountain, flaunting its laurel of primeval forest over the parched floor of the surrounding deserts, is entwined with meandering game trails and contains a rich profusion of wild life in many forms. The twin craters of Choppa Gof and Gof Bongoli, with their wallows and seasonal pools, attract numbers of animals, while the surrounding forest is the haunt of a variety of birds and butterflies. The Boran have named Marsabit "The Hill of Butterflies," and incalculable numbers of these exquisite insects, displaying brilliant armorial bearings which traverse the full range of the spectrum, glide like thistle-down beneath the forest canopy.

Marsabit Mountain stands out prominently from its bleak surroundings. It is a regular-shaped volcanic mass, rising high above the surrounding plains, with thick forest at the upper levels. This verdant oasis appears hard put to defend itself against the onslaughts of the five deserts which invest it. Its cool forests and adequate water provide a natural pivot for the far-flung tracery of paths and tracks which disperse towards every horizon.

Half a century ago, there was ample water on the mountain. The numerous springs and brooks and the two crater lakes, Sogorte Guda and Sogorte Dika (later christened "Lake Paradise" by Martin and Osa Johnson) provided for the requirements of neighbouring tribesmen and their domestic animals, as well as the abundant fauna, however severe the season.

During the late war a combination of factors reduced Lake Paradise to a mud wallow in which only a few rare puddles held water. The intensive military activity during the Abyssinian Campaign, when Marsabit served as an army base, including the intrusion of a great many pastoralists and their livestock evacuated from the forward areas, and the sinking of ill-advised boreholes, led to the drying-up of the crater lakes.

More recently, the persistent trampling of wild creatures has, to some extent, made the floor of the lake impervious and there is hope that, in time, its former usefulness and beauty may be restored.

Concentrations of troops inflicted many casualties on Marsabit's wild animals. The greater kudu in particular, which have never been numerous anywhere in Kenya, suffered severely at their hands. These stately animals, not merely because of their rarity in Kenya (though common farther south), must surely qualify as the most imposing of the African antelopes. The Marsabit kudu probably did not exceed 200 all told. During the post-war period they gradually recovered from the depredations of the military, only to be struck by an outbreak of rinderpest in 1960 which has once more drastically reduced their numbers.

Farther west, the beautifully timbered South Horr Valley is the abode of numerous elephants and is in stark contrast to the forbidding lava-encrusted shores of Lake Rudolf. To the east and north-east, the coral pink wilderness of the Hedad and Koroli deserts once carried an abundant fauna, which was exterminated in the early years of the century by armed raiders from the fastness of the Abyssinian Highlands. To-day, only an occasional gazelle, giraffe and ostrich remain. Very few rhino have survived in the Hedad, and most of those in the Koroli Desert have been exterminated by raiders from the north and local Gabbra tribesmen.

The valley lying between the Matthews and Ndoto mountains on the one hand and the Karissia Hills on the other, is dissected by three great sand rivers—the Seya, Swian (meaning "wild dogs") and the Barsaloi—which finally merge to become the Milgis. At the junction of these three rivers lies El Gerai, a delightful oasis of shady palms and papyrus swamps, which is a favourite spot for elephants and buffaloes, while rhinos are relatively common. The El Barta and the El Bonuki plains to the north, carry sizeable herds of *Oryx beisa*, eland, zebra (both Grevy's and Burchell's), Grant's gazelle and ostrich. In general, the forested heights are well populated with elephant, rhino and buffalo but, during the rainy season, there is an exodus from forest to plain.

The Uaso Nyiro River, which is about ten miles from the southern boundary of the province, contains the only permanent water for many miles and, in the sweltering heat of the Northern Frontier, is a life-giving artery in every sense. It

pulsates with wild life of all kinds. Only a few hippo are to be found in the river, but the maze of tracks threading their way down to the tree-lined banks attest its popularity with other species.

Stretching northwards from Mount Kenya is an extended procession of hill features and mountain ranges which stride across the Northern Frontier to merge with the Abyssinian Highlands. These include Marsabit, the Matthews, Ndoto's, Mount Nyiro, Mount Kulal, and the Hurri Hills.

The Matthews Range is named after General L. W. Matthews, who at one time commanded the Sultan of Zanzibar's Army. The range is separated from the Ndoto's by the Milgis, an extensive seasonal river which drains the surrounding high country. Only for a few days each year does the river flow in the normal sense and then it rushes down in spate, enveloping or thrusting aside everything in its path. It then subsides as rapidly as it began. There are no permanent streams and, apart from the extremely limited rainy season, all living things must depend for water upon the few springs, rock pools or rough excavations in the sand rivers.

The Matthews Range is also one of the homes of the Wandorobo who, for countless generations, have utilised the large caves on the slopes beneath the summit for their dwellings. As a collector of honey the Ndorobo is unsurpassed. His hoard is stored in large wooden barrels with lids made from buffalo hide. Many a large cylindrical *mzinga* is seen suspended with hide ropes either from a tree, or, occasionally, over some deep defile. Few Wandorobo own any livestock. Sometimes a cow or two, or a handful of sheep or goats, are herded on the foothills, often inter-mixed with Samburu livestock while, in some of the remote forest glades, an occasional patch of tobacco may be grown.

Relative to the surrounding plains the various hills and mountain ranges appear well endowed with water but they are not by normal standards adequately watered. The Matthews, to give but one example, has barely a dozen springs which have to provide for the needs of the entire population. It is within convenient reach of these precious water supplies that the Samburu tend to congregate and, as a result, the lower country

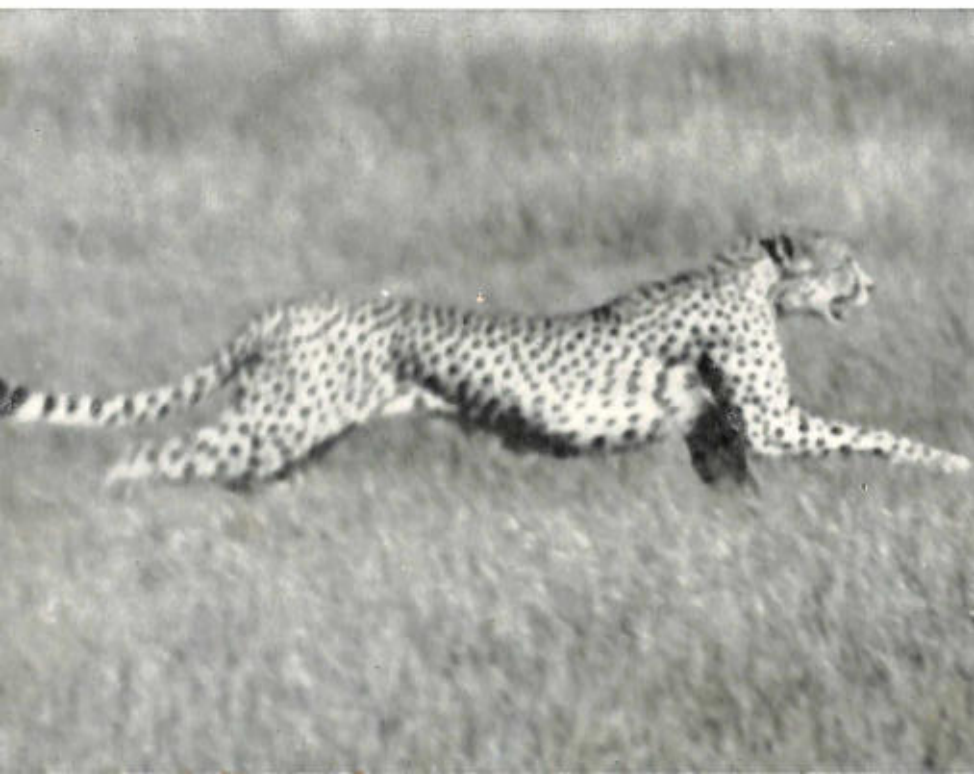
within a wide radius of the springs and wells has been devastated by the constant trampling of their huge herds of cattle. An attempt has been made to protect vital water sources by encircling them with the traditional cut-thorn fences, which serve against domestic animals by day and wild by night, but this precaution has not prevented widespread erosion of the neighbouring countryside, and the land is deeply scarred with a series of gullies and corrugations. Much vigilance is required of the forest guards and game scouts, who not only have to enforce observation of the grazing and watering rights but must also attend to the prevention of forest fires which, if allowed to get out of hand, are liable to inflict immense damage on the dehydrated forest and grazing.

The region supports a wide variety of animals. During the brief rains, when cold and rain cause some of the larger creatures to forsake the protection of the forest, large herds of elephants and buffaloes are to be seen on the near-by plains. Rhino are relatively common, while oryx, giraffe, an occasional cheetah, Grant's gazelle, Burchell's and Grevy's zebra are to be seen. Lesser kudu are frequently observed in the lower country, almost as though they could not bear to be associated with their grander cousins, the kris-horned greater kudu, who confine themselves to the uppermost slopes. The crests are shared with the klipspringers who perch with unconcern upon the most precarious cliffs and ledges.

Kulal is among the lesser known mountains of the Frontier and some consider it to be one of the most spectacular. Its inaccessibility has long contributed to its mystery, but approach to the southern part is now somewhat easier than previously, owing to the construction of a reasonable track from Bulesa Kulal—a series of wells in the bed of the Bulesa water-course. Even so, it is still necessary to prepare for difficult conditions owing to the fact that many miles of waterless and desolate country have to be traversed and there is no convenient township or settlement. Few travellers care to visit this remote area except for infrequent patrols by the District Commissioner, Game Wardens, Foresters or a few Frontier Police in the normal course of their duties. The whole of Kulal is extremely wild and formidable country, particularly to the



The cheetah. *Above*, a very young cub. *Below*, an adult at speed, the fastest animal on earth. Note the difference in the markings



west and south where the earth appears to be engulfed by a sea of lava. Small clumps of *Euphorbia* and other succulents cling tenaciously to the hillside, standing out deeply green against the surrounding amber wilderness, and the muffled sighing of the desert wind rustling the dry, sienna-coloured grass sounds not unlike the rasp of a stooping falcon. The wind, frequently rising to gale force, roars up the gorges and, as a result, all the trees in the area tend to lean westwards. The relentless wind makes it extremely difficult even to pitch a tent and there are many tales of camps being blown away in the night.

Apart from the brief wet season, life in this part of Kenya is a desperate struggle for the native inhabitants. Although the Hedad and Kaisut deserts, lying to the east of Kulal, support large numbers of domestic stock, the Rendille, whose territory extends from Marsabit Mountain to Lake Rudolf, have to undertake lengthy treks to reach the scarce and scattered wells. Africans living on the mountain also find water difficult to obtain. The southern part of the mountain possesses a fair number of springs but there are few beyond the forest zone and the rough nature of the country makes access to the natural cavities and rock cisterns an arduous performance. In the past, much of the game killed at Kulal was ambushed in the mountain's narrow canyons and gullies, for game paths lead up through the ravines and Habash poachers, lying in wait behind the cover of the steep, rock-encrusted cliffs, were able to indulge in a great slaughter. At one time elephants, buffaloes and other animals were plentiful at Kulal, but the wild life of the district was systematically depleted by armed gangs from Abyssinia and the remains of the victims were once strewn over the entire region. The elephants fled and have never returned to this ill-omened place.

The northern and southern sections of Mount Kulal are divided by the El Gijata Gorge, between 3,000 and 4,000 feet deep, which forms a severe barrier between the two halves of the cleft mountain. The walls of this rift have tended to crumble in, leaving a series of sharp precipices and striated teeth descending sheer into the trough. It is almost impossible to penetrate between the tiers of rock and thus skirt the rent, but they provide a suitable refuge for many hyrax, squirrels

and baboons. In places where the forest has managed to creep in, the groves and thickets offer cover to a variety of small animals. The upper parts of the mountain are covered with forest, with sheltered glades and unexpected clearings, in stark contrast to the shores of near-by Lake Rudolf, with its terrible belt of coal-black, stony debris which affords no vestige of shade or shelter.

Nowadays, with the possible exception of kudu, very little game is to be found on the mountain, although sometimes a few rhino and buffalo are present, and an occasional dikdik or bushbuck or, more rarely, lion can be seen. The retreat is shared by baboons, hyrax and leopards, and klipspringers leap with unerring skill over fearful crevices and knife-edged pinnacles. Conditions are favourable to a variety of birds of prey, including the enormous Verreaux's eagle, which nests in fissures in the rock face, the handsome lanner falcon, the repulsive Rüppell's griffon and even a pair of the rare lammergeyer.

The Northern Reserve has endured many vicissitudes since its inception. The huge block of territory that constituted the original reserve was unable to withstand many of the pressures which were directed against it, and has been whittled down to a fraction of the size of the parent Jubaland and Sugota reserves.

The difficulties of administration, while less than formerly, remain formidable and, of these, overstocking stands forth as the thorniest problem. Overstocking has led to a drastic lowering of what was in any event an impoverished and precariously balanced habitat. The future of the Northern Frontier depends very largely on resolving this difficult question.

From a conservation standpoint, the area is every bit as essential as it was when first conceived, for it still remains a vast region in which development on any scale is impracticable and likely to remain so. Although the numbers of wild animals have seriously declined, the region still has great faunal potentialities. Ways in which those potentialities can be realised are considered in Chapter 14.

8. The Southern Reserve

KENYA relied on two principal areas for the protection of wild fauna until the end of the Second World War, the Northern and Southern Game Reserves. At a very early stage the Government recognised that ordered development of the country must inevitably lead to large-scale elimination of wild animals in the high potential areas, and that wild life could only hope to endure in regions which, for one reason or another, were unlikely to be developed. The Southern Reserve was selected, not only because it contained an abundance of wild animals and a wide variety of species, but because it lay within Masailand. For reasons which have already been explained, the traditionally tolerant attitude of the Masai towards wild animals appeared to indicate that wild life would stand a far better chance of survival under the custodianship of the Masai than almost anywhere else in East Africa and, at the same time, would not interfere with the customary Masai mode of life.

Regulations governing the numbers of wild animals allowed to be shot, and instituting a licensing system, had been introduced from the earliest days of British influence in East Africa. The Queen's Regulations, promulgated under "The African Order in Council, 1889," contained a clause which made a breach of the game laws a punishable offence, but not for another ten years was an attempt made to establish reserves. The nearest approach to this was a regulation, published in 1897, which simply stated that "no shooting of any game is allowed within a radius of 25 miles of a Government Station, except with the special permission of the officer in charge of the district, under authority from Her Majesty's Commissioner."

On 11th August, 1899, the Foreign Office, in proclaiming the Game Regulations, authorised the establishment of a game reserve to include "the whole of the Kenia District of the Province of Ukamba, except the area within ten miles around the Government Station at Kikuyu. . . ."

British East Africa's first officially recognised wild life sanctuary was originally called the "Ukamba Game Reserve"¹ but within a few years became known as the Southern Game Reserve, covering some 10,695 square miles. In April, 1906, the area was re-gazetted and the boundaries defined as follows:

An area bounded by:

- (1) The north-eastern limit of the Uganda Railway zone from the Tsavo River to the bridge across the Ngong River, near Nairobi.
- (2) By the right bank of the Ngong River to the edge of the Kikuyu Forest and along the edge of the forest to the Mbagathi River to its source.
- (3) By a line drawn from the source of the Mbagathi River straight across the northern slope of Donyo Lamuyu (Ngongo Bagas), thence across Suswa to Mau Escarpment, which it follows south to the Guaso Nyiro and thence to the German frontier thence following the German frontier to the Tsavo River.
- (4) By the left bank of the Tsavo River from its source to its intersection by the Uganda Railway.

The aforesaid area shall be known as the Southern Game Reserve.

This extensive region, wedged between the Uganda Railway on the north-east and the Anglo-German territorial boundary, was all superlative game country at that time, and extended from near the eastern edge of the Loita Plains, embracing the Athi Plains, Amboseli, and stretching as far as the fringes of what is now the Tsavo National Park (West). The Southern Reserve varied in altitude from 2,500 to 7,000 feet and comprised a great variety of country from forest to high and low veldt, open plains and thorn scrub. It contained extraordinary numbers of wild animals and on one occasion, when camped

¹ Sometimes referred to as the "Kenia Game Reserve."

on the Olgerai River, Percival saw "20 rhinos at a waterhole within 150 yards of my tent."

One of the earliest descriptions of the area, later incorporated in the Southern Reserve, comes from the pen of Sir Frederick Jackson:

My first trip to East Africa was undertaken in the years 1884 to 1887, when that country was perhaps at its best with regard to the quantity of game. Within the last few years, however, since the country has been opened up, and the terrifying accounts of the dangers of entering the Masai country have proved to be absurdly exaggerated, various sporting expeditions have been undertaken and large bags have been made. Some of the game is certainly reduced in quantity, especially rhinoceroses, owing to the ease with which these beasts can be stalked.

The Kapite Plains to the west and the Athi Plains to the north-west of the Ukambani Hills . . . form another grand country with regard to the quantity of game in it, though it does not afford quite such a variety as the Kilimanjaro District. . . . Lions are very plentiful here and are seen perhaps more often than elsewhere, owing to the open nature of the country. The cheetah is by no means uncommon. Rhinoceroses have here rather a bad reputation for charging, which may possibly be accounted for by the fact that they are so much harassed by the Wakamba who, when out hunting, and unable to get within bow-shot of game by fair stalking, have to resort to driving, and wound far more rhinoceroses than they kill.

. . . M'Kameni, the last camp before striking across the Siringeti¹ Plains, between Teita and Taveta, a stretch of some 35-40 miles. These plains are often teeming with game, more particularly when the grass is beginning to shoot after being burnt. In September, 1886, this place was literally crawling with hartebeest and zebra, besides impala, *g. Grantii*, oryx colotis, and a few

¹ There are two Serengeti Plains in East Africa. The one mentioned here is not to be confused with the well known Serengeti National Park, but is the relatively smaller region lying between Amboseli and the Tsavo National Park (West).

eland and giraffe, with an occasional steinbuck and wart-hog.

Mr. Blayne Percival, the Protectorate's first "Ranger," wrote an extremely interesting account of his first two safaris into the interior of this great stretch of country. On the first occasion he marched from the Athi River to Nyiri Marsh (Amboseli) and on to Taveta: on the second trip he went from Taveta via Lake Chala to the Tsavo Swamps and River, thence to the Railway line between Makindu and Simba. He thus covered the region extensively and could justifiably report his satisfaction at finding "game abundant in nearly the whole of the country, in some parts extraordinarily so." Percival considered this region, which was uninhabited except for a few Masai in the Ngong Hills and at the foot of Kilimanjaro, to be exceptionally fine game country and recorded that he did not think "a better tract of suitable ground could be found anywhere." He was, however, concerned at the evidence of large-scale poaching at the base of Mount Kilimanjaro by the Wachagga from the German side of the mountain, "who have honey-combed the country with game pits."

It took Percival three days to cross the Athi Plains from the vicinity of the headwaters of the Stony Athi River. Zebra, Coke's hartebeest, wildebeest, Grant's and Thomson's gazelles were extremely numerous, particularly when well clear of the Railway line. Some idea of what this statement meant in terms of numbers, can perhaps be gauged from contemporary reports by passengers travelling on the Railway. The Uganda Railway ran through country in which wild life was found for nearly 400 miles of its total length of 581 miles; and it bounded the Southern Reserve for the whole length of its north-eastern border for a distance of 194 miles. In fact throughout the Empire there could hardly have been a more interesting or beautiful sight than the immense numbers of wild animals visible from the train. Even a seasoned sportsman like Dickinson, who had previously seen large concentrations of game in other parts of Africa, could scarcely believe his eyes: "East Africa is a paradise in more than one sense of the word. The quantity of game in certain parts, easily get-at-able, is absurd. I remember when in Somaliland, before I came here,

hearing fellows talking about the amount of game one could see in a day from the windows of the comfortable carriages on the Uganda Railway, which passes through the heart of the game country. I said little, but thought every time 'All men are liars.' All I can say now is if you don't believe it go there and see for yourself, and you will be badly startled."

The region in the immediate vicinity of the Railway (within the so-called "Mile Zone") was, of course, disturbed a good deal during the course of construction, particularly as each camp had its quota of rifles and there was a reward offered by the Railway Authorities for lion. Ostriches were plentiful, while Percival thought there were "almost too many rhinoceros; fully 30 must have been driven out of the way during three days' march. At one time I looked round and counted 8 within a half mile of the caravan."

Grant's gazelle were "extremely numerous and outnumbered everything else." Wildebeest were plentiful and several packs of wild dogs were reported on the Athi Plains, while lion were numerous and seen each day. Giraffe were common, "two or three troops being seen every day."

On the way to Amboseli, Percival saw his first Waller's gazelle (gerenuk). After two days' very hard marching, he reached Lake Amboseli only to find it brackish, although one pool fortunately contained a fresh spring. While the men, who "were very done up," rested, Percival explored the district. *Oryx callotis* were particularly plentiful, although very shy and wild, and there were large numbers of Grant's gazelle and wildebeest as well as other animals too numerous to mention.

Rhino were of course common. Even to-day Amboseli is still the best place for seeing and photographing rhino in Kenya.

A few miles farther on, game became scarce on the edge of the Loitokitok District, where the "country is hunted over by the Masai and the Chagga." Similarly, there was very little game to be seen on the lower slopes of Kilimanjaro or on the mountain proper, and only a few animals to be seen in the vicinity of Taveta. However, "within a few hours" of Taveta, game, including eland, again became numerous.

Percival visited Lake Chala and marched from there to the Tsavo Swamps. Between these two points, he saw more ostriches than he had ever seen anywhere else. The bush along the banks of the Tsavo River was so thick, that the safari was forced to leave the river and make for the open country a few miles away where, once again, game was plentiful. Then followed a three day march across undulating country, including crossing a waterless stretch. "Strange to say, this proved one of the best bits of game country I have seen. Oryx, wildebeest, Coke's hartebeest, gazelles, including Waller's, very many zebra, giraffe, rhinoceros, eland, as well as lion and hunting dogs, were seen during the three days we wandered across this part. Our guide proved to be useless and the Railway was reached many miles from Makindu. It seems that the Railway has cut into almost the best of the game country."

The area within easy reach of Nairobi, particularly the Athi Plains, attracted the obvious and immediate interest of sportsmen. There seemed little object in going to the expense of indulging in lengthy safaris, with all the trouble they entailed, when almost unbelievable quantities of wild animals were within comfortable riding distance of Nairobi.

By early 1902, several species were showing signs of being overshot, in particular Grant's gazelle. This became noticeable owing to "the number of females to each male and the poorness of the horns," although Percival was at pains to emphasise that the best country for Grant's gazelle was well to the south of the Railway. Wild animals were still numerous along the Athi River, "but so wild that only a member of the Long Range Club would be likely to make a bag." To the north of the Railway, however, game was still very tame owing to lack of disturbance.

Percival considered that movements of game were far more extensive than was generally supposed. "The chief movement—one can hardly call it migration—is from north to south in November, December and January, and from south to north in June, July and August. From November until June, grass and water are plentiful in the Kilimanjaro District, while farther north the grass dries up and food is hard to obtain in

the bare sandy districts, but on and around the Athi and other permanent rivers (of which there are none to the north of Kilimanjaro) there is food, so north come the beasts, leaving only oryx and Waller's gazelle in the deserts near Kilimanjaro."

Large herds of wildebeest and zebra concentrated on the Athi Plains from June to September but, during the remainder of the year, only relatively few of them were to be seen on the plains.

Wildebeest were perhaps the most conspicuous animals in regard to their movements, because when they left they invariably went in a body, leaving only very few stragglers behind. The last wildebeest to leave for the south each year appeared to be those from the vicinity of Simba. On their return, they were always accompanied by three-month-old calves. During August and the succeeding five months, the wildebeest moved as far north as the Thika River, but few seemed to pass beyond this point.

A number of Wandorobo, estimated not to exceed 40, of whom not more than half were entirely dependent on game, was hunting regularly in the Southern Reserve up to 1906. Most of the younger generation had taken to working with settlers or the wealthier Masai as cattle herders, leaving only the old men to hunt. In addition there were other Wandorobo turned agriculturalists on the Uaso Nyiro, near the Anglo-German border, who hunted only during the dry season.

The Wakamba in the Southern Reserve caused far more destruction of wild life than the Wandorobo, and without the same right to hunt, for the reason that they had almost entirely eliminated the game in their own country. Wakamba hunters had created two well-beaten foot-paths from the Ukamba Hills into the Southern Reserve, the one most employed crossing the Railway line approximately midway between Sultan Hamud and Simba Stations.

Colonel Delme Radcliffe stated that "in the old days the natives never paid attention to what is now called the Reserve, because the Masai were there. When I was in the Athi Plains (in 1902) the whole country was covered with Wakamba at every water-hole and they were killing the game in all direc-

tions; everything that walked was killed with poisoned arrows."

This was confirmed by Jackson, who mentioned that the Wakamba were "in the habit of organising large hunting parties and killing game wholesale outside their own districts." In their own country they had slaughtered all the game long before 1906, "and it is only within the last ten years or so that the Wakamba have dared to leave the confines of their own districts and enter the adjoining game country, owing to their dread of the Masai.¹ The Masai no longer molest them." In November, 1901, when there was a mild famine in Ukamba, "every man who could use a bow was out" on the Athi Plains.

Percival (1906) reported the Wakamba as "quite a truculent lot and it is impossible to send scouts among them." They were even reported to be building villages in the Southern Reserve.

As a general rule Percival was of the opinion that natives using their traditional weapons, principally bows and arrows, were unlikely to do a great deal of harm, but when they organised big drives the damage could be very great. The only district where this was done in Kenya on any scale was in the bush country "between the Tsavo River and the Serangati Plains." A thorn fence, often more than a mile long, was constructed and the game driven along it. Bowmen, who lay hidden in and behind the fence, fired poisoned arrows into the stampeding animals. For killing elephants the natives resorted to "pitfalls and drop spears."

The general consensus of opinion in 1906 was that the Southern Reserve was admirably situated and was sufficiently large to cover the migration of the animals it was designed to protect. There were something like 27 species of wild animals found in the reserve, out of a total of about 57 species known in the Protectorate.

¹ The same remarks could have applied to the Kavirondo who, up to the time of the military operations against the Nandi in 1900, never hunted in the Nyando Valley owing to their fear of the Nandi on one side and the Lumbwa on the other. After that date "they destroyed the game wholesale." (Jackson.)

Inevitably there was a conflict of interests between the preservationists and those who regarded wild life as standing in the way of development of the country. It was not long before the sanctity of the Southern Reserve ceased to be respected. The Railway Zone, which was originally a mile wide, was subsequently reduced to 50 feet on either side of the Railway and the reserve to the east of the Railway followed this reduction, but no official notification to this effect seems to have been published. The situation was quickly restored by the Commissioner, but served as a warning of possible future trends.

There was a Boer colony stationed about 40 miles inside the German boundary, and the Boers were able to cross the border along a line about 60 miles wide to the north of Mount Kilimanjaro. They were never seen, in spite of two African scouts being stationed on Kilimanjaro for the purpose, but numerous old black powder Mauser cartridge cases were found and it was known that the Boers were armed with these weapons. The track made by their frequent crossings of the boundary became a regular road.

The situation was not improved when, despite warnings, several of these same Boer families and their cattle crossed the territorial boundary and settled in the middle of the Southern Reserve. The Boers were no respecters of game regulations and they subsisted very largely on the wild animals they were able to shoot. In this regard they had much the same outlook as a gunbearer, mentioned by Jackson, who wanted a sportsman to shoot another zebra. When told that two had already been shot and that the regulations did not allow more, he retorted: "Never mind the regulations, Bwana, think of the fat."

Even the members of the Anglo-German Boundary Commission were not immune from the temptation to hunt. They killed 457 head of game, which figure did not include animals shot by the two officers of the Commission, most of which were obtained in the Southern Reserve.

During the period October, 1905 to February, 1906, many safaris were out all over the country and "the Athi Plains in particular were covered with camps. On one day I passed

through four in a march of about twelve miles." (Percival, 1906.)

The sport was so popular that Percival thought that "if the number of parties during this year 1906-7 is up to expectations, I do not see where they are all going to shoot, as very few care to leave the beaten track."

The country was so gaining in popularity day by day that it was often impossible to obtain porters in Nairobi for Government purposes at certain seasons particularly favoured by shooting parties, on account of the number of sportsmen in the country who had already snapped them up. By 1906, the number of shooting parties visiting East Africa had increased to such an extent that fears were expressed that some of the rarer species were in danger. The Earl of Elgin therefore decided to restrict the total of sportsmen's licences issued in any one year to a maximum of 500.

In 1908, when various amendments were being made to the game regulations, certain fibre-growing concessions were granted in the Southern Reserve on land fronting the Railway between Kibwezi Station and the Tsavo River, and an area between the Railway and the Chyulu Hills from the Kiboko or Makindu River to the Tsavo. The resultant excision was authorised on the grounds that the area was said to contain a large amount of good fibre and very little game. This was the thin end of the wedge, the official reasoning being that "if it is found later on that the preservation of game is incompatible in this area with the development of the fibre industry, it will be for consideration whether the eastern boundary of the reserve in this part should not be moved back. . . ."

Alterations to the boundaries of the reserve to satisfy the concession created a precedent which was to be followed on several occasions in the years ahead.

The First World War left its mark on the Southern Reserve, since it was in this region, between the Railway and the German border, that much of the fighting took place. It was not surprising that the game suffered severely in the process. The blundering antics of rhinos scarcely endeared them to the troops, particularly as rhino paths were frequently the most convenient routes to follow. After numerous collisions between

rhinos and patrols, each going about his lawful occasions, instructions were issued to kill any rhino in sight. By 1917, Percival expressed doubt as to whether the species would ever recover. There were, of course, many troops who could not resist taking a pot shot at any animal that moved, whether harmless or not, and the destruction must have been great, apart from the numerous animals which escaped wounded.

The troops lived off the country to a large extent and depended for their meat rations on whatever game they could procure. Percival estimated that not less than 40,000 game animals were slaughtered for meat within a two year period.

Giraffe were shot on sight because of their unfortunate practice of playing havoc with telephone and telegraph lines.

For once hyaenas and other scavengers were tolerated if not actually welcomed. In that inhospitable country there was a heavy mortality among transport animals. The hyaenas performed a useful, if grisly, function in disposing of the dead horses and mules which would otherwise have become a distinct menace to health. To the troops on the ground the ever present vultures, wheeling obscenely overhead, must have served as a depressing and constant reminder of the grim realities of war.

The Southern Reserve has held a predominant position in the history of wild life conservation in Kenya from the earliest years of the East Africa Protectorate down to the present day. Boundary adjustments and changes of status, some of which are considered elsewhere in this book, have not altered the fact that the area included within the Southern Reserve was, still is, and will continue to be one of the most important faunal regions in Kenya. In recent years the number of wild animals has seriously declined; water supplies and vegetation have been grievously impaired; and excessive numbers of domestic animals have reduced much of the land to near-desert conditions. The new proposals, which are described in Chapter 16, will not be able to restore the Southern Reserve to its former grandeur, but they should go far to ensure the area retaining its position as a faunal region of the first magnitude.

9. The Tsavo National Park

THE TSAVO NATIONAL PARK, 8,069 square miles in extent, has the distinction of being the largest faunal national park in Kenya. Only a small portion of the western sector of the present park was included within the original Southern Reserve, but to some extent the Tsavo Park can be regarded as partially replacing the Southern Reserve.

The park is situated in the south-eastern part of Kenya and is bisected by the main road and railway from Mombasa to Nairobi. The southern boundary runs with the Kenya/Tanganyika inter-territorial boundary from Lake Jipe to Kavuma; on the west it adjoins the Masai and Kamba Native Land Units, while to the north and east the boundary passes through uninhabited bush country. For administrative convenience the park is divided into two parts. Tsavo West, covering 3,000 square miles, is administered from headquarters situated five miles from Mtito Andei. Tsavo East, with headquarters four miles from Voi, extends to approximately 5,000 square miles.

The park owes its existence to G. G. MacArthur, Senior Assistant Game Warden to Archie Ritchie who possessed a remarkable knowledge of that remote part of Kenya. He strongly urged the 1939 Game Policy Committee to establish a national park in the region situated between the Wakamba Reserve, the Masai Reserve, the Coastal Strip and the Tanganyika border. One of the main advantages of his proposal was that this immense area contained practically no legal human inhabitants.

The boundaries, as finally agreed at the time the park was gazetted in 1948, represented a substantial reduction of the area recommended by the 1939 Game Policy Committee.

Even the reduced boundaries were not agreed until Government was satisfied that the area was hardly likely to be required for any other purpose. The result is a huge chunk of mainly poor country, for the most part badly watered, lacking dry-weather feed and almost totally devoid of forest cover, except for narrow belts of riverine forest along the banks of the principal rivers, and clumps of montane forest on the Chyulu Hills. Furthermore, by far the greater portion of the park had, for years prior to being gazetted, been a no-man's-land beyond administrative reach, a sort of Kenya Badlands, much frequented by bands of poachers who could and did undertake their reprehensible activities undetected and undisturbed.

The boundaries, having been pruned and lopped to avoid including areas which might at some future date prove useful for an alternative purpose, resulted in an ill-gotten and strangely misshapen piece of land, as a glance at the map will show. A similar-sized region, properly shaped and more compact, would have been infinitely more valuable from a conservation standpoint.

Here is an outstanding example of the fallacy of the map method of creating faunal sanctuaries. Eight thousand square miles is an immense stretch of country, and space is without question an extremely important factor in its own right when designing national parks. But it is entirely fallacious to assume that space, or, for that matter, remoteness, are sufficient in themselves to provide adequate sanctuary.

This might not be so bad if it were not for the fact that the Tsavo Park is the *only* major national park in the whole of Kenya and the evidence available makes it abundantly clear that it became a park only because it was so poor and worthless. The question of whether the area might be suitable the year round for the species it was designed to contain and perpetuate appears not to have been considered. Indeed, it is misleading to use the word "designed" in the faunal context, for the park was not really designed at all—at least not in the sense of supporting faunal populations. The park, in short, is characteristic of the whole approach to conservation in Kenya, symbolised by the impressive entrance gates, an elegant but empty façade, with little behind it and which, in the years

ahead, may come to serve as an effigy to remind us of our folly in failing to appreciate the true value of our wild life while the opportunity existed.

Very nearly half the Tsavo Park lies to the north of the Galana River. This little-known country is extremely difficult of access and, being almost devoid of water, does not support a large wild life population. Even the Galla who, in their unceasing search for grazing, do not hesitate to range the most forbidding regions far beyond their own boundaries, are seemingly reluctant to enter this territory.

Although the Tsavo Park contains an interesting variety of wild forms, it cannot be said that any of them is numerous, with the exception of baboon and elephant. Apart from these species, rhino, lesser kudu, oryx, buffalo, gerenuk, bush pig, wart-hog, kongoni, impala, waterbuck, lion, zebra, reedbuck, giraffe, hippo, bushbuck, duiker, Grant's gazelle, eland, leopard and cheetah may be seen but never in large numbers. A small herd of roan was observed on the southern extremity of the Chyulu Hills in 1955, the first report of this species for many years. Until the Second World War, greater kudu were known to inhabit parts of the western sector of the park and, although it is possible that a few may still exist in some remote parts, they have not been seen for more than ten years, except for a lone bull on the Yatta in 1960.

Rhinos were once extremely common and parts of the Tsavo Park carried a large rhinoceros population, but their numbers have been drastically reduced and, to-day, there are strong grounds for concern regarding the chances of the species' survival. Those that remain are generally aggressive and many bear wounds or scars attributable to poachers. One rhino was found to be carrying no less than eight arrow-heads embedded in its body, some of which had caused huge suppurating sores. It is scarcely surprising that they resent the presence of man.

Similarly, buffalo, though widely distributed throughout the park, have learned the ways of man and generally remain in thick cover during the hours of daylight. They are, therefore, seldom seen.

Until quite recently, it was thought that the park still carried large numbers of animals. The fact that they were seldom



The two major African carnivores, the leopard and the lion



visible was attributed to the nature of the country. The dense bush gives excellent cover and visibility is decidedly limited. It was not until an aircraft was based on the park during the 1957 anti-poaching campaign and made regular flights over the area that the truth was realised. From the air it was simple to pick out every last gerenuk, and it soon became evident that, with the exception of elephants, the wild animals, far from being safely and inconspicuously tucked away in the bush, no longer existed in any numbers. Some parts of the park could only be described as faunal deserts.

One of the problems facing the wardens to-day is to know how to re-establish the herds, and it is not an easy one to solve. The first essential is to stamp out illegal hunting, or at least effectively control the poachers. This necessitates a relentless campaign against the gangs, which must go on unceasingly. Let up for a few weeks and the gangs will quickly undo the work of months. Once control has been established, measures must be taken to devise proper techniques for managing the range. One of the more obvious tools in this connection is controlled burning, thus providing favourable pasture in the dry months in selected areas which can be adequately protected. The incidence of fire in Africa is, however, still imperfectly understood and the whole question of burning as an instrument of management requires careful and thorough investigation. The cautious provision of additional water supplies is another valuable method of improving the range. The word "cautious" is used advisedly because any haphazard attempt to provide *permanent* water could conceivably do more harm than good by encouraging excessive utilisation of the surrounding habitat. In the natural course of events, the majority of wild animals are compelled to vacate huge expanses of territory in the dry season as and when the surface water dries out. In this way the vegetation obtains a respite. The provision of permanent watering-points could interfere with this procedure and lead to the herds remaining in a region longer than would normally be the case; in the process doing considerable harm to the environment.

A possible solution, which is worthy of investigation, might be to use cetyl alcohol with the object of retarding evaporation,

thereby prolonging the life of natural water-holes, but without the hazards involved in providing permanent water. Spread over the surface, cetyl alcohol forms a thin, non-toxic film which reduces evaporation by as much as 30 per cent. There is even a device which enables the film to be automatically replenished.

Another possibility would be to take advantage of the numerous rocky outcrops which are fairly evenly distributed across the plain to the east of the Yatta Plateau. Each kopje is a natural catchment, ranging in size from several to many acres, and it would be relatively simple to construct storage tanks, if necessary by blasting into the rock face, into which the rainwater could be directed and stored rather than running to waste as it now does. Such a system would bring water to a very large region and there would be no difficulty in switching off the supply if the area surrounding any particular kopje was being over-used, thus compelling the animals to move elsewhere.

There is also a need to examine ways in which species which formerly inhabited the park, but are now extinct or scarce, could be reintroduced from areas where they are still plentiful. Improved methods of immobilising wild animals with tranquillising drugs should make this a simpler and less arduous undertaking than hitherto, once the technique has been perfected.

Another, perhaps less obvious, aspect of range management or habitat improvement might well be the establishment of clumps of shade trees. Vesey-FitzGerald has demonstrated that in the Rukwa Valley or other areas "where the vegetation catena ends with valley grassland and where fresh growth of perennial grasses occurs during the dry season . . . an alternative to providing water-holes is to provide shade in the remote parts of the open plain." Animals feeding on green pasture, which has been obtained through judicious burning, "do not need to drink, even during the hot season, providing they have access to shade."

These few examples, which are by no means exhaustive, suffice to show the need for detailed, scientific studies covering various aspects of range management in arid regions. Once

poaching is controlled, the abundance or otherwise of any species is determined primarily by the habitat. A proper understanding of the limitations and potentialities of the habitat itself, and ways in which it can be most beneficially employed and improved is, therefore, essential before any effective long-term park conservation programme can be devised. The initiation of research aimed at bridging some of the enormous gaps in our knowledge of habitat management is perhaps the most essential task facing the conservationist in Kenya to-day, for conservation of the habitat is the very keystone of any wild life conservation policy. In a rich and fertile region the problem might not be so pressing, but in a fragile habitat, such as the Tsavo Park, there is less latitude for error and the most careful management is required if harmful or even calamitous mistakes are to be avoided.

The alarming increase of baboons has been occasioned by the near extirpation of their principal predators, leopards and lions, by African poachers. This has resulted in a situation which clearly calls for the application of the principles of conservation in contra-distinction to preservation. Regular armies of baboons have been recorded spreadeagled across the veldt, tearing to pieces and devouring any small creatures in their path, as well as causing wide-spread destruction to birds' nests, eggs and nestlings. However casually conducted these predacious activities may be, they are particularly serious at fawning time when they inflict many casualties on the newly dropped young. Gazelles and antelopes are powerless to hinder this grisly buccaneering. There are many recorded instances of gazelles successfully defending their young against the assault of a solitary baboon, but no amount of determination and pluck can resist the fangs of a full troop. This is the more serious because of the acute shortage of plains game and, coupled with the depredations of human predators, could unquestionably lead to the extinction of certain species.

An attempt has been made to restore the situation by the re-introduction of leopards into the park. Leopards which are causing a nuisance in the settled areas are live-trapped and transported to the Tsavo Park where they are released. To date, more than twenty leopards have been turned loose but,

in view of the extent of the problem, this is little more than a token solution. The short-term answer is the gun—yes, even within a national park—for unless this is done, plains game will never have the opportunity to recover. It is perhaps sardonic to note that the very people who have been primarily responsible for creating this problem through snaring leopards for their skins, are among the most vociferous in demanding that Government should take measures to protect their shambas against pilfering baboons. The irony is increased by the fact that Africans will not take the trouble to trap baboons because they have no commercial value.

Elephants come into an entirely separate category. They are seasonally more numerous than any other animal, and the Tsavo National Park is the most important elephant sanctuary in Kenya. The park is conveniently situated astride the numerous elephant trails which wander across the immense coastal hinterland from north of the Tana River to beyond the Tanganyika border. Along the whole of this route the Tsavo Park is the only place which affords the herds real sanctuary in the course of their migrations.

No precise data exists regarding these protracted movements, but it can be said that they do not appear to adhere to any rigid pattern. Observations have indicated that the herds have sometimes deliberately remained in areas which appear less favourable to them with regard to availability of fodder than adjacent regions.

An accurate census of the park's elephant population has not yet been undertaken. The only serious attempt was an aerial count made by Dr. Buechner in October, 1957, but he was able to cover only about 20 per cent of the park to the south of the Galana River. On that occasion, 2,639 elephants were recorded and, although it was thought that the majority of the herds was concentrated in this section of the park at the time, some elephants were known to be on the upper reaches of the Athi River and there may have been others elsewhere. Therefore, it seems reasonable to suggest that at certain times of the year the elephant population in the park reaches 3,000, and may exceed this figure.

At the height of the dry season, the elephants inflict great

damage on baobab trees by ripping with their tusks, first the bark and then the wood itself from ground level to a height of over 12 feet. Baobabs frequently reach a circumference of 30 feet or more, yet there have been several occasions when these large trees have been so severely damaged that they have been brought crashing to the ground, in at least one instance killing an elephant standing underneath. Damage to baobab trees is so widespread that between the Athi and Tiva rivers it is difficult to find one that has not been mutilated by elephants. This destruction is a recent phenomenon which does not appear to have been recorded until about five years ago. Several reasons have been put forward to account for the practice. The suggestion was made that it is done in order to obtain moist feed when other sources of fodder and liquid are scarce, but the fact remains that damage is often inflicted on trees lying close to permanent water or not far beyond the lush riverine forest strip. The theory that it might be a search for minerals was considered unlikely in view of the practice being of such recent occurrence. However, recent analysis of samples of baobab bark has revealed that this tree has an extremely high calcium content. The results of the analysis are given in Appendix D on page 355. Baobab damage is probably symptomatic of the general upsurge in the elephant population and the confinement of the herds to areas smaller than those to which they had access in the past and, therefore, an indication that the numbers of elephants are now in excess of the carrying capacity of the habitat.

This conclusion appears to be confirmed by the extensive damage to other types of trees and shrubs throughout large sections of the park during the same period. All along the Voi, Tsavo and Athi rivers, across the Yatta Plateau and elsewhere the elephants have devastated many hundreds of square miles of country. Trees have been uprooted over a wide area giving the impression that a division of tanks has been manœuvring there. The protracted drought during 1960 and 1961 served to accentuate a process which has been steadily building up for five years, the stripping of baobab trees being the first noticeable warning symptom.

The elephants have eaten out their habitat but have them-

selves survived partly through their ability to forage far afield and partly because they are able to utilise a wide variety of vegetation. Not so the rhinos, whose diet is limited to a very narrow range of plant species and who, even in the extremity of starvation, seem reluctant to move far from their own particular territory. They have paid with their lives for the damage inflicted by the elephants.

The heaviest concentration of rhinos remaining in Kenya in 1960 was to be found in an area of about 800 square miles in the vicinity of the Athi and Tsavo rivers. The estimated population was between 500 and 600. During the thirteen months October, 1960 to October, 1961, more than 282 rhinos were found dead in this region. A small number had been poached but the great majority had died of starvation. This represents about half the rhinos inhabiting the area and the actual percentage may be higher since it is improbable that all the casualties were located. Heavy rain broke the drought at the end of September, 1961, resulting in the flush of vegetation which saved the lives of the remainder. At the end of the drought the survivors were in the advanced stages of malnutrition, readily distinguishable, even at a distance, by their emaciated appearance and extensive darkening of the upper part of the body caused by coagulated blood.

These tragic consequences could have been at least partially avoided had the reasons for the situation been assessed and appropriate action taken sooner than actually happened. There can be no more compelling example of the fundamental weakness of the preservation (as distinct from the conservation) concept. The only solution lies in thinning out the elephants and then re-introducing rhinos into the park from areas where they are no longer required.

Many of the earliest travellers recorded their impressions of the immense concentrations of wild animals in what is now the Tsavo National Park. One of the original slave routes followed the course of the Galana River and, before the days of the Railway, most of the caravans leaving Mombasa for the interior marched across the (Kenya) Serengeti Plains, via Lake Jipe, to Taveta which, at that time, provided a convenient spot for resting and reorganisation before advancing up-country.

Even as recently as up to the outbreak of the Second World War, this country was classified as some of the finest game country in Kenya. When, in 1928, arrangements were made to show the Prince of Wales some of Kenya's most impressive concentrations of wild animals, it was to the western sector of the present Tsavo Park that he was taken. A special road, constructed for his benefit, is still in use and still referred to as the "Prince of Wales' track." Driving along the track to-day one feels that visiting Royalty would scarcely be impressed with the small numbers of animals now to be seen.

Fire constitutes an ever-present hazard for the wardens of the Tsavo Park. During the dry season, when all is tinder-dry, fires can sweep across country bringing death and destruction with devastating impartiality. A blaze relentlessly advancing on a hundred mile front is an awe-inspiring sight. The larger animals can usually make good their escape, but the smaller creatures suffer heavy casualties. On one occasion the heat was so intense that flocks of birds hovering and soaring above the smoke and flames as they reaped a rich harvest of insects forced by the heat to become airborne, were themselves sucked into the holocaust.

Fire is nothing new in the Tsavo Park, but in days gone by, the fleeing animals had plenty of alternative safe areas to which they could retreat. Nowadays, even if they succeed in escaping beyond the park boundary, they have to run the gauntlet of the human predator. Fifty years ago, even if quite substantial numbers of animals were destroyed in a blaze, there was always an enduring reservoir of replacements, whereas to-day there is not. Once the ranks are depleted, there are only slender reserves for rehabilitation.

Natural fire risks are difficult enough to deal with but added to that is the constant danger of fires started by honey-hunters trespassing in the park. Honey barrels made from hollow logs are wedged in the upper branches of many of the baobab trees and a series of wooden pegs are driven into the trunks to facilitate access. Periodically the owner goes his rounds and, with astonishing disregard for the bees, removes the accumulated honey. This in itself is of no importance but in the process of smoking out the bees the hunter sometimes sets the tree

alight. Disastrous fires sometimes result and many square miles of the park are burned each year by Wakamba honey-hunters. Not long ago a Mkamba was attacked by bees as he collected honey from a tall baobab tree. In falling, he broke a leg and dislocated his spine. Lying disabled on the ground, he was attacked by bees for several hours, and the East African bee is far more aggressive and packs a more vicious sting than his European counterpart.

The man was working alone, and had informed no one else of his intentions. Having lain helpless in the blazing sun for some time, his situation was not improved when a fire, started by another honey-hunter, swept towards him. In spite of the pain, he somehow managed to drag himself to a small clearing, while the fire raged all around and, finally, swept past. He lay there for 24 hours, waiting to die. Quite by chance, some national park rangers happened to be patrolling the area; they heard his groans and brought him into hospital, where he eventually recovered.

Soil and vegetation, and consequently the wild life associated with them, alter considerably across the varied face of the Tsavo Park. At one extreme is the flat, waterless, semi-desert country lying to the north and east of the park. At the other end of the scale is the forest-capped Chyulu Range, rising to more than 7,000 feet, with an average annual rainfall of 60-70 inches.

The park's principal permanent rivers are the Athi, Tsavo, Voi and Galana, the flow varying from a mighty torrent in the rainy season to a modest trickle at the height of the dry weather. The Athi River, which commences as the Mbagathi and flows through the Nairobi National Park, skirts the western foothills of the Yatta Plateau, combining with the Tsavo River to become the Galana.

In the northern sector of the park lies the Tiva River which, like so many of the water-courses in the dry country, is in reality a sand river. Only twice in a normal year, when heavy rain falls in Ukambani, does the Tiva River actually flow and then it comes sweeping down without warning like a tidal bore. On one occasion a party of Rangers was marooned on the far bank and had to be supplied from the air for several

days before they could be rescued. After a few hours or a few days, the fury of the torrent subsides and, for the remainder of the year, water can be found only beneath the sandy surface. The dry river bed, which by day appears so desolate, is by night a veritable lifeline for the wild creatures inhabiting the park. As the dry weather advances and the temporary surface pools and water sources dry out, all except a few species are forced to abandon those regions remote from water and fall back on the few permanent water supplies.

Where there is water flowing the year round, no particular problem arises, but permanent rivers are rare in Kenya's dry lands. It is at this time along the length of the sand rivers, that the elephant performs his essential function as a provider of water. Elephants are the only animals capable of undertaking this useful service and other forms of wild life are forced to rely on them for their very survival.

With their trunks the elephants dig down into the bed of the river until they strike damp sand. Usually the holes are sunk a foot or two into the bed but, at the height of the dry weather, they may be as deep as four feet. Having made a suitable opening, considerable patience is required before sufficient water has slowly percolated through to fill the excavation and it may take several hours before the prodigious thirst of the elephant has been slaked.

The preliminary formalities involve clearing the hole of any sand which may have seeped in and squirting several trunk loads of watery sand between the forelegs and over the flanks and back. Each elephant then stands with the tip of the trunk immersed in the water, gently swaying on his forequarters, occasionally shifting his weight from one leg to the other or raising one foot a few inches from the ground and moving it slowly backwards and forwards, seemingly unmindful of all the squabbling rhinos but becoming instantly alert should another of his kind challenge his right to a hole. In that event there appears to be a standardised procedure. The elephant at the hole backs a pace or two and, with ears outstretched, turns to face the newcomer. They stare at each other momentarily, apparently sizing each other up. Then, without further ado, the smaller of the two swings away with a snort and a shake

of the head and the larger resumes his place at the hole. Sometimes a rhino is sufficiently misguided to attempt to appropriate a hole already claimed by an elephant. The procedure is much less gentlemanly and infinitely noisier and there have been occasions when the difficulty has been resolved by the elephant lifting the rhino bodily into the air and depositing him in a very undignified heap on the ground. Even a rhino cannot fail to take such an obvious hint and, squealing with fury, he scrambles to his feet and dashes off.

When the elephants have consumed their fill small groups of them glide away with muffled tread into the surrounding darkness. Other animals in order of size or aggressiveness then come forward to take their place, and utilise the miniature wells so conveniently provided. The great bulk and belligerent tendencies of the rhino generally ensures him taking precedence over the other animals once the elephants have departed. But however fortuitously considerate the elephants may be, a hole six to nine inches in diameter, though perfectly adequate for a trunk, is quite definitely not designed to accommodate a rhino's outsize snout. Before he can drink he must first enlarge the hole, which he does dog fashion, head buried beneath the surface and showers of sand shooting out behind. This, coupled with *faru's* impatience and notorious bad temper often results in many of the precious holes being filled in. Fortunately, a herd of thirsty elephants will have excavated a great many holes, so the oafish antics of the rhino, while incommoding, are not calamitous.

As one animal succeeds in quenching its thirst, another comes forward to take its place. A shy gazelle steps daintily into the arena and timorously approaches a vacant hole. With eyes at or below the surface, he is extremely vulnerable and, after each hurried sip, raises his head or darts nervously away for a few paces, wide-eyed and alert, before plucking up courage to resume his place.

From dusk to dawn, the cavalcade continues throughout the hours of darkness. As the first signs of dawn herald another day, huge coveys of sand grouse, guineafowl, and other winged creatures drop from the sky and gather round the recently vacated holes.

The riverine growth offers every advantage to the caracals, genets and smaller predators who lie close by in ambush. By the time the sun is up, a litter of feathers, gently drifting in the early morning breeze, bears mute testimony to the fact that such a precious commodity as water can only be obtained at some cost.

As the sun climbs higher in the heavens, the last of the clientele arrive. Baboons and monkeys, though late risers, are resourceful enough to be able to clear out any holes which have inadvertently been filled during the night by clumsy hooves. Thousands of gorgeous butterflies cluster on the river bed and revel in the damp sand. Then, as the last traces of surface moisture evaporate, they too depart and only a maze of tracks and a series of half-filled hollows, scattered across the bed of the sand river, remain as evidence of the previous night's activities and the indispensable role of the elephant as Nature's dowser.

One of the most striking phenomena in this arid land is the remarkable transformation from gnarled and withered scrub to lush green vegetation within a few hours of the onset of the rains. This metamorphosis takes place literally overnight and, for a brief period, the desert is miraculously changed into one huge natural garden, the sandy soil erupting into an endless carpet of gaily coloured flowers and shrubs. The trees, shrubs and flowers appear determined to exhibit every last iota of beauty, while opportunity exists, like a myriad Cinderellas emerging from obscurity for their transient hour of glory.

This overnight transfiguration is no exaggeration. The bushes and plants appear to be able to predict the coming of the rains, and, about a fortnight beforehand, they start unobtrusively coming into bud so that when the first drops fall only a final effort is required to bring them bursting into a mass of flowers and bright green foliage as if by magic.

Before the last war the flood waters of the Tiva River overflowed into a large shallow swamp, several square miles in extent, at Ndiandaza. This natural cistern enabled large numbers of wild animals to remain in the northern sector of the park throughout the greater part of the dry season, and was particularly valuable for herds normally occupying the Galla

country who found a safe dry weather retreat at Ndiandaza. Unfortunately, during the war the Tiva altered course slightly, with the result that the swamp was by-passed and consequently dried out completely. It is now entirely overgrown with impenetrable henna thickets. Although the National Park Authorities had hoped to be able to divert the flood waters of the Tiva back along the original water-course and thus recreate the swamp, this has not proved possible owing to extensive deposits of silt over the swamp bed.

It is of the utmost importance to the whole northern sector of the park that measures should be taken to provide adequate supplies of water in this sector, by drilling or other means, for the benefit of the wild life of this exceedingly dry region, particularly as Ndiandaza lies just within the boundaries of the Tsavo Park and can therefore be adequately protected.

The surrounding country originally carried substantial numbers of wild animals, including Peter's gazelle, and the waters of Ndiandaza supported an extensive region. There is little doubt that by re-creating year round supplies of water, Ndiandaza would again become the key point of the northern part of the Tsavo National Park, as well as many hundreds of square miles of the surrounding country lying beyond its boundaries.

The north-eastern sector of the park can hardly be compared with any other region. The soil, if it can be termed such, is more sand than earth, flat with a deadly, frightening, monotonous sameness that appears to go on for ever, to the sky-line and far beyond; the sort of flatness that somehow gives an impression of infinity and is almost as difficult to comprehend. On the ground one's vision is limited to a few hundred yards by the profusion of scattered scrub and meagre trees but, from the air, the vastness and monotony is glimpsed, though even then not fully revealed. On it goes and on and on, to the distant horizon and beyond, precisely the same dreary, bleak scene, whichever way one cares to look. Only an occasional hill breaks the unvarying and oppressive uniformity; hills which in themselves are insignificant but, in this setting, appear as a welcome relief from the surrounding plain.

Dakabima Hill, lying beyond the eastern boundary of the

Tsavo National Park, is one of the most conspicuous hill features in the plain which stretches on every side. During the rains it is impossible to enter this country except on foot, and anyone attempting a visit during the dry weather must carry sufficient water to be completely self-contained, for there is virtually no water whatever between the Tana and Galana rivers for at least four months of every year. The difficulties of conducting a safari are consequently many and only a small number of Europeans has ever attempted to penetrate this wild and rather sinister part of Kenya. Apart from MacArthur, Baron von Blixen was probably one of the first Europeans to set foot there. He held the region in high regard owing to its prolific wild life, and pioneered hunting in the neighbourhood of Dakabima Hill in the middle 1930's. Evidence of his track is still visible—a string of rusting tins thrust in bushes to mark the route. It was he who originally constructed the primitive airstrip at the foot of Dakabima Hill which was to prove so useful during the anti-poaching campaign in 1957.

The Waliangulu are fully aware of these limitations, and they know that at certain times of the year they can poach to the full with little danger of detection. During the rains, when every depression is filled with water, and grazing and browse are plentiful, the herds are dispersed far and wide and are, therefore, relatively safe from attack but, with the onset of the dry weather, the pools gradually recede until finally they disappear completely. This regular process compels the herds to concentrate at the few remaining watering-points, and it is then quite simple for teams of poachers to ambush the water-holes and let fly their deadly poisoned arrows from close range as the unsuspecting animals come down to drink. An experienced poacher can loose a quiver of arrows in a remarkably brief period of time and a gang can inflict many casualties. As the arrows find their marks, the terrified elephants flee in all directions. Those that have been struck wander dejectedly, sometimes for days, before a lingering death brings an end to their suffering. The poachers, following up the tracks or relying on the vultures to betray the whereabouts of their victims, can then set about retrieving the ivory at their leisure. Doubts about the ownership of a particular kill are rare, since

each arrow-head carries a hieroglyphic which serves to identify its owner.

Poisoned arrows account for large numbers of elephants and rhinos. Most of the tusks and horns are retrieved by the poachers, but about one in five they fail to recover and many of these trophies are picked up by the National Park Field Forces. An idea of the scale of the slaughter can be gauged from the fact that in 1957 the Field Forces counted 1,280 elephant skeletons in one relatively small region, approximately 20 miles square.

It is surprising that wild animals can continue to survive in this completely waterless country throughout the dry weather, but there is absolutely no doubt that species such as lion, giraffe, leopard and ostrich, all of which would normally be expected to water regularly, as well as other animals associated with semi-desert conditions (oryx, gerenuk and lesser kudu) continue to exist throughout the four-month dry period, when there is no water within fifty miles. The predators naturally obtain some of their requirements from the kill, but alternative sources of liquid are limited to certain plants and shrubs. On one occasion tracks of a lion were found leading to a clump of *Sansevieria*, the fibre of which had been chewed. It has also been established that elephants, rhinos, oryx and possibly other animals break open the enormous bulbs, sometimes as big as a sofa, of the *Adenia globosa* and extract the liquid. In addition eland, elephant and rhino have been seen devouring the wild aloes found near Dakabima Hill.

Wild animals also feed on a type of *Euphorbia* with a very milky fluid which grows in this area, a habit which may assist them to go for long periods without water. The suggestion has been made that the absence of this particular type of *Euphorbia* in other parts of the Tsavo Park may account for the fact that more than twenty rhinos died of thirst near Makuka in October, 1956. Several skeletons of rhinos and their calves were found at this place on the Tiva River. They normally have to rely on elephants to dig holes in the dry river bed during the dry season, as has already been related. At the very end of the dry period the elephants had been obliged on this particular occasion, to excavate deeper than usual and the unfortunate

rhinos, not having the advantage of a trunk, could not quite reach the precious liquid. They died of thirst with water only a few inches beyond their snouts.

There is a very prominent type of *Euphorbia* in this part of Kenya, called *hadama* by the Orma (Galla), which is noteworthy as being the only tree offering any real shade. Consequently, during the heat of the day, wild animals are invariably to be found resting beneath these *hadama* trees. This fact was of considerable assistance to the anti-poaching forces, because they knew that when an animal had been wounded it retired to the shade of one of these trees to die. It was even possible to tell from a distance which of the *hadama* trees was likely to yield a carcass, because the weight of the vultures perching on the upper branches so damaged the tree's profile that, instead of appearing flat-topped, it had a noticeably jagged appearance.

Sheldrick made an interesting piscatorial discovery at Lugard's Falls in 1957. When the flow of water over the falls was small, at the end of the dry weather, he observed what at first sight appeared to be jelly-like nodules adhering to the rock face. His interest was aroused when, from time to time, the mucilage was seen to move. After climbing down into the gorge, a closer examination revealed that the substance consisted of a quantity of small fish, each about two inches long, equipped with a prominent sucker formed by uniting the ventral fins into a disc. The fish would periodically move surprisingly rapidly out from beneath the torrent of water cascading down the gorge, advance quickly up the vertical rock face for a foot or so, then pause awhile before darting sideways under the falling water. It seemed almost impossible for them to maintain a hold in view of the force of water thundering down from above. By this process they steadily worked their way up to the top of the falls. Although specimens of the fish were sent to the British Museum, they have not so far been identified. They may be a rare type of Goby (of which 21 species are known to inhabit fresh water in Africa) or possibly a species new to science.

Part of this chapter has described conditions in the Tsavo Park at the turn of the century. Since then, rivers have dried up, the condition of the habitat has declined, and much of the

wild life has been destroyed, but many of these defects could be remedied given an enlightened policy and the means to carry it into effect. Although there are several areas in Kenya possessing greater densities of wild animals, and particularly plains game, the exceptional importance of the Tsavo Park lies in the fact that it is by far the largest region in Kenya with national park status and therefore devoted exclusively to wild life. Its strength and importance lie in its size and status. For these reasons it is by far the most important *permanent* wild life sanctuary in the country and if, through any cause, political or otherwise, other conservation projects should fail or never reach fruition, the Tsavo Park could conceivably be the only large region remaining in Kenya devoted exclusively to fauna conservation. Much will of course depend on the attitude of future African Governments and the future is therefore nebulous and unpredictable. We can, however, be reasonably sure that an African Government is unlikely to wish to acquire Tsavo for other purposes because it is so inherently poor that it is largely unsuitable for development purposes. Herein lies its ultimate strength and permanency.

It is, therefore, of the very greatest importance to make a sustained effort to turn the park into a worthy faunal sanctuary in fact and not merely in name. If possible, its boundaries should be extended to include adjacent Crown Land which is not required for other uses—and there are large tracts of territory which come into this category. At the same time a proper management system based on a realistic research programme, and designed to improve the habitat and re-create the depleted stocks of wild animals, must be undertaken if the Tsavo Park is to take its rightful place as Kenya's pre-eminent faunal sanctuary. The task of consolidating and entrenching the position of the Tsavo Park should be recognised as the highest priority facing the Trustees of the National Parks.

PART THREE

Crucial Problems

10. African Hunting, Past and Present

BRITISH EAST AFRICA was far more fortunate than many other parts of Africa, in that all shooting was regulated right from the very beginning and game laws were introduced and rigidly enforced many years before there was any thought or prospect of settlement. Trophy hunters were rigidly controlled and Government consistently refused to allow hide-hunters to operate—an exception being made in the case of the crocodile. Possibly the Kenya Government had taken note of the activities of hide-hunters in North America where, in the 1870's, an immense slaughter had led to the near extermination of the buffalo. In the Medicine Lodge district of Kansas, for example, 210,000 buffalo were slaughtered in a two month period and, in 1873-74, there was nothing out of the ordinary in 200,000 hides being sold in a single day's auction. In the last great massacre 100,000 buffaloes were butchered by hide-hunters in the two months December, 1877, and January, 1878. Within the short span of a few decades the immense buffalo herds, once estimated to total 60 millions, had been all but wiped out, to the extent that, in 1887, the American Museum of Natural History had the utmost difficulty in procuring a handful of specimens.

The official American attitude at that time was that "the hide-hunters were doing more to settle the Indian question than the entire Army had done in 30 years by destroying the Indians' Commissary." General Phil Sheridan thought it a "sentimental mistake to legislate in the interest of the buffalo . . . let them kill, skin and sell until the buffalo is exterminated, as it is the only way to bring a lasting peace and allow civilisation to advance." A Bill designed to protect the buffalo, introduced by Representative Fort of Illinois, who thought it wrong

to civilise the Indian by "starving him to death by destroying the means which God had given him for his support," was merely pigeon-holed by President Ulysses S. Grant, where it has remained to this day.

In East Africa, the British authorities have consistently refused to countenance any attempt at commercialised exploitation of the Protectorate's wild fauna, primarily to protect the interests of indigenous tribesmen, many of whom, like the North American Indians, relied on wild animals for an essential part of their diet, but the African people themselves have not hesitated to do so. Most Africans are born poachers and commercialised carnage is being undertaken at the present time by many Africans at the expense of the community, to the extent that several tribes are in danger of poaching themselves out of existence.

This statement is in no way intended to belittle the widespread destruction of wild life by Europeans, which is considered elsewhere in this book, and which has exerted a most serious influence on the fauna of East Africa. Black and white have each in his own way materially contributed to the destruction of wild life. This chapter is concerned with the hunting methods employed by Africans, which in recent years have acquired added significance through the introduction of more efficient techniques and the commercial incentive. Techniques have improved immeasurably since the days of the chief encountered by Willoughby in 1887, who had the inspiration of using one of his subjects as live bait for a leopard. The unfortunate individual selected was tied up and another stationed in hiding a short distance away. The only result was that the leopard killed the human bait and was clean missed by his compatriot waiting in ambush. When Willoughby presented the chief with a lion trap he promptly amused himself by setting it and compelling some of his wretched old wives to walk into it.

During the last few years the question of poaching has achieved more prominence than any other aspect of wild life conservation. It is undertaken so consistently, on such a vast scale, wherever animals are to be found, that the methods employed and the results achieved ought to be appreciated.

Although the trapping and snaring of wild animals has taken place in Africa since time immemorial, it is only in recent years that poaching has reached menacing proportions. In the past, human beings were few and scattered, while the animals on which they preyed were so plentiful that the human predator made little impression on the total. To-day, the pendulum has swung far the other way and man, instead of being merely one of several predators in an ecologically balanced community, has assumed a position of overwhelming dominance, both numerically and through more efficient methods of killing. An expanding human population results in compression of wild animals, particularly the more gregarious species, into smaller and smaller regions, followed by constantly increasing pressure on the diminishing herds and habitats.

As explained in Chapter 1, Africans have always regarded wild life as part of Nature's bounty, easy and seemingly inexhaustible riches, to be plucked and used by anyone who feels so inclined. This free-for-all attitude results in a situation where Kenya's most valuable natural resource is being dissipated by the very people who can least afford to squander it.

In referring to strikingly similar circumstances in Mexico, Starker Leopold states: "It can be said, of course, that over-hunting of big game is a socio-economic problem, arising directly out of the low living standards of most rural Mexicans and the desperate need of those people for supplementary protein in the diet. As true as this is, the fact remains that a little husbandry of the wild ungulates would put far more protein on the kitchen table and perhaps some pesos as well."

In East Africa the situation is aggravated by the fact that most problems tend to degenerate into racial issues. Present-day suspicion and resentment of all things European results in an attitude whereby Africans, while insisting that "Progress" is being deliberately denied them, will oppose on principle almost any European-sponsored proposal, including projects designed for their own direct benefit, and not excepting those which are demonstrably philanthropic in conception. The question of hunting is no exception. It is so simple to persuade gullible Africans that restrictive game laws and regulations have been introduced with the object of compelling them to

maintain herds of wild animals on their land for the benefit of a few wealthy Europeans; and that those same Europeans are depriving them of their time-honoured right to hunt when and how they please.

It is doubtful whether more than a small number of people in Kenya realise the immense potentialities of the tourist and hunting industries, or that wild life is one of Kenya's few major natural resources, to be efficiently utilised but not dissipated. In the United States some three billion dollars a year are spent by sportsmen on hunting and fishing, and this type of recreation has a beneficial influence on the economy of the entire country, not least in remote areas where the injection of money by sportsmen stimulates the rural economy and results in the introduction of wealth into otherwise unproductive areas. Proper management of the wild life resource would provide the sportsman with his recreational requirements—for which he is more than willing to pay—and at the same time enhance the productivity of the land in terms of both cash and food, to the advantage of the local people.

In Kenya to-day, illegal hunting by Africans takes place wherever wild animals are to be found. Records of numbers killed are of course unobtainable, and it is difficult to make even an intelligent guess at the figure, but it must be very substantial. In the settled areas, furtive trapping and snaring are the order of the day, and in the Langata Forest bounding the Nairobi National Park, to give but one example, there are literally thousands of wire snares set in every likely place, to the extent that it is difficult to imagine how any wild animals survive at all. On up-country farms, in the forest reserves and throughout the countryside the story is the same. This type of trapping is indiscriminate, for poachers observe no close season and a wire snare recognises no distinction between age, sex or species. Finally, it causes much prolonged suffering to the animals caught.

Until a decade or so ago, the activities of poachers were generally confined to hunting elephants, rhinos and leopards because the ivory, horns and pelts fetched high prices and were much in demand. To be sure individuals trapped antelopes, gazelles and lesser creatures primarily for their own food re-

quirements but, so long as this was undertaken for the pot and their own immediate needs, no harm was done. In recent years, however, subsistence hunting has given way to commercialised carnage on the grand scale, with meat as the principal commodity. This has become big business, and the operators are waxing fat at the expense of the community. Game meat finds a ready market, particularly among such tribes as the Wachagga who possess few cattle of their own, but have acquired considerable wealth through coffee production and are quite prepared to purchase game meat at prices which are high, even by European standards.

So long as teams of poachers operated on foot, their activities and achievements were strictly limited but, in recent years, numbers of lorries and Land-Rovers have been brought into use, thereby greatly extending the radius of operations and enabling gangs to be mobile and to be well clear of an area before the hue and cry can be raised.

THE IVORY TRADE

The quest for ivory since biblical times has often been associated in the public mind with gold, silver and precious stones and an aura of romanticism has, all too often, beclouded the true facts. Some authorities maintain that the ceaseless pursuit of this valuable commodity occasioned more misery, suffering and human degradation than even the search for gold on the indigenous inhabitants of Central and South America. The slave trade was partially motivated by the demand for porters to transport ivory to the Coast where both black and white ivory were sold at a handsome profit.

That ivory trading has always been a lucrative business can be gauged from the fact that, on one safari, Tippu Tib obtained 1,950 *frasilas* of ivory which, at that time, was worth £7 per *frasila* (35 lb.). Sir Samuel Baker calculated the profit on ivory trading to be at least 1,500 per cent. "In some cases we purchased ivory at 2,000 per cent profit, and both sellers and buyers felt perfectly contented." Tusks were of little use to Africans except for barter, and they readily exchanged

them for beads or a few yards of cloth. Even when Jackson first visited Mount Elgon in 1891, the recognised exchange rate was a 16 lb. tusk for six strings of beads. However, although there was little difficulty in procuring ivory in those early days, it was an arduous and expensive undertaking to transport it to the Coast, before the coming of the railway revolutionised transportation.

So long as human portage, at an estimated cost of £300 a ton, was the sole form of transport, ivory was almost the only product which could bear the high cost of carriage to Mombasa. The usual time taken for a caravan from Uganda to the Coast was about ninety days and, although the construction of the Railway, built in order to discharge the British Government's responsibilities under the Act of Brussels, effectively eliminated the need for human portage (costing 200-300 times as much as by rail), it resulted in the ivory trade becoming an even more profitable business than hitherto.

Karamoja and the country to the north of Mount Elgon, for example, were opened up to trade about 1900 and within a few years there was a number of traders—Greeks, Indians, Baluchis and the like—established there. Until then the natives trapped and killed sufficient elephants to satisfy their need for meat, and an occasional Swahili caravan, 80-100 strong, visiting the country every third or fourth year, sufficed to purchase all the ivory they had for sale. But, by 1908, Jackson was reporting that the traders were there "in scores and their sole trade is in ivory and the natives, who are expert hunters, are encouraged in every way possible to kill elephants for them."

Much the same could be said of other parts of the country and Jackson reported that "when Muradi, the Somalis under Adam Mursa and the Wakamba from Kitui, at the instigation of the Indian traders, had the free run of the country round Mount Kenya and north of the Uaso Nyiro, the natives were also encouraged to kill far more than they actually required for meat. Bull ivory was brought out via Nyeri as a blind, whilst the cow ivory was sent via Kitui, and the Rs. 50,000 worth of confiscated ivory last year (1907) was part of it."

There appears to have been a regular commerce in ivory, of

relatively long standing, between the Indian traders at the Coast and the Wakamba. As soon as their crops were safely harvested Kamba hunting parties would cross the Uaso Nyiro River in order to procure ivory either by hunting or trading. Each man carried a bag containing 40 or 50 lb. of ground millet which, coupled with the game they were able to shoot, was sufficient to support them for several months. In 1893, Chanler met several parties of Wakamba, one of them 300 strong, equipped in this manner, some of whom claimed to have penetrated as far as the Turkana country. "Most of them have at one time or another visited the Coast for the purpose of selling their ivory." The primary object of these hunting parties was to obtain ivory, but they were not averse to plunder if opportunity occurred and in the process they harried a wide region. Chanler mentions a people called the Mumoniot who at one time inhabited the upper reaches of the Tana and Uaso Nyiro rivers, but were almost exterminated by the Wakamba. The Galla living along the Tana River "spoke with fear of the Wakamba, and said it would be only a matter of a few years ere these dreaded warriors wiped the Tana Gallas off the face of the earth. I never saw a people so convinced of their evil fate."

Reports of hoards of ivory secreted away, led to the authorities offering a reward of 50 per cent of the value, but this did not lead to much being brought in. Percival thought that this was due to the fact that Africans bringing in ivory were not paid on the spot, but had to wait for payment, often for months, until the ivory was sent to Mombasa and sold, when the amount realised would be notified to the District Officers concerned. This lengthy procedure led the Africans to believe that their ivory had merely been confiscated, and served to discourage any further dealings of that nature, much to the delight of the Indian traders.

When the trade in cow and immature ivory was prohibited in the East Africa Protectorate, it was carried on through Abyssinian territory. In 1903, Mr. Hobley informed Sir Charles Eliot that Swahili and Arab traders entering the Lake Rudolf area from Mumias, had received friendly overtures from the Abyssinians at the northern end of the lake inviting them to sell ivory. Even to-day considerable quantities of ivory,

rhino horn and leopard skins are surreptitiously run over the frontier to Somaliland and Abyssinia by camel caravans, a loophole which is extremely difficult to plug owing to the immense distances involved and the nature of the country.

Poachers hack out the tusks with axes, and the butts and tips, which are the least valuable portions, are sawn off and usually abandoned to save weight. When ivory has to be carried long distances by hand weight is an important consideration.

Sometimes, the tusks themselves are cut in small sections to make them less conspicuous, and anyone who has ever attempted to cut ivory with a light hand-saw will appreciate what an excessively arduous undertaking this can be.

Each poacher buries his cache of ivory beneath the sand near some tree, or other prominent feature, which he can readily identify, or, occasionally, in some remote hideout known only to himself. The ivory remains buried until the end of the hunting season or until a suitable opportunity occurs for transporting it across country to a middle-man who, in turn disposes of the loot to an Asian receiver. Numerous methods of avoiding detection have been devised. A saloon car may stop on some remote road at dead of night and a few tusks or rhino horns are quickly slipped into the boot. A lorry carrying a load of charcoal may have tusks hidden in the sacks. Even the Railway unintentionally played a part when, on one occasion, casks of honey being transported by rail were found to contain ivory secreted in the sticky substance.

The Waliangulu poachers operating in the coastal hinterland are men of the wilds, and it is difficult not to respect their courage and resourcefulness when operating on foot in such fearful country. But their skill in the bush is not equalled by their business acumen, and it is the receiver who reaps the fattest profits from the labours of these ingenuous tribesmen. A poacher usually receives between three and four shillings a pound for ivory which is worth twenty shillings or more. The lion's share goes to the unscrupulous and parasitic receivers lurking in the back streets and bazaars of Mombasa and Zanzibar.

Ivory poaching is extremely profitable in East Africa and

quite a number of "respectable" citizens of Mombasa and elsewhere are involved in the racket. It has been conservatively estimated that not less than £100,000 a year is being lost to Kenya's revenue through the activities of receivers. Some idea of the profits involved can be gathered when it is realised that one Asian, caught red-handed with illegal ivory in his possession, promptly offered a bribe of £15,000.

SOMALI HUNTING METHODS

Brigadier-General Swayne, writing as Commissioner of Somaliland in 1905, stated that the Somalis hunted on horseback and killed numbers of oryx and ostriches by riding them down. The bull oryx was especially prized for his heavy hide, shields being made out of the shoulder and neck skin, which is more than an inch thick. These little round shields were embossed in crude patterns or painted red and black with quotations from the Koran. "Every Somali buys a dozen or so of these shields in his lifetime. Thus, the execution must be very great. When rain has fallen in the 'Haud' oryx become hogged and may be easily caught on foot. When lions have killed men of note the young men turn out on horseback and gallop round and round them. As the lion turns swiftly around in a cloud of dust, he becomes dazed and is plied with poisoned arrows. Hyaenas, which are a greater scourge to the flocks by far than lions, are killed by pitfalls furnished with a short spear blade. In the west, rhinoceroses are killed for the sake of the hide, which cuts up into seven good shields, leaving besides some strips for making whips."

The wealthy Somalis employed Midgans to guard their flocks and herds, and they subsisted almost entirely by hunting. This servile aboriginal hunting tribe used bows and poisoned arrows, as well as packs of dogs, and developed the technique of wearing wild animals down by following them day and night without pause, frequently using a camel as a stalking horse. The Midgans also erected long thorn fences in which gerenuk were snared, the skins being in great demand as soft prayer mats. These activities were not confined exclusively to Somali-

land. Buxton found immense quantities of oryx and gazelle remains in the deserted Arab camps in Kordofan during Kitchener's campaigns.

According to Sir Samuel Baker, the best elephant hunters in this part of Africa were the Baggara tribes of Darfur, on the White Nile. Two mounted men formed the hunting party, armed with bamboo spears about fourteen feet long. The blade was fourteen inches long by three inches broad and as sharp as a razor. "Should they discover a herd, they ride up to the finest tusker and single him out from the others. One man now leads the way, and the elephant, finding himself pressed, immediately charges the horse. There is much art required in leading the elephant, who follows the horse with great determination, and the rider adapts his pace so as to keep his horse so near the elephant that his attention is completely absorbed with the hope of catching him. The other hunter should by this time have followed close to the elephant's heels, and, dismounting when at full gallop with wonderful dexterity, he plunges his spear with both hands into the elephant about two feet below the junction of the tail, and with all his force he drives the spear about eight feet into his abdomen and withdraws it immediately. Should he be successful in his stab, he remounts his horse and flies, or does his best to escape on foot, should he not have time to mount, as the elephant generally turns to pursue him. His comrade immediately turns his horse, and, dashing at the elephant, in his turn dismounts, and drives his lance deep into his intestines. . . . Two good hunters will frequently kill several out of one herd; but in this dangerous hand-to-hand fight the hunter is often the victim."

Lampen's account describes a solitary Baggara rider selecting a bull elephant and heading him towards a party of unmounted men lying in ambush. If the elephant bolted, the rider pricked him with his spear with the intention of inducing the elephant to chase him, keeping about ten yards ahead. The object was to get him exhausted by the time he reached the ambush. The Baggara employed a similar style for hunting giraffe, white oryx and addax. In favourable circumstances a hunter would ride down a giraffe in half an hour. The aim was to drive the exhausted animal among trees where the rider

could dismount and stab it with his long spear. The same technique is still used to-day.

Baker also writes of the Hamran Arabs in the neighbourhood of Kassala on the Atbara River who employ an even bolder method of killing elephants. Three or four mounted men participate in the hunt, their only weapons consisting of swords. The largest bull is singled out from the herd and one of the hunters stations himself a few yards in front, focusing the elephant's attention upon himself. While the elephant is entirely absorbed in chasing the lone horseman, the remaining hunters ride up behind. When close to the elephant's heels, and at full gallop, one man throws his companion the bridle, leaps from his horse and with one stroke severs the Achilles' tendon and artery in the hind leg. The disabled elephant is goaded into attempting another charge, thus allowing an opportunity for the remaining hind leg to be slashed. The elephant dies of loss of blood, killed by two strokes of a sword. Rhinos and lions are hunted in the same way.

The Masarwa Bushmen in Bechuanaland use a similar technique, but they hunt on foot, creeping up behind an unsuspecting elephant and hamstringing it with a sharp axe. The immobilised elephant is then speared. According to Bromfield this method of killing is confined to the Masarwa. The Kalahari Bushmen use poisoned arrows.

SNARES AND POISONED ARROWS

Illegal hunting is undertaken on a scale that is almost unbelievable. In the Lake Province of Tanganyika, for example, as soon as the cotton crop is harvested in June or July, the majority of the able-bodied males of the Wasukuma tribe leave their homes and indulge in two or three months' intensive hunting. This procedure appears to have been adopted as a regular part of the tribal routine. These illegal activities coincide with the migratory movements of the wildebeest, zebra and other species from the Serengeti Plains into the Lake Corridor where the herds fan out to the north and south and where, for perhaps three months, they depend for water on the

Grumeti and Mbalangeti rivers, which form the park boundaries, and the Duma, Simiyu and Ruwana, which lie beyond the park.

In the vicinity of water-holes and rivers the riverine growth makes concealment simple and the usual practice is for gangs to lie in ambush and fire poisoned arrows at the herds as they come down to drink. A skilful hunter has little difficulty in loosing an entire quiver, containing up to twenty arrows, before the herd stampedes out of range, and, in the past, gangs on the fringes of the Serengeti Park frequently bagged as many as 200 animals at a time. Circling vultures guide the hunters to their victims, which are then collected at leisure.

On the plains different techniques are employed. Extensive lines of rope or wire, often several hundred yards long, are stretched between trees or supported by stakes about three feet from the ground and concealed in long grass. Suspended from these wires is a series of snares, almost touching one another. Beaters then drive the animals into the line and kill them with spears or clubs.

Very often snares are attached to a tree or heavy log, and in its frantic struggles the victim will either strangle itself or drag the log some distance before it collapses from exhaustion. In Uganda, an elephant caught by heavy wire cable uprooted the tree to which the wire was attached and dragged it a considerable distance before a merciful bullet from the warden put an end to its suffering. Elephants with trunks amputated by wire snares have been reported from several parts of Uganda. An elephant without a trunk is as helpless as a man without hands.

The snare and the poisoned arrow are the weapons most commonly used by poachers in Kenya. During the dry season, when water-holes are few, it is usual for gangs to construct hides and blinds covering all the scattered water-points and salt licks. By day and on moonlight nights bowmen lie waiting for the herds, which sooner or later must come to drink. In the Mara a case was reported of eight elephants being struck simultaneously by arrows. All were found within a short distance of the water-hole, indicating that the poison was fresh and extremely potent, but when the poison is old or of

inferior quality many of the animals escape to die later many miles away and are never recovered.

There is a real need for the introduction of legislation designed to make the manufacture and carrying of arrow poison illegal, and the East African Wild Life Society has urged the authorities to adopt this recommendation. The official argument against the proposal—that Africans require bows and arrows for defence—is patently weak. The bow is primarily a weapon of offence; spears would appear to be more suitable for defensive purposes. Stronger legislation is also required with regard to all forms of snaring of wild animals.

The following statement is typical of many made by poachers and indicative of their attitude towards wild life:

In July I went on safari with my father to a place known as Kitani on the Yatta Plateau in the Tsavo National Park. One evening, while we were sitting in the hideout, we saw some eland nearby. My father told me to go and try to shoot one, so I left the hideout and, after stalking the eland for a little way, succeeded in shooting a large bull. It ran off and, as it was getting late, I did not follow it up but returned instead to the hideout. Early the next morning we tracked it and found it dead not far away. We only took a little meat as we were moving camp the next day and did not want to have to carry heavy loads. In August we went on another safari to a place called Sangayiya, which is the name of another hideout on the Yatta Plateau. The day after we arrived we all went out hunting together and, after a short while, saw a rhino and calf. As I had never shot a rhino before, I decided to try and shoot the calf. I crept up close and fired one arrow at the calf which only went a few yards before going down. The mother ran off. The calf was so small that the horn was only about four inches in length, so I did not bother to cut it off. We did not take any meat, but left the calf where it had fallen and went on our way.

Poachers' camps are a grisly sight. The meat is stripped from the bones, cut into strips and either laid on poles over fires or sun-dried. The resultant biltong then finds a ready market. Normally, one would expect the camps to be swarming

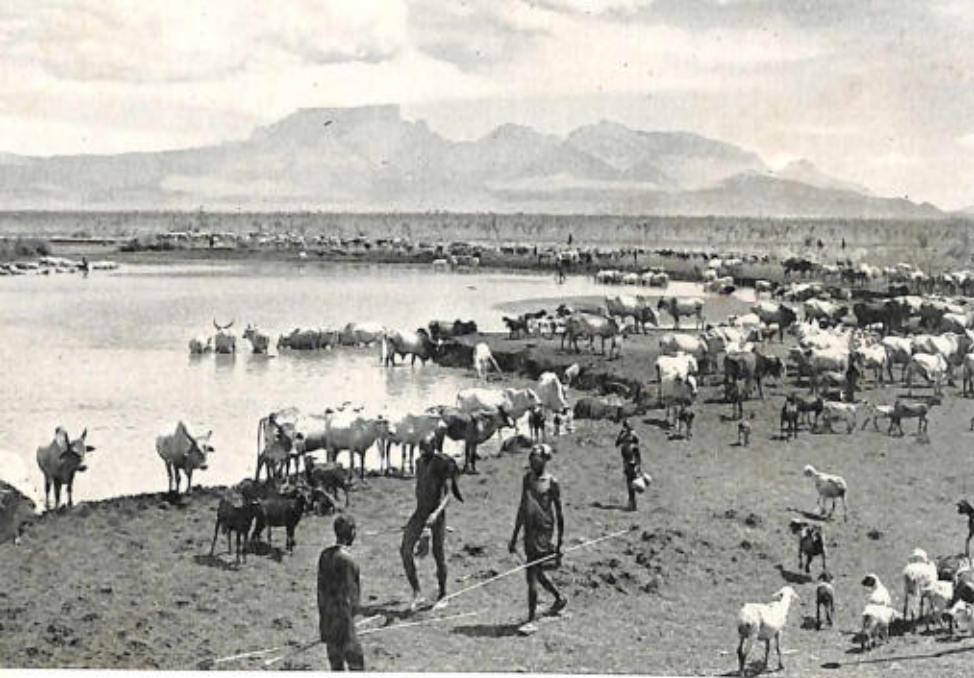
with vultures, but the poachers are at pains to shoot any coming within range to avoid betraying their whereabouts. Vulture feathers are also used for making arrow flights. Hyenas and jackals are killed with the object of preventing these scavengers from robbing the snares or stealing meat from the camp. Even so, hyenas frequently get to the kill first and, unless the trap lines are visited regularly, the hunter is likely to find only a broken skeleton for his trouble.

FIREARMS

If this were the whole story it would be serious enough in all conscience but, in addition to large-scale trapping and snaring, Tanganyika is confronted with the problem of large numbers of fire-arms in African hands, which are used almost exclusively for the destruction of wild animals. Official figures record 70,000 licensed muzzle-loaders and shotguns in the territory, so it can be safely assumed that the true total is at least 100,000 licensed and unlicensed weapons.

The law allows any African in Tanganyika to shoot fifteen animals a year within a five-mile radius of his home and, for this privilege, he is expected to purchase a licence costing 15/-. But with each game ranger responsible for at least 25,000 square miles of territory, the Game Department's staff is so thin on the ground that it is quite impossible to enforce the game laws. Black powder is freely available; bullets of a sort are easily manufactured from any nut or bolt and, because the evidence is consumed so rapidly, who can say how many animals a particular individual has shot in the course of a year, or whether they were obtained within the statutory five-mile limit?

The Tanganyika Game Department report states that one dealer sold enough black powder to give 20,000 shots a year. The powder is usually diluted with locally made powder, thus giving an equivalent of 60,000 shots a year. Furthermore, one in every three poachers arrested admitted using neat local powder. This brings the total up to 90,000 shots a year in one district alone. In the same district, every elephant shot on



The perpetual problem of watering the huge domestic herds. *Above*, vegetation around pools and waterholes is totally destroyed. *Below*, herdsmen raising water from a well by relays of leather buckets



licence or control had been wounded by bullets from muzzle-loaders.

Even if one disregards the unlicensed weapons, the official allowance of 15 animals, when applied to the 70,000 licensed fire-arms, represents 1,050,000 animals killed each year. Add to that the numbers killed with unlicensed muzzle-loaders and the fact that, wherever conditions allow, the quota is invariably exceeded, and one can begin to appreciate why the wild life population of Tanganyika has declined to the stage where Kingsley-Heath can report that, in 1951, there were numerous animals to be seen on the Bohoro Flats in the Southern Highlands Province whereas, in 1959, he saw only 30 animals during the course of a 346 mile drive. Similarly, the game ranger at Tabora counted only 27 animals in a week in an area where it was usual to see ten times as many in a single day. Apart from the high percentage of animals which must be wounded in hunting with such primitive fire-arms, the ceaseless persecution has had the apparent side effect of reducing the breeding potential of the survivors, particularly roan and sable.

BUSH FENCES

Another method is to erect a series of bush fences, which are constructed of trees and severed branches piled together to a height of six or seven feet, and have been known to extend as much as seven miles in an unbroken line. As the green timber and brush dries out, small gaps appear in the fence, and the animals do not take long to find their way through. After a few weeks, when the animals have grown accustomed to threading their way through the obstruction, tribesmen set a snare in every well-used gap. Under this system, many hundreds of animals are caught in a single night and, once caught, there is no escape. The larger animals are slaughtered with spears or poisoned arrows and the smaller creatures clubbed. Occasionally, when the numbers caught are so great that the meat cannot be readily processed, some of the animals are ham-

strung, or their legs broken, so that they will remain alive until the hunters care to dispose of them at their leisure.

The Wakamba used to construct long bush fences extending for several miles. Bowmen lay stationed at intervals behind the fence. Infinitely slowly, the herds of wild animals would be driven towards the fence but, rather than jump it, they would wander down its length seeking a way through. The hidden bowmen were then able to effect a great slaughter. This technique is nowhere near so commonly used by the Wakamba as formerly, but only because their unscrupulous methods have entirely eliminated the game in their own district.

WHEEL TRAPS

The Turkana are one of the few tribes to have evolved a method of trapping elephants and rhinos. They construct a wheel trap some three feet across, the rim of which is of twisted rawhide: bayonet-sharp spikes are attached to the circumference, all pointing in to the centre. This contrivance is then placed in position over a shallow hole set in a track known to be frequented by elephants, and carefully camouflaged with earth and vegetation. The trap is firmly attached by a long hide rope to a heavy log. When an elephant steps in the trap, the spikes penetrate the flesh all round its leg and the terrified beast drags the tree trunk until it is exhausted, often for many weary days. It is then quite simple for the Turkana to track down their quarry and finish him off with poisoned arrows.

A smaller wheel trap, constructed entirely of wood, is similarly used for antelopes. This device is also favoured by certain coastal tribes, particularly Muslims, whose religious custom insists on game being captured alive.

GAME PITS

Game pits have been used for centuries in Africa, particularly in the forests. Security Forces found numbers of them in the

Aberdares and Mount Kenya forests during the Mau Mau uprising. Judging from their appearance, they must have been many years old. The pits were originally excavated by the Wandorobo along paths used by elephants. They were usually about twelve feet long, three broad and nine deep, wedge-shaped, with the bottom about the breadth of an elephant's foot. The pit was carefully concealed with sticks and grass, and the normal path or track diverted towards it. Elephant dung was strewn about to create a natural effect. When an elephant fell into the pit, two of his feet became firmly wedged in the bottom in such a way that he could not extricate himself. A series of long spears or sharpened stakes were then driven into the creature's back behind the head.

Along the foothills of Kilimanjaro, the Wachagga relied extensively on game pits but they finally defeated their own object. The whole region became so honeycombed with pits that, in Percival's words, "the slaughter eventually ceased for the sufficient reason that nothing remains to be caught."

Major Monty Moore, v.c., states that prior to his appointment as Game Ranger in charge of Tanganyika's Lake Province in 1931 (including what is now the Serengeti National Park) the Waikoma used massed game pits. The elders informed him that there was nothing unusual in catching 2,000 or more animals in a day's drive. They would take whatever meat they required and leave the rest.

When pits are employed in open country, they are generally sited in lines up to half a mile long and well camouflaged. The spaces between the holes, which are sometimes as much as 12-15 feet deep, are blocked with thorns and *Sansevieria*, to form an impenetrable barrier. It frequently happens that the brush takes root and grows into a living fence. At either extremity of the line of pits, an additional bush fence is laid at 45 degrees, designed to prevent the animals escaping to either flank, and funnelling them into the trenches. Beaters then slowly drive the herd into the traps and, as the only apparent exits are the gaps above the pits, few animals escape.

The labour of excavating a series of pits is very great but is regarded in the nature of a long-term investment which remains in regular use for many years. This method is now

held to be excessively laborious and too easily detectable, especially from the air, and is therefore being discarded in favour of wire snares.

DROP-SPEARS, DARTS AND HARPOONS

The drop-spear is commonly used in many parts of Africa for killing elephants. It usually consists of a metal spear-head set in a heavy log and suspended from a branch of a tree overhanging a well-frequented elephant path. The release mechanism is in the form of a rope pegged into the ground, which triggers off the spear when an elephant blunders into it. Occasionally, the spear is released by the hand of a hunter hiding in the branches. In 1888, when in the vicinity of the Ituri River, Stanley found a spear of this type which had fallen from a tree and embedded itself so firmly in the ground that it defied the combined efforts of three men to extract it.

The Wandorobo, a shy secretive people, who generally inhabit the large areas of indigenous forests such as are found on the Mau Escarpment, are among the most skilful natural hunters in Africa. They shoot birds and monkeys and small game with poisoned arrows, are expert at trapping and snaring, and sometimes adopt ingenious methods.

Thomson and Chanler have given interesting descriptions of an unusual weapon used by the Wandorobo to hunt elephant. Its shape was not unlike an outsize ramrod, manufactured from the wood of the wild olive, some eight feet long, with an enlarged heavy head, into which was inserted a dart daubed with arrow poison.

An Ndorobo would attack the elephant from close quarters and, using his weapon like a harpoon, drive the dart into the elephant's abdomen. The dart, being detachable, remained embedded in the elephant until the poison had done its deadly work, while the harpoon could be immediately reloaded with a fresh dart.

Hippos are hunted with a harpoon, a piece of barbed metal with a long cord and wooden float attached. The line is threaded through a piece of bamboo, several feet in length.

The hunter conceals himself by the side of a hippo track and, as the animal passes, the harpoon is thrust home. The wounded beast rushes into the water and the bamboo, through which the rope runs, is held firmly by the hunter. The hippo seeks refuge in deep water but the float betrays his whereabouts. Other hunters set off in their canoes and wait in the vicinity of the float until the hippo emerges from the depths to breathe, or attempts to attack the canoe containing his assailants. He is then speared. This appears to have been a common method of hunting hippos throughout East and Central Africa.

At one time hippos were common in the Athi River but Buxton (1899) noted that "the remains on the banks showed that numbers are killed by the Wakamba. Their method is to build a slight staging in the pool, constructed of the mid-ribs of palm-leaves. On this they crouch, waiting the opportunity to discharge a poisoned arrow, which does its work with certainty if the skin is penetrated."

DECOYS

Percival records Wandorobo disguising donkeys as decoys. "I was out looking for Grevy zebra when suddenly from behind a bush there appeared the strangest of figures leading—of all animals in the world—an oryx; at least I took it for one at first. It proved to be a donkey disguised. His ingenious owner had fitted him out with a mask of zebra skin, the black stripe round the face, horns of stick fastened into it; and the flanks and legs of that donkey were embellished with marks like those of an antelope. He really looked wonderfully well! The sportsman himself was got up to suit the case, smeared all over with wood ashes to the proper colour . . . I don't doubt that under cover of the metamorphosed donkey the man was able to approach within killing range of his game." A similar stratagem was employed using a dummy ostrich.

Chanler also saw the Wandorobo along the Uaso Nyiro River employing a similar technique. One donkey was painted to resemble a zebra and another had a pair of oryx horns attached to its head. Before the hunt commenced the

Wandorobo took a dip in the river and then smeared their wet bodies with mud and sand by way of camouflage.

GAME DRIVES

In certain parts of Africa, notably the Sudan and Somalia, the native inhabitants formerly indulged in game drives in which entire tribes would sometimes participate. These drives became orgies of destruction, and the Sudan Report for 1895 mentions that the Homr and Rizighat Arabs killed about 800 elephants that year, including 87 in one day.

In Uganda, large-scale game drives were regularly undertaken by tribesmen, in which immense numbers of wild animals, including females and young, were indiscriminately slaughtered. Not only were hundreds of animals massacred but, in the process, it frequently happened that once the blood lust was aroused some of the tribesmen lost control of themselves and killed anything within range, including their fellow men.

The red lechwe are "fully protected" in Northern Rhodesia but, in deference to African custom, the Government still allows *chilas* to take place on the Kafue Flats. The procedure is for a large body of tribesmen, armed with an assortment of weapons and accompanied by dogs, to encircle a herd of lechwe and, slowly closing in, to allow as few animals as possible to escape. Boyle mentions a *chila*, held on the 19th and 20th June, 1957, in which 1,993 lechwe were killed, 64 per cent of which were gravid females or young. It is scarcely surprising to learn that the red lechwe population of the Kafue Flats, which was estimated to number 250,000 in 1932, had been reduced to 30,000 by 1958. (Boyle, 1959.) During the same period, but for different reasons, the black lechwe population of Lake Bangweulu has been reduced from Pitman's estimated 150,000 in 1932 to 15,000 in 1954.

Similar hunts, called *chacos*, were undertaken by the Incas in South America. Up to 20,000 Indians would participate, surrounding a large area and driving the game into the centre. Many thousand of animals would be captured in a *chaco* and, although some were slain, the vicuñas and guanacos were shorn

of their wool and released. The point of particular interest, which is in marked contrast to African practice, is that the Incas had the intelligence to recognise the need to conserve the basic stocks of wild animals and a *chaco* was not held more frequently than every third year in any one district. (Koford, 1960.)

The survival of the rare James's flamingo down to the present day may be attributable to an extension of this traditional practice. Conway informs us that the colonies of James's flamingo at Laguna Colorada, 14,800 feet up in the Andes, have almost certainly been systematically robbed of eggs since the time of the Incas. "Although the Indians raid the same colony at two-week intervals through much of the season, they carefully test all of the eggs before taking them from the colony by the simple expedient of seeing whether they will float or not." The Andean Indians realise that if an egg floats it is fertile and therefore unsuitable for consumption, so it is replaced on the nest. If a less selective method of egg collecting had been employed, the James's flamingo would probably have become extinct long ago.

FIRE, SPEARS AND NETS

In the Congo and the southern Sudan tribesmen adopted the grim technique of ring-firing elephants. The height of the dry weather, when the long grass was like tinder, was the great elephant-hunting season. Perhaps a thousand men would surround a herd and, at a given signal, fire the grass. In a few minutes the herd was enveloped by an advancing wall of fire and smoke to a height of twenty feet or more. Wherever the elephants ran they were met by an impassable barrier of flame. The panic-stricken animals retreated into the centre of the ring and the fire raged over them. Burnt and blinded, they were then attacked by the surging crowd of hunters and few escaped. "Black ivory" is a term usually applied to the slave trade but here it can be used in the literal sense. Blackened tusks, charred by fire, are frequently found in ivory consignments from the Congo.

A similar method was used by the Acholi, of Uganda, who opened their hunting season when the grass was very inflammable. After conducting various ceremonies, designed to invoke the blessing of the Hunting Spirits, the tribe assembled, armed with an assortment of spears, knives, clubs and other weapons, to start the *Dwar Lino*, the traditional "Hunting with Fire." Everybody joined in, including even the pregnant women. The area to be hunted was surrounded and, on sounding the horns, the grass was ignited and the entire tribe advanced behind the flames. Many animals were burnt to death; others were speared or clubbed as they plunged through the smoke.

A few months later, following the commencement of the rains, the new growth of grass served to entice the wild herds back into the area which had been burnt during the course of the "Hunt with Fire." This was the time for the Acholi to arrange the *Dwar Arum*, or "Hunt with Spears." The various clans would take their appointed places, the men accompanied by their dogs and armed with spears and clubs, the women with sticks and baskets. The circle of hunters might enclose an area as much as ten miles or more in diameter. The hunters advanced towards the centre, the object being to obtain the maximum bag, from edible rats, hares and squirrels, to lions, buffaloes and elephants. Antelopes fell an easy prey, but the hunters did not always have everything their own way. Lions and buffaloes invariably gave a good account of themselves and inflicted casualties. Leopards sometimes took refuge in "ant-bear" holes, dashing out for a swift attack, then backing into the hole again. In this event, the entrance would be blocked with branches cut from thorn trees, while another hole was dug to enable the hunters to spear the leopard in its underground retreat. Elephants, being formidable opponents, were manoeuvred into a position where they could be attacked from above.

The third method traditionally used by the Acholi was the *Dwar Obwo*, or "Hunt with Nets." Poles, eleven feet high, were staked into the ground at intervals of 30 to 50 feet, and nets suspended from them, extending in an unbroken line for ten or fifteen miles or more. Beaters would then stampede the

herds into the nets, whereupon teams of hunters who, until then, had remained hidden from view, emerged to spear the trapped animals. (Onyinge, 1961.)

The use of fire as a hunting tool has been prohibited in East Africa for many years. There are, nevertheless, occasional reports of the Waboni constructing a large, circular bush-fence with a narrow exit into which, over a period of time, numbers of wild animals find their way. At a suitable moment the bush-fence is set alight. The animals in the enclosure stampede for the only exit, where they have to run the gauntlet of Waboni bowmen.

DOGS

The forest-dwelling Wandorobo used to employ a special breed of dog for hunting. These dogs, yellow in colour, were small, prick-eared and heavily built, with short heads and very broad noses. According to Percival, the breed was wiped out by the distemper epidemic in 1906 and 1907. Wandorobo dogs were used extensively for hunting colobus monkeys in forests such as the Mau and the Aberdares where, at the higher elevations, trees give way to bamboo. The technique was for the hunters to advance through the forest forcing the quarry up-hill into the bamboo. The pack would drive the colobus swiftly forward and, because the monkeys experienced some difficulty in maintaining a sure foothold on the vertical bamboo, it was not long before one lost his grip and fell to the ground, when the pack would be on him. A variation of the technique was for the pack to form a wide circle and advance slowly towards the centre. The colobus, seeing himself cornered and not knowing how to escape, would remain undecided where he was, whereupon the Wandorobo would shake the bamboo violently until they dislodged him.

The Wandorobo consumed the flesh of colobus monkeys, but the skins were supplied to their Masai overlords, who adorned their legs with long tufts of colobus hair. This exceedingly handsome monkey derives its name from the Greek word for "mutilated," because of the absence of a thumb. The thumb

is in fact present in the young of the red colobus (which, in Kenya, is confined exclusively to the Tana River region) but gradually disappears with increasing age, until only a small nail remains. It may seem surprising that an animal with such conspicuous and contrasting coloration as the black colobus can be so difficult to see in its natural surroundings. Perhaps the reason is that they frequent high-altitude forests, where the trees are coated with long moss which acts as an effective camouflage. When they leap through the trees their long body hair and bushy white tails spread out like so many Lippizaners performing a capriole.

That most elusive of antelopes, the bongo, falls an easy prey to Wandorobo using dogs for the purpose. After running a short distance, the bongo will invariably turn and stand at bay. It is then quite simple to spear it. Bongo hide is used for making honey bags, while the sinews become excellent bow-strings.

Dogs are now used extensively by Luo, Kisii and other tribes in hunting game. On occasion, more than two hundred tribesmen with as many dogs participate, and the slaughter can be great. In recent years the appreciable increase in the numbers of African-owned dogs, which are maintained primarily for hunting and seldom, if ever, fed by their masters, has reached menacing proportions, and in several parts of Kenya the almost total absence of wild animals is directly attributable to this cause. They inflict far more casualties than wild dogs. Strict limitation and control of the numbers of mongrel dogs is extremely important to the conservation of wild life.

BY-PRODUCTS

Tribesmen generally make good use of the by-products of wild animals, although to-day many of the valuable by-products are destroyed in case they should incriminate the owner. From the hides are made clothing, shields and drum heads. Hide thongs are used to tether cattle. The horns of kudu and sitatunga are transformed into excellent trumpets for cere-

monial occasions, to summon the tribe to foregather, or for sounding an alarm. Sometimes the smaller duiker or steinbok horns are made into whistles, while sections of oryx horn become tobacco pouches. Buffalo horns appear to be favoured by witch doctors for holding their charms and the strange knick-knacks associated with their calling. They are also convenient for carrying fat or grease. The sinews of several animals, particularly giraffe, are used for making bow strings, and giraffe tail-hairs are employed in fletching arrows.

Elders of the Kipsigis, Nandi, Kikuyu and other tribes wear carosses of hyrax, colobus or blue-monkey skins and, although these cloaks are rarer than formerly, they are still occasionally seen. Hyrax are considered a delicacy by many tribes, particularly the Kavirondo. They are caught with the aid of a long stick, the end of which is split for a couple of inches of its length. The stick is thrust into a hollow tree until it makes contact with the hyrax and is then rotated so that the cleft catches in the fur. All that then remains is to withdraw the stick to which the hyrax is firmly attached. Many thousands of these creatures are killed each year in this way.

RECENT ANTI-POACHING OPERATIONS

Much of the time and energy of the wardens of the National Parks and Game Department is necessarily devoted to anti-poaching work. The poaching situation became so serious in and around the Tsavo National Park, that in 1956, following representations from the Kenya Wild Life Society and the National Park Authorities, the Kenya Government agreed to authorise the establishment of two mobile anti-poaching teams, each consisting of two Europeans and thirty African rangers, in addition to the standing National Park's Field Force already in being at Voi. The Kenya Police and the Game Department actively co-operated, and an aircraft of the Police Airwing, which proved invaluable, was seconded to Voi. All operations were under the over-all command of David Sheldrick, Warden of the Tsavo National Park (East).

Kenya was fortunate in having a Governor who appreciated

the value of wild life, and his abiding personal interest undoubtedly influenced the launching of the anti-poaching campaign. On 2nd January, 1957, the Governor, Sir Evelyn Baring, issued the following directive to all Administrative Officers:

I am disturbed by the grave threat to Kenya's wild life caused by the activities of poachers. These activities have recently become so extensive as to present a serious danger to the preservation of the game population of the Colony. Though it is primarily the responsibility of the Game Department to protect the Colony's game, it is the duty of all officers to help in the prevention of poaching; this duty is of special importance because the staff of the Game Department is small and cannot with the many functions it has to perform over wide areas, give undivided attention to poachers.

2. The Wild Animals Protection Ordinance (No. 18 of 1951) makes provision for the preservation and control of wild life. Under section 8 of the Ordinance it is an offence to hunt, kill or capture any game animals, except in accordance with the conditions of a licence granted under the Ordinance. It is intended to introduce more stringent provisions.

3. Under section 12 of the Royal National Parks Ordinance (Cap. 215), it is an offence to enter a National Park without a valid permit, to possess a weapon, explosive, trap or poison, or to kill, injure capture or disturb any animal in the National Park.

4. I wish all officers and particularly those of the Administration and of the Police, to make themselves familiar with the relevant provisions of these Ordinances and to take all possible measures to put down poaching. I am sure that I can rely on all officers to apply themselves to this task. Kenya's game population, although unhappily diminished during the past two decades, is still a great natural asset and it is of the first importance that it should be protected.

Under Sheldrick's leadership results exceeded all expectations. Originally it had been estimated that two years

would be required to clear the Tsavo Park of poacher gangs but, in the event, this was achieved in only nine months and the Field Forces were able to advance into the little-known country beyond the park's boundaries, a region which owing to its remoteness and inaccessibility had for long been considered a sort of no-man's-land, beyond the reach of the law.

The climax of the campaign was the discovery of 1,280 elephant carcasses or skeletons, 10 per cent of which were immature, in one relatively small area, some twenty miles square. Many of the immature elephants had undoubtedly died of starvation following the deaths of their mothers at the hands of poachers. The majority of the victims had been killed during the previous two to three years.

Approximately one in five of the carcasses still retained the tusks intact, and from these, 444 tusks weighing 8,215 lb. were recovered—an average weight of $18\frac{1}{2}$ lb. per tusk. In addition, 1,589 lb. of butts and tips were found, making a total of 9,804 lb. of ivory retrieved by the Field Forces from this area. Including trophies previously recovered, this amounted to a total of 25,219 $\frac{3}{4}$ lb. of ivory obtained by the Field Forces in fifteen months' operations.

With the knowledge that only about one tusk in five was recovered, it was estimated that at least 3,000 elephants were killed illegally in the Tsavo Park and adjoining Coast Province during the two to three years prior to commencement of the drive against the poacher gangs.

African rangers of the Field Forces became adept at operating in desolate country and thought little of patrolling without pause for many hours on end. On one occasion, at the end of a particularly arduous operation, when one of the Field Forces was being withdrawn, the lorry was so laden with recovered ivory and equipment that it could carry nothing else. Instructions were therefore given for the lorry to go on ahead, off-load at the Galana River and return to pick up the rangers. That evening the entire Ranger Force, impatient to be off, walked the forty to fifty miles to the Galana between dawn and dusk without a single halt and reached the rendezvous at the same time as the lorry.

The Field Forces evolved a most successful method of

operating in dense bush country. A lorry, carrying water and supplies, set off at first light and drove in as straight a line as possible for six or seven miles, where it halted and camp was set up. Meanwhile, the rangers, having fanned out on either side of the track, spread themselves so that each man was within shouting distance of the next. They then advanced in extended line, thus covering a large area. When they estimated that the time had come to return to camp, they cut in towards the track and, when they struck it, followed up the wheel marks. On the other hand if, after a reasonable time, they found no tracks, they knew that they had over-shot and that the camp must be behind them. If they got lost the rangers were under strict instructions to stay put and as night drew on to climb the tallest tree in the vicinity and watch for Very lights. A roll call was made each evening and in the event of a ranger being absent, Very lights were fired at regular intervals to guide him back to camp.

During the course of operations, a number of rangers found themselves "bushed" for the night, but it says much for the discipline and skill of the Field Forces that they always succeeded in finding missing personnel. Two rangers were lost for two days and nights and, when found, were in a state of complete collapse. Several rangers also had hair-raising escapes from wild animals, including a party of three who were charged by an elephant, one of whom was actually drenched in saliva from the beast's trunk. The majority of the men were "treed" by rhino at one time or another.

In one of the hideouts the skeleton of a poacher was discovered. Some ex-poachers, who were acting as guides, stated that he was a Mkamba who had been killed by a lion he himself had snared. Another and more likely version was that he was murdered by his companions for the ivory known to be in his possession.

From this region have come unconfirmed reports of elephants removing the tusks of their dead companions and carrying them quite long distances from the skeletons. In some cases the tusks have been deliberately broken against trees or rocks. Although there is no authentic evidence in support, a reliable ex-poacher stated that he had actually witnessed elephants

carrying tusks in this way. The suggestion that hyaenas are responsible is extremely unlikely, as a hyaena could neither carry an 80 lb. tusk, let alone succeed in breaking it, nor was there any sign of teeth marks on the tusks examined.

THE FUTURE

Sir Evelyn Baring's directive had a marked influence on the wild life situation in Kenya and, for a time, there was an appreciable improvement.

The successful anti-poaching operations clearly demonstrated that a well-led and determined team can achieve decisive results out of all proportion to the size of the forces engaged. A handful of European wardens and 90 African rangers succeeded in eliminating poaching in an area of some 20,000 square miles. Unfortunately, the termination of Sheldrick's command was followed by a period of stagnation, partly induced by the Kenya Government's decision to reduce expenditure on the Field Forces. Much of the good achieved by the anti-poaching campaign therefore evaporated. At the same time, the poachers, who were not slow to profit from their experiences, adopted new techniques for eluding the law, with the result that the situation deteriorated to the stage where poaching is now more serious than ever before.

Early in 1961, the present Governor, Sir Patrick Renison, issued a further directive drawing the attention of all Administrative Officers to the urgent necessity of doing everything possible to control poaching and bring an end to wanton destruction of wild life . . .

It has been brought to my attention that the activities of poachers have once more assumed proportions which threaten the continued existence of Kenya's wild life.

In 1957 the then Governor, Sir Evelyn Baring, while Governor, found it necessary to issue a directive to all officers and particularly those of the Administration and of the Police, asking them to make themselves familiar with the provisions of the Wild Animals Protection Ordinance and of the Royal National Parks Ordinance,

and to take all possible measures to put down poaching.

As a result of that directive, and of active campaigns undertaken against poachers in the field, the illegal killing of game animals was for a period brought under control.

Recently, however, there has been a resurgence of this form of law breaking and I wish all officers to redouble their efforts to suppress it. Wire snares and poisoned arrows together account for the greatest toll of animals thus killed and every possible step must be taken to put down their illegal use or possession.

I wish in particular that every effort be made to save the dwindling number of rhinoceros from the attentions of poachers and to bring to justice those guilty of unlawfully killing them or of dealing in their horns.

There appear to be two alternatives if large-scale poaching is to be effectively contained. The Government must be prepared to maintain adequate mobile anti-poaching Field Forces as a permanent feature of Game Department organisation—"Flying Columns," which would be free to move wherever required at short notice. This strong-armed approach would need to be a continuing operation and would probably cost more than the Government is willing to afford. Each Field Force costs approximately £15,000 a year to maintain and at least two would be required for full-time operations.

Apart from the difficulty of financing anti-poaching operations, it is in any event doubtful whether a repressive policy will achieve satisfactory results in the long term. A more positive and practical alternative appears to be the adoption of a system whereby the African tribesmen concerned are brought into some form of active partnership, or ownership, in game management schemes designed for their benefit. Africans must be shown that it is more worth-while and more profitable to participate in controlled harvesting of the wild life crop, than to continue indulging in indiscriminate and wasteful slaughter, which can only lead to total extinction of wild life, to their own eventual detriment. There would then be at least a reasonable chance that the African might come to realise that game management is in his own interests. This subject is considered more fully in Chapter 14.



The Tiva Sand River, showing elephants, rhinos, buffaloes and sand-grouse drinking at holes excavated by the elephants. It is unusual to see this scene by daylight



II. Arrow Poison

THE DIFFERENT TECHNIQUES AND CEREMONIALS surrounding the manufacture of arrow poison in East Africa are many and varied, but there are a number of common denominators. It is interesting to note that of the various plants and shrubs used in the production of poison primitive tribesmen have succeeded in utilising almost all the vegetable cardiac poisons that are known to modern science.

Early records are fragmentary, but the few sources of information that are available show that arrow poison has been used in East Africa for a long period. Theophrastus, writing some three hundred years before Christ, mentioned the use of such poison by the Ethiopians and, from the time of the sixteenth-century Portuguese explorers onwards, references to the use of arrow poison on the East Coast of Africa become more and more frequent.

Sir Richard Burton, in his *First Footsteps in East Africa*, relates how, during his journey to Abyssinia disguised as an Arab, he heard that a virulent arrow poison called *Wabai* was manufactured somewhere in the forbidding wastes of the Somaliland wilderness. But he was unable to find out much about it.

This is the celebrated Waba, which produces the Somali Wabayo, a poison applied to darts and arrows. It is a round stiff evergreen, not unlike a bay, seldom taller than twenty feet, affecting hill sides and torrent banks, growing in clumps that look black by the sides of the acacias; thornless, with a laurel-coloured leaf, which cattle will not touch unless forced by famine, pretty bunches of pinkish-white flowers, and edible berries black and ripening to red (*sic*). The bark is thin, the wood yellow, compact,

exceedingly tough and hard, the root somewhat like liquorice; the latter is prepared by trituration and other processes, and the produce is a poison in substance and colour resembling pitch.

In February, 1853, Dr. Arnott had forwarded to him a watery extract prepared from the root of a tree, described as "Wabie," a toxicodendron from the Somali country on the Habr Gerhajis Range of the Goolies Mountains. . . . The poison is obtained by boiling the root in water, until it attains the consistency of an inspissated juice, which is regarded as a virulent poison, and it renders a wound tainted therewith incurable. Dr. Arnott was informed that death usually took place within an hour; that the hairs and nails dropped off after death, and it was believed that the application of heat assisted its poisonous qualities. He could not, however, ascertain the quantity made use of by the Somalis, and doubted if the point of an arrow would convey a sufficient quantity to produce such immediate effects . . . yet he was led to the conclusion that it was a very powerful narcotic irritant poison. He had not, however, observed the local effect said to be produced upon the point of insertion.

A great degree of secrecy appeared to surround its manufacture, which was undertaken by the Sa'ab, an outcast people made up of four groups: Midgan, Yibir, Yaha and Tomal, held in subjection amounting to slavery by the Somalis. According to legend, the Sa'ab, who were the original inhabitants of Somalia, were conquered by the Somalis in a great battle near Hargeisa and enslaved by the victors. In this capacity they became herbalists and hunters as well as craftsmen in wood and metal, making spears, arrow heads and other weapons for their masters.

Von Höhnel, in his account of Count Teleki's expedition to Lake Rudolf and Lake Stefanie, wrote:

As we approached the Doenye Lamuyo the scenery improved. On the eastern side rise several insignificant streams and a rivulet called the Morio, all of which flow eastward, and, meeting those from Kikuyu, form the Kaya, which is in reality the upper portion of the Sabaki, which

flows into the Indian Ocean near Melinda. On the south grows one kind of tree only, the poisonous morio (*Acokanthera schimperi*), which Hildebrandt met with near Taveta and on the Ahl Mountains in northern Somaliland. The effect of a landscape in which the morio grows is very weird and quaint, the squat, bulky trees, with bare stems only some five to eight feet high, surmounted by a massive cone-shaped crown of leaves, standing out as if carved in wood against the yellow steppe. They tolerate no other plant or tree near them, but congregate in little groups; the variety we saw here were all about the same height, and though the trunks looked as if they were single, they really consisted of several thin stems twisted together like those of a vine. The leaves and flowers are both small; the latter are white or of a pink colour, resembling those of the elder, and they give forth a delightful aromatic scent. The Wakikuyu and Wandorobbo, as well as the people of Somaliland, use the distilled sap of the roots to poison their arrows. Natives and caravan-men alike consider the whole tree deadly poison and will not even smell the flowers. Our experience, however, was that the dangerous qualities of the morio are much exaggerated, for the scent is certainly perfectly harmless.

A few years later, when describing the then little-known Kikuyu tribe, Sir Gerald Portal wrote that they seldom or never show themselves and run the risk of a fight in the open, but lie like snakes in the long grass within a few yards of the line of march, watching for some incautious porter to loiter a few yards behind. Even then not a sound is heard but the twang of a small bow and the almost inaudible whizz of a poisoned arrow. A slight puncture in the arm, throat or chest is followed almost inevitably by death. Another favourite trick of the Kikuyu is to plant poisoned skewers in the path, set at an angle so they will pierce the stomach of anyone advancing through the underbrush. For a man to lag behind the others, even for a few seconds, means certain death.

Chanler states that the Kikuyu "plantations were often visited by elephants and rhinoceroses. As a precaution against

the inroads of these beasts, the frontier of the country was skirted with deep pits, at the bottom of which sharp, poisoned sticks were placed in an upright position."

The work of Raymond and others has enabled the botanical sources of the chief ingredients to be identified with certainty. Methods of manufacture vary with the locality and from tribe to tribe, but it is now established that poisons are derived from three main indigenous botanical genera: *Acokanthera*; *Strophanthus*; and *Urginea*.

In Kenya and Tanganyika the principal botanical sources for poison are one of the three species of *Acokanthera*. These are: *Acokanthera venenata*; *Acokanthera longiflora*; *Acokanthera friesiorum*; the last named is thought to be identical to *Acokanthera schimperi*. They all contain a toxic glycoside which Professor Reichstein, of Basle University, has shown to be oubain.

Although widely distributed, *Acokanthera* does not appear to be common in more than a relatively few, and often widely isolated, localities. In some regions the trees are so dense as to give the impression that they must have been artificially established in the distant past. In the Southern Province of Tanganyika, for example, *Acokanthera* is found in only one locality in the Liwale District, but it is not possible to say how or by whom the trees were introduced.

The tree itself is unmistakable. It averages some 20 to 30 feet in height, with a circumference ranging from a few inches to two to three feet at waist height from the ground. It has a grey-coloured bark and ovate leaves four or five inches long and two inches broad. The presence of the tree does not appear to have any deleterious effect on other vegetation; nevertheless, some tribes insist that it is preferable to use the young, solitary trees since they believe that the leaves shed by the poison tree will discourage the growth of other vegetation, and the scarcity of growth in the immediate vicinity is, therefore, regarded as an infallible indication of the tree's toxicity.

Manufacturing technique differs in detail from district to district but, as a general rule, the poison is prepared by cutting a section of the tree, from which the leaves have been stripped, into thin slices which are then placed in a suitable vessel,

covered with water and boiled for about seven hours, until a sticky black mass is produced. The woody parts are then skimmed and the contents of the bowl concentrated through further evaporation. Some tribes add the leaves, roots and branches to the pot. Another description states that the twigs are sliced into small sections and boiled hard, stirring the while. As soon as the bark begins to separate from the wood, the liquid is decanted into a second pot, fresh twigs added and the whole brew boiled again. Finally, this too is drained off and the contents evaporated until a dense mass remains. The poison is then either packed in strips taken from the stem of the banana or the husks of maize cobs, or alternatively, stored in pots or similar containers until required for use. The strength of the finished product is dependent on the quantity of water used. It possesses an extremely bitter flavour. The poison remains potent for a long time if protected from the effects of sun and rain, but its strength progressively declines with age.

Sometimes the poison is applied to the arrow shortly before it is expected to be required for use. On other occasions it is coated on to the arrow not long after manufacture. In both instances the arrow head is enveloped with some sort of protective covering. Narrow strips of hide, preferably of reedbuck or impala, are kneaded until they resemble chamois leather and then wound round the arrow head like a bandage, so that the poison remains in good condition. The material is removed prior to the hunt. When poison has become hardened through long storage, the Wakamba re-invigorate it by heating up *Sansevieria* and squeezing out the juice into the poison pot and then re-boiling, but nowadays it is seldom left unused for long enough to require this treatment. *

As a general rule the arrow heads are of metal, but some are made either of fire-hardened wood or of wood tipped with a small triangular metal blade. Occasionally, the iron heads are spirally shaped to facilitate adhesion of the poison. If the metal is smooth, thin strips of fibre are wound round it to enable the poison to adhere more readily. Sometimes the barbs of the arrow bear nicks to assist adherence.

In some tribes a great deal of secrecy surrounds the manu-

facture of poison and knowledge of the technique is confined to a few individuals, or a particular family, and the secret is passed on from one generation to another. An inherited knowledge of the manufacturing process is naturally a useful source of prestige and wealth and places the person fortunate enough to possess it in a powerful position in the tribe. An individual holding a manufacturing monopoly of this sort is assured of a lively business and, so long as the quality of his product remains consistently high, he can be sure that there will be a ready market for his wares. Africans will travel long distances to acquire a reputable high quality poison and pedlars conduct a brisk trade hawking the finished article in surrounding districts, sometimes several hundred miles from the source of supply. The present market price is 50 cents for enough to cover one arrow. A single arrow may carry five grammes of crude poison, which is sufficient to kill 250 adults when absorbed in the blood stream. One man was caught with 20 lb. in his possession.

The Waikoma are manufacturers of poison, but will not divulge the secret of its preparation to the Wasukuma, to whom they sell large quantities. In other parts of East Africa there appears to be no particular secret concerning the preparation of the poison. Some tribes, however, insist that women must not be present during the brewing: they are permitted to bring food to within shouting distance but must then retire as quickly as possible.

The Wasukuma are also reputed to obtain some of their supplies of poison from the Loliondo area of Masailand, but it may, of course, pass through many hands before reaching its final destination. Poison appears to be used by the Masai, though they do not manufacture it themselves but obtain it from the Wandorobo or, on occasion, from the Wakamba and Wasanye. Statements that the Wandorobo hold poison in such awe that they do not attempt to make it and know nothing of its manufacture appear to be inaccurate. Kenya Wandorobo, with whom this subject has been discussed, say that any man of the tribe requiring poison obtains it through the simple expedient of cutting the *Acokanthera* tree into convenient lengths and laying them on a fire. The hot

sap bubbling out of the ends of the logs is then collected and used without further treatment.

The Giriama are unquestionably the foremost experts in the manufacture of *Acokanthera* poison in Kenya. Their product is much esteemed by other tribes, particularly the Wakamba and the Waliangulu, and a considerable quantity also finds its way into Tanganyika.

The potency of the poison depends on the method of manufacture as well as the age and condition of the concoction. An average strength poison may kill a man in from half to one hour but, when very potent, will cause death in less than ten minutes. In the Coast Province of Kenya the freshest poison is required for wart-hog and zebra which, according to the Waliangulu, seem to be less affected by it than other animals. Giraffe and rhino rank next in that order. The most susceptible species include bush pig, oryx, eland, buffalo and elephant. In parts of Tanganyika local tribesmen consider that the elephant possesses an immunity to *Acokanthera* poison, but this is not borne out by experience in Kenya. The belief may have arisen because of the difficulty of penetrating an elephant's hide. Where wooden arrow heads are used, as in parts of Tanganyika, penetration would be exceptionally difficult, but in those parts of Kenya where metal arrow heads are used the situation would not arise.

Acokanthera poison is effective only when introduced into the bloodstream through a wound, and acts by arresting the action of the heart in systole; i.e., by halting the muscular contractions of the heart and arteries. It may be handled, or even drunk, providing there are no open sores, and the effect would be nothing worse than an attack of dysentery. A well-known Kenya poacher, Wambua Makula, has said that if the fat of a wart-hog or sheep is placed in contact with the poison, it loses its potency almost immediately.

Sometimes the same plant material is re-used a number of times before being discarded, but rarely more than three times. Poison derived from the final brew will naturally be the weakest of the batch. Sometimes lizards, snakes and other creatures are added to the boiling pot, and some tribes maintain that the addition of a live shrew enhances the poison because they

believe that a shrew will drop dead if it attempts to cross a footpath, and the wounded animal will not, therefore, be able to cross a path without collapsing. According to Champion a rat called "Pinji" is used for the same purpose by the Wasanye.

Near Lake Victoria, the natives sometimes add the gall bladder or liver of a crocodile as it is believed that, by this means, a wounded animal will at once die if it should stop to drink. The stomachs of puff adders or mambas are also added to the pot when available.

In the neighbourhood of Bagamoyo, the poison is brewed for two days, then pummelled to the consistency of putty. The finished product is tested by applying a small quantity to an incision made in the skin of a chicken. If the bird is dead after the second jump, the poison is regarded as top grade. Occasionally the poison is tested on an antelope. If urine and droppings are seen on its track, the poison is considered too weak.

Certain Kenya tribes, notably the Waliangulu, test the efficacy of the brew by making a small incision in the arm above the elbow, so that a thin trickle of blood flows down as far as the wrist. Poison is applied to the flow of blood and, if the concoction is of a sufficiently high quality, it rapidly coagulates the blood as the poison advances up the arm. Just before it reaches the wound the flow is casually wiped off with the other hand. An alternative test is to apply a little poison to a stout thorn or thin sliver of wood and jab it into a frog, tortoise or lizard. The rapidity of death is an indication of the efficacy of the poison. A lizard will travel only a few feet if the poison is very active. Another common test is to prick a small hole in an egg and insert a little poison. If the poison is of good quality the egg will burst after about half an hour.

Death usually occurs within a few minutes to half an hour, depending on the species of animal and the age and strength of the poison. One reliable report states that an antelope struck by a poisoned arrow leaped into the air and was dead by the time it reached the ground. This is exceptional, but good poison will drop an antelope before it can travel 200 yards. The animal usually dashes off after being hit and then stands trembling violently before rolling over dead. At the other

extreme, elephants have been reported as taking anything up to three days to die. During this period the wretched beast stands with its trunk and ears hanging dejectedly and appears quite stunned.

The meat of animals killed by *Acokanthera* poison is edible: only the flesh in the immediate vicinity of the wound is tainted, and this is cut away and discarded. Whenever possible the arrow head is extracted and used again. Not only is metal a precious commodity but arrows carry the owner's identification mark and, when the quarry has to be tracked for hours or even days after being struck, the arrow head provides positive identification which enables the hunter to claim his victim.

So far as is known no proven antidote exists, but there are a number of natural remedies which are said to be effective. The root of a plant with the Swahili name of *Kikuro* (*Fadogia* sp.) is carried by some natives using the poison. The root is ground against a stone and rubbed into the wound. It is considered to be more effective when application is delayed as long as possible.

It is said that, as an antidote, the Masai urinate directly into the wound of a moran struck by a poisoned arrow. Charcoal made from *Agauria salicifolia*, or possibly the plant itself, has also been mentioned as an antidote in parts of Masailand, but such reports are indecisive.

In Bukoba, it is claimed that an effective antidote is couch grass, red sweet potatoes or wild fig leaves which, after being chewed, are applied to the wound, which is then sucked. The statement that the poison is so astringent that the lips of the individual brave enough to undertake the task will crack, is more than understandable.

The root and juice of *Temnocalyx obovatus* (Rubiaceae), which is widespread, is described by Greenway as an antidote to *Acokanthera* poisoning. In West Africa, the leaf and berries of a related species, *Fadogia erythrophloea*, are used among other antidotes.

Meinertzhagen had the misfortune to be struck in the fleshy part of the thumb by a poisoned arrow during the 1905 Nandi Rebellion. His hand went black within about ten minutes. He fastened a tourniquet around his wrist and gave

himself an injection of strychnine, which had been issued to the troops engaged in the expedition as a specific antidote. Seven of his men, who were wounded by arrows during the same fracas, were given similar injections, but two died within the hour, "although whether of strychnine or arrow poison I shall never know."

The poison is packed in a variety of ways. The Waliangulu take a quantity sufficient for a single arrow and wrap it neatly in dried banana leaves which are then bound with raphia. Each *mkala*¹ is about 5½ inches long and half an inch thick and looks something like an elongated cigar. When bound together they resemble nothing so much as a bunch of rather spindly bananas. In Tanganyika the poison, which is first rolled in hands which have been liberally coated with wood ash, is sometimes packed in the empty shell of *Strychnos* fruit, while bulk quantities are stored in gourds or similar containers.

Although a number of species of *Strophanthus* occur in East Africa, only one is apparently used for arrow poison—*Strophanthus eminii*. Stuhlmann's account of Emin Pasha's African journey (1894) mentions the poison used by the Wanyamwesi near Tabora. He writes: "The arrow poison is prepared by the expert far from the village and in the full secrecy of the forest. He cooks the pounded root bark of *bungo-bungo* and *mwelle-mwelle* together and adds lizards, snakes' heads, snakes' tongues and other dismal ingredients thereto. The rising vapour is very deadly. After some time the pot is removed from the fire and the poison, which now forms a dark pulpy mass, is allowed to cook overnight." Braun and Raymond have both identified *mwelle-mwelle* as *Strophanthus eminii* and are of the opinion that *bungo-bungo* is

¹ Tribal names are as follows:—

<i>Tribe</i>	<i>Packet of poison for one arrow</i>	<i>Poison</i>
Giriana	<i>Mkala</i>	<i>Uchungu</i> or <i>Mutsungu</i>
Kamba	<i>Ikaa</i>	<i>Ibai</i>
Kikuyu	<i>Ururu</i> or <i>Ifai</i>	<i>Murishu</i> or <i>Mururu</i>
Kipsigis	<i>Warnet</i>	<i>Keliot</i>
Liangulu	<i>Mkala</i>	<i>Hadda</i>
Masai	<i>Esaiyiet</i>	<i>Esaiyiet Ol-Morijoi</i>

murugurungu, which they consider may be a species of *Fagara*.

Raymond describes two methods of manufacture which bear some resemblance to Emin Pasha's description, but emphasises that laboratory examination leaves no doubt that the *seeds* of *Strophanthus* are the principal ingredient. One account states that the boiled sap from *Strophanthus eminii* is mixed with liquid extracted from a species of *Adenium* and other material. The second account relates that the plant *panju* (*Adenium* sp.) was the main ingredient. The leaves and small stalks of this plant, which must be fresh, are removed and the thick parts of the stem are cut into small pieces and placed in a calabash of water. After being boiled for about twelve hours, pieces of the shrub *murugurungu* (mentioned above) are added with the object of assisting coagulation. The solid matter is then skimmed off and, with occasional additions of water, the remaining liquid is kept boiling until only a thick, glutinous residue remains. This is then removed, moulded and cut to whatever shape is required on a convenient stone. It is then ready for use. The whole process takes about twenty-four hours but from a large calabash full of the shrub only a few ounces of poison are obtained. The poison manufactured from *Strophanthus* is not nearly as well known in Kenya as *Acokanthera*, but *Strophanthus kombe*, found in Portuguese East Africa and Nyasaland, is the most important arrow poison of Southern Africa. Livingstone and Kirk mention its widespread use, and it is recorded in Tanganyika, extending as far north as the coastal belt of Kenya.

Apart from the Wanyamwesi, Raymond mentions its use by the Watindega, a small remnant of primitive nomadic bushmen, who subsist entirely by hunting, using only the bow and arrow, and are to be found scattered over a wide area in the vicinity of Lake Eyasi and Mbulu District in Tanganyika. They speak a "click" language and should more correctly be referred to as Hadzape.

In the Ufipa area a poison is also derived from species of *Urginea*. In this case the bulb, known locally as *Sungwe*, is pounded between stones and the fibres allowed to dry in the sun. After a further pounding, water is added until the right consistency is obtained and the resultant paste is smeared on

the arrow and then dried in the sun. Only men are allowed to prepare the poison, which sometimes causes a rash to appear on the hands, but this apparently disappears if washed quickly.

The *Urginea* bulbs are obtained from beneath the Ruwenzori Escarpment, and this poison appears to be confined to the tribesmen of the Ufipa Plateau and the adjacent region in Tanganyika, as well as parts of Northern Rhodesia and the Karoo District of Nyasaland, wherever the Nyika and Safwa tribes are to be found. It is said that if an arrow penetrates a man more than an inch, he will recover if the wound is treated with a mixture of soda and wood ashes in hot water. Failing this he will not survive more than three hours. The wart-hog is reputed to be the most difficult animal to kill. If struck on the shoulder it will take six or seven hours for one to succumb. If hit in the loins it will run a mile, but it will not die if struck in the stomach.

The Wanyika are reputed to use another poison in addition to *Urginea*. It is said to be made from a tuber found near Dar-es-Salaam and identified as *Dioscorea dumetorum*. The tubers are pulped and dried before being mixed with seeds of the *Pondo* flower, whose botanical name is unknown. A specimen of this poison has been examined.

Other plants have been mentioned as sources of arrow poison, but they have not so far been positively identified, even if they do in fact exist. Inasmuch as *Euphorbia* and *Adenium* are concerned, they must be regarded primarily as supplementary ingredients. Greenway, however, believes that *Adenium* may be a poison in its own right. Raymond considers that certain members of the Euphorbiaceae may enhance the toxicity of *Acokanthera* poison, while Greenway is of the opinion that the resin contained in *Euphorbia* has the useful effect of "coagulating" and gumming the poison to an arrow.

In summary, the bulk of the arrow poison used in Kenya is derived from one of the species of *Acokanthera*, and poisons from other botanical sources are seldom encountered. In Tanganyika the use of *Strophanthus eminii* is widespread. Farther south *Strophanthus kombe* is the common source of poison.

Although outside the scope of this work, it is interesting to note that the seeds, leaves, bark and roots of several shrubs and

small trees are used in varying ways for poisoning fish. The leaves of *Tephrosia vogelii* are simply thrown into the water. The effect is to stupefy the fish, which are then easily collected by hand. The roots of *Neorautenenia pseudopachyrhiza* are used for the same purpose. In certain East African coastal rivers fish have been entirely eliminated by these methods. Greenway states that the pounded bark of *Mundulea sericea* and *Tephrosia vogelii* are used in certain parts of the East African coastal belt as fish poisons. The former is considered more toxic than the latter. The stems are cut at ground level and the bark peeled or stripped and then pounded. He quotes reports that *Mundulea* is reputed to kill crocodiles up to four feet long, and other statements to the effect that it drives crocodiles away. The Wakamba cleared the Uмба River of all crocodiles by using poison, but it is not known whether this was definitely *Mundulea*. Greenway also refers to a reliable report that certain of the tribes along the Pangani River tie strips of the bark around the legs of their cattle when they water at the river to protect them from crocodiles, but it seems strange that the poison should not also affect the cattle.

12. Arid and Marginal Lands

UNTIL THE COMING of European administration, only a very small percentage of Kenya was occupied by human beings in any sense of permanency. Perpetual wars, locusts, famine and disease, coupled with man's own technical limitations, resulted in the human population remaining very small.

In the 1880's, for example, the native population in the Teita Hills was reduced from 10,000 to 1,500 by famine and a few years later Bishop Tucker commented: "For many a long and weary month did the famine last—and tens of thousands of men, women and children were swept away by its ravages ere its course was stayed. The plague of locusts . . . which was one of the chief causes of the famine, and of its continuance, was one of the most extraordinary ever witnessed in East Equatorial Africa. In countless myriads they marched through the land, invading houses, swarming into water-tanks, creeping up trees, eating up everything before them. Their movement was ever onward. Even the sea failed to stop them. On reaching the shore they attempted to cross the harbour to the island of Mombasa. Millions were drowned but on their floating carcasses living millions crossed, and then onward they went again in their career of destruction. What the plague of locusts was like in the land of Egypt in the time of Moses, we could easily imagine by the sight of this terrible visitation in East Africa, in January 1895." Reports from early missionaries estimated the *average* rate of infant mortality to be as high as 80 per cent. When the Consolata Mission was established in Kikuyu country in 1902, the Rt. Rev. Dr. Perlo reported that the rate was even higher, and in "certain seasons of the year, or in case of an epidemic . . . the death rate of the adults reached

such percentages that such disease was by the natives themselves called *Mothiro*, i.e., the all-finishing disease."

A first-hand account of the mortality from sleeping sickness is given by Bishop Tucker: ". . . The ravages wrought by this fell disease have been appalling. The islands have been almost depopulated. Kome, which at one time was said to have a population of 10,000 has hardly 500 souls left. The fishermen on the Lake shores have become practically an extinct race. South Busoga has suffered even more than Uganda. Nanyumba's country has been more than decimated; while Wakoli's, formerly the very garden of Busoga, is now a howling wilderness." Sir Albert Cook estimated that, between 1898 and 1904, at least 200,000 people died of sleeping sickness in the tsetse fly areas of Uganda out of a total population of 300,000.

Many further examples could be given but perhaps one of the most revealing relates to Mutesa, whose name became a by-word for atrocities and cruelties of the vilest kind, which earned him the title "Causer of Tears." Sir Harry Johnston stated, on the authority of Monseigneur Streicher, that "in Mutesa's reign the population of the Kingdom of Uganda approached four millions." In 1903 he considered that it was "doubtful if the same kingdom possesses eight hundred thousand inhabitants." Disease accounted for many casualties but the decrease was primarily due to the massacres, mutilations and constant executions that occurred under the Kabakaships of Mutesa and Mwanga between 1860 and 1898, and the activities of Kabarega, who completely depopulated certain districts.

According to Lugard, Mwanga's Court was the "public scene of all the vices of Sodom and Gomorrah." Mwanga displayed almost as much ingenuity in devising excruciating methods of torture as did Artaxerxes in his "punishment of the boats."

Unsettled conditions existed for centuries throughout the almost unknown interior of the African Continent, and it was only because of the chaos prevailing in human affairs that Africa's wild life was enabled to survive, supreme and undisturbed, down to the dawn of the twentieth century. If ordered government, stable conditions and a prosperous citizenry had been the rule, there is no doubt whatever that

wild animals would never have survived in the numbers they did. As things were, the African Continent, south of the Sahara, was entirely dominated by countless herds of wild animals, with man in a subordinate role as one of several predators. The advent of Pax Britannica abruptly changed all that. All at once the roles were reversed and, for the first time, man became the dominant animal.

In so far as factors affecting Kenya's fauna are concerned, the most notable feature, which is fundamental to the present situation, has been the large increase in the human population in the short space of a single life's span, resulting directly from the introduction of stability by the British Administration. Ignorance and fear have, to some extent, been banished: life expectation and the level of health increased and the conditions of human welfare improved, to mention but a few of the more obvious benefits bestowed on Kenya. Ordered government has, however, resulted in more than doubling the human population in fifty years and an even more significant upsurge in the numbers of domestic livestock. This transformation, which was achieved at the expense of the once dominant fauna, may prove a two-edged weapon, for unless measures are taken to slow down the rate of human increase, the benefits of civilisation and progress may prove elusive and result only in misery, different in kind, but not in effect, from that which prevailed a century ago. Africa appears determined to exchange the interminable bondage of past ignorance, poverty and fear for the equally ruinous enthrallment of excessive human increase.

A rapidly rising population—and the graph shows little sign of levelling off—has led to the expansion of human enterprise into parts of the country previously regarded as less suitable for settlement. Inevitably, this has resulted in the blind transference of ideas and techniques designed to be admirably suited to more favoured regions, but which all too often are entirely inappropriate for poorer soils and range land.

Natural limitations of soil and climate are the determining factors in regard to human expansion, and much of Kenya is so poor that any attempt at development would only lead to irreparable destruction of the soil and vegetation on which development must depend.



In parts of the Northern Frontier Province, the camel is the most important domestic animal (*above*). The handsome reticulated giraffe (*left*) is found exclusively in this part of Kenya

From an agricultural point of view, Kenya can be divided very roughly into regions of average or high agricultural potential and regions of marginal or low potential. In each of these widely differing regions it is logical that every effort should be made to utilise the latent potential to the maximum, the sole criterion being whether the methods employed are in accordance with the rules of proper land usage. Intensive farming is unquestionably the wisest form of land use in the high fertility and high rainfall regions and here wild animals, with the exception of certain beneficial species, have no place. By the same token, if proper land usage can be broadly defined as using the land to the best advantage without in the process damaging or destroying it, then it follows that development should in no way be stereotyped, but should take the form that is best suited to the particular circumstances prevailing. Arid regions, incapable of agricultural or pastoral development, would be more advantageously employed for wild life management. Land is man's basic resource and it is necessary to think less in terms of exploiting the soil and more in terms of conserving the land itself. Sir Julian Huxley summarises the position when he says that "We must apportion the use of land, not only according to our various human needs, but also according to its varying capacities of continuing yield whether that yield be of food, wild life, timber or recreational space. Above all, we must see that its yield capacity of whatever sort, is not reduced (or even totally lost) by faulty or short-sighted exploitation."

The regions of low rainfall and poor fertility are more extensive than the areas of high rainfall and good agricultural potential. The total area of Kenya is 219,789 square miles which, when correlated to rainfall, can be subdivided as follows:

Under 10 inches	58,700 square miles	26½%
10-20 inches	80,800 square miles	36¾%
20-30 inches	38,300 square miles	17½%
Over 30 inches	42,000 square miles	19%

Looked at another way, 63½ per cent of Kenya has less than 20 inches of rainfall, but the true figure is even higher than this if related to Brown's aphorism, "a rainfall of 20-25 inches in

Kenya is about the equivalent of 10-12 inches in the United States, while a rainfall of 20-25 inches in the United States, the critical level of rainfall for cultivation, about equals 30-35 inches with us in Kenya."

Increasing attention is being focused on Kenya's marginal lands with a view to absorbing the country's rising population, but in many of these regions development, in the normal agricultural sense, is likely to be synonymous with devastation. Admittedly certain selected low rainfall areas could support conventional development, such as irrigation projects. Such schemes, while expensive, are feasible in a few areas but could at best be applied only to relatively small and isolated pockets of Kenya's marginal lands. There still remains the problem of knowing how to use the huge areas of arid country which constitutes so much of Kenya.

Proposals have been made that large-scale cattle ranching schemes should be initiated in these areas, but even a cursory examination of the economic factors inseparable from such proposals does not give cause for optimism. The considerable sums of money required, among other things, for the provision of adequate watering-points in parts of the country notably deficient in water resources, would almost certainly result in attempts being made to increase output in order to justify the large capital outlay and give a good return on the investment. There would, therefore, be a great temptation to overstock, whereas stocking rates should be conservative in arid zones in order to avoid depleting the natural vegetation. Nomadic tribesmen usually tend to build up their herds in the wet years and consequently over-graze in the lean ones.

Many of the pastoral areas of Kenya, such as Kajiado and Narok, have already suffered severely from overstocking, and these examples serve as a warning that the introduction of domestic livestock into marginal lands must inevitably lead to desiccation of the habitat.

Development in terms of customary systems of pastoralism and agriculture, involving the disturbance or elimination of the indigenous fauna and flora, frequently leads to large-scale downgrading of the land. There seems no reason to suppose that the result would be any different from that in the United

States, or several other countries, where misuse of marginal land resulted in widespread destitution.

The attitude of the early United States settlers appears to be repeated in Africa to-day. "Resolved that none of us know or care to know anything about grasses, native or otherwise, outside the fact that there are lots of them, the best on record, and we are getting the most out of them while they last." (McIlvain and Savage, 1954.) In view of this attitude it is hardly surprising that grazing did not last as long as the settlers might have wished. Brown informs us that, in 1884, the Great Plains supported a cow to one and a quarter acres but, by 1900, the stocking rate had dropped to a cow to ten acres and is probably even lower to-day. He adds that similar deterioration amounting to quite 150-200 per cent has already occurred in Baringo District and in parts of Masailand. Degradation is of course very much more rapid in arid areas, the higher rainfall regions being far more resilient.

Before Europeans settled in the United States, when the country was largely inhabited by immense herds of wild animals the estimated total of stock units was approximately 97,000,000, including 60,000,000 buffaloes: the 1952 figure is only 31,000,000 stock units (Brown, 1959). This is an outstanding example of abusive "development," and is equally applicable to Africa. Most East African range lands are degraded to the extent that they are no longer capable of supporting the huge herds they carried a century ago.

Brown (1961) draws an interesting comparison between economic ranching, primitive pastoralism and wild life: "In very round terms the extensive or range stock industry in Kenya is worth some three and a half million pounds per year. Of this about one and three quarter millions comes from about 4,000 square miles of European ranches, and the remaining 1¼ million comes from the huge area, totalling 183,000 square miles, which is potentially available to pastoral tribes and most of which is used, at least sporadically; the return is largely in the form of hides and skins. In the one case the gross return per acre is about Shs. 13/50, and in the other about 30 cents. There are areas of African pastoral land which produce more than this, but the highest economic return per acre of African

land would not exceed 3/- per annum gross, on land which is as good as and often better than the European ranches.

“The relative value of land usage in terms of wild life as opposed to stock has not been accurately computed, but if it is assumed that the tourist industry based on wildlife, and the African stock industry, make use of roughly the same areas of land, then in East Africa the tourist industry is clearly a far more valuable form of land use. For Kenya alone, it has been computed at about five and a half million pounds per annum and it is capable of rapid expansion. At the worst, therefore, it is worth about three times as much per acre as is the African stock industry. When one considers, in addition, that it is concentrated on a few relatively undamaged areas where game, in the absence of domestic stock, is still relatively abundant, it becomes plain that the return per acre from wild animals through tourism is far greater than that of the African stock industry. The Nairobi Park makes a gross revenue from actual receipts of about 45/- per acre, not counting any revenue that may come in indirectly from tourists who visit it. Although no figures are available to me, I have no doubt at all that the value of Amboseli as a tourist attraction far exceeds its value in terms of production of African stock in the same area. And this is simply considering the sightseeing and hunting tourist, and takes no account at all of the potential value as a source of game meat on a sustained-yield basis.”

The figures already quoted illustrate that a substantial percentage of Kenya's lands will not withstand agriculture or pastoralism. Arid habitats are very precariously balanced, and disturbance or elimination of the indigenous flora on sub-marginal lands leads only to rapid deterioration. But these arid zones are neither valueless nor need they be wasted. The ecological solution is to take measures to harvest such crops as the country naturally provides, foremost of which is wild life. The potentialities inherent in proper utilisation of the ungulate fauna as an important natural resource have been almost entirely neglected. This is the one crop that thrives under arid conditions where it would be almost impossible for other forms of livestock to exist.

Not only is Africa's ungulate fauna ideally adapted to marg-

inal conditions, as well as possessing a natural resistance to most of the diseases and parasites affecting domestic stock, but the complex of wild creatures affects the fullest possible utilisation of habitat without, in the process, harming or destroying the habitat. This is a vital consideration in maintenance of environment.

To quote from a statement by Dr. Fraser Darling, the 20 or 30 ungulates to be found under natural conditions in most parts of Kenya, "ranging from elephants down to the smallest antelopes, each have their particular niche, their particular call on the environment, their particular influence on it. The stratification of species is significant in maintenance of habitat, and cannot be disregarded when the habitat is tender as is so much of Africa."

Each animal within the spectrum of 20 to 30 wild species has its own special contribution to make and, by this means, the most effective use is made of the habitat, without in any way maltreating the structure. If this spectrum is reduced to 3 or 4 species of domestic animals, which are ill-adapted to the environment, not only will they be unable to utilise the habitat as efficiently as indigenous animals, but there is a very real probability that their impact on the environment will result in large-scale desiccation of soil and vegetative cover.

Wild animals thrive where domestic livestock can barely exist, and comply with Fraser Darling's axiom that "success in evolution is in finding some slight difference of activity from others, in being able to exploit some unique link in the conversion cycle." Nowhere is this statement more applicable than in Africa's arid regions. Using only four species—cattle, sheep, goats and camels—all too little of the total vegetation is converted to use. Heady (1959) has shown that less than 10 per cent of the grass species in his study area are used by domestic livestock, which are therefore supported on only a small amount of the total forage actually available.

The wide variety of wild herbivores collectively makes far more efficient use of the different types of available vegetation. Although species such as topi, zebra, wildebeest and kongoni are all primarily grass feeders, they rarely compete with one another because each has certain preferred grass species or

consumes a particular type of grass at different stages of its growth. Similarly, impala, Grant's and Thomson's gazelles browse as well as graze, consuming grass, herbs, and woody plants, depending on the season and stage of growth. Buffalo are mixed feeders, yet their grass preferences are entirely different from the antelopes and zebra. Rhinoceros and giraffe rely principally on woody shrubs and trees for their food and their preferences are such that they do not conflict with each other or the antelopes. (Talbot, 1961.) These few examples are sufficient to demonstrate that the wide variety of ungulates normally found in East Africa collectively utilise all the vegetation in the habitat, whereas domestic livestock use only a small part of the total.

Not only are wild animals equipped to effect a much more efficient utilisation of browse and grazing, ranging from the tops of trees to beneath ground level, but they are far less dependent on water. Some species, such as gerenuk, require no water whatever, while others can exist for long periods without drinking. They are also dispersed over a wide range and constantly on the move, never remaining in any one locality long enough to damage the vegetation. Little is known of the precise function and contribution of each wild animal species in relation to the habitat, and this is one of the subjects calling for research. The movements of domestic animals, on the other hand, are primarily conditioned by availability of water, which leads to heavy concentrations for long periods close to available water supplies and consequent degradation of the land.

For these reasons it seems logical to suggest that in those parts of Kenya which are incapable of orthodox agricultural or pastoral development, consideration could be given to harvesting the complex of ungulate species under natural conditions for the direct benefit of indigenous tribesmen, and that such a system should be recognised as an entirely legitimate agricultural pursuit. In a country such as Kenya which is notably deficient in animal protein, it seems foolish to disregard the latent possibilities inherent in the efficient utilisation of Nature's livestock on a basis of sustained optimal yield. Quite apart from the important consideration of proper land use, such a

system would have considerable socio-economic significance in relation to primitive tribal communities.

In a similar category are those areas of East Africa which have been protected from abasement by the relentless custodianship of the tsetse fly, the most consistent conservationist in Africa. Present policy appears to be directed at eliminating the fly with the intention of introducing domestic livestock. Land dominated by fly is officially regarded as wasted, and strenuous—and extremely expensive—efforts are made to reclaim such "waste" land and bring it into production. Once the fly has been eliminated, there is an immediate uncontrolled influx of scrub stock and before long yet another region lies devastated, in the name of Progress.

Brown (1961) informs us that "to open up an area of tsetse bush for use by African pastoralists may involve a minimum cost of 60/- per acre for a possible gross return of 1/- per acre per annum. Unless such development schemes are closely supervised, involving some regimentation of the pastoralists, they are doomed to failure anyway and the initial capital expenditure will be wasted. No example is known in East Africa of hitherto unused land opened up for grazing which, in the absence of such control, has not degenerated or is not degenerating to an eroded waste."

Governments do not appear to have grasped the fact that in these circumstances it would be wiser and, in the long term, far more beneficial to the tribesmen themselves, to take full advantage of the natural resistance to fly enjoyed by wild animals and utilise them to man's advantage. It seems almost Gilbertian to go to immense trouble and expense to eliminate the very species of animals which are so eminently adapted to fly country and attempt to replace them with exotic creatures which are entirely unsuited to it; which can only be maintained there by costly artificial means, and whose presence must eventually lead to impairment of the land.

An excellent illustration of this attitude occurred early in 1959 during the course of a scientific conference on malnutrition in Dar-es-Salaam. Mention was made of widespread dietary deficiencies in Tanganyika which resulted in considerable suffering, particularly among children. This is

because 70 per cent of the territory is infested by tsetse fly which makes stock farming impossible in the greater part of the country and prevents residents from obtaining milk and meat regularly.

Nowhere, however, was there any indication that any of the delegates to the conference appreciated, or even considered, the immense possibilities inherent in a system of proper utilisation of the wild animals as a source of animal protein in fly country. An appeal was made to a body of experts on malnutrition to assist by devising means of overcoming protein deficiency in tsetse infested country, while the very animals which could and should fulfil that urgent need are being ruthlessly and senselessly exterminated. Instead of the intrinsic nutritional value of tsetse areas being enhanced and utilised, it is being eliminated through expensive "reclamation" schemes which threaten to be as disastrous as the ill-conceived groundnut fiasco. Is it asking too much for the Governments of African territories to realise the immense importance of the wild fauna from the viewpoint of protein production in areas unsuited to traditional pastoralism?

The urgent need appears to be not so much new institutions as new attitudes of mind, because however convincing the arguments, Agricultural Departments and other organisations tend to look askance at any entirely unconventional proposition of this nature. At best the proposer is regarded as somewhat eccentric; at worst a long-haired crank who must be humoured. Ideas which cut across accepted practices are invariably suspect and agriculturalists and administrators generally prefer to play safe and have nothing to do with such singularly bizarre notions.

Figures are available clearly demonstrating that under certain conditions virgin Africa can, and has, yielded a bigger return in terms of meat per acre from wild animals than from domestic stock and, in the process, the land itself has remained unharmed and in good heart.

The potential yield from the indigenous animals which have evolved in pace with their environment, is several times greater in much of East Africa than the yield from domestic animals which, having evolved under conditions far removed

from those encountered in Africa, are not adapted to the natural range lands of Africa.

Talbot and others have assembled data showing that the standing crop of domestic animals on well managed East African grasslands does not exceed about 32,000 lb. per square mile and, in Masai acacia savannah country, the stocking rate ranges between 11,200 and 16,000 lb. per square mile. Similar land grazed by wild animals supports a standing crop of from 66,000 to 90,000 lb. per square mile; i.e., between 2 and 8 times that of cattle.

The standing crop of goats and sheep in bush country, which cattle cannot use because of tsetse fly, varies between 2,100 and 8,000 lb. per square mile, whereas when the same land is used exclusively by wild animals the figure is 30,000 lb. per square mile.

Talbot's studies showed that "in all cases the high standing crops of wild life appear well within the carrying capacity of the rangeland while in virtually every case the standing crops of livestock under existing management conditions exceed the rangeland's carrying capacity, judging by vegetation deterioration."

These figures serve to illustrate the fact that wild life has for too long laboured under the disadvantage of being regarded as attractive but useless. It is attractive to be sure, but that is the least of its virtues. Instead of being kept constantly in the background wild life needs the chance to come out into the open and show that it can more than justify its existence and hold its own by whatever yardstick one cares to apply:—breeding potential; productivity in terms of protein; resistance or immunity to many of the diseases and parasites affecting domestic animals; the ability to utilise marginal and sub-marginal land far more efficiently than domestic animals; the capacity for flourishing in fly country; the faculty of thriving in remote regions largely devoid of water resources; the supreme virtue of not harming or abusing the habitat. Surely a natural resource possessing these varied attributes should not be lightly relegated to oblivion without a serious attempt at better understanding its qualities? An impartial and influential organisation such as UNESCO, which has a great

responsibility for the future of under-developed areas, could and should enter the lists with an imaginative programme aimed at demonstrating the innate values of the African fauna in all its varied aspects. The potentialities of wild life have been neither appreciated nor adequately explored, and the efficient utilisation of the resource could well result in the creation of a self-perpetuating major industry. Notable progress towards attaining this objective is currently being made by the International Union for Conservation of Nature and Natural Resources.

Riney sums up when he observes: "Wild life has a potential value not only in itself, but as part of the principle of multiple use of pastoral veldt lands and can add real value to lands at present either unused or that are marginal to the types of land now in use. It is particularly on lands now on the borderline of being economic that the re-development and management of the wild life resource can become a practical economic proposition as a form of land use."

PART FOUR

The Status of Species

13. The Status of Species

SEVERAL of East Africa's early explorers and travellers recorded with incredulity the multitudes of wild animals which were found to dominate almost every part of the hitherto unknown interior.

Sir Charles Eliot spoke of the "extraordinary and almost incredible quantity of big game," adding that "one can travel many hours on the Uganda Railway without losing sight of antelopes," and Jackson described the Serengeti Plains, between Teita and Taveta, "often teeming with game, more particularly when the grass is beginning to shoot after being burnt. In September 1886 this place was literally crawling with hartebeest and zebra, besides impala, granti, oryx and a few eland and giraffe with an occasional steinbok or wart-hog." He also informs us (1906) that "game is found throughout three-fifths of the whole Protectorate in great variety and more or less plenty, and in about one-fifth in great quantities."

Sir Harry Johnston, Her Majesty's Special Commissioner in Uganda, gave this description of game seen from the Uganda Railway on October 10th, 1899:

From Makindu I travelled on through the night towards Nairobi. As the dawn diffused itself over the Athi Plains we saw from the windows of the train a rare and beautiful sight. These immense level stretches of grass-land, reduced in the present drought to uniform grey-yellow stubble, were literally covered by herds of game, individuals of which would approach quite close to the line as though they had already lost all fear of the rushing jointed monster with the smoking head. We saw zebras as close as one might see horses grazing in the meadows along an English railway, and gnus were to us as cattle lazily flicking the flies off their

haunches. Grant's gazelle and Thomson's gazelle would graze and merely lift their lovely heads as we rattled by. Hartebeests faced us and shook their horns with mock indignation . . . while pallah and oribi, wart-hog and jackals were things of no account. Ostriches were constantly seen. . . .

The whole hour's panorama of this wonderful zoological garden was like a sportsman's dream, but the fact was we had been crossing the Athi Game Reserve, where some two years of strenuously enforced respect of the Game Regulations has brought about this wonderful collection of animals, so rapidly growing in confidence of the protection accorded them, that herds of zebra frequently gallop like runaway horses through the sketched out township of Nairobi.

The restrictions imposed on all persons entering the Game Reserve of the Athi Plains have been so firmly and consistently enforced, that here, more than anywhere else in British Africa, has the Government met with a prompt reward in its first efforts to preserve from extinction the remarkable and beautiful animals which still constitute the glory of African fauna.

An indication of the heavy concentrations of wild animals can be gained from Meinertzhagen's diaries. On the 18th May, 1902, he recorded the following animals counted from the train to the south of the Railway line between Athi River Station and Nairobi, a distance of 16 miles:

5	rhino
18	giraffe
760	wildebeest
4,006	zebra
845	Coke's hartebeest
324	Grant's gazelle
142	Thomson's gazelle
46	impala
24	ostrich
16	baboon
7	greater bustard

Plains, valleys, mountains, rivers all contained beasts and
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birds of every description; so plentiful that it was difficult to estimate numbers for the whole Protectorate, even if anyone had thought to do so. Consequently no existing figures show the likely size of Kenya's total wild life population prior to drawing aside the heavy veil of centuries.

It is true that Brigadier-General E. J. E. Swayne, Commissioner for the Somaliland Protectorate, was bold enough to hazard a guess at the numbers of wild animals in that territory and, based on his figures, a *pro rata* estimate could be worked out for neighbouring Kenya. Unfortunately, Swayne's rough census was not undertaken until 1905 when the wild life of Somaliland had already been seriously depleted.

In describing the drastic change that had taken place since 1891/92, when he first visited Somaliland, Swayne tells of the astonishing numbers of wild animals formerly seen.

I remember in the rainy season of 1891, entering the rolling western plains, where, at an altitude of 5,000 to 6,000 feet, we came across a bushless tract one thousand square miles in area, covered by short succulent grass. The whole ground was covered with immense herds of hartebeest, oryx and Soemmerring's and Speke's gazelles, and troops of ostriches loomed up and disappeared in the folds of the prairie. On firing a shot the whole mass stampeded, one herd communicating its fears to another, until right up to the horizon there was a crowd of galloping animals. I counted 400 oryx in one herd, and roughly dividing the masses as well as I was able into groups of the same size, I estimated that the total number of animals I then saw could not have been less than ten thousand.

It was the same in the hill tracts, the home *par excellence* of the kudu, both the lesser and the greater variety, and klipspringers. No day passed that kudu were not seen and there was no temptation to shoot moderate sized heads which now (1905) would be considered good.

The contrast between the past and the present is distressing. I have frequently travelled across the prairie since then and I do not think I have ever seen more than a dozen animals at a time, excepting perhaps, the common

and unsought-after awal. Hartebeest have practically disappeared, and oryx are met in dwindled and scattered herds.

The decline of the Somaliland fauna was brought about by a number of factors, not least of which was the disastrous series of rinderpest epidemics. The situation deteriorated still further following the introduction of modern firearms.¹ The interior of Somaliland at the time of the Mad Mullah was beyond effective administrative control. The five to six hundred officers stationed in Somaliland during the various campaigns at the turn of the century inflicted enormous casualties on the game population, and even the sepoy were habitually allowed to kill as much game as they wished without restriction, quite apart from the activities of the Mullah and his numerous followers. To add to the confusion, the Abyssinians took advantage of the unsettled conditions to send in paid Midgan gunmen who in the space of a few years, almost obliterated the large herds of oryx and hartebeest which swarmed there. Passenger liners calling at Aden were besieged by hawkers selling kudu and oryx horns obtained in Somaliland by Midgan hunters.

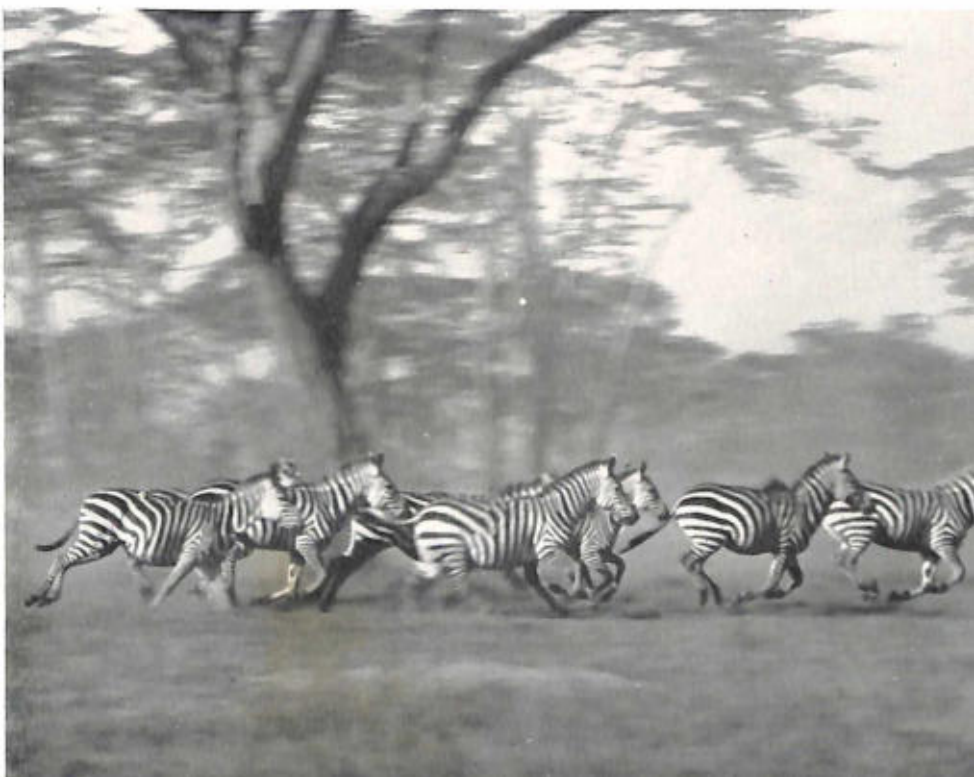
Swayne's Somaliland figures (Appendix c) are extremely valuable and interesting in that they are possibly the only estimate made by an individual who knew the country intimately over many years, who was an accurate observer and deeply interested in the fauna of the territory for which he was administratively responsible.

Swayne's general description could equally well have applied to almost any other part of Eastern Africa, but we have no means of appraising even the approximate numbers of wild animals inhabiting Kenya prior to the introduction of European influence. An assessment of the relative status of the various species is, however, necessary for an appreciation of the present situation. This chapter attempts to fulfil that need,

¹ According to Buxton, the French "poured military rifles through Jibouti into Abyssinia, and it is to be feared that they will find their way into the adjoining territories. Indeed, it is almost incumbent on us to allow the Somalis to have them, as they are powerless to defend themselves against the raids of their neighbours."



The two zebras of Kenya. *Above*, Grevy's zebra, confined to the Northern Frontier region, with narrow stripes and prominent rounded ears. *Below*, the more common Burchell's zebra



although only the more important species are included in this brief survey.

On each of the following maps showing present-day distribution, the shaded areas indicate those parts of Kenya inhabited by the species concerned. Shading and hatching are used to indicate the relative abundance of that species in different parts of the country. The terms "frequent" and "occasional" may be criticised on the grounds that they are the result of subjective choice, since they are not related to actual numbers of animals but rather to observation of the frequency of occurrence of the species in different areas. However, they provide useful information which is not available on a map showing presence or absence alone. The maps do not show any numerical comparisons between species. When referring to wildebeest, for example, the term "frequent" implies an order of numbers very different from the same term used for rhinoceros.

LION (*Panthera leo*)



• *Frequent*
 × *Occasional*

From earliest youth most English people are brought up to regard the lion as the symbol of courage, bravery and nobility. As an emblem of British chivalry the lion has appeared in the arms of kings and queens of England for many hundreds of years. It is, therefore, difficult to adjust one's mind to regarding

him as vermin as happened—and still happens—in some parts of East Africa.

During the closing years of the nineteenth century there was a heavy slaughter of lions in East Africa. Not only were they the most sought-after sportsman's trophy but the presence of prides of lions was hardly compatible with settlement.

Numbers of lions were killed from the waiting rooms along the Railway line by sportsmen, and lion hunting with ponies was one of the causes of big bags. This ranked among the finest sports in the world. The rider had to gallop hard over any sort of country as close to the lion as possible—and to stop a lion one had to ride extremely close. Then the gallop with the lion close behind and in the knowledge that if the horse went down it was all over.

A variation on the same theme was for four or five horsemen to space themselves at 200 yard intervals and advance in line. When sighted, the quarry was pursued by the nearest horseman while his companions spread out on either flank. After a mile or so the lion became blown and generally took refuge under a bush facing his pursuers. The gun then dismounted and advanced on foot, the object being to get near enough for a certain shot, but not so close as to bring the lion to charge prematurely. The correct distance was about 40-50 yards. A faulty aim was almost certain to cause the lion to charge and, as his speed over a short distance could be up to 40 m.p.h., one was necessarily conscious of the short time available to mount and get away. All this assisted in making the sport exceptionally enthralling and, so long as lions were plentiful, no lasting harm was done.

By 1903, Percival was able to report "a great reduction in the number of lions killed during the last year." He attributed this to several reasons, "the first being the withdrawal of a reward offered by the Uganda Railway for lions killed within the Mile Zone; the closing of construction camps and consequent reduction of white men on the line, and also to the extremely wet year resulting in longer grass than usual."

Lions were still very numerous and the Game Department recognised that "there is no cause to regret their numbers." The prides inhabiting the Athi and Stony Athi river beds had

become extremely cunning, which was hardly to be wondered at, as they were hunted constantly, but they were plentiful elsewhere, and in the Nakuru District some fine beasts with outstanding manes were taken.

Sotik ranked among the best lion country in East Africa and, in the 1908/9 season, 150 were killed there. Wild animals were numerous in the Sotik District, the commonest species being zebra, Jackson's hartebeest and topi, with Robert's gazelle found in the western sector near the border, although its chief haunt was south of the Anglo-German border. Altogether some 26 species inhabited the area.

The Uasin Gishu District ran Sotik close in regard to numbers of lions, and undoubtedly bettered it for size and fine manes. No district in East Africa possessed finer lions than those to be found on the Uasin Gishu Plateau, and more were killed in that area than anywhere else since the early days of the Cape Colony. It was the coldest region in which lions were found in any number, and the fine manes owed a great deal to this fact. Elephant, rhinoceros, hippopotamus, buffalo, giraffe, eland, Jackson's hartebeest, topi, waterbuck, Thomas's kob, bushbuck, sitatunga, oribi, reedbuck and various duikers also abounded.

Near Ol Kalou, at the foot of the Aberdares, lions were common. On one occasion, Mr. Fred Chart took out a party which shot eleven in a few hours.

They were also plentiful in Somaliland. In two days' surveying, Brigadier-General Swayne and his brother killed two lions and five rhinos, besides other game, and he tells of several safari parties shooting from 20 to 30 lions in a three-month trip, including two sportsmen who shot as many as eight before breakfast.

Percival estimated that between 50 and 70 lions were killed each year prior to the First World War, about two-thirds of them on the Athi Plains between Nairobi and Machakos, but he later qualified this statement when he admitted that although in a three-month period from November, 1905 to January, 1906, he knew of 27 bagged, "many sportsmen have been down whose bags I do not at present know." The official figures were likely to be misleading as they did not take into account the large numbers of animals destroyed by

landowners or other individuals which were never reported. The firm of Newland, Tarlton and Co. alone claimed that, between 1907 and 1908, nearly 200 lions were shot by its clients, which lends credence to Lord Cranworth's estimate that 795 lions were destroyed in 1910 and 1911 in the East Africa Protectorate. This figure did not include "the large numbers which creep away to die from poison and other causes." Poison undoubtedly accounted for appreciable numbers of lions. Lord Cranworth mentioned 14 being found dead on one kill. Paul Rainey's pack of hunting dogs was also used with marked effect to clear lions from farming land and accounted for 200 in an eighteen month period.

The most critical period in the life of a lion is probably between the fifteenth and eighteenth month. Until then the adults have always undertaken the hunting. As the cubs grow older, the adults find it increasingly difficult to satisfy their hunger. Eventually they get bored with the youngsters and leave them to fend for themselves. During the last few months that the cubs spend with their mother, she teaches them the rudiments of hunting but, so long as they remain with the adults, they do not have to depend on their own skill. The result is that when they suddenly find themselves abandoned by their mother and thrown on their own resources, the cubs go through an extremely difficult period while they are learning to fend for themselves. Occasionally the youngsters rejoin their mother after her next litter is born and assist with the work of the pride.

The gestation period of a lioness is between 108 and 112 days, and she usually mates 20 to 22 months after cubbing. A lioness can therefore be expected to produce a litter every second year. When they have cubbed, lionesses often group together for mutual protection, for the cubs are vulnerable to marauding hyaenas and other predators, and it is usual to find two or more lionesses with cubs of varying ages together in one big pride. Each lioness suckles all the cubs of the pride with complete impartiality. This socialistic régime makes it possible for the lionesses to take turns to stay behind guarding the cubs while the remainder go hunting.

But the domestic scene is not always peaceful. The old males

sometimes object to the presence of the younger lions and attempt to kill them or drive them away, and a lion's own progeny is not exempt from the same fate as other intruders. The mortality rate is high and only a relatively small percentage reach maturity.

Lion now ranks as one of the seven Kenya animals in serious danger of extinction, the others being rhino, cheetah, roan, serval, caracal and wild dog. Greater kudu and sable are only omitted from this list because neither has ever been plentiful in Kenya, although both require careful watching.

The Mara is generally regarded as the finest lion country remaining in Kenya, but it is doubtful whether more than 250-300 are there to-day. The Masai practice of killing lions is a constant threat to their survival. In recent years the Masai have taken to placing a kill under a convenient tree and spearing lion from above. In addition there have been a number of reports of them burning out litters of cubs—practices which scarcely bear comparison with the traditional Masai attributes of courage, pride and honour.

The baiting of lions and leopards by European sportsmen is an equally despicable and disastrous practice. It is difficult to imagine anything less sporting than sitting over a bait and waiting for an indolent lion to present itself a few yards from one's rifle. A man's idea of sportsmanship must be pretty jaded to feel any sense of achievement in a trophy acquired by this method. Baiting for sport should be prohibited.

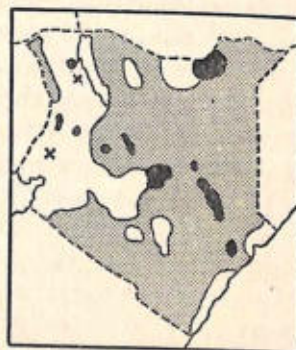
Apart from the Mara, all the national parks possess modest numbers of lions, and they are to be found in many other areas in small numbers. Precise figures are not available, but it would be surprising if there were more than 900-1,000 lions remaining in Kenya to-day, and this may prove an optimistic estimate.

LEOPARD (*Panthera pardus*)



Formerly common throughout most of Kenya, leopards have been seriously reduced since the war to the extent that, in many localities, they have been exterminated. The high price of leopard skins has resulted in intensive trapping, and large quantities of skins are sold on the black market, notably through Kiunga, thence across the Somaliland border by camel caravan. Leopards are still to be found in many parts of Kenya, generally in the more remote and isolated districts but, with the exception of the Mara region and high altitude forests such as the Mau, Mount Kenya, and the Aberdares, they are no longer plentiful.

CHEETAH (*Acinonyx jubatus*)



In 1906, cheetah were said to be fairly numerous in certain parts of the country but very local. Never plentiful, the cheetah population has decreased alarmingly in recent years. Cheetahs

are timid creatures and easily destroyed, but the decline has been more rapid than can be accounted for by hunting, both legal and illegal, and the existence of a fatal disease is suspected. In Kenya the species is balanced precariously on the brink of extinction and may already have passed the point of no return.

HYAENA (*Crocuta crocuta* and *Hyaena hyaena*):
distributed throughout Kenya

The various outbreaks of rinderpest and pleuro-pneumonia which caused heavy losses among Masai cattle, resulted in hyaenas appearing in large numbers. So long as there were carcasses to devour the hyaenas performed a useful function, but when the epidemics died down they became a serious menace, sometimes assembling in large packs and running game down. They were particularly destructive to newly dropped fawns and even resorted to attacking Masai children.

The common spotted hyaena is the largest and most powerful of the hyaenas and is mainly confined to open country. On occasion it can be surprisingly bold, even attacking aged or crippled lions, and each year many unguarded lions cubs are taken by hyaenas. The striped hyaena is more slightly built than the spotted, with longer coat and bushier tail, and has a less aggressive disposition. It is also much rarer and less frequently seen, but its strictly nocturnal habits may mean that it is more plentiful than is generally supposed. These essential scavengers are still widely distributed throughout the country and are well able to maintain their numbers.

JACKAL (*Canis* spp.) : distributed throughout Kenya

Percival was not at all well disposed towards jackals, and he considered them more destructive to gazelles than even lions or leopards. He was especially concerned at their habit of taking young fawns when lying unprotected in long grass with no adults to defend them. Grant's and Thomson's gazelles

were frequently to be seen chasing jackals away, but they did not always succeed in preventing the depredations of these small predators. Percival considered they should rank as vermin, and even went to the length of reinforcing his argument by mentioning the damage jackals caused to fruit trees on the Rev. Stuart Watt's farm at Machakos. He also thought that unless they were thinned out, it would be quite impossible for sheep farming to be undertaken in Kenya.

Artificial control measures proved unnecessary owing to an outbreak of distemper which started on the Uasin Gishu Plateau in 1906, almost exterminating the jackal, and quickly swept the whole country to the east of the Kikuyu Escarpment. The species suffered spectacular losses and jackals soon became quite rare animals. This appears to have been the first outbreak of distemper in the Protectorate and, a year or so later, the disease spread into the Rift Valley causing further heavy mortality among jackal, as well as killing off all the little hunting dogs used by the Wandorobo.

Three species of jackal are found in Kenya. One or other of the two races of the common silver-backed jackal is distributed across the Uasin Gishu Plateau, the lower parts of the Rift Valley and the Coast drainage region, and is the only jackal to be found in the low lying desert nyika country. The golden jackal is distinguished from the more northern races by its smaller body size and lighter coloration and, in general, its geographical range coincides with that of the striped hyaena. The side-striped jackal is a somewhat heavier animal than the silver-backed, and of a much more solitary disposition, preferring denser bush country. All three species appear to be maintaining their numbers.

WILD DOG (*Lycaon pictus*)

Percival did not have much time for wild dogs either. "These most destructive beasts are fortunately not very common, their wide ranging habits making them appear more numerous than they actually are. They drive game out of a district quicker than anything else"; though he admitted that "as soon as they leave, the game comes back."

Until 1906, wild dogs were "undoubtedly on the increase and at present rate will become a terrible scourge to game in a year or two. They do more damage than lion as they disturb the game so much. During the year I have been able to destroy 22 dogs and sportsmen have destroyed about 30. A pack of about 40 dogs has been hunting near Athi River for several months. They breed every year near the Stony Athi River." (Percival, 1906.)

The Game Warden received so many complaints of the damage they were inflicting on ostrich farms—a good cock ostrich was worth up to £200 at that time—that wild dogs were treated as vermin. Large numbers were poisoned on the East African Syndicate's land at Naivasha in 1906, and the outbreak of distemper resulted in further mortality. The following year the suggestion was officially mooted from London that there appeared to be "no sufficient reason to attempt to preserve these animals," and that it might be desirable to exterminate them altogether. The Government bacteriologist was instructed to report on the feasibility of deliberately introducing distemper among wild dogs with the avowed intention of bringing about their extinction, but nothing came of the proposal. Demands

for the elimination of the species are still occasionally heard, but it is to be hoped that wiser opinions will always prevail.

The unflagging skill and ruthless determination of wild dogs has led to them being stigmatised as "foul creatures" and a menace to the herbivores. These extremely interesting and intelligent animals are used by Nature for maintaining stable wild life populations, splitting up the herds of ungulates, thereby preventing in-breeding, keeping the herds on the move and fulfilling a function similar to the wolf in northern latitudes. The role of the predators in relation to management of wild populations is a subject concerning which all too little is understood and needs thorough expert examination. The present lack of criteria by which to evaluate the precise role of the wild dog in the ecological structure is no reason for failing to heed the comparable example of the wolf in Canada and Alaska. The fallacy of assuming that stringent reduction of wolves would benefit the wild herbivores of those countries has been clearly demonstrated.

Wild dogs have been reduced to the point where the sight of a pack is not a common occurrence in East Africa. There are thought to be only about fifty remaining in the Serengeti National Park. Although in no immediate danger, proposals aiming at extermination of the species must be firmly resisted, and it is hoped that the Game Warden's recent recommendation to include wild dogs on the list of fully protected species will be implemented.

ELEPHANT (*Loxodonta africana*)

Elephants are widely distributed throughout Kenya, from the Coast to the high bamboo forests of Mount Kenya and the Aberdares, and from the Northern Frontier Province to Kilimanjaro. Sixty years ago the Uasin Gishu Plateau was considered the best elephant country in Kenya. Large herds wandered over the plateau during the rains, and so many fine bulls were shot that there was some danger of a falling-off in the size of ivory. The country to the north of the Nzoia River was scarcely known, but it was thought probable that there were as many or more elephants there than on the plateau itself.

The seasonal migrations covered long distances. Practically no precise information exists concerning these movements, although Jackson was of the opinion that the elephant herds seen during the wet weather in the Southern Reserve were normally resident on Kilimanjaro, the Mau, Southern Sotik and the Aberdare Range, the last named entering the Southern Reserve via the Kedong Valley. The Laikipia herds originated from Mount Kenya and the Aberdares, and there was a seasonal movement of elephants passing through Solai—where there was a resident herd of about a hundred cows—skirting the western side of Lake Baringo and going northwards. During the dry season the elephants generally remained in the forests, emerging with the onset of the heavy rains, as they still do.

Apart from the small Solai herd, very few elephants were to be seen in the Rift Valley, except during the course of migration. In the Northern Reserve elephants were seasonally numerous

at Marsabit and Laisamis, as well as being found on Mount Elgon, in the Elgeyo and Marakwet forests, the Nyando Valley, Sotik, the Sondo Valley, Voi and all along the Coast. Along the shores of Lake Victoria down to the Anglo-German border they were present in strength.

Strangely enough, there appear to be no early records of elephants in what is now the Tsavo National Park, and it is certain that the early ivory hunters wasted no time there but pushed on inland.

The absence of elephants seems to support the theory that less than a century ago the coastal hinterland and much of what is now the Tsavo National Park consisted of open grassland. Evidence that the Galla grazed their cattle in the region is given by their scattered graves. The probable explanation is that overstocking and consequent impoverishment of the soil and vegetation led to bush encroachment and permitted the tsetse fly to become established. The Galla were then forced to evacuate the region—the exodus being accelerated by the Rinderpest epidemics in the 1890's—and elephants moved in.

In spite of the fact that elephants have long been one of the principal targets of hunters and poachers and large numbers have been slaughtered, the species has shown amazing resilience. Despite a lengthy gestation period, elephants are regular breeders and it is common for a cow with a small calf at foot to have a second older calf with her as well. From the evidence available the species appears to be undergoing a population upsurge and there may well be more elephants in Kenya to-day than there were at the beginning of the century.

Buss and Brooks (1961) have calculated that the Uganda elephant "population of 11,793 immature and adult females of 1959 is capable of increasing to a total population of 26,878 females in 60 years."

A reduction of the Uganda elephant herds has become very necessary. Buss and Brooks estimate that there are now 23,500 elephants in Uganda. This is a higher population than in Pitman's time, which is further accentuated by the fact that the herds are restricted to a much smaller area than in the past. In Tanganyika 1,923 elephants were shot on

control in 1955; 2,137 in 1956; 2,040 in 1957; 2,599 in 1958; and 2,594 in 1959. These figures represent an average of more than five a day and do not include elephants shot on licence, which may total another 500 a year. In Somaliland, however, the last remaining elephant was shot in 1949 at Dibrawein.

One frequently hears that the size of ivory has declined and concern is expressed at the scarcity of big tuskers. In the absence of adequate statistics it is difficult to be dogmatic but it is interesting to note that the Tanganyika Game Department's Annual Report for 1959 states that "five elephants having tusks of over 100 lb. a side were obtained in Masailand during a period of six weeks. At least 10 elephants of the 100 lb. mark or over were shot in the Mpanda Range (the best had tusks of 150 lb. a side . . .). Southern Highlands Province also produced some fine elephants, the biggest having tusks of 117 and 118 lb."

In Kenya elephants occur in very satisfactory numbers in all suitable habitats east of the Rift Valley and south of a line through Mount Nyiro—Ol Donyo Mara—Marsabit—Lorian Swamp—Kolbio—and the Somalia border to the sea. North of this line there is at least one isolated herd in Wajir District. They are no longer seen at Kulal or along the eastern shores of Lake Rudolf as described by von Höhnel—a region that is now so arid that even if the Habash poachers had restrained their hands, it is hard to imagine how elephants could have survived.

West of the Rift Valley they are less plentiful, but a few occur in the extreme north of Turkana on the Uganda border, and several hundred exist on the higher reaches of Mount Elgon. They are found in most of the forest reserves, including Mount Kenya, the Aberdares, the Cherangani Hills and the Mau Forest. Each dry season there is a regular exodus of elephants from the arid Northern Frontier Province to the Uaso Nyiro River, Lorian Swamp, Tana and Galana rivers, and to the forests of Mount Kenya, the Aberdares, Matthews and Ndoti ranges; and in the reverse direction after the commencement of the rains.

In the Mara country the elephant population fluctuates seasonally, with movements across the Kenya/Tanganyika border. About 500 are reported beneath the Isuria Escarp-

ment. The largest concentration of elephants in Kenya to-day is found in and around the Tsavo Park, although the migrations of the Tsavo herds are imperfectly understood.

There may be as many as 10,000 elephants in Kenya to-day, with at least 6,000 of them in the coastal hinterland (including the Tsavo Park).

Providing adequate sanctuaries are maintained for its benefit the species is in no danger except from itself in that unless stringent measures are taken to limit numbers there is a danger that elephants will destroy their own habitat and themselves with it.

GIRAFFE (*Giraffa* spp.)



Above the line: Reticulated giraffe
 Below the line: Masai giraffe
 The two instances of frequent occurrence
 to left of map: Rothschild's giraffe

Giraffe originally existed in thousands, particularly in the drier country, and were common all over the Protectorate. More specifically they were plentiful along the Tana River, Voi, the (Kenya) Serengeti Plains; the whole length of the Rift Valley from Kilimanjaro to Sosian, Baringo District, Uasin Nyiro and the Northern Reserve, Turkwel River, the Uasin Gishu and north of Mount Elgon. Only a few were to be found on the Athi Plains and in the Rift Valley, south of the Equator, until Sosian was reached. At Sultan Hamud, Percival counted one

hundred and thirty adults in about eight miles and nearly every cow had a calf with her."

"Amongst the places where I have seen the giraffe in fair numbers are the caravan routes between Vanga and Teita, especially at Adda and Kisagao, and between Ndara in Teita, and Nzoi in Ukumbani, particularly near Ndi, Mto Ndai, and Mto Chumvi. In 1887 the open bush and sparsely mimosa-wooded country just outside Taveta forest, on the road to Langora, was a sure find for these stately beasts." (Jackson, 1894.)

Rothschild's giraffe was formerly widely distributed over northern Uganda, extending into Kenya. Approximately 200 still remain in the Soy area, Baringo and West Suk. According to Brooks, another 900 survive in Uganda, so extermination appears unlikely in the foreseeable future.

The Masai giraffe is still holding its own throughout the greater part of its original range, and Fraser Darling (1958) estimated a total of 750 in the Mara.

Perhaps the most seriously threatened is the handsome reticulated giraffe, whose numbers have shown a marked decline in the last decade. According to Dracopoli (1914) they occurred in Jubaland in "astonishing numbers." There were large numbers to the north of the Nzoia River, but only a few on the south bank. The burning of grass on the Uasin Gishu Plateau induced them to migrate towards Mumias. The reticulated giraffe was seriously affected by the 1960 rinderpest outbreak and, in the course of six weeks, the staff of the Senior Game Warden, Isiolo, collected as many as sixty tails from animals which had died of the disease. Giraffe afflicted with rinderpest appear to become temporarily blind and in this distressing condition fall an easy victim to the predators.

HARTEBEEST OF KONGONI
(*Alcelaphus buselaphus*)



1. Coke's hartebeest (*Alcelaphus buselaphus cokii*)
2. Jackson's hartebeest (*A. b. jacksoni*)
3. Lelwel hartebeest (*A. b. lelwel*)
4. Kenya hartebeest (*A. b. jacksoni x cokii*)
5. Nakuru hartebeest (*A. b. jacksoni x cokii*)

The chief haunt of kongoni in Kenya is the Athi Plains where, until the 1920's, it was usual to have several thousand in view at one time, extending as far as the eye could see. The various forms had a wide range from the Coast, south of Mombasa, to Naivasha and from Kitui District to Kilimanjaro. It was by far the commonest antelope in Kenya and was found almost everywhere in fairly open country, except in the Galla country and north of Lake Baringo.

Neumann's hartebeest was confined exclusively to the Northern Frontier region, along the east shore and north-east of Lake Rudolf, adjoining the Abyssinian border.

The Lelwel hartebeest inhabited a small region lying within Kenya to the north-west of Lake Rudolf, extending over the border into Abyssinia.

The Kenya and Nakuru hartebeests were both hybrids between Coke's and Jackson's. The former was found in a limited region along the western foothills of Mount Kenya. The latter inhabited the Rift Valley south of the Equator to about the Gilgil River. Within this restricted locality Nakuru hartebeest were formerly very plentiful but, by the 1920's heavy shooting had reduced them to a few hundred. Stone



Above, a large baobab tree which has been felled by elephants.
Below, buffalo, one of the species most susceptible to rinderpest



protection enabled the herds to recover satisfactorily for a time, but to-day they hardly exist. Four solitary specimens on Ngata Farm, a few miles beyond Nakuru, are all that now remain.

Jackson's hartebeest was numerous from Lake Victoria to the Rift Valley where it met the Nakuru hartebeest. A few were found at Lake Baringo and on Laikipia, while on the Uasin Gishu Plateau they existed in very large numbers.

Coke's hartebeest is one of the commonest animals in the country and its range is very extensive. Jackson's found in the western portion of the Colony has a narrower range. Coke's has been much reduced in numbers of recent years, especially on the Athi Plains, but it still exists in tens of thousands over very large areas. The principal haunt of this antelope is probably the Southern Game Reserve, but it occurs from the Tana River in the north, far into Tanganyika in the south, and from the Lake to the Coast. . . . His worst enemies are hunting dogs and hyaenas.

He is *the* meat animal of the country. The settlers on the Uasin Gishu Plateau kill many hundreds yearly for their boys, the labour of that region consisting very largely of Wakavirondo, the most meat hungry natives in Africa: and to keep them happy the employer provides a meat meal of the largest at short intervals.

The numbers of kongoni must be beyond count. Sir Edmund Loder told me he did not believe that the American bison, which he had seen in the days of their multitude, were thicker on the prairies than is the kongoni in British East Africa to-day. [Percival, 1906.]

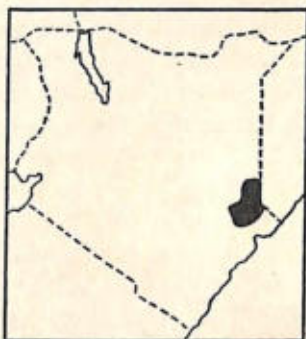
Kongoni were regarded as a pest. Wire fencing was unable to control them, and Percival once watched 40 to 50 kongoni leap the four foot high quarantine fence round Nairobi without any difficulty. The practice of feeding them to the farm labourers accordingly fulfilled the dual object of keeping the labour content and eliminating a menace to progressive farming.

Kongoni suffered severely from internal parasites, particularly the lung parasite. So long as grazing was plentiful they did not appear to be affected, but whenever there was pro-

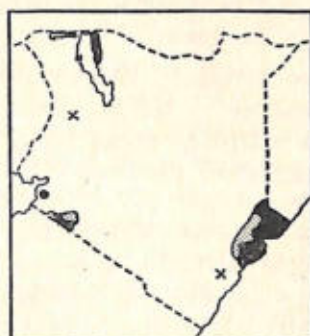
longed dry weather or drought conditions there was invariably a heavy mortality. This was possibly Nature's method of keeping the wild herds within the carrying capacity of the habitat.

The Rift Valley was the meeting place of three forms. South-east around Naivasha was Coke's; beyond Eburru and Elmenteita and at the south-east end of Lake Nakuru was the Nakuru hartebeest; towards Njoro and on the Molo River was Jackson's. With the exception of Coke's, they now exist only in very small numbers, having been heavily reduced between the two World Wars.

HUNTER'S ANTELOPE
(*Damaliscus hunteri*)



The range of the Hirola, or Hunter's antelope, extends from the left bank of the Tana River in Garissa District, behind the coastal rain belt into the southern regions of the Somaliland Republic. Recent reports indicate that the species is extending its range, if not increasing in numbers, and is in no danger at the present time.

TOPI (*Damaliscus korrigum*)

Sixty years ago topi were described as "a very adaptable and widely distributed species." They were plentiful along the Kenya Coast and Percival shot a pair north of the Sabaki River within 300 yards of the sea: "I found they frequently grazed the shallow bays when the tide was out." Willoughby described topi as "the only game in any number" on the lower Tana. A few were found near Lake Victoria and in the Nyando Valley. They were common on the Mau, Sotik and Kisii and were also to be found in substantial herds in Jubaland and in the neighbourhood of Lake Rudolf and the Turkwel River. In the Galla country it was the commonest of all the antelopes. Along the old German border and on the Athi Plains topi were plentiful. On 2nd August, 1912, Percival "noted that we passed almost 1,000 topi on that day's march" along the Mara River. Topi were found all over the western side of the Uasin Gishu Plateau in small herds of 25 or so, while to the north of the Nzoia River they were even more numerous than the hartebeest. They have all vanished from the plateau except for three solitary specimens that have somehow contrived to survive just outside Kitale township.

Today, topi are found in the Northern Frontier Province and Coast Province from Galma Galla right down to the Coast and south of the Tana River to Karawa. In 1957, they were to be seen in fair numbers in the open country near Karawa but, since then, have been so heavily persecuted that very few now remain in this district.

The largest topi herds remaining in Kenya to-day are to be

found in the Mara, where Fraser Darling estimated a population of 4,000. Apart from the Mara herds, there are at least 1,000 topi in the Boni country from Kolbio southwards to Ijara, and the population is at present at a safe level for survival. In August, 1960, the Chief Game Warden counted 1,300 south of Illoret (north-east of Lake Rudolf) and a further 300 to 400 at Alia Bay. A thriving herd, estimated to exceed 400, inhabits the Orma Delta on the Kenya side of the border.

WILDEBEEEST
(*Connochaetes taurinus*)



Wildebeest were only found in the Southern Reserve and the Mara, where they rivalled Coke's hartebeest in numbers, but only over a relatively small area. At certain times of the year, they spread northwards over the Athi Plains as far as the Thika River; but few crossed the river. According to early Boer reports, the main body of wildebeest from the Southern Reserve moved south across the Anglo/German border during the rains.

. . . when there is plenty of grass, they may be seen on the Athi Plains, both within and without the Reserve, in tens of thousands; places where, at other seasons, your eye may range far without resting on a score. In July, 1912, while in the Loita . . . I saw immense numbers. [Percival.]

The great majority of those living to the east of the Rift Valley, never leave the Game Reserve; if they do, it is to go south and not to the Athi on the north; at the same time, large numbers from that region travel as far east as the Ithanga Hills— The wildebeest dwelling across

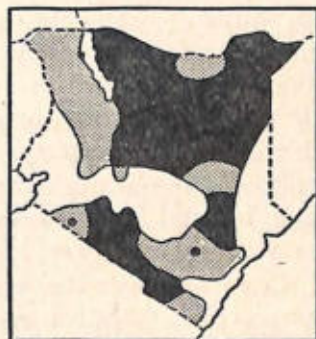
the Thika River do not appear to change their ground at all at any season. [Percival].

Herds of wildebeest still inhabit the Nairobi National Park, Amboseli and the Athi Plains. The largest concentrations remaining in Kenya are to be found on the Athi Plains where, in 1960, the Game Department estimated an average total ranging between 5,000 and 7,000.

The Mara population was thought to be about 50,000 in 1947 but, by 1958, had been reduced to 15,000 (Fraser Darling). Talbot and Stewart counted 17,817 in May, 1961. The serious numerical decline of this key plains species may be partially attributable to a substantial movement across the territorial boundary, whence the herds have not returned for some climatic or ecological reason, but may also be partly due to heavy Watende poaching in the Lamai Wedge, immediately south of the Kenya border.

In the eastern part of Kajiado District wildebeest are much scarcer than formerly, largely because overstocking has resulted in deterioration of the habitat to near-desert conditions, and partly because of measures taken by the Game Department since the end of the last war which were designed to reduce the wildebeest population, following representations from the Masai that their cattle were short of grazing. Several thousand were shot at that time.

GRANT'S GAZELLE (*Gazella granti*)



At the turn of the century, Grant's gazelles were found in the Southern Reserve in incredible abundance and were more

numerous than any other species inhabiting the Reserve. They were a favourite target for sportsmen and their numbers declined rapidly. The rams were so heavily persecuted that, by 1905, herds were frequently seen without a single ram amongst them. Of the 478 Grant's gazelles shot on licence in that year, 251 were taken on the Athi Plains, but the true figure was probably much higher. (Game Department Report.)

Grant's gazelles are usually seen in small herds of from half a dozen to 30 or so. They prefer the open plains where there is a certain amount of bush, but are often to be found in quite thick bush country. They appear to avoid long grass which would provide cover for their enemies. In the Northern Frontier Province they survive in barren country where one would think it impossible for them to subsist. Grant's gazelles are found under suitable local conditions throughout Kenya right up to the Sudan, Ethiopian and Somalia borders, though absent from the south-east coastal area and the Elgon-Tsavo-Nzoia-Kisumu areas.

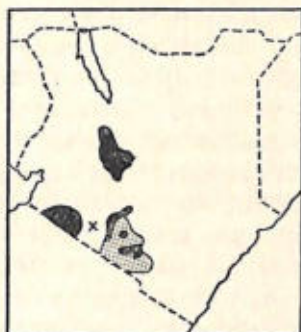
During the rains, when other animals are drawn to the fresh grass and numerous rain-pools on the plains, the Grant's gazelles move to the higher ground. When drought forces other species to fall back on more permanent water supplies, they return to the deserted plains.

Although possessing great vitality they are by no means fleet of foot and are at a particular disadvantage if surprised on soft or swampy ground. No doubt this accounts for the fact that they are extremely vulnerable to attack by wild dogs and Percival mentioned that "I have found more remains of *granti* destroyed by these brutes than any other game." "During the dry season the *brighti* in the district north of the Eusso Nyiro collect in thousands to seek the water . . . at the Lorian Swamp too, I found herds of several hundred near the water." Only very rarely, however, have they been seen to drink.

Grant's gazelle still exist in almost all the national parks and game reserves, but in reduced numbers. There are 300 in the Nairobi National Park; more on the nearby Athi Plains and a great many in the Northern Frontier Province, while Fraser Darling estimated 500 in the Mara. In addition, small relict

herds are to be seen on private land in many of the settled areas.

THOMSON'S GAZELLE
(*Gazella thomsoni*)



The commonest of all Masailand plains game, this dainty gazelle was discovered by Joseph Thomson in 1883. It was especially abundant between Kilimanjaro and Lake Baringo; the northern limit of the species being roughly a line from south of Kisumu to a few miles north of Lake Nakuru—north to the Leroghi Plateau (excluding the high country around Mount Kenya)—east to the headwaters of the Tana—south to the Tanganyika border near Taveta. North of the Uaso Nyiro they occurred only on the Leroghi Plateau in Maralal District. Prior to the 1914 War they were particularly numerous near Nakuru, especially in the dry country between lakes Nakuru and Elmenteita. In the month of January immense numbers congregated in this region.

Thomson's gazelle are found only on the grasslands of Central and Southern Kenya and Northern Tanganyika. They are entirely absent from the eastern parts of Kenya, which may be due to the fact that they are strictly grazers (according to Brooks 90 per cent of their diet consists of grass) unlike Grant's gazelle which browse as well as graze. They are essentially creatures of the plains and open savannah and always avoid long grass and bush, evidently to have a clear field of vision. Their eyesight is excellent but this does not prevent them from being the principal prey species of cheetahs and wild dogs.

Hyaenas, jackals, baboons and birds of prey inflict substantial casualties on the young at fawning time.

Percival says that "certain districts of the Rift Valley, where the grass never grows to any height, were literally covered with *thomsoni*; they were to be seen in thousands, having apparently collected from many miles round on the short grass of their preference. Even now (1928), though the whole of that district is settled and carries large crops of sheep, these gazelles still swarm thither in the rainy season." This observation was confirmed by Sir Charles Eliot who, in 1905, wrote: "I have seen the country near Elmenteita, in the Rift Valley, literally covered with them, so that it appeared of a sandy yellow."

Wherever they occur at all, *thomsoni* are numerous; far more so than the *granti*, which affect the same sort of country. . . . They appear to greater advantage, so far as numbers are concerned, when on trek at the end of the rains; I have seen more *thomsoni* near Nakuru at the time of this seasonal movement than I have anywhere else. At the end of the rains the grass in the Rift Valley, north of Nakuru, is very long, whereas about lakes Nakuru and Elmenteita it never attains to any length, hence the movement; they trek down in thousands. [Percival.]

Percival recorded that twin fawns were not uncommon, and considered that they sometimes bred twice in the year as a female heavy with young and having a fairly large fawn at foot was often seen.

Thomson's gazelle are extremely gregarious and when in large herds display little sign of nervousness. When alarmed, individuals adopt a characteristic gait, generally referred to as "stotting." With head and tail held high and legs stiff as ramrods they spring up and down in a curiously wooden manner. Females adopt this attitude when attempting to lure a predatory dog or jackal away from their fawns. This strange gait immediately holds the eye and, apart from drawing the attacker, also serves to warn the remainder of the herd that danger is at hand. At first sight, it would appear that "stotting" is a slow method of progression, yet it is remarkable how fast they can cover the ground when pressed. Percival once observed a male "continue stotting for over an hour in front

of two fox hounds." He considered Thomson's gazelle "the best meat we have . . . so far as the Rift Valley is concerned; if every white man in the region lived on *thomsoni* all the year round the drain on the herds would do little to reduce their numbers."

"Tommy" steaks are justifiably regarded as a gourmet's delight, and many thousands were slaughtered for meat and because they were thought to deprive domestic livestock of valuable grazing. Although still widely distributed throughout their traditional habitat, they are now found in hundreds where previously they existed in thousands.

On the Athi Plains and throughout most of Kajiado District, Thomson's gazelle have declined greatly in proportion to Grant's as a result of degradation of the habitat. Over-grazing by domestic livestock leading to serious depletion of the plains grasses, bush encroachment and semi-desert conditions, are the greatest danger to the future of the species.

GERENUK (*Litocranius walleri*)



Gerenuk (Waller's gazelle), is widely distributed throughout the dry thorn-bush country and deserts of Kenya, extending almost from the foot of Kilimanjaro in the south to the Northern Frontier Province, and inland from the coastal belt all across the dry country in the vicinity of the Tana and Juba rivers, to Lake Rudolf and almost as far as the Nile. A few inhabit the (Kenya) Serengeti, and the lower part of the Rift Valley from Kilimanjaro to Sosian. Widespread degradation of the habitat has resulted in a marked increase of gerenuk in

the Kajiado District during the last fifteen years and they can frequently be seen from the main road in the vicinity of Longido. They are also found on the Uaso Nyiro River to the north of Mount Kenya. Its range is more extensive than any other East African gazelle. Gerenuk do not associate in herds and only rarely are more than three or four seen together.

Gerenuk means "giraffe-necked" in the Somali tongue. Long legs and necks enable them to browse on the forbidding wait-a-bit thorns and other bushes to be found in the driest parts of the country. They never graze. They stand erect on their back legs when reaching the higher branches of the prickly bushes which form their exclusive diet, with one or both forefeet against a branch, often using the other leg to pull down higher branches. When adopting this stance they appear extremely graceful, in strange contrast to their rather clumsy gait when moving through thorn-bush with head and neck thrust out in line with the back, and body hunched low on the legs, giving the impression of slouching along.

Gerenuk are among the wariest of all wild animals. They require no water whatever, and this accounts for their ability to thrive in dry country which is unable to support other animals, with the sole exception of dikdik. The physiology of the gerenuk is worthy of detailed study.

According to Percival, they bear a high percentage of twin fawns, and may be one of the most prolific breeders of all the antelopes or gazelles, but this observation has not been corroborated by present-day naturalists. The nature of their habitat and independence of water have enabled the gerenuk to survive more readily than almost any other animal. The species is in no danger at the present time and can be relied upon to maintain itself well into the future.

IMPALA (*Aepyceros melampus*)

Impala is one of the most numerous of the antelopes, evenly distributed over a large part of Kenya, excepting the Northern Frontier Province and mountain forests. Its range extends from the Taru Desert to the Rift Valley and as far north as the Uaso Nyiro River.

Impala normally haunt the bush along the forest edge and riverine growth, but they are never far from water: even the waterbuck wanders farther from water than the impala. With this limitation, they are widespread through the country.

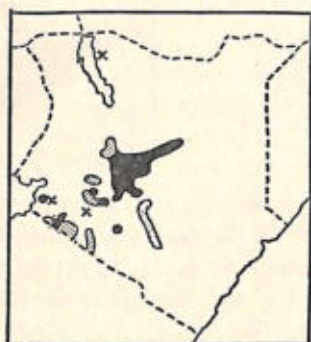
In recent times, impala have been compelled by circumstances to accept change of habitat. In the 1920's, Percival noted that they "are now to be seen on the open plains of the Athi." He considered these animals to be the ones which normally inhabited the fringes of the Kikuyu country, which by then was being cut up into farms.

"They are extremely numerous over Mount Erok on the old German border; I do not think I have seen them in such numbers elsewhere, and numerous along the Olgerai in the Southern Reserve." Having regard to its wide distribution throughout the country, the absence of the impala from the Uasin Gishu Plateau was somewhat curious; the more so as it occurred in the surrounding districts.

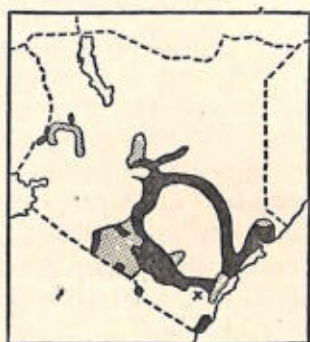
When moving fast, the impala, like most of the other antelopes and gazelles whose habitat is bush and scrub, effects a plunging action with the hind quarters rising higher than the fore. However clumsy this may appear, it has the advantage of assisting movement through long grass and bush. This is

interrupted by an occasional bound high into the air, with each animal in the herd appearing to take off from the same spot as the preceding one. Impala are still found throughout much of Kenya and, although numerically greatly reduced, the species is in no immediate danger.

WATER-
BUCK
(*Kobus*
spp.)



Defassa waterbuck
Kobus defassa



Common waterbuck
Kobus ellipsiprymnus

Of the two species of waterbuck that occur in Kenya, the common *ellipsiprymnus* is found from the Coast to the edge of the Rift Valley and northwards to the Kikuyu Escarpment and Mount Kenya. In Percival's day it was very evenly distributed and was formerly plentiful on most rivers and swamps, whether in the open or in the forest.

The *defassa* replaces the common waterbuck on the western side of the Kikuyu Escarpment and extends along the Rift Valley to Baringo, into the Northern Reserve, Laikipia and Lake Victoria. *Defassa* waterbuck were at one time particularly plentiful near Nakuru but their numbers were drastically reduced by settlers, who used their hides for rhems, which were considered the best available.

"... The line of demarcation between the ranges of the two is well marked... only at one point do the species intermingle. Starting from the south, the line of demarcation follows the Ingong Hills, the Kikuyu Forest, Mount Kenya, then follows the Eusso Nyiro westward to the point where the Larogi

Mounts approach that river. . . . This appears to be the most westerly point of their range. . . . The white race, or breed, of waterbuck is found near the Lorian Swamp. . . . In all, I saw 60 or 70 of these cream or white animals, 30 or 40 within a couple of days at the Lorian itself. . . . I also heard of their existence along the rivers which run into the Tana; so they exist in considerable numbers." (Percival.)

The finest specimens were those found in the swamps on the Upper Nzoia River near Mount Elgon and Percival records that on the Uasin Gishu Plateau a herd of waterbuck swam across the Sergoit Lake every afternoon, a distance of a quarter of a mile or so. Similarly, at Naivasha, a herd swam across to Crescent Isle regularly, but usually at night. Meinerzhagen observed several waterbuck on an island in Lake Naivasha in 1902, and considered it probable that the females swam out to the island to drop their young. "When crossing a river that is neither wide nor deep, waterbuck appear to swim hardly at all except for the last brief stage of their passage. They cross in great bounds, apparently from the bottom, a method quicker than swimming and one which struck me as calculated to scare away the crocodile." (Percival.)

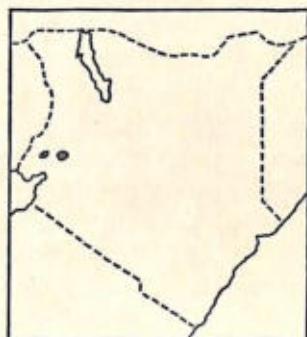
A great many waterbuck are killed by wild dogs. This is not surprising, for these antelopes have little staying power and dogs run them to a standstill in a comparatively short time. When pursued, they always make for water, which, if deep enough, enables them to give a good account of themselves, even against a pack of dogs. If cornered on land, they will drop to their knees to fight.

Until 1906, ten waterbuck, impala and Grant's gazelle were allowed on a licence on the Third Schedule. Consequently, large numbers were killed by sportsmen, and on one tour of Laikipia Jackson saw only one waterbuck ram, although "several herds of cows were met, without even a young bull between them." Jackson made representations which resulted in the number allowed on a licence being reduced to four in favour of waterbuck and six Grant's gazelle and impala.

In Kenya neither species seems to occur in the large herds to be seen in Central Africa. Distribution is still much the same

as formerly, but numbers are sparse. Waterbuck appear to persist in what can only be regarded as below threshold numbers. Albino specimens are occasionally seen in the Nairobi National Park, where it is thought that the two species inter-breed. Downey has also observed inter-breeding at Kitete, near Lake Manyara.

THOMAS'S KOB (*Adenota kob thomasi*)



Thomas's kob has never been common in Kenya. Small herds were found on the shores of Lake Victoria and the Nzoia River. Between 300 and 500 kob are estimated to remain along the Nzoia River (although still plentiful in Uganda) but because they are considered a nuisance by local farmers, their numbers are likely to be reduced unless measures can be taken to translocate them to fresh habitats. Attempts are being made to transfer the nucleus of a breeding herd to the Meru District Game Reserve.

ROAN ANTELOPE
(*Hippotragus equinus*)



In British East Africa roan were at one time well distributed, occurring in many different parts of the country in places suited to their habit, but never in any numbers. Roan was one of the antelopes reputed to have suffered most severely from rinderpest. The species was particularly vulnerable to hunting, once the whereabouts of a herd had become known, and they consequently suffered heavy losses at the hands of natives.

During the past 30 years, an increase has been marked in some districts; in others a serious falling off; in yet others, total disappearance. Within the last few years (i.e., the early 1920's) they have been seen in good numbers on the Mara River in the Syria (*sic*) Masai country and also in one small locality near Lake Victoria. . . . Some years ago, roan were found along the edge of the Kikuyu Forest where now not a single animal roams . . . settlement drove them away. They also occur on the Uasin Gishu Plateau. My favourite haunt is along the edge and in the glades of the Mau and Nandi forests. Both Northern and Southern Reserves harbour them; never seen more than 14 together myself, but I believe they go in much larger bands in the Nandi District. . . . [Percival, 1928.]

In the Rift Valley they were scarce though a few were found on the edge of the Njoro Forest, towards Eldama Ravine and at Solai. Small numbers were seen along the forest edge and in the rough country to the south of the Uasin Gishu Plateau.

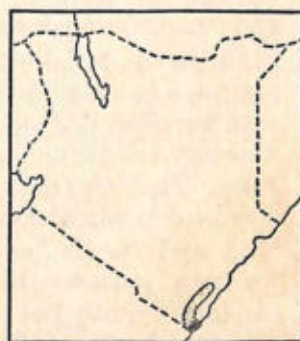
Four or five herds inhabited the Southern Reserve (1906);

there were two herds at Machakos, one in the Kiangundo Hills and another at Ol Donyo Sabuk. Along the Chania and Thika rivers, on the Yatta Plateau, in the Nyando Valley, at Kulungu on Lake Victoria and along the Anglo/German border small numbers were to be found (1906).

To-day, small herds, totalling 20 or so, exist in the Mara Triangle, with a further 7 just across the Tanganyika border in Cis-Mara. Sixty-two are estimated to inhabit the top of the Isuria Escarpment and there are probably a few on the Ithanga Hills. A herd of 23 survives on private land north of Endebess, and more than 100 were counted in the Lambwe Valley in South Nyanza by the Game Department in March, 1960. Many of these have since been killed by large gangs of up to 200 armed poachers who periodically invade the Lambwe Valley, killing large numbers of wild animals in open defiance of the District Commissioner.

Roan cling rigidly to a particular locality and are social mammals which must maintain a threshold number to ensure successful breeding. The Kenya herds appear to have been reduced below the threshold and require special protective measures.

SABLE ANTELOPE
(*Hippotragus niger*)



Early reports indicate that sable were found only along a narrow strip of the Coast, reaching into the coastal hinterland nearly as far north as the Galana River. There were probably not more than 200-300 all told. On 13th December, 1886, Willoughby saw 5 sable near Maji ya Chumvi.



A spear hunt of the Acholi tribe

They are still confined to the same area to-day. It is estimated that there are between 100 and 150 in the Shimba Hills two herds of 7 each were seen in the Mrima/Lunga-Lunga area in December, 1960; 5 were seen at Gazi in the same month, as well as a herd of 40 plus on the Mangea watershed, 20 miles inland from Malindi. The total of this herd has been estimated at 80. The Waliangulu have also reported sable watering at Alangashira, north of the Galana River, but there is no confirmation of this. A solitary specimen was seen in the eastern part of the Tsavo National Park in 1961.

Agricultural settlement schemes in the Shimba Hills have resulted in some poaching of sable, and there is an urgent need to declare part of the Shimba Hills a wild life sanctuary. This exceptionally attractive region, containing superlative stands of mvuli trees, is only 20 miles from Mombasa, and could become as big an attraction for Mombasa as is the Nairobi National Park for Kenya's capital city.

ORYX (*Oryx* spp.)



Above the black line: beisa oryx (*Oryx beisa annectens*)
 Below the black line: fringe-eared oryx (*Oryx beisa callotis*)

The oryx herds were seriously reduced in the latter part of the decade 1890 to 1900, but, according to contemporary accounts, losses do not appear to have been attributable to rinderpest.

Oryx were originally common in the Makindu area, but constant hunting drove them off and, by 1903, it was unusual

to see them there. This did not occasion undue alarm at the time as they were quite numerous elsewhere, particularly at Tsavo and on the fringes of the Taru Desert.

In the Southern Reserve, including the (Kenya) Serengeti, Lake Jipe, Amboseli and the foothills of Kilimanjaro, the depleted herds soon re-established themselves and, by 1906, they were seen in "considerable numbers and wonderfully tame." They were also found in the Rift Valley as far as Magadi. *Oryx beisa* were present in fair numbers on Laikipia and at Baringo, and in great numbers on the Uaso Nyiro.

In the Northern District, oryx are by far the commonest of the antelope; they range over the country in huge herds, taking the place of the kongoni as the animal upon which one relies for meat. As a rule, these great herds are seen not more than 30 miles from a drinking place, but smaller troops are found far from any known water. The season when I saw them far from water was of the hottest; everything was bone dry and the only animals seen farther from water than the oryx were Waller's gazelle and dikdik . . . Oryx appear to be less dependent on water than many antelope. I have a note in an old diary to the effect that they visit it only every third or fourth day; also that they dig up and eat roots of certain shrubs which were found undermined all round and the roots eaten away. [Percival, 1928.]

The shoulder skin of an old male is more than an inch thick and even tougher than that of rhino or giraffe. Hence this portion of the hide was much in demand among the Somalis, whose best shields were made of it.

Although the herds of *Oryx beisa* are nowhere near as big as formerly, and have largely disappeared from Laikipia and Rumuruti, they seem to be holding their own farther north, and on the north-eastern shore of Lake Rudolf they appear to have increased during the past ten years.

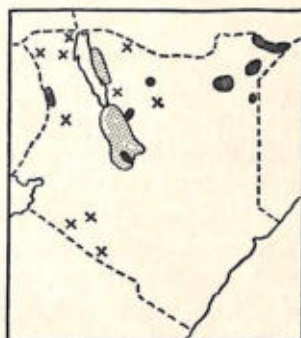
During 1961, the Game Department recorded the following numbers:

- 357 in the Wamba Grazing Scheme
- 180 in the Leroghi Grazing Scheme
- 1,327 in the Baragoi Grazing Scheme

435 in the Meru Grazing Scheme

400 seen in two herds near Archer's Post in May, 1960.

The position of the fringe-eared oryx is far less satisfactory. Only small remnants remain. At Amboseli where even 15 years ago there were sizeable herds, oryx are now rarely seen and probably total less than one hundred. The Tsavo Park and the area allotted to the Galana River Game Management Scheme carry small isolated herds, but there are no grounds for complacency and the fringe-eared oryx can be included on the danger list.



GREATER KUDU
(*Tragelaphus strepsiceros*)

Greater kudu have always been scarce in Kenya. In Percival's time they were found in fair numbers only near Baringo, and the mountains of Northern Turkana and Marsabit, although some inhabited Mount Kulal and a small number were seen near Lake Hannington. A few were reported from the Ngong Hills, Mau Escarpment, Sotik, Solai, Sultan Hamud, Makindu, Serengeti, Tsavo River, down which the species ranged from the headwaters of the Sabaki, thence north up the Athi River, and at Mile Seventy on the Railway. Unconfirmed reports said that they were frequently encountered on the old road between Vanga and Taveta.

Greater kudu were reduced by rinderpest to such a low ebb that there was some danger of them dying out and, in 1908, Percival estimated a total of 70 to 100, in the whole of Kenya excluding any there might be near the Tsavo River.

During the intervening period, visitations of rinderpest have

caused the greater kudu population to fluctuate considerably. To-day they probably do not number more than 150 to 200 all told. Of this small total the largest concentration is to be found on Marsabit Mountain (although the Marsabit herds were once again decimated by rinderpest in 1960). They occur on the Hurri Hills and near Moyale and are found on a number of other isolated mountains and hills in the Northern Frontier. A few are to be seen in the Loldaiga Hills and there are reports of a solitary bull seen on the Yatta in 1960—the first record of a greater kudu in the locality for more than ten years. A few may still be present on the Loita Plateau.

LESSER KUDU (*Tragelaphus imberbis*)



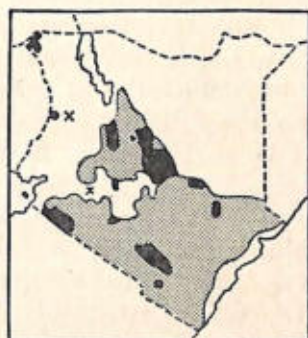
Before 1890, lesser kudu were freely distributed throughout the bush country from the Coast to Makindu, and following the belt of bush country north to the Tana River and Jubaland. They were common all through the Northern Reserve as far as the Uganda border, and extended far into Ethiopia and Somaliland. A few were found in the vicinity of Kilimanjaro, although they were more numerous on the German side of the border.

The lesser kudu is very plentiful on the banks of the Tana River. In 1885/6 it was also numerous at Merereni, on the Coast. A few are found in suitable places near Taveta, and as far west as the Sogonoi Hills in German territory. They appear, however, to be confined principally to the belt of dry bush country extending from the Coast for about 100 miles inland, and I think that very few of them range west of the Masai country. I was told by Messrs. Hobleby

and Bird-Thompson, on their return from a trip up the Tana River in 1891, that many of these antelopes have fallen victims to the cattle disease. . . . [Jackson, 1894.]

Distribution is still the same as formerly and, although numbers have declined considerably, the species appears to be in no immediate danger.

ELAND (*Taurotragus oryx*)



“Eland . . . is seen more often in open bush and country thinly wooded with mimosa trees and quite out in the open. In 1887 it was plentiful round Taveta, where I have seen as many as 60-70 in one herd. In the open bush country west of Mount Kisigao, elands are fairly numerous. Other places in which they are found are the park-like country below Ndi in Teita; the open country east of Ndara and north of Mount Maungu; and the Siringeti Plains. I have also seen them between Lakes Nakuro and Baringo, and again at Turkwel, in the Suk country. As a rule they go about in herds of four or five up to fifteen or twenty.” (Jackson, 1894.)

Eland died in large numbers during the series of rinderpest epidemics during the 1890's but, within a few years, they had increased sufficiently for Percival to report (1902) that they were “not only increasing in range, but undoubtedly coming out on to the plains more than they used.” At Baringo they were considered “the most numerous antelope,” while at Voi they were exceptionally plentiful. Selous said that he had “never seen eland more numerous anywhere, even in the best days of South Africa, than at Voi.” There was even a herd at Fundi Isa within $2\frac{1}{2}$ miles of the sea.

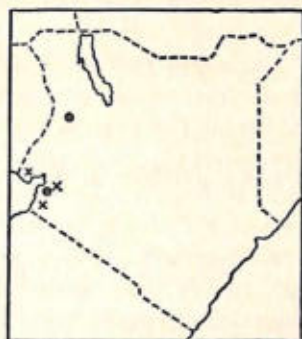
Eland were to be found all along the edge of the Taru Desert, and there were several herds near Nairobi, one of about 60, another of 40 and others of smaller size, but they were scarce in the Rift Valley. There were, however, a few in the Menengai Crater and some on Delamere's, Chamberlain's and Flemmer's land, with a small herd estimated at 60 plus near Solai.

The Game Department (1908) described eland as "numerous on the east bank of the Tana and extend to the Yatta Plains where very good heads have been obtained." Two hundred and fifty were seen by the Game Warden in three days in this area. "I do not consider that eland are, or ever were, in danger of extermination in the East Africa Protectorate. The only things that could be dangerous . . . would be hunting on horseback as was done in South Africa; and even this would not affect the best eland country between the Taru Desert and the edge of the plains, say between Voi and Makindu on the Railway, as no horse could stand the fly." (Percival.)

They are still plentiful in Narok and Kajiado districts and throughout the Southern Province. Until the 1960 rinderpest outbreak, they were present in very satisfying numbers in the Nanyuki/Laikipia region and on the Leroghi Plateau and other higher parts of Maralal District. Eland are also to be found on the moorlands of Mount Kenya and the Aberdares.

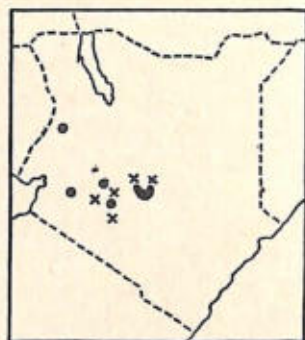
The species appears to be holding its own in most of its natural habitat except the Embu and Kamba country, where it is heavily poached. It cannot occupy the more arid parts of the Northern Frontier Province. The greatest threat to the species is rinderpest—a disease to which it is particularly vulnerable.

Eland are very well adapted for game cropping purposes and their meat equals the best quality beef. They put on weight and condition where cattle would starve. An adult male in good condition may exceed 1,600 lb. liveweight.

SITATUNGA (*Tragelaphus spekei*)

The sitatunga was originally called Speke's antelope or, more commonly, the marsh-buck. Speke obtained his original specimen near Lake Victoria in 1863 during his second journey to discover the source of the Nile. Its greatly elongated hooves enable the sitatunga to walk on the submerged reeds and mud of the swamps in which it lives. The skin on the back of the pastern is thick and horny as well as hairless, thus extending the supporting area of the hoof. It spends most of its time submerged in the water, with only its head and horns visible, and moves surprisingly rapidly in a series of bounding leaps. When danger approaches, the sitatunga submerges, leaving only the nose and tips of the horns above water, and can remain absolutely still in this manner for a long period. Africans paddle close to the submerged animal and spear it.

Sitatunga used to be extremely common in the swamps surrounding Lake Victoria and on some of the uninhabited islands in the Sesse Archipelago in Uganda. They are still found on almost all the Sesse Islands, although in reduced numbers, and on nearby Lake Nabugabo. It is possible that others still occur in the lake-shore swamps of Central Nyanza District. Another colony, perhaps 100 strong, survives on private land in the Kitale area.

BONGO (*Boocercus eurycerus*)

First found by du Chaillu in the Gaboon, West Africa, the bongo's existence in East Africa was not definitely established until its discovery by Mr. F. W. Isaac in the Mau Forest in April, 1902. For some years the presence of a strange antelope had been suspected in the vicinity of Ravine Station and guesses made as to its identity. In 1897, F. J. Jackson sent a pair of horns to England, together with certain native information which proved remarkably accurate. Nevertheless the bongo appears to have remained a relatively rare animal for many years after its discovery. This statement seems to be supported by Mr. C. M. Dobbs who reported that, on 12th January, 1913, a male bongo was killed in Kericho township, a few hundred yards from the boma. The natives did not have a name for it and stated that they had never seen another specimen, yet Kericho lies on the fringe of the Mau Forest Reserve which contains more bongo than any other part of East Africa. A possible explanation, which may account for this, is given on page 73.

Bongo are found in four main localities in Kenya; the bamboo forests of Mount Kenya, the Aberdares, the Cheren-gani Range and the Mau Forest. During the Mau Mau uprising, terrorist activity reduced the Aberdare bongo herds to a precariously low level and many years must elapse before they recover. In the three remaining habitats bongo appear to be secure, and the recent (December, 1960) creation of a nature reserve of 105,000 acres in the South West Mau Forest Reserve, a region containing the largest number of

bongo in East Africa, will ensure the future of this majestic antelope.

Apart from leopards or the rare incursions of packs of wild dogs, the high bamboo forest contains very few predators. As a consequence bongo suffer little from natural predation. Nature has, however, succeeded in effectively controlling bongo populations by means of the *setyot* vine (*Mimulopsis solmsii*). The *setyot*, which grows profusely in association with bamboo, forms an important part of the bongo's diet. It flowers once in seven years, and it is interesting to note that the Kipsigis and some other tribes hold their circumcision ceremonies with the flowering of the *setyot*. After flowering the entire vine dies back and, according to the Wandorobo, the second year after die-back the *setyot* causes heavy mortality among the bongo herds.

This theory appears to have been substantiated when Mr. Tony Henley and the author spent several days in the South West Mau Forest in July, 1960. This was the second year of the *setyot* cycle, and there was evidence of heavy scouring among the bongo and giant forest hog and several corpses of both animals were found. Samples of *setyot* were collected for laboratory analysis, resulting in a report that the plant material was definitely toxic, and an extract of one gramme of the wet stem was sufficient to kill a mouse after first causing chronic diarrhoea. This is an exceptionally interesting example of a natural control of mammalian fauna, and it appears likely that both bongo and giant forest hog are subject to the same control mechanism.¹

¹ It is interesting to note that this brief safari also resulted in identifying the copper-tailed monkey (*Cercopithecus nictitans schmidti*) as inhabiting the Mau Forest. In so far as Kenya is concerned, specimens had previously only been recorded in the Kakamega Forest and at Lumbwa, and this is the first time it has been known to inhabit bamboo. The Mau Forest also contains an interesting small mammalian fauna which is inadequately explored.

BUFFALO (*Syncerus caffer*)

Buffaloes were at one time plentiful throughout the East Africa Protectorate and, in some districts, where the country was suited to their habits, were to be found in enormous herds. Towards the end of the year 1890, and in the early part of 1891, they contracted rinderpest which almost exterminated them. Jackson estimated that at least 90 per cent of the buffalo population succumbed and he graphically described the effects of the disease.

On my way down from Uganda in July, 1890, between Lakes Baringo and Naivasha, I saw in one day's march as many as six herds of buffaloes, varying in number from one hundred to six hundred head in a herd. In the same district in the following March, my friend, Mr. Gedge, on his way down to the Coast, saw nothing but carcasses. . . . In 1892, the officers of the Mombasa and Victoria/Nyanza Railway Survey only saw on two different occasions the spoor of a single beast, although they traversed a great part of the country where buffaloes were once so plentiful. Amongst other places where this grand beast was particularly abundant was the Arusha-Wachini District, now in German territory, to the south of Kilimanjaro, and the Njiri Plains to the north of the mountain; Turkwel, in the Suk country to the east of Mount Elgon; the extensive undulating plains on the top of the Mau and Elgeyo Escarpments; Lykepia, to the west of Mount Kenia; the banks of the River Tana and the thick bush country on the mainland near Lamu.

They were also very abundant throughout the Masai country between Kilimanjaro and Lake Baringo. Percival thought that all the buffaloes inhabiting the plains were wiped out by rinderpest, and held that as a general rule only those inhabiting the forest regions survived the devastating disease. Ukamba Province appears to have been one of the most severely affected regions. Between 1894 and 1900, buffaloes were considered comparatively rare animals and the few survivors were being constantly harried by Wakamba and even by the Masai who, having lost almost all their cattle, were forced to eke out an existence as best they could.

Buxton noted: "Throughout the Athi Plains there must have been at one time a great number of buffalo. Their massive skulls were to be found all over the place. . . . Though not extinct, the survivors at the time of my visit (1899) were probably confined to one or two small herds. . . ."

The recovery of the buffalo herds is even more remarkable than their decline, and is an excellent illustration of the resilience of wild animals. By 1902, Percival considered the increase in the buffalo population "most satisfactory," particularly in Ukamba Province.

In the Southern Reserve, close to Nairobi, a few were to be seen where the previous year Percival had seen no sign of them. In the Rift Valley and on the Mau Escarpment they were becoming quite plentiful. They flourished in the Kedong and, along the Tana River, they were fairly numerous in spite of constant persecution by the Wakamba who, apart from the meat, "are very fond of the skin for making sandals and for shrinking on to handles of native hoes and axes."

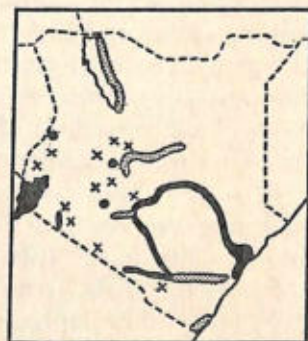
Between Mombasa and Malindi and all along the coast, wherever the bush was suitable, small numbers were to be found, while on the Juba River they were said to be numerous.

By 1906, small herds and solitary animals had infiltrated back into the Laikipia and Lake Rudolf regions. Three herds were reported on the Athi Plains, while in Uganda buffalo had increased to such an extent that they had become not merely a nuisance but a menace, and were so vicious and dangerous that few people cared to go out of their way to hunt them. From 1904 to 1907, no fewer than 87 persons were

killed in the Kingdom of Toro alone through attacks by buffalo and elephant. For this reason the mere removal of the buffalo from the Schedule of Protected Animals was not considered adequate to meet the situation, and consideration was given to offering inducement in the form of bonuses to kill them.

In the ensuing half century, Kenya's buffalo population has fluctuated considerably, through its susceptibility to rinderpest and other diseases. The most recent rinderpest outbreak occurred from June to September, 1960, seriously reducing buffalo herds in the Marsabit, Isiolo, Samburu and Nanyuki districts. It was thought that the outbreak had subsided but, in December, 1960, it spread across the intervening farm land into the Mount Kenya Forest, resulting in severe losses in the Timau-Nanyuki region, and may well spread farther. Hitherto the herds have always contrived to recover and it seems safe to predict that although buffaloes are unlikely to be permitted to survive in close proximity to settled areas, the species is in no danger at the present time. The Mara contains several herds of 500 to 600, and Talbot and Stewart estimated the Mara buffalo population at 5,943 in May, 1961.

HIPPOPOTAMUS
(*Hippopotamus amphibius*)



Hippos were common in almost all the lakes and rivers of Kenya to the extent that in some waters they were a distinct danger to navigation and caused much damage to African plantations.

“ In 1885, hippos were very plentiful in the River Tana, at the mouth, and for a few miles farther up, but I am told that they have since then been either killed off by the Wapokomo, or been driven away, and have taken up their quarters either in the Ozi River or the salt water creeks. They are still, however, very plentiful in the upper waters of this river beyond Korokoro, where the Wapokomo dare not go to hunt them for fear of other natives more warlike than themselves. In the Ozi, near Kipini, at the mouth of the river, they are to be found in fair numbers and again farther up beyond Kau, as also in the Sabaki River . . . in the small lakes at Jipi, on the mainland opposite the island of Lamu, they are found, at Mpecatoni near Kipini, and also at Jilori near Melindi, besides in several of the salt water creeks. Farther inland there are a good many in Lake Jipi near Taveta, and also in a large “ ziwa ” (swamp) to the east of Kilimanjaro and in lakes Naivasha and Baringo. They are, however, far more plentiful in the River Nzoia in northern Kavirondo than in any other place that I know of . . . ” (Jackson, 1894.)

Widely distributed in most of the large rivers, lakes and swamps. Numerous in Lake Victoria, on the Coast, in the creeks and mouths of rivers. In the Tana River they are also numerous and often prove a danger to small boats and canoes. They did great damage to lakeside shambas and to rice crops in Vanga District on the Coast. [Percival, 1906.]

The Wakamba took a heavy toll of hippos but they were still numerous in the Athi and Thika rivers until the First World War. Downstream both rivers swarmed with hippos. The Rift Valley lakes—Naivasha, Elmenteita, Nakuru and particularly Baringo—contained substantial numbers.

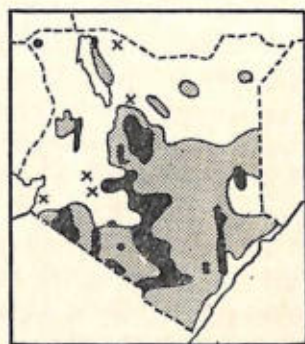
The hippopotamus is not in danger of extermination at the present time, but numbers have been drastically reduced, and nowhere in Kenya are they now plentiful. The most spectacular place to see them is in the crystal clear waters of the Mzima Springs. A handful still inhabit the Nairobi National Park and there are perhaps a dozen at Amboseli. Lakes Nakuru and Elmenteita boast a few, and they can still

be seen along the Tana, Galana and Mara rivers, but in small numbers.

A Game Department count along 30 miles of the Tana River above Garissa in September, 1960, revealed an average of 2.7 hippos per mile. Approximately 100 are reported in the Tana River for 10 miles upstream from Kipini, and the Mara River carries about 4 per mile in the vicinity of the Mara Triangle.

The rocky shore of Lake Rudolf does not make the lake particularly attractive to hippos, except in the vicinity of Illoret, Alia Bay and El Molo Bay in the east, and other limited areas on the western side. It is rare to see more than 5 or 6 hippos together anywhere in the lake. The heaviest concentrations in East Africa occur in Uganda's Queen Elizabeth National Park, where the authorities have found it necessary to reduce the hippo population, which was causing excessive damage to the habitat, from an estimated 14,000 to about half that figure.

BLACK RHINOCEROS
(*Diceros bicornis*)



The decline in the number of rhinos during the past half century is more marked and more serious than with any other single species, lion alone excepted. Johnston described rhino as "found pretty well all over British Central Africa, though nowhere in such large numbers as was the case in East Africa before the advent of British sportsmen." Jackson agreed that "there is no place where they exist in greater numbers at the present day."

This observation was confirmed by many other individuals, among them Willoughby who, in 1887, when hunting in what is now the Tsavo National Park, regularly shot four or five rhinos a day for many days on end close to the Mzima Springs. Forty-three rhinos were shot by his party within a fortnight and other animals were equally abundant. This region was superlative game country and Sir Charles Eliot tells us that "it was generally considered that the greatest variety, if not the greatest quantity of game was to be found either in the scrub-covered plains between Voi and Taveta, or in the open country between Nakuru and Baringo."

African tribesmen had little use for rhino horn although a few tribes—the Masai and the Wachagga for example—at one time fashioned the front horn into knobkerries, the Wataveta made snuff boxes from the tip, and in Abyssinia sword-hilts manufactured from rhino horn were much esteemed. The fact that they were not easy to kill with simple weapons, allowed rhinos to enjoy a certain degree of immunity from attack in most parts of the Protectorate. "It is a curious fact that natives are, as a rule, more afraid of a rhinoceros than of either elephant or buffalo. They also find him more difficult to kill, but this is entirely owing to his tough hide, and the primitive nature of their weapons. The people of Turkwel in the Suk country, who live by hunting, and who kill large quantities of game, including elephant, all of which they kill at close quarters with spears, told me that they feared a rhinoceros more than anything else, and rarely cared to attack him." (Jackson, 1894.)

This attitude was evidently not shared by the Wakamba, and Dickinson described the extraordinary number of rhino skulls and skeletons to be seen all over Ukamba as evidence of the immense slaughter by the Wakamba, who carried on a great trade in rhino horns.

The Southern Reserve, which supported a large rhino population became a focal point for African poachers and an early official report stated: "Last quarter three thousand pounds weight of rhino horn passed through the Customs at Mombasa in transit from Kilima Njaro. It is not improbable

that a large proportion of these horns were obtained in our Southern Reserve." (Jackson, 1906.)

Rhinos were widely distributed throughout most parts of Kenya, although they were quickly shot out in close proximity to the old caravan routes. According to Percival (1902) they were "found over more than half the Protectorate in fair numbers, and in smaller numbers over the rest" but owing to their wide distribution it was "impossible to make even a guess at their numbers." "From all sportsmen and prospectors who have visited out-of-the-way districts I have heard the same story of the great number of these fine old beasts."

The story was the same in almost every part of Kenya. In Laikipia, Thika, Tana and Kitui districts, as well as the Northern Reserve, Percival described them as plentiful. On the Thika River, where Percival saw five or six every day, and between Ol Donyo Sabuk and the Tana River they were common. Close to Nairobi, rhinos were to be found both in the reserve and on the open side of the Railway. On Ol Donyo Sabuk they were very plentiful "as the thick patches of forest and long grass makes the hill particularly suitable for them." In the Southern Reserve they were extremely numerous. Percival noted "more than 150 while crossing to Kilimanjaro, several times having six or eight in view at once." He returned by a different route and saw just as many. In Baringo District they were more numerous than anywhere else. (1902.) They were common in the Elgeyo Valley and although very plentiful on the Yatta their horns were considered poor.

Rhinos were inimical to settlement, as well as extremely vulnerable to modern firearms. In the course of a few years their numbers were drastically reduced and in 1906 Sir James Hayes-Sadler recommended the number of rhinos on a licence to be reduced from two to one. "This interesting pachyderm, though sometimes dangerous, is always a stupid animal and, from his bulk and the nature of the country he inhabits, with but few exceptions falls an easy prey . . . in fairly open country he is easily driven away and therefore the necessity of shooting to protect life is not nearly so frequent as has sometimes been alleged."

In the half century since these words were written the



Above, a poacher applying poison to his arrows. *Below*, a bow trap set along a game path. The arrow is released when an animal walks into the string stretched across the path



rhinoceros population has seriously declined. In 1936, C. W. Hobley estimated that the rhinoceros population had been reduced to 20 per cent of its former numbers. By 1960 the National Park Authorities estimated the numbers in Kenya to be no more than 2,500 but this figure included the Tsavo rhino population which has since been heavily depleted. (See page 134.) On the credit side, recent Game Department investigations have shown signs of a flourishing population of rhinos on the east shore of Lake Rudolf in the neighbourhood and to the south of Alia Bay.

Fraser Darling considers:

that the rhinoceros is a key species in management of African vegetation, and that its wanton and drastic reduction in half a century is one of the factors which have led to a decline of much habitat. The black rhinoceros eats vegetation of coarse and prickly nature which does not seem to be affected by other species. Observation of the diligent action of the rhinoceros in getting hold of young plants of gall acacia and pulling them out of the ground leads one to wonder what effect the animal has had in the past in keeping land open. If 250 of such plants were eaten by each rhinoceros *per diem*, a conservative estimate, the influence must have been considerable. What we do know now, is that gall acacia has vastly increased its areas, to the impoverishment of game-carrying capacity of the land. The rhinoceros should be protected absolutely throughout Kenya. The slaughter of rhinoceros during the last 10 years has been extensive and intensive—and senseless. The name of this animal should be removed from the schedule of game which may be killed for sport, because there is no sport in killing a rhinoceros. Its so-called tendency to charge, too much encouraged by those safe in a Land-Rover, is largely a spurious evocation of behaviour, despicable in the human being provoking it for a false thrill of danger.

In most parts of Kenya rhinos live in constant danger of poaching and the scarcer they become the greater the incentive to the poacher. With a breeding potential of only about 5 per cent per annum, the black rhinoceros stands in grave peril of

extinction in Kenya, unless effective protection can be afforded at least in recognised sanctuaries. The recent development of immobilisation techniques has made possible the translocation of rhinos from districts where they are not wanted into national parks, and a number have been moved in this way. Successful development of new methods of translocation will achieve their purpose only if complete safety can be assured after the rhinos have been released, and at the moment there is no absolute guarantee of this.

WILD ASS (*Equus asinus somaliensis*)

Herodotus recorded that some of the Indian contingents in Xerxes' army were equipped with chariots drawn by wild asses, but in Egypt and Mesopotamia the ass had been domesticated at least 3,000 years before Xerxes' time and is known to have been hunted by Rameses III.

In 1861 Baker saw the Nubian form along the Atbara River and the species evidently impressed him. "Those who have seen donkeys in their civilised state have no conception of the beauty of the wild and original animal . . . the animal in its native desert is the perfection of activity and courage; there is a high-bred tone in the deportment, a high-actioned step when it trots freely over the rocks and sand, with the speed of a horse when it gallops over the boundless desert. No animal is more difficult of approach; and, although they are frequently captured by the Arabs, those taken are invariably the foals, which are ridden down by fast dromedaries, while the mothers escape. The colour of the wild ass is a reddish cream, tinged with the shade most prevalent of the ground that it inhabits; thus it much resembles the sand of the desert. . . . It was with extreme regret that I saw my beautiful prize in the last gasp, and I resolved never to fire another shot at one of its race. This fine specimen was in excellent condition, although the miserable pasturage of the desert is confined to wiry herbage. . . . The height of this male ass was about 13·3 or 14 hands; the shoulder was far more sloping than that of the domestic ass, the hoofs were remarkable for their size; they

were wide, firm, and as broad as those of a horse of 15 hands."

Swayne (1905) estimated ten thousand in the Maritime Hills of the eastern part of the Somaliland Protectorate. In the Berber Province of Somaliland it was the practice to tether domesticated she-asses away from the villages, so that they were served by wild ass stallions.

The wild ass is not generally associated with Kenya, but Sir James Hayes-Sadler (1905) believed that they were to be found in Rudolf Province. Though he was unable to give any information regarding numbers or distribution, he took the precaution of including the species in the 1906 Uganda Game Schedule.

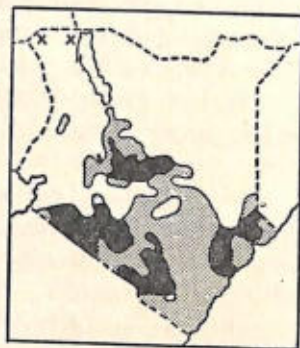
Sir Harry Johnston had this to say in 1900: "The wild ass, which is the parent of our domestic donkey, is indigenous to the desert region round the northern shores of Lake Rudolf and possibly also between Lake Rudolf and the Upper Nile. This ass is seemingly very easily tamed. It has long been domesticated by the negroid inhabitants of the Rudolf countries and has passed down from their lands through the Rift Valley to the Masai. The Masai again, in times gone by, passed this donkey down to the lands south of the Victoria Nyanza, where it was eagerly adopted by the Wanyamwesi people. The result is, curiously enough, that at present day these donkeys of East Africa which are absolutely indistinguishable from the wild animal, are known as 'Unyamwezi donkeys.'"

The species is now probably extinct.

ZEBRA
(*Equus* spp.)



Grevy's zebra
(*Equus grevyi*)



Burchell's zebra
(*Equus burchelli*)

When Joseph Thomson marched through Masailand in 1883, he found zebra in their thousands. "It was a magnificent sight to watch the beautiful animals thundering along in great squadrons; here stretching out like racers as they passed in dangerous proximity to the enemy; there massed up at bay with excited mien and head erect, trotting about with splendid action as if daring the hunter to approach."

Zebra were to be found in incalculable numbers all over the Athi Plains and the Rift Valley and appeared to have increased so prolifically that, in the early 1900's, Percival thought that they were becoming too numerous. "They trek from time to time from Elmenteita to Solai and Njoro and also the Molo River where, in March this year, they were in countless numbers: they had just trekked past Nakuru, the stream dividing at Nakuru, one half going to the south of Menengai and then on to Njoro and Molo, the other half going to Solai and Hannington District." (Percival, 1902.)

Grevy's zebra were common throughout the Northern Reserve, "so much so that during the dry season they may be seen in thousands at the various water-holes, particularly Larsamis." (Jackson, 1906.)

Very serious attempts were made to domesticate Burchell's zebra, in order to take advantage of its natural immunity to horse sickness. As early as 1888, Lord Lugard advocated this

course, as well as crossing with horse or donkey mares in order to obtain a larger and handsomer animal than the mule, which would have been invaluable for draught purposes. It was hoped that the resultant hybrid would solve the problem of obtaining suitable transport animals for East Africa. Widespread interest in the matter led to the Hon. Walter Rothschild breaking three Burchell's zebra to harness and driving them through the streets of London. There was even talk of entirely prohibiting the slaughter of zebra and making their capture a state monopoly.

The Germans, in particular, went to considerable lengths to experiment with domestication of the zebra, and Baron von Shellendorf established one of several zebra farms at Mbuguni, to the south-east of Kilimanjaro. A herd was also kept at the Government farm near Naivasha. At first the experiments looked promising, but most of the successfully broken zebra were incapable of standing up to sustained work. In captivity they also incurred serious mortality through heavy infestations of intestinal worms.

After a number of years, the experiments were abandoned, as were parallel attempts to train East African elephants.¹

Zebras were extremely numerous throughout a large part of Kenya up to the 1939-45 War. On one occasion Mr. Bror Kuhle shot 500 on the Ol Kalou Plains in a fortnight, but made no visible impression on the total. Large numbers were slaughtered during the war to feed the prisoner-of-war camps and in the cause of crop protection.

Although greatly reduced in numbers, Burchell's zebra are still to be found in fair-sized herds in most of the national parks and game reserves, with the exception of the Mountain Parks, and in small numbers in the Rift Valley and Laikipia regions. They are to be seen in satisfactory herds as far north

¹ Ptolemy Philadelphus (who ruled Egypt from 285-247 B.C.) established stations along the coast of northern Abyssinia with the principal object of obtaining war elephants, so it would appear that the African elephant was not entirely intractable. African elephants were also used in the Punic Wars, and the Carthaginians were reputed to have stabling for 600. With the fall of Rome the art of training the African elephant was lost until revived by the Belgians who, from 1910 onwards, succeeded in breaking in Congolese elephants.

as the Ethiopian border and were recently recorded at Illoret on Lake Rudolf and eastwards to Dukana, as well as in small numbers in Turkana District, to the west of Lake Rudolf. Grevy's, which are found only in the Northern Frontier Province and the Meru Game Reserve have been reduced to the point where special precautions are required to ensure their survival.

Recent counts are:

1. Meru North Grazing Scheme, December, 1960.

Burchell's	2,404
Grevy's	641
2. Wamba (Samburu) Grazing Schemes.

Zebra (both species, but mainly Burchell's)	
March, 1960	805
September, 1960	812
3. Leroghi (Samburu) Grazing Schemes.

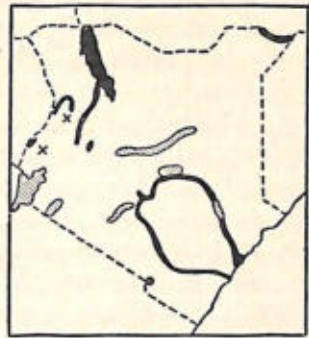
Zebra (both species, but mainly Burchell's)	
May, 1960	4,096
September, 1960	4,014
4. Baragoi (Samburu) Grazing Schemes.

Zebra (both species, but mainly Grevy's)	
May, 1960	1,203
September, 1960	1,283
5. Mara

May, 1961 (Talbot and Stewart)	20,867
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This is thought to represent about half the zebra population inhabiting the Mara at the end of the Second World War.
6. Athi Plains.

1960, average count	5,000-7,000
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CROCODILE (*Crocodylus niloticus*)

From earliest times the crocodile was revered as a sacred beast in certain parts of Egypt. Herodotus tells us that "the strongest belief in its sanctity is to be found in Thebes and round about Lake Moeris; in these places they keep one particular crocodile, which they tame, putting rings made of glass or gold into its ears and bracelets round its front feet, and giving it special food and ceremonial offerings. In fact, while these creatures are alive they treat them with every kindness, and, when they die, embalm them and bury them in sacred tombs."

The famous labyrinth above the huge artificial lake of Moeris was near a place called the City of Crocodiles. Herodotus considered that although the pyramids were "equal to many of the most ambitious works of Greece . . . the labyrinth surpasses them" and that it "must have cost more in labour and money than all the walls and public works of the Greeks put together." Some idea of the regard in which crocodiles were held can therefore be gauged from the fact that the lower rooms of the labyrinth contained the tombs of the kings who built it as well as the tombs of the sacred crocodiles.

In other parts of Egypt crocodiles were not considered sacred and Herodotus explains the interesting method used by the ancient Egyptians to catch them. "They bait a hook with a chine of pork and let it float out into midstream, and at the same time, standing on the bank, beat a live pig to make it squeal. The crocodile makes a rush towards the squealing pig, encounters the bait, gulps it down, and is hauled out of the water. The first thing the huntsman does when he has got

the beast on land is to plaster its eyes with mud; this done, it is dispatched easily enough—but without this precaution it will give a lot of trouble.”

For many hundreds of years no one believed the story related by Herodotus to the effect that birds entered the mouths of these ungainly reptiles to pick the leeches from their teeth. There is still no conclusive evidence but it is said that the spur-wing plover performs this useful, if unnerving, function. Many other birds associate closely with crocodiles, ridding them of parasites and giving warning of danger.

Nearer our own times the inhabitants of the Sesse Islands in Lake Victoria regarded the crocodile as the high priest of one of their gods. This particular deity would accept no offering but men, so whenever it was considered necessary to appease him, some unfortunate individual was dragged to the lake shore where his knees and elbows were broken to prevent him making off, and then left to his fate. Mutesa also found them useful and, when he defeated the Mohammedan faction, he caused his prisoners to be marooned on a small island in Murchison Bay where they had the alternatives of starving to death or being eaten by crocodiles. Von Wissmann was of the opinion that crocodiles could partially adapt their coloration to their surroundings. “On light sands I used to see animals of a yellowish green, while on dark and boggy ground they looked dark brown, and even crocodiles lying on stones resemble the colour of their resting place.”

Crocodiles are said to possess acutely sensitive sight and hearing and, although there are conflicting reports of how long they can live, it appears likely that they reach 100 years or more. They lay an average of about 60 hard-shelled oval eggs, white in colour, which are deposited and concealed in dry sand, not far from water.

The principal predator is the monitor lizard, which attains a length of 5 or 6 feet and appears unusually skilful at locating crocodile nests. Burrowing down into the sand, the monitor lizard extracts the eggs and smashes them against a nearby tree or rock before devouring the contents. Baboons, mongooses and spotted hyaenas also raid the nests, and marabou

storks participate in the ghoulish feast after the nests have been exposed.

The size of crocodiles has been greatly exaggerated. A specimen 15 feet from the snout to the tip of its tail can be considered big. The largest authentic specimen appears to have been one shot by the Duke of Mecklenburg at Mwanza on Lake Victoria, in 1905, which measured nearly 21 feet 6 inches, while one obtained by Captain Riddick at Namasagali on Lake Kioga, in 1916, was stated to have measured 26 feet.

There are several accounts of crocodiles travelling considerable distances on land in order to reach water. These movements probably result from crocodiles moving into areas which have been temporarily inundated. When the flood waters recede the crocodiles find themselves stranded. Percival wrote of the lake at Afmadoo in Jubaland, which dried up in the early part of the century. As a result a number of crocodiles were cut off in the midst of desert country. They crawled away into the bush and, failing to find the water they sought, stayed there. He stated that for many years after the lake had entirely disappeared crocodiles were to be found hiding under thick cover far from any water. Sir Charles Eliot records a similar occurrence from Jubaland: "Lake Hardinge, or *Deshek Wama*, frequently dries up, and it is said that crocodiles may then be seen lying in piles, one on the other, under the bushes round the bed of the lake in a somewhat torpid condition, but quite alive and waiting for the return of the water."

Dr. Cott gives several examples of aestivation, including crocodiles occupying cavities which are reached by tunnels in the banks of the Rukwa River and others which have buried themselves five feet beneath the surface for periods up to five months.

On the lower reaches of the Uaso Nyiro River crocodiles literally swarmed. They were also plentiful in the Juba River where they had acquired a reputation for exceptional size and man-eating propensities. Before the First World War crocodiles were extremely numerous in the Mwanza District and elsewhere in Tanganyika, but the Germans instituted a system of rewards, namely a cent for each egg produced, and the natives made a business out of seeking crocodile nests.

Large quantities of eggs were thus destroyed. Perhaps the heaviest concentrations were to be found in the lakes, swamps and rivers of Uganda. But they have been drastically reduced and heavy losses were inflicted even on the crocodiles within the sanctuary of the Murchison Falls National Park.

For several years after the end of the Second World War crocodile hunting was a lucrative business and many thousands of them were killed in East Africa by commercial hide-hunters. Precise figures do not appear to exist but one individual alone claims to have shot 8,000 and Cott quotes a report that 60,000 were shot in East Africa in 1954, including 1,000 which were collected by a team of hunters in six weeks. Hunting ceased only when the crocodile population was reduced to such a low level that it was no longer a profitable proposition. In some areas the species has completely gone and in others its existence is seriously threatened. It would be a tragic loss if man's shortsightedness and ignorance led to the disappearance of this interesting and valuable species. As these words are being written much treasure and energy are being expended in devising ingenious ways of saving the monuments of ancient Egypt from inundation but little thought seems to have been given to the infinitely simpler problem of saving the reptile which some of those monuments were designed to commemorate.

PART FIVE

The Means

14. Utilisation and Management of Wild Life

IT IS ALL TOO FREQUENTLY ASSUMED that fauna conservation is contrary to human, and particularly African, interests. This attitude tends to be reinforced by documents such as the Sessional Paper on Game, where the constant stressing that wild life shall be preserved only so long as it does not conflict with legitimate human interests implies, to the casual reader at any rate, that retention of wild fauna must run counter to human rights. This belief may well have come about through undue emphasis on strict preservation. The cry of preservation for preservation's sake has led to the false assumption that, in this day and age, wild animals are some strange anachronism and can be preserved only under artificial conditions. Nothing could be more misleading or inaccurate.

Preservation is a negative attitude of mind, which can scarcely hope to prevail because it frequently conflicts with human endeavour. Preservation implies the strictest protection of animals, almost without regard to consequences. Conservation, on the other hand, is something positive and, being directly beneficial to man, is itself a legitimate human interest. Conservation means the scientific regulation of numbers to ensure the perpetuation of the complete biomass, and the maximum sustained yields of all the values. Expressed in another way, conservation means maintaining the most suitable ratio as between one species and a combination of all the others in any given environment, from the largest mammals down to the smallest invertebrates, as well as the proper safeguarding of the habitat itself.

The question of killing also requires comment. It is not killing which is disastrous but the scale on which killing is done, and the indiscriminate methods employed. One constantly

hears strongly expressed opinions condemning any suggestion of condoning slaughter of any sort. A person who has the temerity to suggest that in certain circumstances controlled slaughter is not merely harmless but downright beneficial, is liable to find himself regarded in much the same light as a priest caught rifling the offertory.

The issue can perhaps best be judged on the record. It may be more than coincidence that the demand for preservation, loudly voiced since the end of the war, has not provided the required results. On the contrary, the overall wild life situation has seriously deteriorated during that period. There is no suggestion that this attitude is the sole reason for the present depressing state of affairs, but it may justly be regarded as one of the contributory factors.

Nature is not remotely interested in the survival of the individual, but is profoundly concerned with the species. It is this fundamental law of Nature that the conservationist strives to emulate. This does not imply advocating the adoption of a callous attitude towards animals; nor does it amount to support for uncontrolled or indiscriminate killing in any circumstances, or slaughter to satisfy a blood lust, but it does mean that the problems confronting Africa's wild fauna will not be solved in an aura of emotionalism or sentimentality. Controlled harvesting of the wild life crop is not only justifiable but also a realistic method of managing wild populations; a method which allows the off-take of the annual surplus, but regards the basic stocks as sacrosanct.

The suggestion is frequently heard that so long as Kenya has its national parks, the future of the country's wild life is assured. It is true that a comprehensive system of national parks, in which the interests of wild animals predominate over all other considerations, is the ideal at which to aim, but ideals are rarely attainable, and Kenya's national parks system as established at present is not, in itself, adequate to ensure the perpetuation of all the major species and their differing habitats.

Not one East African national park can claim to be a self-contained faunal unit. Each relies to a greater or lesser degree on peripheral areas as essential adjuncts to the park itself, into

which the wild animals seasonally overflow. Artificial restriction of the seasonal migratory patterns has been contemplated as a solution but, because migrations are undertaken in quest of grazing and water, which are the controlling factors, any impediment to movement, resulting in constriction of the herds to limited areas, could be achieved only at the expense of the total number of animals the parks could contain. The Ngorongoro Crater is, perhaps, the only exception to this prescription in East Africa, but no longer qualifies for national park status. It is essential to recognise the need for any park or reserve to contain year-long habitat to enable it to maintain its wild fauna. This basic principle has long been regarded as self-evident from the time of Jackson, Delamere and other early naturalists to the more scientific studies undertaken in recent years. In assessing the situation created by the realignment of the boundaries of the Serengeti National Park, Grzimek makes the strong point that unless adequate food supplies are available within the park, it will not be able to support a year-round wild life population within its boundaries. This may seem a statement of the obvious, but it is a fact which does not appear to have received adequate consideration when drawing up the boundaries of the East African national parks.

Perhaps the most important function of the national parks is to perpetuate those species which are unable to survive under conditions of intensive land use. In Kenya there is a wide spectrum of species included in this category. For this reason it is essential to strive for the creation of additional national parks to make the system truly representative and comprehensive but, at the same time, alternative schemes must be devised to cover those species and habitats which are not embraced by the national parks.

Because the national parks are in themselves inadequate to safeguard the future of the country's fauna, and because any appreciable extension of the national parks system is unlikely in present circumstances, it is necessary to look for alternative methods of perpetuating the wild life resource.

The role of the Forest Estate as a vital factor in long-term wild life conservation has not been sufficiently widely appreciated. Apart from the importance of Kenya's forests as

water catchment zones and as a substantial revenue earner through the sale of forest produce, the Forest Estate can be regarded as an exceptionally important reservoir of wild life. The conservation of flora—the essential prerequisite for the conservation of fauna and avifauna—can be more readily accomplished in the Crown Forests than anywhere else, besides which the Forest Estate affords an excellent example of multiple values—water, wild life, timber, tourism—all factors of great significance to this fast growing territory.

The tragedy is that very few of Kenya's inhabitants appreciate the importance of the Forest Estate to the well-being of the country, and there are constant demands for excisions for agricultural development projects or other purposes. From some parts of East Africa in recent months have come weird statements by unthinking politicians to the effect that forest reserves are merely a Machiavellian stratagem to deprive the African of his land, and when *uhuru* comes they will be thrown open for African settlement. The blunt truth is that the Forest Estate is much too small for its essential function. Any attempt to reduce it further would be sheer lunacy, disastrous to the country's water sources which are the very life-blood of an equatorial territory such as Kenya. Most European countries have at least 10 per cent and, in some, as much as 20 per cent, of their land devoted to forestry. In Kenya the figure for Crown Forests is 2.8 per cent (5,268 square miles) and the greater part of this inadequate acreage is in the Kenya Highlands.

Of this total, much of the spectacular indigenous forest has been eliminated and replaced with exotic soft-wood plantations. While appreciating the necessity for planting quick maturing trees which yield an early return, it becomes increasingly important to preserve adequate stands of indigenous trees in which no development or commercial exploitation will be permitted. Certain regions, because of their botanical, faunal, scenic or geological significance, should be afforded permanent protection while the opportunity still exists. These selected areas should include as many differing types of habitat as possible, thus preserving at least representative samples of varied forest forms in their pristine state for the future. They



The work of poachers. *Above*, a lesser kudu which has been shot from cover beside a water-hole. *Left*, a giraffe which died in a wire noose

should be gazetted nature reserves, thereby remaining under the control of the Forest Department, yet secure from exploitation.

Riverine forest in arid regions calls for special protective measures. The long, narrow strip of indigenous forest along the banks of the Tana River, for example, should more properly be left completely undisturbed as protection against the encroaching desert, but tribesmen have cleared the forest belt and tilled the land. A continuous line of cultivation now stretches for many miles on both banks of the river. This is a disastrous practice in more ways than one. Elephants and other wild animals have no alternative but to force their way through the cultivated land in order to get to water. Complaints are then made that crops are being destroyed or damaged and the Game Department is forced to undertake control measures.

In Ghana and other parts of Africa the forests are now almost the only refuge remaining for wild animals. While working to ensure that this unhappy state of affairs will not be repeated in Kenya, it would be unwise to ignore the fact that, in the last resort, the Forest Estate is wild life's final redoubt. For this reason it is essential for fauna conservation to be recognised as an integral function of the Forest Department, on a level of importance with the Department's other responsibilities, and not merely an incidental side-line as in the past. Wild life can be advantageously managed as an additional renewable crop from the Forest Estate without damaging or interfering with the established principal use.

Another most hopeful method of perpetuating wild life lies in the establishment of African-owned parks or game reserves. The Meru people are the first to have appreciated the advantages of retaining wild fauna in their district and have pointed the way to other tribes by creating their own wild life sanctuary on land which is unsuitable for settlement owing to the prevalence of tsetse fly. The game reserve, lying between the forested Nyambeni Mountains and the Tana River, contains such diverse species as elephant, rhino, buffalo, lion, leopard, oryx, Burchell's and Grevy's zebras, cheetah, hippo, as well as a variety of antelopes and gazelles. Facilities similar to those

found in national parks are being constructed, with a main camp on the Morera River. The game reserve is being managed by the local people under the guidance of their own European warden. If this pioneer scheme proves successful there is every reason to hope that more tribes, not only in Kenya but in other African territories as well, will be encouraged to follow the commendable example of the Meru people.

There is a third avenue which requires consideration: game management.

The concept of game management is based on the premise that certain parts of East Africa would be more wisely employed and the land would yield a better return from wild fauna than from domestic livestock. A broad definition of a game management zone would be an area wherein the wisest form of land use would be the conservation of wild life.

Game management schemes aiming at perpetuation of the wild life resource would require to utilise the annual surplus of animals for the benefit of indigenous tribesmen. Such schemes would effectively demonstrate to Africans that a system of controlled harvesting of the wild life crop is more to their advantage than present indiscriminate and wasteful methods, which can lead only to eventual faunal extermination, to their own ultimate detriment. Several tribes, such as the Waliangulu, rely almost exclusively on wild animals for subsistence, yet their present activities, unless checked, will lead to them poaching themselves out of existence. They themselves stand to suffer most as a result of their own thoughtless activities, but it is difficult to reason with people who are incapable of looking beyond the immediate present and who are unable to appreciate that their customary attitude towards wild animals must, in their own interests, be adjusted to modern circumstances.

The attitude of the majority of Africans towards wild life can perhaps best be summarised by explaining that in the Swahili language the words "animal" and "meat" are synonymous. Most tribesmen have an almost insatiable craving for meat which can be appreciated only by those who have witnessed it, and they will go to considerable lengths to satisfy this need. The combination of a steadily expanding human

population endeavouring to satisfy this craving on a diminishing number of wild animals can have only one result.

The attitude of the more sophisticated Africans was summarised by an African politician who considered that the presence of wild animals merely served to remind him of the primitive past which he earnestly wished to forget. By some confused association of ideas, emancipation could best be achieved through extinguishing the wild animals with which the past was associated.

The only recorded instance of practical conservation among indigenous African communities comes from Ghana where, since the remote past, giant land snails have formed a major article of diet. The hatching season is proclaimed by the beating of a gong, after which the collection of immature snails is discontinued. It is unfortunate that this far-sighted and intelligent attitude is confined exclusively to the humble snail; larger creatures are slaughtered with cold-blooded ruthlessness at all seasons. (Collins, 1960.)

The following examples may help to show what has been achieved in other parts of the world and, at the same time, demonstrate to Africans that even in the most advanced countries the conservation of wild life, far from being retrogressive, is regarded as one of the badges of civilisation.

An impressive instance of wild life management, which also strikingly illustrates the recuperative powers of certain ungulates, concerns the saiga antelope in the Soviet Union. In spite of a prohibition of hunting instituted in 1919, the saiga population steadily diminished, due to a combination of poaching, wolf predation and exceptionally severe winters. By 1930, only a few hundred remained and special measures were taken to protect the species. Within ten years the number of saiga had been restored to the level of a century ago and, today, the total saiga population has reached approximately two millions, with a density equivalent to $\cdot 8$ per square kilometre of its range. The annual harvest is between 150,000 and 200,000 saiga (each yielding an average of 60 lb. meat and a valuable skin) and yet they continue to increase. The investigations of Russian conservationists have shown that "there is no pronounced rivalry between the domestic animals and the saiga

for pasturage," since a high percentage of the vegetation consumed by saiga is unpalatable for cattle and sheep and even includes about 15 per cent of poisonous plants. For these reasons the saiga has now come to be recognised as an important species of commercial significance. (Bannikov, 1960.)

No less remarkable are the achievements of a small, densely populated and intensively developed country such as Denmark. The total area of the country is approximately 40,000 square kilometres, of which 75 per cent is intensively cultivated and some 10 per cent forested land. The average annual bag is 25,000 roe-deer, as well as numerous lesser game animals and birds—a figure which is more than made good through natural increase.

Canada has developed an exemplary system of managing the fur-bearing beaver and muskrat for the benefit of native Indians. Some 40 years ago the hereditary beaver hunting grounds in Quebec Province had been almost trapped out and fresh stocks were flown in from south of the St. Lawrence. At the same time the Indians were dissuaded from hunting until reproduction had restocked the area. A harvest quota was instituted, based on the number of occupied beaver houses and designed to keep the beaver population within the limit of its food supply. The quota is six beavers per house. Registered trap lines, which are the property of the individual Indian concerned, are to be found throughout most of Southern Canada and have resulted in creating a regular and valuable source of income for the Indians. The 1960 beaver quota for Quebec Province was approximately 30,000 pelts, each of which, if properly prepared, may be valued as high as 30 dollars. Indian trappers who reach a sufficiently high level of proficiency are awarded a special badge which is greatly prized and adds to the individual's status in his community.

In the Northern Prairie Provinces managed muskrat marshes provide a major industry designed to benefit the Indians and are, at the same time, a most suitable form of land use for the conditions prevailing. (Wright, 1960.)

Indiscriminate hunting reduced the prong-horn antelope from an estimated maximum of 40,000,000 to 30,000 in 1924. The application of a sound conservation policy has restored

the prong-horn population to a stable 400,000. Numbers are regulated through hunting, and the sport has become a profitable sideline for many farmers. In Wyoming, for example, the landowner receives \$3 from residents and \$5 from non-residents for each prong-horn shot on his land, while in Texas the fees range from \$30 to \$100. Experience in the United States shows that through the exercise of proper controls, prong-horns do not seriously conflict with agriculture or cattle. (Buechner.)

Although Africa possesses a more abundant and varied wild fauna than any other continent in the world, these examples show that countries less favourably endowed have far outstripped Africa in devising methods of managing this most neglected of natural resources. During the last few years there have, however, been encouraging signs that Rhodesia and South Africa have at last come to realise that wild animals have a distinct economic value which has previously passed unnoticed.

The assumption that wild animals and farming are incompatible led to the extermination of wild life on many farms and ranches throughout Southern Africa. The widely held belief that wild animals were in direct competition with domestic stock blinded most farmers to the fact that game can be a profitable side-line to regular farming activities. Anyone who has seen sleek, fat zebra and antelope grazing alongside thin and emaciated cattle, can appreciate the ranchers' outlook.

No other country in Africa has gone nearer to total elimination of its natural fauna than South Africa, although many others run it close, and it is, therefore, particularly gratifying to witness the change of heart currently taking place in the Union. The Union Government became very concerned at the widespread depletion of wild life and established a number of "game farms" where basic breeding stocks could be maintained and increased. Several game farms have been established in different parts of the country, some of them specialising in breeding up the rarer species, others devoted to producing those animals most in demand among the farming community. Surplus animals are sold to farmers wishing to re-

introduce wild animals on to their land, and the number of farms now stocking game in the Transvaal is estimated to be in excess of 2,000. The Municipality of Pretoria has its own game farm, and sends regular supplies of meat to the Pretoria market. Meat is sold as fresh venison or turned into biltong and has become a profitable proposition. Many farmers have increased their incomes by hundreds of pounds a year and, although much has still to be learnt, the utilisation of wild animals appears to have become an established agricultural practice. (Riney, 1960.)

In areas where land deterioration has led to a serious decline in carrying capacity, some farmers have taken to ranching springbok which, under marginal conditions, can be a more profitable undertaking than orthodox farming. The market value of a springbok compares very favourably with the return from sheep ranched on good land.

Riney states that "in 1959 alone at least 3,593 tons (over 7 million pounds) of meat was taken from private ranches in the Transvaal and this does not include meat or live animals sold from Government owned and managed wild life ranches and reserves. . . ." "Several ranches are already realising over £1,000 a year, nett profit, and a few over £2,000 from what originally was a few animals encouraged to build up as food for labour and for aesthetic purposes. Already some ranchers are gradually reducing domestic stock (both cattle and sheep) while increasing their populations of harvestable wild animals."

The decision to eliminate zebra and wildebeest on one Rhodesian ranch led to permission being granted by the Government to market the animals slaughtered. Over a period of several years the annual kill averaged 1,343 zebra and 203 wildebeest. No doubt the landowner was surprised to find that the gross annual income amounted to approximately £12,500, giving an average value of £8 for each wildebeest and zebra. If they had been sold in South Africa the return would have been even higher. This income was achieved without the necessity of dosing, dipping, fencing, watering or supervision, as would be necessary when ranching cattle. With serious direction results could doubtless be improved and a much broader range of species utilised. The figures quoted are minimal, because no

Rhodesian ranch yet carries the wild life population that could be sustained through proper management.

On another ranch the owner shot 168 impala in two days, which were marketed at a wholesale price of Shs. 1/3d. a pound. Total income was £672, an average of £4 each. In South Africa impala would fetch £6-£7. Dasmann and Mossman, from whose report these data were obtained, consider

It is certain that the forage which produced these impala could not have supported the increased number of cattle needed to equal this income. . . . On another ranch we found a population density of 30 impala a square mile, and evidence to indicate that an annual cropping of 20 per cent can be taken from the impala herds without depleting them. If the same figures are applied to this ranch, it would support at least 3,000 impala and at least 600 of these could be removed annually. These would be worth £2,400 in Rhodesia or from £3,600 to £4,200 in South Africa.

These illustrations exemplify the economic value of wild animals and show that the production of game meat, either as a primary method of land utilisation or as a means of obtaining a supplementary income from game ranches side by side with cattle, can provide a valuable source of income from ranching land.

Domestic animals are selective feeders and many of the so-called weeds which they find unpalatable are consumed by wild animals. This natural method of controlling weed growth by means of wild animals actually improves the grazing for cattle. The economic potentialities of the natural fauna have hitherto scarcely been appreciated, but when the monetary value is more widely recognised, wild animals will no longer be regarded as incompatible with regular ranching.

If conservation measures are to be effective in East Africa, it is first necessary to wean the African from his present attitude of mind and show conclusively that proper wild life management is to his advantage. It is entirely unrealistic to suggest that primitive tribesmen will be impressed with arguments that wild life conservation is of great economic benefit to the country; neither can they be expected to appreciate aesthetic

considerations. The only argument to which a bush African is likely to respond at present is through the simple expedient of seeing for himself that he personally derives material benefits through the conservation of wild animals.

Considerable emphasis has rightly been laid on the necessity for educating Africans to a better appreciation of their wild life heritage and there are encouraging signs of an increasing awareness among some of the cultured Africans of the value of their natural fauna. This growing pride in a fauna which is so essentially African has been fostered by men like Dr. Wasawo whose influence on African thought is so wholly beneficial. It is his belief that

the cultural development of a people is judged not only by what they produce but also by the way their spirits and minds are developed to appreciate what is around them and in them. In Africa we have a unique flora and fauna which can play a great part in this development. . . . The youth of Africa have a superb heritage in their fauna and flora which they can use for intelligent observation, for trained listening and for informed utilisation. This is a challenge for education in its broadest sense . . . an opportunity for which they would be justifiably envied by the youth of other lands.

No one will fail to agree that education in this field is vitally necessary. There is need for a Chair of Conservation and Ecology at Makerere and other universities in Africa, but even if this were done it would not be sufficient in itself. Academic training is a long term policy and, by the time it takes effect, there may be precious few animals left to conserve. The need for academic training for future leaders must run concurrently with practical education of a type the primitive bush African can understand and assimilate. The sophisticated and the primitive African must each be educated in a different way, and the term "education" in this context should imply a two-pronged approach: one academic and the other utilitarian, the latter including demonstration game management projects.

However distasteful it may be, it is only realistic to accept the fact that at this moment in Kenya's history the right of wild animals to live will be largely judged according to their

contribution to the economy of the country and, more particularly, the economies of the tribes in whose land the bulk of the surviving herds are to be found. So long as the tribesmen most intimately concerned receive no direct benefit from retaining wild animals in their midst, so long will large-scale poaching and eradication of the fauna continue. This deadlock can be broken only by bringing Africans into some form of partnership in game conservation projects which leaves them materially better off than before.

These considerations resulted in a proposal for the establishment of a pilot game management project in the arid and little-known country situated on the eastern boundary of the Tsavo National Park. This semi-desert country is incapable of supporting more than an extremely limited number of people and then only at bare subsistence level. Animal or crop husbandry in the accepted sense is virtually out of the question and the wisest use for this poor, infertile, waterless, bush country lies in utilising the wild animals that have lived there for generations without in any way maltreating the environment.

The project was woven around the Waliangulu tribe who rely almost exclusively on hunting for a livelihood but, through excessive poaching and indiscriminate methods, were the principal culprits responsible for reducing the number of wild animals in and around the Tsavo National Park to a precariously low level. The 1957 anti-poaching drive was primarily directed against the Waliangulu and, on the successful conclusion of the campaign the Administration was faced with the difficulty of providing them with alternative occupations, without which the ex-poachers would have had little option but to revert to their previous disastrous practices.

It was a question of literally converting poachers into game keepers and, encouraged by a generous grant of £10,000 from the Nuffield Foundation, the Kenya Government agreed to support the proposal. An area of some 2,000 square miles lying between the Tana and Galana rivers has now been set aside for the scheme where controlled hunting of elephants, under the supervision of two European wardens, will be carried out. At the moment elephants are almost the only animals present in sufficient numbers to warrant cropping, most other

species having been reduced to such a low ebb that several years may have to elapse before numbers are sufficiently restored through natural increase but, as time goes by, they too will be cropped and the meat and by-products marketed. The Chief Game Warden intends to set up a marketing organisation to dispose of meat and trophies and the income derived from this source should eventually make the project financially self-supporting.

The project was designed for the betterment of the Walian-gulu and, besides allowing an outlet for their natural hunting propensities, will provide them with employment and income where none previously existed. Illegal hunting, in Sir Julian Huxley's phrase, is in any event "a large unregulated industry," and the Galana River Game Management Scheme is the first attempt in East Africa to regulate hunting for the direct advantage of indigenous tribesmen.

The cropping of game is the most practical method of overcoming widespread dietary deficiencies and will go far to counter the meat hunger which is prevalent throughout Africa. The success or failure of this pilot scheme will undoubtedly exert a considerable influence on the future of wild life conservation in East Africa and, if successful, there is every reason to hope that similar schemes will be undertaken elsewhere which, besides benefiting the tribes concerned will also help to ensure the future of the country's fast diminishing wild life.

Advantages of the scheme can be summarised as follows

1. First and foremost, game cropping is a medium for gaining the active co-operation of Africans in the conservation of wild fauna, without which the outlook for Kenya's fauna is problematical.
2. Africans will be able to see that wild life conservation is of material benefit to themselves and not merely the preserve of wealthy Europeans.
3. A successful demonstration project will show the economic value of wild animals and thereby provide factual data to strengthen the case for retention of the natural fauna in many parts of Kenya outside established sanctuaries.

4. African participants will obtain their meat requirements and, at the same time, leave a useful marketable surplus.
5. The scheme will provide evidence that the cropping of wild life represents the most suitable form of land use for certain arid regions at present lying idle.
6. The scale of poaching will be substantially reduced within the game management zone as it will no longer be in the interests of the Walianguku to kill indiscriminately or unlawfully.
7. By controlling and legalising the sale of ivory, rhino horn, leopard skins and meat, there will not be the same necessity to patronise the black market. Africans will obtain the full value for trophies instead of the pittance they receive from unscrupulous middlemen and receivers.
8. The area used for game management will form a protective buffer zone on the eastern boundary of the Tsavo National Park.
9. Because this buffer zone lies athwart one of the main elephant migratory routes across the coastal hinterland, it will be possible to thin out the park's excess elephant population in the management zone. The area included in the scheme therefore represents an important adjunct to the park itself.
10. The game management area will be of indirect help to agriculturalists at the Coast since elephants will be retained in the hinterland. In the past, much of the damage to cultivation in the Coast Province has been caused by elephants which have been compelled to vacate the interior because of constant harrying by poachers. During the dry season, the limited number of water-holes are easily ambushed by gangs of poachers, and the elephants have no alternative but to move into the settled areas in order to survive.
11. Not least of the advantages of the game management scheme is that a relatively modest capital outlay has sufficed for its establishment, and there is every

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11. Not least of the advantages of the game management scheme is that a relatively modest capital outlay has sufficed for its establishment, and there is every

reason to believe that within a few years the project will have become financially self-sufficient.

12. The Galana River Game Management Scheme will provide useful and profitable employment where none at present exists and, if successful, will have a marked effect on African opinion.

An essential part of game management is the prevention of over-population, and game cropping schemes are currently taking place in Uganda, devised to cull the mounting elephant population in Bunyoro by about 1,000 a year. In the Queen Elizabeth National Park, where excessive numbers of hippos have caused widespread damage to soil and vegetation, the population is being progressively reduced and the meat distributed to the local people or sold commercially to the tune of 3,000 tons a year.

Some species lend themselves more readily to game cropping than others, but there is hardly one that cannot be utilised to a greater or lesser degree under the principles outlined in this chapter. A brief look at two such diverse creatures as the rhinoceros and the crocodile may help to illustrate the point.

It is doubtful whether any creature has been so maligned as *Crocodylus niloticus*. This sole survivor of the so-called "Ruling Reptiles," the Archosaurs, has successfully held his own for more than one hundred million years, yet man seems well on the way to exterminating him in the brief span of a few decades.

The crocodile's ungainly and ferocious appearance react against him but, due to the investigations undertaken by Dr. H. B. Cott, on whose reports these observations are primarily based, many of the popular prejudices appear to be unjustified. Crocodiles are not voracious feeders as is generally supposed; nor do they devour immense quantities of fish. On the contrary, they consume relatively few fish except in the middle years of life and, even then, generally prefer the coarser species of predatory fish. The economically important genera, such as *Tilapia*, are seldom part of the crocodile's diet. Immature crocodiles eat fresh-water crabs, predatory giant water bugs, carnivorous water beetles and many other creatures which themselves prey on fish, fry and eggs, while the adult crocodiles take a heavy toll of fish-eating animals, birds, such

as cormorants and darters, as well as cane rats, otters, marsh mongooses, snakes and monitor lizards. In the water, and along the shores, they act as scavengers, keeping the waters clean and performing functions similar to those of hyaenas and vultures on land, and equally essential.

In spite of occasionally causing damage to nets, the presence of crocodiles has been shown to be directly or indirectly beneficial to a fishery. Elimination of the reptiles has seriously affected the biological balance in waters where they were previously common. In many waters where eradication has already occurred, cannibal fish, such as barbel and lung-fish, have multiplied rapidly, the latter preying on the netted tilapia. An increase in the numbers of omnivorous crabs and other invertebrates usually follows the elimination of crocodiles and they too take a heavy toll of eggs and fry, as well as sometimes feeding on netted fish.

The majority of people regard crocodiles as vermin, but neither ecologically nor economically is this true. Because crocodiles do not rank as game animals (except in the areas named in the next paragraph) it is legal to hunt them at night with the aid of spotlights; a technique which would carry severe penalties if used on any other animal. This is a very destructive form of hunting, against which the crocodile has no defence and leads to speedy, and often total, elimination of the reptile in waters favourable to the hunter.

Quite apart from this consideration, the crocodile has a distinct economic value in its own right. Prime crocodile skins fetch up to Sh. 9/- a belly inch, yet in Kenya this valuable reptile is protected only in Garissa, Isiolo, Maralal, Narok and lakes Baringo and Rudolf. Everywhere else crocodiles are regarded as vermin and District Commissioners are authorised to grant licences costing from two to five shillings. As a result, there has been a heavy killing of crocodiles along the Tana River and elsewhere. In Tanganyika, crocodile hunting is not regulated outside game reserves and controlled areas, and drastic reduction of stocks has forced most of the big operators out of business. The Ruvu River, where crocodiles once swarmed, is now almost devoid of them, and hunting is mainly confined to individual Africans who sell to middlemen. The

official Tanganyika Game Department returns showed that 26,192 crocodiles were taken in 1957. Adults are the first target of the hunters and, when they have been eradicated, immature reptiles are taken. Dr. Cott's observations have led him to the conclusion that *C. niloticus* does not reach breeding condition until about nineteen years of age, by which time it will have attained a length of about 8 feet 6 inches. On Lake Victoria and elsewhere, hunters are now killing the three to four year age groups. Unless proper control measures are instituted, these practices can lead only to extermination. It is essential to declare *C. niloticus* a game animal and treat it as such.

There appears to be no reason why crocodiles should not be cropped in exactly the same way as has been suggested for other animals. Because of the nature of their environment and their habits, crocodiles would probably lend themselves more readily to a system of game cropping than many mammals. Along the Tana and other rivers, especially in arid and semi-desert regions, there would be little difficulty in building up a valuable and productive self-perpetuating rural industry, designed to harvest crocodiles on scientific lines.

This would necessarily involve a close season at breeding time and, in the initial stages at any rate, special measures might be necessary to protect the breeding grounds and nests from egg-eating enemies, such as the monitor lizard, baboon and maribou, with the object of re-stocking the waters as quickly as possible. Due to the reptile's slow maturing characteristics, and scant breeding stocks, crocodile management schemes would take a number of years to become properly established but, in the long term, they would prove valuable to the economy of rural regions.

Rhinoceros horn is the most highly priced animal commodity of all and, as the rhinoceros population decreases, so the value of horn soars proportionately, and the pressure of poaching on the survivors becomes more excessive. The principal markets are India and China, where horn is in great demand as an aphrodisiac—the very countries where, judging from their teeming millions, one would assume such artificial stimulants to be entirely superfluous. Talbot says of Asian rhino horn that

a horn brought half its weight in gold in Calcutta in 1935 . . . its weight in gold in Siam in 1937 . . . and nearly £500 in Sumatra in 1933. . . . In Saigon, traders told me they could get 100,000 piastres for a large horn. That was then the equivalent of 2,000 dollars (£700). In Palembang a Chinese merchant was offering a new American car for a whole dead rhino. In Telukbetung, Sumatra, a Chinese trading group had a standing offer of 100,000 rupiah, then \$2,500, for a large horn.

Talbot's description of the economic value of the rhinoceros can hardly be bettered:

Every part of the body is highly prized, from hide, hair and toenails to the blood and visceral organs. In many cases the belief extends even to the urine and faeces of the animal. In 1955, tiny bamboo vials of urine, presumably from zoo rhinos, sold in Calcutta for 12 annas (about 15 cents).

The most valuable single part is the horn. In the past, rhino horn has been an important part of the export trade of all the south and south-east Asian countries. The greatest market was China. Even in Borneo, rhino was considered one of the three most important wild products in the trade with China (Harrisson, 1956).

Rhino horns were carved by the Chinese and others into a number of highly prized articles from buttons, belt-plaques and ended up as cups. Most of these were libation cups, important in certain religious ceremonies. Others were kept, especially by the rulers, because of the belief that they protected the user from poison. Such cups have been used in Asia up to recent times, but they also have been used by some British and European monarchs and popes.

As a protection against poison, the use of rhino horn varies by locality. In Sumatra, it should be drunk as a purgative if one feels the first signs of poisoning. In Burma, a belief exists that when one puts rhino horn shavings into a cup containing poison, they will bubble and smoke. In Nepal and parts of India, the belief is that if poison is placed in a rhino horn cup the poison will bubble,

discolour or become harmless, or else the cup will slowly disintegrate or shatter. Interestingly enough, there may be some basis for this latter belief. Many of the old poisons were strong alkaloids, and the horn is what amounts to an agglutination of hair, closer in structure to toenails than to cattle horns or deer antlers. Such a structure would indeed be affected, although the shattering and other dramatic behaviour is probably an embellishment.

To-day, the greatest demand for rhino horn is based on its supposed value as an aphrodisiac and this widespread belief accounts for the greater part of its market value. China still provides the biggest market, with Singapore acting as the main collection point for horns, whether they come from Africa, India or South-East Asia.

Usually the horn is ground to a powder and mixed with water or coconut oil. Among the cures this mixture is supposed to effect are the following: to remove a thorn from the palm of a hand, apply the horn oil to the back and the thorn will work right out; to ease childbirth, the expectant mother should drink some of the mixture just before the baby is born; to shrink lumps, stop infections, close cuts, soothe irritations or cause broken bones to heal properly, just apply the mixture to the nearby skin surface and rub well.

The horn may be sold in small pieces, in powder, in a coconut oil or other solution, or in combination with other parts of the rhino. In the latter case, a mixture is made of rhino horn, toenail, rib, foreleg and occasionally other parts of the rhino body, all mixed in coconut oil. This is placed in a small bamboo vial and is sold by itinerant "medical men." I saw a mimeo-graphed paper giving the proportions of rhino in one mixture being sold by such a travelling druggist. The sheet described the parts of rhino included and the various ailments they were good for. I saw similar charts, along with large drawings of rhinos, in druggist shops in some of the larger cities of Indonesia.

The astronomical value of rhinoceros products brings to mind the 1,088 rhinos shot by J. A. Hunter a few years ago.



The process of destruction. *Above left*, during the dry season when grazing is scarce, Samburu women (*right*) lop off the branches of trees for fodder. *Below*, destruction of trees and heavy overgrazing lead to extensive erosion



He was commissioned by the Game Department to exterminate them in the Makueni District, in order to open an area of 50,000 acres for a Kamba agricultural settlement scheme. When considering these figures, it is difficult to avoid the conclusion that either the rhinos were so thick on the ground (one to 50 acres) as to be unnaturally abundant, or they were being taken from farther afield beyond the area allocated to the settlement scheme and, therefore, more were shot than was strictly necessary.

The rhinoceros was the one animal to really thrive in the Makueni District, and was more plentiful in this region than any other comparable place in the world. Yet conventional thinking resulted in complete eradication in order to make way for a settlement scheme on marginal land which was incapable of supporting more than the crudest form of subsistence agriculture. From 1946-1959, a total of £307,535 was spent on bush clearance and water supplies, and a further £15,377 in the form of loans and grants. But these subsidies have not prevented the scheme from becoming a failure through lack of co-operation from the Wakamba settlers, and there is little to show for the heavy capital expenditure incurred. The destruction of the Makueni rhinos does not, therefore, appear to have served any constructive purpose. The value of rhino products is so high that it might have been more profitable for the Wakamba to have cropped rhinos.



15. Masailand

THE AREA OF MASAILAND is approximately 41,000 square miles (26,240,000 acres) of which 26,000 are in Tanganyika and 15,000 in Kenya. With an estimated total population of 117,000, this amounts to a density of roughly 3 human beings per square mile. The official reports indicate that each family unit possesses about 70 cattle, 85 sheep and goats and 18 donkeys, but the actual figures are probably higher. The Masai Reserve originally contained some of the finest pastoral land in East Africa and, from the point of view of land and numbers of livestock, the Masai can be regarded as one of Africa's wealthier tribes.

The rinderpest epidemics almost exterminated their cattle, but the Masai re-established the herds as quickly as circumstances permitted. In 1904, the Kenya Masai were estimated to possess 50,000 cattle and 600,000 sheep. By 1910, the figure had risen to 130,000 cattle and 2,230,000 sheep. The 1915-1916 Official Report showed no increase in the number of sheep, but the figure for cattle had jumped to 700,000.

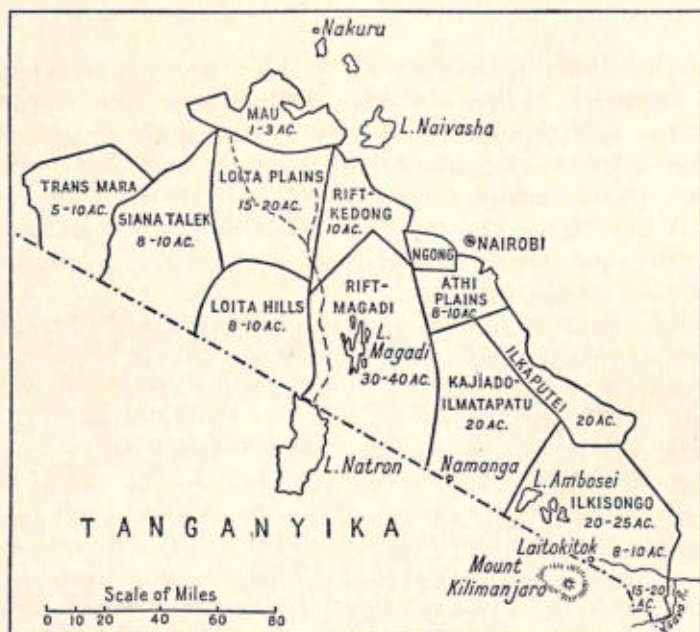
After allowing for some 3,000 square miles of land which they are unable to use owing to tsetse fly or other causes, the 1960 figures show that the Masai were attempting to carry 973,000 cattle, plus an estimated 660,000 sheep and goats (equivalent to an additional 132,000 stock units) as well as large numbers of donkeys, on the remaining 12,000 square miles. This amounts to a beast to 7 acres on land which, apart from a few selected areas, has an average carrying capacity nearer 15 to 20 acres per unit of stock. In other words, in 1960 the Masai possessed more than double the quantity of domestic animals that their land is capable of supporting. The following table, based on data provided by the Agricultural and Veter-

inary Departments, sets forth the position, but it is necessary to add that after two very dry years, such as were experienced in 1959 and 1960, another 5 acres per beast should be added to the figures given. Some parts of Masailand could not continue to carry these stocking rates with safety in their present overgrazed condition. The map and table on page 292 indicate the optimum carrying capacity of each section in terms of acres per unit of stock.

Despite the fact that it is nearly as large as England, Masailand is often regarded as inadequate for the requirements of the tribe. Rainfall is generally low, and the life of the tribe is largely conditioned by the constant search for water and the incidence of disease. The availability of grazing does not seem to influence their movements to any great extent. It has been said that only about once in seven years does rain fall evenly throughout Masailand. One region or another is, therefore, almost always suffering from drought, and grazing for the herds is at the whim of an erratic and unreliable rainfall. In the past this factor was of small account since the Masai were free to herd their cattle wheresoever they would. The grasslands of the Mau Plateau and the Kinangop, for example, too high and cold for year-round use, were regarded by the Masai as dry weather grazing zones. Nowadays the only reserve grazing areas are the relatively small mountainous regions within the Masai Land Unit, such as the Ngorongoro Crater Highlands, to which the herds withdraw when the plains dry out. This practice results in heavy seasonal concentrations of cattle in the very areas from which, in the true interests of the Masai themselves, cattle should be rigidly excluded.

The Serengeti Committee of Enquiry recommended the excision of the Crater Highlands from the national park "with the object of conserving water supplies, forest and pasture. . . ." The Committee specifically recommended the introduction of rules to ensure: "(1) Protection of all water sources against grazing and trampling; (2) Protection of forests against fire and the prohibition of grass burning; (3) Power to direct and control pastoralist activity in the interests of grassland development."

The excision was duly made, but the reasons for doing so



KENYA MASAILAND

Section	Location	Acreage	Number of Cattle (1960) ¹
IL-KISONGO	Il-Kisongo	1,380,000	120,000
	Amboseli		
	Tsavo		
	Loitokitok		
IL-KAPUTEI	Il-Kaputei	432,000	89,000
	Athi Plains		
IL-MATAPATU (including IL-DALALEKUTUK, SIGIRARI and IL-DAMAT)	Kajiado-Namanga	1,237,000	163,000
IL-ODOKILANI	Rift Magadi	1,564,000	60,000
IL-KEKONYUKEI	Ngong	103,000	113,000
	Kedong	534,000	
LOITA	Loita Hills	827,000	49,000
PURKO	Mau	510,000	88,000
PURKO	Loita Plains	1,022,000	191,000
	Siana Talek	1,071,000	
SIRIA, IL-MOITANIK and IL-UASIN GISHU	Trans Mara	734,000	100,000
		<u>9,789,000</u>	<u>973,000</u>

¹ Since this census was taken, the severe drought conditions during 1961 caused heavy losses among the Masai herds, particularly in Kajiado District. It has been estimated that at least 300,000 cattle died.

appear to have become obscured and these rules have not been implemented. The result has been precisely the opposite of that intended by the Committee of Enquiry. No precise figures are available, but in 1960 an estimated 200,000 stock units were present in the 4,000 square mile Conservation Unit area, made up of 150,000 cattle, 210,000 sheep and goats and 7,000 donkeys. Uncontrolled admission of domestic animals into the Crater Highlands has resulted in severe damage to the forest cover through over-grazing, trampling and burning. On occasion it is impossible to see across the Ngorongoro Crater for the dense pall of smoke resulting from fires raging in the Crater Forest Highlands. If these thoughtless and short-sighted activities continue, it is only a matter of time before the forest cover is destroyed and, with it, the vital water sources. The Munge Stream, which rises in the Crater Highlands and flows into the Ngorongoro Crater, has already been diverted near its source and piped to cattle troughs and some of the swamps on the crater floor have been severely depleted. If the few remaining streams and springs cease to flow, as could easily happen, the crater will become as valueless to the Masai as to the wild animals. The type of administration that allows the Masai to continue unrestricted pastoral practices which are demonstrably impoverishing their land and water resources, can hardly be in the real interests of the tribe. Firm administration of a comprehensive plan is necessary if the natural resources of the Conservation Unit are to be secured for the future.

Precisely the same comment applies to the Masai Forest on the Mau. In their attempts to acquire additional grazing land, the Masai have cut down or burnt many thousands of acres of forest cover in a region which is probably one of the most important water catchments in Kenya.

The incidence of fire has played a leading part in the desiccation of Masailand. Apart from deliberate destruction of forest through burning, the regular firing of the grass plains, sometimes more than once during the course of a year, has had the result of gradually eating into the forest fringes and, over a period, has seriously reduced the forest cover.

Many examples could be given. The Ngong Hills were

probably completely enveloped in forest less than a century ago. Small patches of relict forest in the valleys are all that now remain. Similarly, according to early German reports, both the internal and external rims of the Ngorongoro Crater were once thickly forested, but regular burning of grass on the crater floor and the plains beyond has gradually reduced the forest canopy to its present meagre proportions.

The Serengeti Plains may have been typical savannah country within relatively recent times, but to-day there is scarcely a tree to be seen. Stumps are still occasionally found in what is now open country. Similar evidence has come from several separate sources, leading to the conclusion that the Serengeti region was at one time much more thickly wooded than now. The regularly disposed circles, each about 15 yards in diameter, which can be seen so clearly from the air do not, however, indicate the position of former trees, as has sometimes been suggested. These are the remains of termite mounds which, through fire and trampling, have, over the years, gradually eroded away until they are almost level with the ground.

The effect of burning is aggravated by the Masai practice of constructing their manyattas from thorn bush; a method which involves the destruction of almost every tree within a wide radius of each habitation. Manyattas are only occupied for a limited period, after which they are burnt and fresh ones constructed on new sites. This system results in extensive destruction of the limited available tree cover. In addition, the heavy concentrations of cattle cause deep furrows to fan out from each manyatta, resulting in widespread erosion.

Burning, followed by heavy grazing, has resulted in extensive erosion, particularly on the hillsides and this, in turn, has led to scrub encroachment. Talbot believes that "each year the Masai lose through leleshwa invasion at least as much grazing land as they have procured from the forest; the narrow strip of opened land moves yearly higher into the forest; followed closely by encroaching leleshwa. This ecological Rake's Progress is marching inexorably up the Mau and in places its path can be traced for over 25 miles back through a sea of leleshwa-covered badlands."

Even where new areas are opened up, over-grazing is certain to follow, for wherever there are Masai cattle, there is sure to be over-grazing, and this has resulted in large-scale wind and water erosion over wide areas. We have Talbot's description of parts of the Mau Escarpment where "virtually no topsoil can be seen over hundreds of square miles at the lower elevations, and where some does remain, it may tend to be fourteen feet above the present ground level, on top of a pedestal of earth held against erosion by the roots of a few surviving cedar trees."

Overstocking is reducing much of Masailand to near-desert conditions. Individuals who knew the region lying between Namanga and Longido during the campaigns of the First World War state that it was then open, grass-covered country, so open that one could see for miles, to the extent that there was seldom any necessity to send out patrols ahead of the main military formations, as was standard procedure in thicker country. Serious over-grazing in recent years has reduced the area to eroded bush-land, almost totally lacking grass cover, where visibility is very limited owing to heavy infestations of useless scrub. Even the Mara fly country, until recently immune from the depredations of domestic livestock, is now subjected to increasing pressure from mounting numbers of sheep and goats. Each year they penetrate deeper into the fly country, and Talbot estimates that "the combination of intensive burning and follow-up grazing is apparently actually pushing back the tsetse fly so that the area grazed by cattle is extending south into the former cattle-free area at the present rate of about 5 miles a year."

There still exist a few rare and isolated pockets of Masailand which have never been subjected to cattle, but have been intensively grazed by herds of wild animals. Even though the numbers of wild animals, in terms of equivalent stock units, greatly exceed the densities of cattle, there has been no degradation of soil or vegetation. This is because the grazing and browsing requirements of the various species of wild animals are so diverse that they make use of the total vegetational complex, whereas domestic animals concentrate exclusively on a strictly limited number of preferred plant species.

It is not necessary to look beyond Africa for examples of once fertile lands which have been reduced to desert within historical times. Rome's North African granary is a classic example of how wild lands were "developed" into barren wastes. The indigenous vegetation and animals were first replaced by cultivation or cattle and, as the habitat declined, so sheep were introduced because they could survive on poorer vegetation. Finally only goats and camels could be supported, and the deserts moved in rapidly behind them. The pattern is being repeated to-day in Masailand and other parts of East Africa, in astonishing disregard for the most elementary rules of land use.

From the slender evidence available it seems probable that when the Masai first settled in the vicinity of Lake Rudolf, several hundred years ago, the Northern Frontier Province was a relatively prosperous region. Subsequent deterioration of the soil and vegetation has been attributed to climatic change. There is no early data for the Northern Frontier Province to prove or disprove this suggestion, but the weight of evidence from other parts of Africa seems to indicate that the effects of climatic change during historical times have been exaggerated. Support for this assertion comes from Bovill who, referring to somewhat similar circumstances in the North African littoral, concludes that "the rainfall records kept by Ptolemy the geographer in the second century A.D. show that in Egypt although the rainy days were about as numerous as they are to-day, they were better distributed. But had the changes been more than slight, had the rainfall been materially heavier, some of the Roman bridges would not have spanned the rivers, and many fords would have been unfordable. . . . In historical records the problem of water supply frequently recurs. When Caesar was campaigning near Hadrumentum (Sousse) lack of water was a constant anxiety to him, as it was to Belisarius six centuries later. Droughts, too, were seemingly no less common than they are to-day. Hadrian was beloved of Africans because rain fell for the first time in five years on the day of his arrival in the country. The conclusion that climatically the Maghreb has changed but little in the last 2,000 years is impossible to resist."

The hand of man, not climatic change, was responsible for devastating the North African littoral and there is no evidence to suggest that any other explanation should apply to the Northern Frontier Province. In the absence of records this conclusion is necessarily speculative but the probability is that whether the drastic land desiccation which compelled the Masai to evacuate the Lake Rudolf region, and led to the disappearance or extinction of the Ma'anthinle people, was induced by destructive practices similar to those we see in Masailand to-day. It is difficult to avoid the inference that for the second time in their history, the Masai are intent on reducing their environment to the status of a desert. On the previous occasion there were almost unlimited virgin grasslands to which they could retire but, now that they are restricted to a limited region, no such alternative awaits them, and they must conform to proper land use practices or go the way of the Ma'anthinle.

The scattered limestone wells in southern Masailand, sometimes descending as much as sixty feet beneath the surface, with ramps taking the cattle down to the water, resemble the wells at Wajir and other parts of the Northern Frontier. Is it too much to suggest that they should serve as constant reminders that Masailand could conceivably degenerate into a second Northern Frontier Province?

The situation can be better appreciated when it is realised that rivers and permanent waters are very scarce in the Masai Land Unit. The Ruvu ranks as the only large permanent river in Tanganyika Masailand—there are also two or three minor streams—and the Mara is the sole river in the same category in Kenya Masailand. The remainder are wet-weather streams. Admittedly there are three large lakes—Eyasi, Manyara and Natron—but, of these, only Eyasi can be used for stock. Manyara is largely useless because of fly, and Natron because of high salinity. A fourth lake, Embagai, is of great scenic beauty, but lies at the bottom of an almost inaccessible crater and is, in any event, highly saline.

Masai culture is based on cattle and involves possessing the maximum. In their opinion there can never be too many cattle but, from the foregoing, it will be apparent that because

of their present practices the long-term result is likely to be the reverse of the intention. Unfortunately, the Masai appear to be perfectly content with their methods and are apt to regard any conservation scheme which might restrict them from doing precisely what they want as unwarranted interference, or a device to deprive them of their land.

Considerable interest has been focused on Masailand during recent months and tribal representatives have openly expressed concern for the future. Anxiety has been occasioned primarily by political developments in East Africa, and only a handful of Masai seem to appreciate that the immediate danger to the tribe lies not so much in the political field, but rather that their deplorable misuse of their own land, grazing and water supplies will, unless checked, result in a situation not far removed from self-imposed genocide. If present methods of husbandry are allowed to continue, the land will become as useless to man as to beast. In that event the political problems of the Masai would be finally and decisively resolved, for who will covet Masailand when the desert takes charge?

Although they may not recognise the fact, the Masai are facing the biggest crisis in the recent history of the tribe, more serious, perhaps, than the rinderpest epidemics and internal dissensions at the end of the last century.

This is not to belittle the political considerations which, in themselves, leave the future of the tribe wavering in the balance. Masailand is surrounded by tribes who, having proliferated under British protection, now live in relatively congested regions. In the years to come it would be surprising if Kenya's expanding population did not look with increasing envy towards the sparsely inhabited plains of Masailand. The danger is accentuated by the presence of numerous Kikuyu cultivators who, in recent years, have been permitted to take up residence in Masailand.

There are few who will not sympathise with the Masai for wishing only to be left undisturbed to continue their traditional way of life, but it is impossible to ignore the fact that traditional life patterns are being disrupted at an alarming rate throughout the length and breadth of the African Continent, and it is absurd to hope or pretend that the Masai, alone of all the East African

tribes, will be able to remain aloof from change, however strongly they may wish to do so. It is essential for the Masai to burst forth from the mental chrysalis with which they have enveloped themselves and in which they have so long been content to remain dormant.

The problem with regard to the Masai is how they can best secure their tribal lands and help to forward the development of Kenya and Tanganyika, but with the minimum disruption to their way of life. Only by making an adequate contribution to the development of the country will they, as a minority group, be able to withstand the pressures on their land by African neighbours; pressures from traditional enemies which may prove irresistible when Britain no longer retains responsibility for the administration of the country.

This, then, is the essence of the dilemma. On the one hand the Masai regard civilisation with proud disdain and are understandably reluctant to abandon their customary mode of living; on the other, they must adjust to modern circumstances, however distasteful that may be, or go under. Fortunately for them the Masai hold a trump card in their hands, if only they are wise enough to play it correctly. Masailand contains a greater variety and greater numbers of wild animals than any comparable part of the African Continent, and it is probably true to suggest that the abundant sympathy and interest extended to the Masai people from so many quarters of the globe partly derives from the fact that they, almost alone, have contrived to retain extensive herds of wild animals in their midst. The Masai have long been the agency through which so much of East Africa's irreplaceable wild life has been preserved. It is not inconceivable that through the medium of an imaginative conservation programme the wild animals could, in turn, be the means of saving the Masai.

Bearing in mind the almost disastrous decline in wild life population elsewhere in East Africa, there is the possibility that in the years to come the Masai may find themselves in possession of a near monopoly in terms of extensive herds of plains game, with all that that implies from the standpoint of the tourist industry. In that event Masailand could become one of the larger revenue earners in East Africa. Tourism is still

in its infancy, but it is a very valuable potential source of revenue, and whoever possesses the most spectacular displays of wild animals will be in a remarkably strong position.

It is often said that the Masai are not interested in money. Until recently that was true, and the Masai have consistently resisted any suggestion of going over to a money economy but the stage has now been reached when they have no alternative. Money does not interest them, but it can be said that the Masai admit to certain requirements that only money can buy. Improved pastoral methods, water supplies, cattle dips, schools and so on, are all included on the list of Masai needs, and it seems improbable that any future African Government will be either willing or able to provide sufficient funds for these purposes. They must be economically self-sufficient if they are to maintain their tribal culture.

If Masailand is to be developed, substantial sums of money will be needed, and capital on the scale required can be provided only from external sources. At the same time it is equally true that the prospect of obtaining funds in order to extend present deplorable pastoral practices is extremely slender, since that would serve only to accelerate destructive processes and allow the desert to enter.

Masailand is already grossly overstocked with hordes of uneconomical scrub cattle. Contrary to Masai opinion, the solution lies in reducing, not increasing them. But if this were done, what alternative could be offered?

Many proposals have been put forward, most of which have proved unacceptable to the Masai. The suggestion has been made that agricultural development schemes should be initiated within the Masai Land Unit but, apart from Masai aversion to this form of labour, it would be as well to bear in mind the disastrous attempts to "develop" similar land in North America and elsewhere for agricultural purposes. Twenty million acres of the Great Plains of North America, for example, which were sown to wheat during the 1914/18 War had been abandoned by the 1930's. It is doubtful whether much of Masailand could be "developed" in the conventional manner without being destroyed in the process.

A method must be found whereby the tribe can achieve

economic self-sufficiency within the framework of Masailand's true ecological potential. If that is a fair appreciation of the problem, it seems logical to suggest that the situation could be met by a system based on the recognition of wild fauna as a valuable renewable natural resource and its proper utilisation for the benefit of the Masai.

The Masai have always regarded wild animals with indifference, but their attitude has recently deteriorated to scarcely veiled hostility. The change has come about because of the Masai belief that wild animals consume grazing and water which they consider should be used only by their cattle. It is difficult to persuade them that when the country was dominated by wild animals, in greater densities than to-day's domestic livestock, the habitat was not impoverished. They also believe that there is a danger of expropriation of their land for the creation of additional national parks. This reasoning has resulted in a situation of conflict which many Masai consider can best be averted by eliminating the wild animals.

Both these reasons are understandable but neither will stand up to close examination. Masai fears regarding the establishment of national parks in Masailand without their prior agreement no longer have any foundation and can be disregarded. And if the eradication of wild animals resulted in the Masai stepping up the numbers of domestic livestock, the result would be an accelerated rate of environmental decline.

The Masai attitude towards wild animals appears to have blinded them to the real value of the fauna which they possess in such abundance. Far from being a liability, wild life could be an asset of singular significance to the future well-being of the tribe. The point is well illustrated by the Tanganyika National Parks' estimate that 150,000 wild animals are killed each year in and around the Serengeti National Park by poachers. At a nominal valuation of £5 each, the annual loss is £750,000. There are no statistics showing the total estimated slaughter throughout Masailand but, since it is eight times the size of the Serengeti National Park, losses are unlikely to be less than those quoted. Yet because of their inimical attitude towards wild life, the Masai tolerate the poachers who, in the past, would not have dared set foot in Masai territory, in the

mistaken belief that the poachers are rendering a service. The thought does not seem to have occurred to the Masai that unscrupulous individuals are depriving them of a valuable asset. If the Masai appreciated the value of wild life, they would make very competent game wardens and would have little difficulty in controlling the activities of poachers.

The development of Masailand should be based on a balanced combination of wild and domestic animals. Cattle and sheep should continue to provide the subsistence requirements of each family unit, with numbers regulated to prevent overstocking. At the same time, the broader economy of the tribe as a whole should be based on the management of the wild life resource, both as a tourist attraction and as a source of marketable protein. The wild herds would also have to be carefully regulated, and the cropping of the surplus undertaken either by the Masai themselves or by wardens and hunters. Whatever methods are chosen, the essential point is that any game management project must belong absolutely to the Masai, with proceeds derived from tourist facilities and cropping schemes going into the tribal exchequer: otherwise, Masai suspicions will not be allayed and their support will not be forthcoming.

The Nairobi National Park is an excellent barometer for measuring the potentialities of Masailand in the context of game management. Admittedly the park is better endowed with water than the greater part of Masailand, but before it became a national park it was neither better nor worse in this respect than other parts of Masailand. The Nairobi National Park extends to approximately 44 square miles¹ and carries an average faunal population (excluding the smaller mammals and avifauna) in excess of 8,000 animals. Table I (pages 344-5) is the result of a series of monthly counts, commencing in July, 1960.

It is interesting to compare the figures given in Table II (pages 346-7) with the return from the present cattle economy. The Department of Agriculture considers that in order to sell 100

¹ The actual area is 45.07 square miles (28,844 acres) but for the purposes of the monthly census a small section of just over 1 square mile was excluded.

stock units it is necessary to maintain 450 to 470. On this basis the following acreages are required in order to sell 100 animals a year, each worth Shs. 400/-:

<i>Carrying Capacity. Acres per stock unit</i>	<i>Acreage required to sell 100 animals without losses</i>	<i>Anticipated losses</i>	<i>Total acreage required including losses</i>	<i>Gross Return per acre per annum</i>	<i>Gross annual return per sq. mile from domestic livestock</i>
5	2,250	2 - 3%	2,305	17/-	Sh. 10,880/-
10	4,500	5 - 8%	4,800	8/-	5,120/-
15	6,750	10%	7,225	5½/-	3,520/-
20	9,000	10 - 12%	10,000	4/-	2,560/-
25	11,250	12 - 15%	12,650	3/-	1,920/-
30	13,500	15 - 20%	15,500	2½/-	1,600/-
40	18,000	20%	21,600	2/-	1,280/-

In Rhodesia and South Africa game meat sells at Shs. 1/- to Shs. 1/6d. per lb. These figures therefore indicate that, providing satisfactory marketing arrangements can be made, the potential yield from cropping game in all but the few high fertility areas of Masailand would be more remunerative than the present yield from cattle. In addition there would, of course, be the return from tourist revenue and licence fees from the hunting industry.

On this basis there would appear to be some advantage in treating Masailand as one large Conservation Unit, with wild life fulfilling an important role as a cash crop through a combination of game cropping, hunting and tourism. This could be done if Masailand were zoned according to the best use to which each region should be put. Thus, certain areas, such as forest catchments, should be denied to domestic livestock: others might be devoted to agriculture, in which wild life would have to be eliminated: some would be pastoral zones in which the numbers of both wild and domestic animals would require careful regulation. The Mara fly country, the Ngong Reserve, Amboseli and possibly other areas should be retained either as wild life management zones or as Masai parks or Masai game reserves: but, whatever the principal function of each zone, all should be included within a single, comprehensive Masailand Development Plan. The implementation of such a plan would require substantial financial aid but, unless the problem



The poacher's snare is indiscriminate and may trap an elephant's leg (*above*) or its trunk (*below*). The trunk may be completely amputated



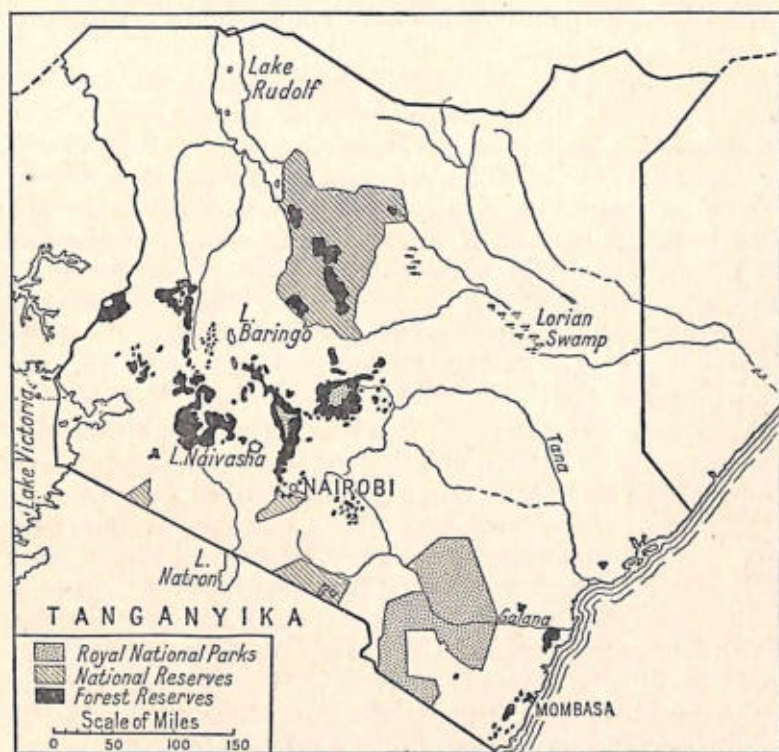
clusion of Tanganyika Masailand would nearly double that figure. This large expanse of territory includes most of the best game country remaining in East Africa. If wild animals were allowed to take their rightful place in the proper development of this extensive region, the future of wild life in East Africa would be assured, and the position of the Masai would be immeasurably strengthened.

16. The National Parks and Reserves

THE MAP OF KENYA shows large tracts of territory, totalling many thousands of square miles, neatly apportioned as "National Parks" and, until 1961, "National Reserves." A casual glance at the map will give the comforting assurance that with so much land devoted to the country's fauna, there can be little cause for pessimism. But gaily coloured lines on a map can sometimes create false impressions, and to obtain an accurate assessment of the wild life situation in Kenya it is necessary to examine what lies behind them.

It is not easy to trace the precise train of events leading to the establishment of national parks of Kenya. Captain Archie Ritchie, who became Game Warden in Kenya in 1923, had for some years been concerned at the insecurity of the game reserves because they could be created or abolished and the boundaries could be altered at any time by the Governor in Council with the approval of the Secretary of State. He therefore made strong representations to Government urging the necessity of establishing inviolable wild life sanctuaries. (The strength of national parks lies in the fact that they may be rescinded only by an Ordinance passed by Legislative Council.)

In 1930, the Society for the Preservation of the Fauna of the Empire, with the approval of the Secretary of State for the Colonies, sent Major R. W. G. Hingston to Kenya to investigate the game situation and make recommendations for the future. The position was reviewed at a conference held under the presidency of the Governor, Sir Edward Grigg, on 31st July, 1930, and, resulting from this, a sub-committee was appointed under Captain Ritchie's chairmanship to consider the possibility of establishing permanent faunal sanctuaries. The sub-



Kenya's National Parks, National Reserves and Forest Reserves as in 1960

committee recommended the establishment of three national parks, embodying the Northern Reserve, part of the Aberdares, and a region lying to the north of the Sabaki River, situated between the Giriama and Kamba reserves.

After hearing evidence from Ritchie, the 1933 Carter Land Commission supported his recommendation that the greater part of the Nairobi Commonage should become a national park. In the same year, the International Convention, held in London, laid down the principles upon which national parks and other sanctuaries were to be established. The ratification of the Articles of the Convention by the United Kingdom

Government in 1935, automatically bound the Government of Kenya to acceptance.

However, no practical substance was given to the establishment of national parks until, in 1939, the Kenya Government appointed a Game Policy Committee under Cecil Hoey's chairmanship "to consider and make recommendations concerning the institution in the Colony of a national game park or parks including their location, extent, constitution, control and management." In spite of the outbreak of war disrupting its work, the Game Policy Committee was able to recommend certain legislation which was adopted by the Legislature in January, 1945. The National Parks Ordinance was approved a few months later and, in December, 1946, Kenya's first national park was gazetted. This was followed by three other national parks of predominantly faunal interest, a number of historical and prehistoric importance and six national reserves.

Without Ritchie's constant efforts against what at times must have seemed almost insuperable difficulties national parks might not have been established in Kenya. It was typical of Ritchie that after working for many years for their creation he declined to take charge of them on the grounds that they would be in a far stronger position if divorced from Government control—a self-sacrificing decision which set the pattern for subsequent national parks in the other East African territories.

It is necessary to understand the essential difference between a national park and a national reserve. The International Convention of 1933 defined a national park as an area

- (a) placed under public control, the boundaries of which shall not be altered or any portion be capable of alienation except by the competent legislative authority;
- (b) set aside for the propagation, protection and preservation of wild animal life and wild vegetation, and for the preservation of objects of aesthetic, geological, prehistoric, historical, archaeological, or other scientific interest for the benefit, advantage, and enjoyment of the general public;
- (c) in which the hunting, killing or capturing of fauna and the destruction or collection of flora is prohibited except

by or under the direction or control of the park authorities.

In other words, national parks are areas in which the interests of wild life take precedence over every other consideration.

National reserves, on the other hand, were regions of high faunal interest originally referred to as "park adjuncts," which, owing to the existence of established human interests were ineligible for full national park status. National reserves were a local Kenya concept with no direct counterpart in other East African Territories. Although all hunting, killing or capturing of wild animals was prohibited in the national reserves, except in defence of life or property, the preservation of wild life was possible only so long as it did not interfere with the needs and rights of the human inhabitants.

The National Parks' Trustees were given responsibility for the preservation of wild life within the national reserves, but this was rarely in accord with human interests, for which the Administration was accountable. The system of dual control proved unworkable, resulting in a conflict of interests which engendered considerable misunderstanding and antagonism, finally leading to failure and abandonment of the national reserve experiment.

The local tribesmen resented the fact that responsibility for wild life on their land was vested in a public body which was not under direct Government control, and considered that wild animals were being protected at their expense with no tangible advantages to themselves. They also realised that national reserves were only an interim expedient, and were afraid that the next stage would be expropriation of their land for national park purposes. Their fears and suspicions were aroused and they adopted an increasingly hostile attitude towards the wild animals which they regarded as the cause of the trouble. At the same time, increasing numbers of domestic livestock were destroying the land and vegetation and making the habitat less suitable for game, thus steadily reducing the value of the national reserves as conservation areas.

The 1956 Game Policy Committee, appointed by the Government to make recommendations regarding the future of

Kenya's wild life, recognised these difficulties and proposed the abolition of all the national reserves. The Marsabit National Reserve was de-gazetted with effect from 1st January, 1961. The remaining national reserves, with the exception of the Tsavo Road and Railway Reserve, were de-gazetted on 1st July, 1961, and the Game Department assumed responsibility for wild life conservation in these areas. Some of the former national reserves have been placed under local control, as described later, and the remainder are now operated as controlled areas.

The Game Department regulates hunting through a system of "controlled areas" in which the shooting of game animals conforms to the needs of each area. The status of every species in each of the controlled areas is regularly reviewed by the Game Department which decides how many animals may be taken on licence. The Game Warden is empowered to impose any restrictions or conditions he sees fit and this flexible system enables him to control the volume of licensed hunting undertaken throughout the country.

The national parks and national reserves (excluding historical and prehistoric sites) as they existed prior to the alterations introduced in 1961, can be tabulated as follows:

NATIONAL PARKS

1. *The Tsavo National Park.* Gazetted April, 1948, and covering approximately 8,069 square miles. Kenya's principal national park which is described in some detail in Chapter 9. (In 1961 the Kenya Government agreed to add 513 square miles to the park. But the enacting legislation has still to be passed.)
2. *The Nairobi National Park,* of 45 square miles. Gazetted December, 1946.
3. *The Mount Kenya National Park,* of 228 square miles. Gazetted December, 1949.
4. *The Aberdare National Park.* 228 square miles. Gazetted May, 1950.

NATIONAL RESERVES

1. *The Marsabit National Reserve.* Gazetted September,

- 1948, and extending to 10,280 square miles in the Northern Frontier Province.
2. *The Mara National Reserve*. Gazetted November, 1948. Generally known as the Mara Triangle. 250 square miles situated west-south-west of Narok in the Masai Land Unit, enclosed by the Mara River, the Isuria Escarpment and the Kenya/Tanganyika boundary.
 3. *The Amboseli National Reserve*. Gazetted November, 1948; 1,259 square miles. Situated in the Masai Land Unit, some 150 miles south of Nairobi, on the Kenya/Tanganyika inter-territorial border.
 4. *The Ngong National Reserve*. Gazetted September, 1949. Adjoining the Nairobi Park and covering 455 square miles in the Masai Land Unit.
 5. *The West Chyulu National Reserve*. Gazetted November, 1948. 144 square miles including the western slopes of the Chyulu Hills adjoining the Tsavo National Park (West).
 6. *The Tsavo Road and Railway Reserve*. Gazetted August, 1949, and including the road and railway reserve leading through the Tsavo Park which, for purposes of administration, could not be incorporated within the park.

THE NAIROBI NATIONAL PARK

Originally included within the Southern Game Reserve, the Nairobi Park is, for its size, the most remarkable national park anywhere in the world, in that it still carries sizeable herds of wild animals within only a few miles of the City of Nairobi. Not many years ago, the whole of the Athi Plains, of which the Nairobi Park is a part, contained similar densities of wild animals. The remarkable concentrations of wild life on the Athi Plains no longer exist and only the Nairobi Park stands as a constant reminder of the wild splendour that has passed.

The park was originally part of the Nairobi Commonage which was occupied by several Somali families, the majority of them retired askaris who had served in the Army during the early days of the East Africa Protectorate. The Commonage

was used during both world wars for military purposes. In the Kaiser's War a camp and firing range were established and the route to the front went through the present park. During Hitler's War troops were again encamped at Mbagathi and part of the Commonage was used as a bombing range. Peace brought many demands for the Commonage to be used for a variety of purposes including native settlement, cattle holding grounds and military cantonments, but the recommendations of the Game Policy Committee fortunately prevailed.

From these harsh beginnings a national park has arisen which can justly claim to be unique. The Somali cattle have been gradually reduced from 3,500 to about 200; dams and roads have been constructed, salt licks replenished and the wild animals have returned in increasing numbers. To-day only a fence divides the old Africa from the new. On one side are the broad streets and fine buildings of modern Nairobi and the latest jet aircraft using Embakasi Airport; on the other the Africa of the old days before the construction of the Uganda Railway. There could be no greater contrast between the ways of Nature and of man.

The serious drought in 1961 resulted in heavy losses among the park's occupants. Large numbers of wild animals were attracted into the park by the presence of water. Shortage of grazing caused them to overflow on to neighbouring farms where many thousands were shot by ranchers who were themselves desperately short of grazing and water for their cattle.

The future of the Nairobi National Park is irretrievably linked with the adjoining Ngong Reserve. The park is far too small to be a self-contained faunal unit and, unless adequate measures are taken to protect wild life within the Ngong Reserve, the park will be unable to survive in its present form.

THE MOUNT KENYA NATIONAL PARK

The park incorporates the higher parts of Mount Kenya lying above the 11,000 foot contour, but contains only a limited number of wild animals since the bulk of the forested land lies

outside its boundaries. The Mount Kenya National Park is, therefore, primarily an area of scenic and botanical interest. At about 8,000 ft. the true forest gives way to bamboo which is dense and difficult to penetrate. Between the 10,000 and 12,000 foot levels strangely shaped giant heaths are to be seen enveloped in moss and lichen. About 12,000 feet, the heaths give way to giant groundsel and giant lobelia which grow to a height of 12 feet or more, and the open moorland is covered with a profusion of everlasting *Helichrysum*, growing almost to the snow line. Ferns and orchids can be seen as well as a remarkably varied avifauna, ranging from large eagles to dainty multi-coloured sun birds. The glaciers, tarns, frozen lakes and waterfalls above the snow line are of great scenic beauty and are easily accessible, but the twin peaks, Batian (17,058 ft.) and Nelion (17,022 ft.)—part of the cone of an ancient volcano that once exceeded the height of Kilimanjaro—and certain of the subsidiary peaks and glaciers can be attempted only by experienced climbers.

The usual route to the topmost peaks is by way of the south-east face. Starting at the upper hut, about five hours' rock climbing is required to reach the summit of Nelion. A high standard of climbing is required as the face is extremely steep with two severe pitches. From Nelion a further $1\frac{1}{2}$ or 2 hours is needed to reach the top of Batian. Five alternative routes have been made to the summit but they are all more difficult than the south-east face. Climbers are unlikely to succeed unless conditions are perfect.

THE ABERDARE NATIONAL PARK

With the exception of a narrow tongue of land running down to the forest edge, in which Treetops is situated, the Aberdare National Park is mainly above the 10,000 foot level. It consists principally of open moorlands covered with thick entanglements of wiry tussock grass interspersed with occasional stunted tree heaths. Ice-cold streams, well stocked with trout, thread their way across the moors and tumble over a series of waterfalls to form the headwaters of the three principal rivers

rising in the eastern Aberdares. On very rare occasions the moorlands have been briefly covered in snow from a freak fall.

In spite of the cold and mist, there is a surprising variety of wild life on the moorlands. The larger animals generally prefer the sanctuary of the forest but elephants can often be seen crossing the open moors in a leisurely fashion; as well as eland, waterbuck and many smaller creatures. Before the Emergency, this high plateau could be regarded as one of the few places in Kenya which man did not covet for his own purposes. There was practically no human disturbance except from a few Wandorobo honey-hunters.

Below the moorlands the country supports a dense cover of bamboo forest, with only a few cedar, podo or olive trees breaking through the canopy to relieve the tedious claustal atmosphere. The topmost extremities of the massed bamboos rhythmically bend and sway at every caprice of a wind which can be heard but not felt on the ground 20 to 30 feet below. An occasional unexpected open glade breaks the monotonous uniformity and provides a glimpse of the sky—a welcome relief from the cold and gloom in the bamboo, through which the sun can barely penetrate. At a lower elevation the dense forest, entwined by lianas and landolphas, provides an ample retreat for a variety of wild animals. Elephant, rhino, buffalo, bongo, eland, waterbuck, bushbuck, leopard, colobus monkey, giant forest hog and many other lesser creatures inhabit the Aberdares, and are frequently encountered on the open moorlands.

The peace and solitude of the park was rudely shattered when, in 1952, large numbers of Mau Mau thugs established themselves in the Aberdares, sallying forth from the shadows of the forest to terrorise the surrounding countryside. For several years the gangs lived by trapping and snaring and thousands of wild animals were killed. Each group of terrorists had its own team of expert hunters whose function it was to keep the gang adequately supplied with meat. Snares were set in every likely place and parts of the Aberdares were almost denuded of game. The activities of the Security Forces were scarcely less damaging. The pseudo-gangs had, to a large extent, to emulate the terrorist practice of living off the country: the

Army went into action with automatic weapons and mortars: tons of bombs hurtled down from the sky and fighter aircraft strafed the widely dispersed hide-outs. Members of the Security Forces had frequent encounters with rhinos and other wild animals which had been wounded during the course of operations and, as a result, were not well disposed towards human beings.

The extent of the destruction of wild life will never be known, but it must have been very great. The bongo herds were particularly seriously affected and one of three known bongo concentrations, originally estimated at 200 animals, was thought to have been almost obliterated. Numerous bongo skins were recovered from Mau Mau hide-outs, and Major Venn Fey reported having found the pelt of a golden cat in one encampment—the first indication that this rare animal was to be found anywhere in Kenya beyond the confines of the Mau and Cherangani forests. Several years must elapse before the fauna of the Aberdares recovers from the effects of the Emergency.

Reports are still heard of the spotted lion which is said to inhabit the Aberdares. It is beyond dispute that lions are found in the high country but there is no conclusive proof that they differ from the plains lion. On one occasion a lion attacked and killed a mule belonging to a safari party at 10,000 ft. on Mount Kenya. There are also reports of lions on the Aberdares from Gandar-Dower who searched for evidence of the spotted lion and, more recently, from persons operating in the area during the Emergency. The general consensus of opinion is that they are plains lions which have retained their cub spots into adult life. All that can be said is that the existence of this mysterious animal has yet to be disproved.

THE MARSABIT NATIONAL RESERVE

The Marsabit National Reserve was the rump of the original Jubaland, Sugota and Northern game reserves and was the largest and least known of any of Kenya's national parks or national reserves. In 1961, following the recommendations of the Game Policy Committee, the Marsabit Reserve, together

with all other national reserves, was abolished, and its status and boundaries revised.

The position to-day is that Government has offered the National Parks' Trustees the two small national parks recommended by the Game Policy Committee. One, of 39 square miles, embraces the greater part of the forest region on Mount Marsabit: the other, of 22 square miles, surrounds the Uaso Nyiro safari lodge. As an interim measure large areas around the two parks have retained temporary national reserve status until the boundaries and other details have been finally settled, when they will be de-gazetted. It is questionable whether such tiny parks can survive unless stringent protective measures are applied to the surrounding regions.

The Government has announced that the forested cap of the Matthews Range is to become a nature reserve. In addition there are several important forest-clad mountain ranges, including the Ndotos, Mount Kulal, Mount Nyiro and Ol Donyo Mara, which require special protective status. In the dry Northern Frontier Province the few isolated mountain and hill features are the only means of stabilising water sources, but pressure from excessive numbers of domestic livestock on the surrounding plains has led to invasion of the forest regions and severe damage to the catchments. Protection of the stream sources from trampling and grazing is of the utmost importance. Unless this is done, the ground becomes so compacted that rain is unable to soak in and merely runs to waste, instead of being stored underground for gradual release into the sand rivers which, for many months of the year, are the only water supplies available throughout the greater part of the Northern Frontier Province.

It is therefore particularly gratifying to know that Government intends to give the higher reaches of the Matthews Range the status of a nature reserve, thus affording complete protection to this important forest region, and it is to be hoped that measures will be taken to protect the other forested hills and mountains already mentioned.

The remainder of the erstwhile Marsabit National Reserve is now a controlled area which is open to carefully regulated hunting under the direction of the Game Department. In

certain hunting blocks only foot safaris are allowed—an innovation which the true sportsman will warmly welcome, and which it is hoped will be extended to other areas of Kenya. At the same time, and in conjunction with rotational cattle grazing schemes, game cropping is being undertaken for the benefit of local tribesmen.

Leroghi and all the plains to the west of the Matthews and Ndotu mountains were included in controlled grazing schemes while the area was still a national reserve but, because the National Parks' Trustees would not agree to allow the numbers of wild animals to be controlled, there were complaints from local tribesmen that game was consuming all their grazing. Under the new system the Game Department counted all the wild ungulates in the area and agreed with the African District Council on the number of both game and cattle units to be allowed in each grazing scheme. The agreed number of game units was never less than the numbers existing at the time of the count, and varied between 8 per cent and 15 per cent of the total biomass in each grazing scheme. Regular cropping by the Game Department now keeps the numbers of wild animals within the agreed total and, in the first few months of operating the new system, more than £1,000 was paid into the African District Council treasury.

Control of grazing, which must include proper facilities for marketing excess domestic livestock, will undoubtedly prove beneficial to the land and the local people, as well as ensuring the continuance of reasonable numbers of wild animals in the region.

THE MARA NATIONAL RESERVE

The Mara/Loita region is without question the best game country remaining in Kenya to-day. The undulating plains, intersected by extensive fingers of riverine forest, form a well-balanced habitat capable of supporting a remarkably varied fauna, ranging through plains game to riverine species and forest dwellers. It is one of the very few parts of East Africa where one can see elephant, rhino, lion, buffalo and leopard

in one locality within the space of a few hours. The Mara is also the last real stronghold of the major predators—lion, leopard and cheetah—in Kenya.

Prior to the Second World War, great concentrations of wild animals inhabited the Mara Plains. In the early post-war period the region was thrown open to shooting which was uncontrolled in everything but name. Biltong hunters took advantage of the excessive number of animals then allowed on a full licence, until the position was rectified by reducing the schedule of animals on a licence and instituting the controlled area system. For a short while there was very heavy slaughter, and biltong and meat were carted away by the lorry load. This sorry episode marked the beginning of the continuing decline of the great assemblages of Mara plains game. Although reduced in numbers, substantial herds of wildebeest, buffalo, impala, zebra, topi, Thomson's and Grant's gazelles are still to be seen in the Mara, together with lions, leopards and elephants. But with poaching going on all around the fringes, and increasing encroachment of domestic livestock, the Mara is a diminishing asset.

Early population densities are unknown, but were probably at least three times heavier than those quoted by Dr. Fraser Darling, who informs us that the following ungulates were resident in the Mara in the latter part of 1958:

Wildebeest	15,000
Zebra	12,000
Thomson's gazelle	12,000
Impala	5,000
Topi	4,000
Buffalo	4,000
Kongoni	1,000
Giraffe	750
Waterbuck	500
Eland	500
Grant's gazelle	500
Elephant	500
Reedbuck	250
Oribi	150
Rhinoceros	100

THE NATIONAL PARKS AND RESERVES

Hippopotamus	3-5 per mile of river and creek.
Dikdik	Common in bush but numbers not estimated.
Chanler's reedbuck	} Occasional in own habitat.
Klipspringer	
Steinbok	
Duiker	
Giant forest hog	Some in the Mara Forest.
Bush pig	Rarely seen but signs noticed.
Wart hog	Very common.

More recent figures for the population are given by Stewart and Talbot following their aerial survey in May, 1961: wildebeest, 17,817; zebra, 20,867; topi, 4,111; buffalo, 5,934; elephant, 455; kongoni, 721; eland, 1,500-2,250 ("estimate based on count"); rhino, 54 ("minimal count; only small proportion of total").

The Mara is one indivisible ecological unit with the Serengeti National Park, and the extension of the Serengeti Park boundaries northwards to the Kenya/Tanganyika border, thereby linking the entire Serengeti/Mara complex, has gone far to stabilise the richest faunal region in East Africa. All that stands in the way of accomplishing this admirable objective is a small wedge-shaped piece of land, scarcely 100 square miles in extent, which lies immediately south of the Tanganyika side of the territorial boundary. This Lamai Wedge is infested with tsetse fly and therefore unsuitable for cattle, neither has it any authorised human occupants. Nevertheless the Tanganyika Government has so far refused to allow the Lamai Wedge to be incorporated within the Serengeti Park because the Watende regard it as a possible area for future tribal expansion. The wonder is not that the Watende have raised objections but that the Tanganyika Government has so steadfastly upheld their dubious claims. One can understand the Watende being reluctant to vacate the area, for the whole of the Lamai Wedge is superlative game country through which the Mara herds must seasonally migrate. Poachers' camps and extensive Watende snare lines have turned Lamai into a carnage area

on a scale that the wild herds cannot withstand. The Lamai Wedge is a suppurating wound in a vital part of the Serengeti and the Mara and, unless the Tanganyika Government is prepared to incorporate the area within the Serengeti Park, there will be a constant drain on the region's wild life, the effects of which will be felt over a wide area and which will go far to nullify the constructive work of conservation on both sides of the border. A decision is needed here.

With the abolition of the Mara National Reserve the Masai agreed to pass bye-laws creating an African District Council Game Reserve under their direct control, and this proposal was formally approved on 8th March, 1961. The Game Reserve covers 700 square miles, including the whole of the former Mara National Reserve and part of Controlled Area Block 61. Apart from regulating the conduct of visitors, the bye-laws prohibit burning throughout the area, except when undertaken on a planned rotational basis by the warden employed by the African District Council. Within an inner area of 200 square miles the bye-laws prohibit the entry of Masai and their domestic livestock. The inner sanctum will be provided with roads and a safari lodge and will be developed for tourists. The outer sanctuary is split into a series of blocks for camping and photography, each block being reserved exclusively by one party at a time. The Kenya Government has contributed £25,000 for the construction of a safari lodge and is providing the Masai with an annual subsidy of £8,000.

THE AMBOSELI NATIONAL RESERVE

Amboseli takes its name from the largest of the group of lakes and swamps surrounding Ol Tukai. The lake is approximately 16 miles long by 7 wide and for the greater part of the year the surface is dry, but saline water is found at a depth of about 15 feet. Only very rarely is the rainfall sufficient to provide more than a few temporary shallow pools scattered across the lake bed.

Ol Tukai derives its importance from the swamps and ponds which are fed from Kilimanjaro, the water emerging from



Two species which are rarely seen. *Above*, the bongo, which inhabits dense high-altitude bamboo forest. *Below*, the aard-wolf, a nocturnal animal sometimes mistaken for the hyaena



springs situated at the tips of the lava flow. They provide the only perennial water for many miles around and have, therefore, become a focal point for wild life in an otherwise arid region. During the dry season wild animals concentrate in the vicinity, remaining there until the onset of the rains when they disperse.

Ol Tukai is attractive to cattle as well as to wild animals and difficulties have arisen through the conflicting claims of wild and domestic animals competing for the limited available water and grazing. In the dry season large herds of Masai cattle move into Ol Tukai. Thousands of scrub cattle pulverise the friable soil as they trek to and from the swamps and springs. Over large areas constant trampling has destroyed the last remnants of grass and vegetation and caused much damage to forest cover.

The widespread destruction cannot be remedied unless firm measures are taken to limit the numbers of cattle entering the area. This could be achieved through providing alternative watering-points some distance from Ol Tukai but a proposal to pipe water to outlying areas had to be abandoned because of the heavy expense involved. Fortunately the problem was partially solved when, in November, 1957, the Engon'ngo Naibor Swamp situated west of Ol Tukai began to rise, possibly because of seismic disturbance, and measures were taken to canalise the increased flow towards Lake Amboseli, some 9 miles away. The installation of drinking troughs has enabled the Masai to water their cattle away from the main wild life zone but does not appear to have prevented them from continuing to bring their livestock into the swamps and forests of Ol Tukai.

In July, 1961, the Kajiado African District Council assumed control of the reserve, which is now known as the Masai Amboseli Game Reserve. Responsibility for imposing strict regulations to control grazing and prevent further damage is therefore in the hands of the Masai themselves. It is now in their own interests to devise a practical solution to a problem which has grown progressively more acute and which has been accentuated by severe drought.

Bye-laws have been passed controlling burning, grazing,

cultivation and other land-use practices, as well as regulating the conduct of visitors. Government has agreed to allocate a further £25,000 with which to construct a new safari lodge, replacing the Ol Tukai lodge which has fallen into disrepair. In addition the African District Council now receives an annual subsidy of £8,500 which is linked with observance of agreements reached regarding the West Chyulu and Kitengela areas of the Ngong National Reserve.

THE NGONG NATIONAL RESERVE

The 455 square mile Ngong National Reserve and the Nairobi National Park which it adjoins constitute a single ecological unit and the park is to a very large extent dependent on the degree of protection accorded to wild life within the Ngong National Reserve. The Ngong Hills, rising to a little over 8,000 ft., are the most prominent feature of the reserve. They have great ritualistic significance for the Masai (see page 79) and are important as a catchment zone and as a recreational area for the constantly expanding population of Nairobi.

Now that control has been handed to the African District Council, bye-laws have been passed controlling burning, fencing and agricultural development in the Kitengela area of the Ngong National Reserve. This block of country, 300 square miles in extent, constitutes the vital faunal reservoir to the south of the Nairobi National Park. Although the Kitengela was previously protected by the presence of East Coast Fever, there was every likelihood that dipping, fencing and the development of proper ranching practices would overcome the disease factor. Fencing would, of course, prevent the movement of game into and out of the Nairobi Park. The African District Council does not propose opening the Kitengela as a rival tourist attraction to the Nairobi National Park, and the overall subsidy is partly linked with the area for the reason that the game protected in the Kitengela earns its keep when it enters the Nairobi Park. There is a plan to crop wildebeest and zebra when they move southwards out of the Kitengela and threaten established ranches. The remainder of the former

Ngong National Reserve has become a controlled area in which no hunting is permitted, thus preserving the *status quo*.

THE WEST CHYULU NATIONAL RESERVE

The West Chyulu National Reserve was designed to protect the western section of the Chyulu Range, along the crest of which runs the boundary of the Masai Land Unit. The reserve was established to safeguard the important catchment zone feeding the Mzima Springs which, in turn, provide Mombasa with the greater part of its water requirements. Rain falling on the Chyulu Hills percolates through the porous volcanic cinder which acts as a gigantic sponge. Much of the water eventually finds its way to the southern part of the hills, flowing beneath the lavas and emerging as the crystal clear waters of Mzima Springs, at the rate of about 50 million gallons a day. The Chyulu Hills also help to sustain the Tsavo and Galana river systems which are the life lines of the Tsavo National Park. Therefore, although the hills do not contain any great quantity of wild animals they are essential to the well-being of the Tsavo Park—as well as the port of Mombasa—and are one of the most important water catchments in the eastern part of Kenya.

The Chyulu Hills, which rise to a height of 5,600 ft. in the north and 7,200 ft. in the south, are of recent origin and consist of a series of volcanic cones with lava flows extending to the lower levels. The western side of the range enjoys a higher rainfall than the eastern. Consequently patches of montane forest are to be found on the western slopes but only solitary trees to the east. The forest would undoubtedly expand but for the frequent fires which sweep the hills and which, in recent years, have become a routine measure. The established forest is ringed by a narrow belt of *Erythrina* the bark of which is fire resistant and thus serves to protect the forest against what Fraser Darling has termed “excessive pyromania.”

The annual rainfall in the hills exceeds 60 inches but the porous nature of the soil results in the total absence of surface water, and probably for this reason game is not very plentiful.

Most of the species common to the Tsavo National Park are to be found on the lower slopes up to a height of about 4,500 ft. At the higher altitudes buffalo, eland, bushbuck, leopard, bush pig and many other forest-dwelling species occur. Chanler's reedbuck appear to be permanent residents and fifty or more are sometimes seen together. In 1955 a small herd of roan antelope was reported from the southern end of the Chyulu Range. This was an interesting occurrence since roan have not been seen in this locality for many years. Until 20 years ago greater kudu were known to inhabit the southern end of the hills. There have been no authentic reports of them for more than a decade but it is possible that a few may have managed to survive.

In a relatively small area on and around the Chyulu Hills one can trace the progressive stages of evolution of soil, vegetation and forest, commencing with raw volcanic ash and culminating in the rich montane forest clothing the crests. Here one can see the dark, fertile top-soil which has slowly built up over hundreds of years. Not many miles away—in Ukambani—the reverse process has taken place in a very much shorter period of time. There, thousands of acres of top-soil have been lost, swept away by casual peasant cultivation.

In 1892, Bishop Tucker described Ukambani as "a fertile and prosperous country" and Kibwezi as a place "where woods and forests are a marked feature of the landscape." Near Machakos was "some beautiful forest country. . . . The country is a magnificent one, with great possibilities for the agriculturist and cattle rearer." This description does not hold good to-day.

Until 1961, the eastern slopes of the Chyulu Hills were part of a controlled area and the western slopes a national reserve. The eastern side of the range, being Crown Land, has now been added to the Tsavo National Park. The western portion of the Chyulu Hills is, however, situated within the Masai Land Unit and cannot, therefore, qualify for national park status. The African District Council has agreed to pass by-laws controlling burning, fencing and cultivation on the western slopes in the area originally incorporated in the national reserve. Because of the presence of tsetse fly these

measures should suffice to maintain the Chyulu Hills in their pristine state. The Government's subsidy to the Masai relates in part to observing this agreement.

THE TSAVO ROAD AND RAILWAY RESERVE

No change is contemplated in the status of this area and the Trustees of the National Parks retain control of faunal matters in these two narrow strips which bisect the Tsavo National Park.

ZONING

An important aspect of the Kenya Government's statement of game policy in February, 1961, was the decision to zone Kenya according to the use to which a particular region is to be put. Zone 1 will consist of areas where the preservation of fauna and flora will be of paramount importance, such as national parks and similar sanctuaries. Zone 2 will include regions where wild life and human enterprise are considered to be complementary to each other and can continue to exist side by side. Finally, there will be the third zone in which agriculture or other forms of development make it necessary for wild animals to be eliminated. This appears to be a very realistic approach to the problem. In the past the limited resources of the Game Department have been spread too thinly all across the country and the Department has, therefore, been prevented from functioning as effectively as it would wish. By drawing in its horns and concentrating its personnel and resources on the areas of greatest faunal importance the Game Department will be able to achieve much more than in the past.

PART SIX

Conclusions

THE UNDERLYING DESIGN of British administration in East Africa has been consistently devoted to avoiding repetition of the pattern set in opening up new countries in other parts of the world, where development so frequently consisted of uncontrolled exploitation of natural resources, without making adequate provision for their perpetuation.

The lodestar of British policy has always been the paramountcy of native interests but, in regard to land, excessive altruism has defeated its own object and would have been better served with some degree of benign firmness. Government's reluctance to use compulsion in the adoption of proper agricultural and pastoral systems without the consent of the tribesmen concerned has led to gross overstocking and large-scale desiccation of pastoral lands. Strenuous efforts are being made to remedy the effects of overgrazing and keep the deserts at bay through the introduction of rotational grazing schemes. Seven million acres have now been brought under some form of grazing control but only time will tell to what extent these measures will retrieve the situation. It is unlikely that much of the damage can be undone.

The wild life and wild lands of East Africa must have seemed inexhaustible when Europeans first set foot in the country and this is not the only occasion in history when the impression of limitless abundance has proved illusory. The serious depletion of wild fauna may be attributable more to a failure to appreciate its potentialities than to any other factor but, in the light of increasing knowledge of the subject, there is every reason to believe that, even at this late hour, the implementation of imaginative policies would go far to remedy the

present critical position. Failing this, Kenya's wild life faces the prospect of extermination.

The future depends to a considerable degree on whether the Government will recognise wild fauna as one of the few natural resources the country possesses in any abundance and give effect to a clearly expressed and firmly administered land-use policy. Conservation will never be effective without firm administration. Soil deterioration, water shortage, forest destruction, declining wild life, are all closely inter-related facets of a single problem and must be treated as a whole.

This book attempts to draw a picture of the accelerating reduction of wild populations during the brief span of six decades, with the object of demonstrating how the decline can be arrested and how Kenya's wild life can be effectively utilised for the benefit and enjoyment of man. No one expects the country to return to the state it was in during the old days when the entire landscape was alive with innumerable wild herds. Those days will never return and, however much we may regret their passing, we must accept and meet the challenge of changed circumstances. The concept of preservation is a fading ideal, perhaps never fully attainable, which is no longer in tune with events. The East African fauna requires a more substantial base of justification than preservation. Wild animals can be considered useful only if they can be used, and it is vitally necessary to utilise the wild fauna in order to ensure its survival.

The wonders of wild nature are part of the wealth of Africa and of mankind, which the world cannot afford to lose. Few other countries in the world possessed such an abundant and varied fauna as was to be found in Kenya, Uganda and Tanganyika. Yet we have allowed this unrecognised wealth to be dissipated through failure to appreciate its significance. Not only does this amount to neglect of our responsibility as custodians of an international asset but, in the parochial sphere, where money and energy are fervently devoted to discovering methods of broadening Kenya's economy in order to increase productivity and raise living standards, the potentialities of the country's one incomparable natural resource which, if properly

used, could do so much to help achieve this purpose, have been almost entirely overlooked.

The full potential of the land must be developed by every means, but development must take the form most suited to the prevailing circumstances and the purpose to which an area is best adapted. Development of faunal resources is as important as the development of any other organic natural resource and should be undertaken to the maximum extent consistent with its perpetuation. The natural surplus can be legitimately used without detriment to the continuation of the resource.

For many centuries Africa supported the largest and most varied complex of grazing and browsing animals the world has ever known which, in terms of carrying capacity, was superior to domestic livestock, without in any way harming the land. Ecological stability existed throughout that period, but has been destroyed in half a century without due consideration being given to cause and effect.

The destruction of Africa's wild life is an example of profligate waste of a notable natural resource which threatens to surpass the near extermination of the American bison but, in spite of this catastrophic example before our eyes, we appear to be indifferent to profiting from the hard-earned experience of others.

There has perhaps been an altogether naïve belief that science can always cover up man's mistakes and provide solutions in the form of fresh alternatives and new resources, but neither science nor all the ingenuity of the human race can recreate the creatures of the wild or expel the deserts once they have taken charge. We would do well to remember that man's most remarkable achievements are puny when measured against the works of Nature.

One of the neglected facts of life is that a country with an economy based almost exclusively on agriculture cannot hope to raise the standards of its spiralling human population to the extent of an industrialised country. The high productivity of farming in many European countries is achieved only through wealth derived from industry, which creates the means whereby high prices can be maintained and therefore enables the productivity of the land to be increased. In under-developed

countries a rising human population is practically synonymous with soil depletion. With little hope of controlling the birth rate, the increasing human population is incapable of being geared to economic development. Mineral deposits are almost non-existent in Kenya and major industrial undertakings are at present only pipe dreams: yet without industry to absorb surplus populations and without wealth with which to improve the land, there are few alternatives to the continuance of subsistence agriculture in much of the country, which in turn intensifies soil exhaustion. The need for food still remains paramount, and the prevailing conditions increase the urgency of utilising the resources which are naturally to hand.

Substantial sums of money have been spent on the development of fish farming in East Africa with the object of helping to overcome the shortage of protein, and these projects have been very successful. The need for protein has thus been recognised but the infinitely greater sources of cheap natural protein readily available through harvesting the wild herbivores, particularly in sub-marginal and tsetse country, have been utterly neglected.

Kenya possesses large tracts of unused lands which now produce almost nothing but which are ideally suited for ranching wild animals. These "waste" lands can produce crops at least as valuable as farm crops. Wild animals are the most efficient medium for converting scrub vegetation into protein and, under sub-marginal conditions, constitute the optimum form of land use. There is no adequate substitute for wild animals under these conditions, and proper administration of wild lands can produce a valuable return through recreation and meat production.

Attempts to raise domestic livestock in regions unsuited to them merely result in putting the land out of production. Entirely different types of animals are required for arid and sub-marginal regions, and we have them ready to hand in the form of wild game.

Although much of Kenya's marginal land has degenerated to the point where its potential has diminished—and degradation is far more rapid in Africa than elsewhere—the remarkable resilience and regenerative powers of wild animals would

resuscitate the depleted herds if proper systems of wild life husbandry, designed to work in accord with Nature, were adopted, and would bring marginal areas into effective use. The greatest opportunity for wild life lies in the poorer parts of the country in regions which are unsuited to intensive methods of land use.

The wild lands and the wild life that is an integral part of them are the most exceptional natural assets Kenya possesses. It is almost impossible to assess the value of space or the worth of solitude. They are valuable commodities but, in East Africa, there is a noticeable lack of appreciation of their significance. Americans and Europeans are finding increasing difficulty in savouring the few remaining wilderness areas in their own countries. So many others are intent on the same objective that it is becoming less easy of attainment, but Africa can still offer the wild places they seek.

Not many years ago a visit to Africa was a protracted and expensive undertaking but, to-day, it is only a short trip from Europe and a safari is no longer the preserve of millionaires. As travel becomes simpler and cheaper the recreational value of wild lands increases. There is universal interest in the fauna of Africa, and the earning capacity of wild nature through tourism and hunting could become an important factor in the development of Kenya. Wild life is the only unrivalled attraction East Africa possesses and visitors will come only so long as it remains. Without it there would be nothing to draw fugitives from civilisation and, as wild animals disappear in other parts of Africa, the value of our own stocks rises proportionately. Other countries with less power to attract have thriving tourist industries, but we have not made a sufficiently determined effort to advertise our attractions.

There are other kinds of hunters than those who go out with a gun, and a head mounted on the wall is not the only trophy people seek. Some hunt with camera or binoculars, and a growing number hunt for peace and solitude. Wild nature fulfils a deep and growing human need and those who find it obtain perhaps the most rewarding trophy of all, a replenishment of mind and spirit which has become a dire necessity for over-civilised man.

Many people object to hunting but they appear to overlook the value of sportsmen to the territory. The hunting industry materially aids the country's revenues and was estimated to bring in £510,000 to East Africa in 1960. Controlled hunting is also the most logical method of cropping game. An understocked region will not affect the fullest utilisation, while overstocking results in lessening the productive capacity. There is a point beyond which overstocking leads to a lowering of productivity and danger to the habitat and it becomes essential to remove excess stocks.

In East Africa the question of under-harvesting scarcely arises, except in the case of the Queen Elizabeth National Park in Uganda where there is an excess population of hippos, and the Murchison Falls and Tsavo national parks where there are too many elephants. The immediate problem is to re-create the depleted herds. Once that objective has been accomplished it will then be necessary to ensure that numbers are not allowed to exceed the optimum carrying capacity of the land, for to do so would result in exhaustion of the habitat and a drastic lowering of the number of animals capable of being supported on the range. The careful regulation of numbers is an essential ingredient of the art of management and can best be done through the medium of scientifically managed hunting.

This controlled off-take is in stark contrast to the system prevailing in East Africa to-day. Throughout the country incalculable numbers of wild animals are being trapped and snared each year by African poachers and, unless this massive slaughter can be controlled, East Africa's wild life cannot survive. The only practical method of halting the decline is to introduce systems whereby it is more in the Africans' interests to participate in controlled cropping yielding a sustained profit rather than to continue indulging in wholesale, indiscriminate slaughter.

The existing national parks give an illusion of faunal security but are inadequate to serve the purpose for which they were created. This is particularly true in respect of preserving representatives of all the indigenous species in their natural habitats. Kenya's national parks contain examples of little more than two-thirds of the major mammalian species in-

digenous to the country. Species not found in any of the national parks are:—*Oryx beisa*, topi, sitatunga, oribi, greater kudu (apart from an exceptionally rare individual in the Tsavo National Park), Hunter's antelope, sable antelope, roan antelope, Jackson's hartebeest, Thomas's kob, reticulated giraffe, Grevy's zebra, and dugong. There is an urgent need to extend the national parks system to embrace areas of exceptional faunal significance before they are taken up for other purposes, and the need for a marine park off the East African Coast, to protect the coral reefs and the wealth of spectacular tropical fish life associated with them, should not be overlooked. The aim—which will not always be possible to achieve—should be to surround each national park with a game management area which would act as a protective outer buffer zone for the central kernel of the park proper. The game management areas would serve as wild life reservoirs for the parks and, at the same time, would be regions wherein the overflow of animals from the parks could be cropped. Every encouragement should be given to Africans to enable them to establish their own parks on lines similar to the Meru District Game Reserve.

The tendency in the past has been to concentrate exclusively on the preservation of the larger mammals and, in the process, the smaller creatures have been seriously neglected. The East African avifauna is as varied, profuse and spectacular as the mammalian fauna and includes about a thousand separate species of birds. Destruction of habitat and other forms of development have resulted in a marked decline in bird populations, less noticeable perhaps than with the mammals, but equally serious. Special measures will be necessary to protect East Africa's bird life. A particularly encouraging and useful start has been made by declaring the greater part of Lake Nakuru, and the whole of Lake Manyara, sanctuaries with national park status. Both lakes are of exceptional ornithological interest and Lake Nakuru, with more than 370 recorded species and immense seasonal concentrations of flamingos, has been described as the finest ornithological spectacle in the world. Additional bird sanctuaries should be established in selected areas.

Kenya's forests are of great importance to the future of wild

life and an annual harvest of wild animals might equal, or even exceed the value of the timber produced. At least 25 years are required to raise a crop of soft-wood, yet during the same period annual crops of wild animals could be produced without detriment to the established principal use. The supplementary value of wild life as a part of forest management appears to have been obscured.

The establishment of additional nature reserves will go some way to secure Kenya's wild life. A few have been in existence for several years, including one of 3,200 acres in the Mount Kenya Forest and a second, covering the upper reaches of Mount Elgon, is scheduled to be given national park status. Another nature reserve, extending to 105,000 acres in the South West Mau Forest Reserve, was gazetted on December 23rd, 1960. This large tract of high-altitude bamboo country is a particularly impressive catchment forest and noteworthy as the most important bongo habitat in Eastern Africa. It also contains considerable numbers of elephant and buffalo, as well as giant forest hog, golden cat, yellow-backed duiker and numerous other species, quite apart from an interesting avifauna. It is to be hoped that the Forest Department will follow this up by establishing a system of nature reserves within the Forest Estate to safeguard areas of special interest and importance. Adequate blocks of land should be permanently protected because of their botanical, zoological or scenic interest and as natural laboratories. They may contain outstanding examples of different types of indigenous forest; they may serve as green belts surrounding ever-expanding towns. Most important of all, complete protection must be given to the diminishing but absolutely vital forest catchment areas on which the country's water resources depend.

However nebulous the future, it is conditional upon the degree of support derived from the people locally. Success in wild life conservation will be possible only if the majority of Africans favour the perpetuation of wild animals. To attempt to conserve wild life without the co-operation of the African people is merely to fight a delaying action, and almost as short-sighted as allowing it to be exterminated. This underlines the necessity for enlisting popular support from the people



Above, in East African waters, the crocodile performs a function similar to that of the hyaena and vulture on land. *Below*, flamingo on Lake Nakuru, most of which is now a National Park



primarily concerned by demonstrating the value of wild life through tourism and food production and educating them to a fuller appreciation of their own heritage. Perception and co-operation can best be promoted through pilot schemes and demonstration game management projects designed to show Africans the worthwhile advantages of wild life conservation, which would enable them to see that, far from inhibiting the development of the country, wild life can substantially assist towards that end. Communal projects demonstrating the value of wild fauna under different types of land use would also go some way in showing Africans that an individual killing game illegally is doing so at the expense of the community, particularly when they see that sustained slaughter results in the reduction of breeding stocks and does not produce as high a return as would be obtainable through legal means.

A glance at the map will show that much of the finest game country remaining in Kenya to-day is in Masailand. Faunally speaking Masailand represents the biggest prize and the biggest challenge in the wild life field in East Africa. More than any other single factor—tsetse alone excepted—the tolerant attitude of the Masai has been of supreme importance in saving substantial remnants of the East African plains game. But, in recent years, Masai tolerance has altered to scarcely-veiled and mounting antagonism and, without their co-operation, wild life cannot hope to survive. The future of game impinges to a marked degree on the relationship between the local people—the Masai in particular—and the wild life with which they share their land.

Masai fears and suspicions would be largely overcome, and they would be more amenable to adopting measures designed to conserve their natural resources, if they were to receive firm guarantees regarding the future of their land, and if the tribe obtained an adequate financial inducement to conserve their fauna. The generous subsidy granted by the Kenya Government in 1960 is a most constructive step in this direction.

Although Kenya has long possessed extremely competent agricultural and veterinary services, and the science of land use ecology has not been neglected, the implementation of sound land use policies, especially in marginal areas, has not pro-

gressed as far as the Departments concerned would wish. Africa, with its unequalled arrays of wild animals, is notably lacking qualified ecologists, and the Game Department would be strengthened by the appointment of ecologists to its staff. There is a wide range of problems requiring investigation, and a comprehensive research programme should be drawn up and implemented with the aid of overseas ecologists who should be invited to carry out research into specific problems. The little research done so far has been admirable in itself, but has not had the advantage of any overall co-ordination or direction as part of a clearly defined plan; neither has it been sufficiently co-ordinated with investigations in other parts of Africa. There has thus been some over-lapping or duplication, insufficient dissemination of results and inadequate communication or co-operation between research workers in East Africa and farther afield. There has also been a lack of continuity which has lessened the effectiveness of much of the work that has been done, and the scientific importance of the work has not been adequately appreciated. These shortcomings have been pointed out by the scientists involved and could be remedied by means of a centrally directed research programme.

A decisive conservation policy can be applied only when research has first produced conclusive results, and effective results will be achieved only through a close working relationship with the veterinary, agricultural and allied sciences. It would, therefore, seem logical to place wild life research in East Africa under the umbrella of the existing research organisations at Muguga where excellent facilities already exist, and which appear to be the obvious organisations to co-ordinate investigations into land use problems. Wild life research cannot be isolated from the broader issues of land use.

Opportunities for research are almost unlimited, for the surface of the comparatively new scientific discipline of wild life and human ecology has scarcely been scratched. The very breadth and scope of this new field of research makes it doubly important to ensure that the limited resources available are directed towards investigating the most pressing and practical aspects of the problem without assuming too academic a character at this stage.

The importance of research is self-evident, but since local governments are unlikely to be able to provide finance for the purpose, it is necessary to look to international sources for financial and technical assistance.

Research is needed into methods by which the carrying capacities of different habitats can be determined: factors limiting the increase of wild populations and how they can be overcome: territorial and breeding behaviour: the significance of migratory movements: food and water preferences of the different species: the precise niche-function of each species in the biotic community and its inter-relationship within the whole habitat, particularly its effect on soil and water: the role of the predators and the effects of natural predation: the effect of fire and its use as an instrument of habitat management: the game/cattle relationship with particular regard to disease. Above all, the prime object of research should be to acquire knowledge relating to conservation of the habitat. This is the core of the whole problem and what we know least about, for if one can succeed in conserving an adequate habitat, the mammals would, to a great extent, conserve themselves.

Much credit is due to the Ministry of Tourism, Game, Forests and Fisheries and to the Minister, Mr. W. E. Crosskill, for the statement of wild life policy issued in February, 1961. This imaginative and far-reaching document, details of which are given in Chapter 16, means that Kenya at last has a policy where none previously existed. This marks a great step forward and the importance of the official policy statement cannot be gainsaid, but its effectiveness will have to be judged by the degree to which Government intends to implement it. Decisive implementation will go far to secure Kenya's wild fauna, but Government has added the proviso that it can only be applied subject "to the limits of the finance available for this purpose." It was unfortunate that the release of the policy coincided with the announcement of a substantial reduction in the Game Department's annual subvention. Unless the financial limitations can be overcome the new statement of policy, for which Kenya has waited so long, may

come to be regarded as little more than an expression of pious hopes.

Kenya is a poor country and the requirements of education, medical and other social services rank higher than wild life conservation. Opportunities for obtaining adequate finance locally are very slender and it therefore becomes necessary to seek financial support elsewhere. But, this is unlikely to be rewarding without first drawing up a comprehensive blue-print, presenting wild life as part of the natural wealth of the country. Unless this is done neither the necessary degree of support can be expected from financiers nor are long-term conservation measures likely to be introduced.

It is not necessary to look beyond the Kikuyu Land Unit to see a perfect example of the effect of proper planning and its impact on a primitive peasant economy. The Swynnerton Plan has brought about an agrarian revolution in the areas to which it has been applied, and must rank as one of the most remarkable achievements in the post-war history of Kenya. A Swynnerton Plan is also required in the field of wild life conservation—a charter for wild life which will enable Kenya's fauna to be sustained and intelligently utilised as a renewable natural resource of the first magnitude.

Such a blue-print would go far in cutting adrift from the emotional standpoint and establishing wild fauna as an asset of great economic potential which could be not only of pre-eminent importance to the revenues of the territories concerned but also of significance to the African people.

What chance will the African of the future have to know wild places and wild animals unless measures are taken to protect them now? However strong to-day's reaction against the past; however urgent the demand for Progress, or seductive the superficial attractions of the utopian urban life may now seem, the time will surely come, as has happened in almost every other country in the world, when the burdens of undiluted civilisation become intolerable and a man, be he black or white, must periodically seek the inspiration of wild places. To modern man almost nothing is left as created by Nature. Somehow development seems so much more acceptable, more in keeping with the world we live in, than simply

leaving Nature alone and enjoying it for its own sake. Everything must be moulded, pruned, realigned and reshaped. We seem to act as though we believe that Nature's handiwork is inadequate and must always be bulldozed into some other configuration, the better to suit our immediate purpose. Each year the wild places are reduced; each year the majestic wild creatures become fewer. The sounds of axe and tractor reach deeply into places where they were previously unheard, and the forests and remote wilderness, no longer capable of resistance, give way and surrender to man's unceasing demands.

Whether or not the present generation of Africans yet knows it, the time must come when Africans, with their intense, deep-rooted love of the earth, will begin to know and need the exhilaration of wild places and will realise that unless Progress walks in harmony with the earth, it can be little more than a superficial veneer.

TABLES

APPENDICES

GLOSSARY

ACKNOWLEDGMENTS

BIBLIOGRAPHY

INDEX

TABLE I

	17/7/60	21/8/60	18/9/60	23/10/60	27/11/60
AARD WOLF	—	—	1	—	—
BABOON	49	70	24	75	146
BUSHBUCK	4	8	15	8	7
BUSH PIG	—	—	—	—	—
CHEETAH	1	—	4	5	—
CROCODILE	1	3	1	1	—
DIKDIK	—	—	—	3	1
DOG, WILD	7	—	—	—	—
DUIKER	1	—	1	1	—
ELAND	10	27	22	100	80
FOX, BAT-EARED	7	2	—	2	—
GIRAFFE	47	83	80	112	106
GRANT'S GAZELLE	285	239	232	351	433
HARE	—	—	—	—	—
HIPPOTAMUS	3	4	3	4	2
HYAENA, SPOTTED	—	1	2	6	1
HYRAX, ROCK	13	27	17	—	—
IMPALA	437	270	380	732	768
JACKAL, SILVER-BACKED	13	4	4	9	14
KONGONI	1,096	956	1,017	1,500	1,492
LEOPARD	—	—	—	—	—
LION	5	13	22	17	15
MONGOOSE, BLACK-TIPPED	—	—	—	1	—
MONKEY, SYKES	—	—	16	—	—
MONKEY, VERVET	1	—	—	15	—
OSTRICH	144	137	140	99	131
REEDBUCK, BOHOR	—	1	—	1	—
REEDBUCK, CHANLER'S	—	—	—	—	4
RHINOCEROS	—	—	1	11	2
STEINBOK	2	3	—	—	1
THOMSON'S GAZELLE	216	249	192	330	303
WART HOG	126	126	95	202	286
WATERBUCK	99	103	151	115	153
WILDEBEEST	2,205	2,395	3,279	2,572	2,175
ZEBRA, BURCHELL'S	2,334	2,636	3,891	1,826	2,704
	7,106	7,357	9,590	8,098	8,824

NAIROBI NATIONAL PARK GAME CENSUS, 1960-1

18/12/60	22/1/61	26/2/61	26/3/61	23/4/61	28/5/61	25/6/61	Average
—	—	—	—	—	—	—	—
291	53	237	168	262	120	329	152
12	14	12	12	13	8	17	11
—	—	1	—	—	—	—	—
4	5	—	1	3	4	1	2
1	1	2	1	1	2	1	1
1	3	3	2	6	2	3	2
—	17	16	14	17	—	16	7
4	—	—	2	—	2	1	1
98	68	58	70	35	35	20	52
4	—	2	6	2	2	9	3
83	100	71	86	116	123	71	90
433	413	373	327	305	389	312	341
—	1	2	—	1	2	2	1
—	4	4	—	2	3	4	3
4	4	1	3	1	5	13	3
18	10	10	3	24	19	37	15
506	535	388	728	764	756	830	591
19	23	8	16	16	12	16	13
1,177	1,514	2,059	1,000	991	999	951	1,229
—	—	1	—	—	—	1	—
4	8	13	2	17	13	17	12
—	—	1	1	—	—	—	—
4	8	—	—	—	9	—	3
16	28	3	16	9	14	2	9
142	123	152	93	58	84	90	116
2	4	2	8	5	8	—	3
5	—	—	6	—	8	6	2
1	—	—	2	2	5	3	2
4	2	3	1	—	3	4	2
430	316	271	395	383	411	300	316
229	251	243	346	263	234	237	220
103	112	163	140	96	124	135	125
2,460	3,724	6,255	4,774	1,470	1,149	1,418	2,823
1,572	2,640	2,650	1,208	489	1,149	1,028	2,011
7,627	9,981	13,004	9,431	5,351	5,694	5,874	8,161

TABLE II

Note that weights vary over the geographical range of the species. Live weights are based on data supplied by the Tanganyika Game Department, and represent an estimated average for each species, taking into account an appropriate proportion of

	Average number of animals 1960-1961	Estimated average live weight (lb.)
BABOON	152	38
BUSHBUCK	11	120
CHEETAH	2	110
CROCODILE	1	No data
DIKDIK	2	10
DOG, WILD	7	60
DUIKER	1	25
ELAND	52	1,200
FOX, BAT-EARED	3	10
GIRAFFE	90	1,700
GRANT'S GAZELLE	341	120
HARE	1	4
HIPPOTAMUS	3	(4,000)
HYAENA, SPOTTED	3	110
HYRAX, ROCK	15	5
IMPALA	591	100
JACKAL, SILVER-BACKED	13	28
KONGONI	1,229	300
LION	12	330
MONKEY, SYKES	3	11
MONKEY, VERVET	9	9
OSTRICH	116	No data
REEDBUCK, BOHOR	3	100
REEDBUCK, CHANLER'S	2	85
RHINOCEROS, BLACK	2	2,200
STEINBOK	2	25
THOMSON'S GAZELLE	316	43
WART HOG	220	120
WATERBUCK	125	410
WILDEBEEST	2,823	460
ZEBRA, BURCHELL'S	2,011	550

8,161 = 185 per square mile

BIOMASS IN THE NAIROBI NATIONAL PARK

young animals. Weights shown in brackets are based on inadequate data and are, therefore, only approximations.

<i>estimated dressed carcass weight</i>	<i>cropping percentage</i>	<i>estimated annual yield of meat (lb.)</i>	<i>biomass</i>
—	—	—	5,776
60	20	132	1,320
—	—	—	220
—	—	—	?
—	—	—	20
—	—	—	420
—	—	—	25
600	20	6,240	62,400
—	—	—	30
1,000	15	13,500	153,000
65	20	4,433	40,920
—	—	—	4
—	—	—	12,000
—	—	—	330
—	—	—	75
65	25	7,683	59,100
—	—	—	364
150	20	36,870	368,700
—	—	—	3,960
—	—	—	33
—	—	—	81
—	—	—	?
50	20	30	300
45	20	18	170
—	—	—	4,400
12	20	5	50
25	20	1,580	13,588
70	50	7,700	26,400
200	20	5,000	51,250
260	20	146,796	1,298,580
255	20	102,561	1,106,050
		332,548 lb.	3,209,566 lb.
		= 7,500 lb./sq. ml.	= 73,000 lb./sq. ml.

APPENDIX A Regulations issued by the Imperial
British East Africa Company under the title
“ Sporting licences ”

1. Every person desiring to take or kill game in the territory of the Imperial British East Africa Company must obtain a licence for the purpose from the Company.
2. Licences are obtainable from the Administrator at Mombasa, or from the District Superintendents at Wanga, Melindi, or Lamu.
3. The fee for a licence is £25, and such licence enables the holder to take and kill game in any part of the Company's territory, the animals at present comprised within the designation being the elephant, rhinoceros, and the larger antelopes.
4. The licence must be taken out and paid for in advance, and will run for a period not exceeding 12 months, and is non-transferable. The licence must bear the name in full of the person to whom it is granted, the date of issue, and period of duration, and the signature of the Administrator or his duly authorised representative. Any omission or alteration of these particulars will render the licence invalid. All licences are to be submitted to the inspection of the Superintendents of Districts when required, and the non-production of a licence when duly demanded will, unless a good and sufficient reason is given, entail the same penalties as the non-possession of a licence.
5. If a licence is lost or destroyed, the licensee can obtain a fresh one for the remainder of the term for which the lost licence was available, on payment of a sum calculated at the same ratio as the sum total for the whole term.
6. The importation and use of fire-arms and ammunition are in all cases subject to the Special Regulations which may be in force under the General Act of the Brussels Conference.
7. It is notified that, in accordance with the Schedule of Duties laid down in the Zanzibar Commercial Treaties of 1885 and 1886, ivory obtained in the Company's territory is liable to a tax of 15 per cent. *ad valorem*, and rhinoceros horn and hippopotamus teeth to 10 per cent. *ad valorem*.
8. Licensees, while in the Company's territory, will be subject to the Laws and Regulations of the Company, and, before obtaining a licence, will be required to deposit a sum of £100 as surety, which will be returned to the

APPENDIX A

licensee on leaving the country, provided he has conformed to the said Laws and Regulations in good faith.

9. Any person found taking or killing game in the Company's territory without a licence shall be liable to a penalty of not less than £50.

APPENDIX B Report by His Majesty's Special Commissioner on the Protectorate of Uganda

As regards the condition of the Baganda people, before British interference put an end to the cruelties of King Mwangwa, those who will consult the works of Speke and Grant, of Stanley, Lugard, various missionary writers, Catholic and Protestant, and the letters and records which the Baganda chiefs themselves have compiled and published will see the state of things that existed at that time.

The vicinity of the King's Palace at Mengo was blood-stained, almost as the cities of Benin and Dahome, with the constant slaughter and maiming of wives, Councillors, pages and slaves. King Mutesa beheaded his wives for forgetting to shut the door. Pages were horribly mutilated for treading on the tail of a pet dog. In Busoga, until the establishment of something like British rule about two years ago, no girl of pleasing appearance was allowed to remain in her own home, or with a husband of the peasant class. She was immediately haled off to swell the harem of a local Chief, or even sent to some magnate in Uganda or Bukedi. Much of the same practice prevailed in Unyoro and Toro. Wars would take place resulting in the complete depopulation of a country, of its domestic animals, and of its cultivation. Take, for example, the Gwas 'Ngishu Plateau in the Elgon district. This was at one time inhabited by a powerful clan of Masai, who, like their modern descendants, the Kwavi, were good cultivators. They established many flourishing villages, and possessed large herds of cattle. Attacked by the Nandi, the Elgeyo, and by another branch of the Masai, they were nearly completely extirpated, their villages were destroyed, and such as escaped the spears of the victorious enemy took refuge in far distant countries. The result was the complete depopulation of a large and fertile district, which has remained depopulated to this day, all natives being afraid to settle there for fear of the predatory habits of the Nandi and the adjoining tribes. Many parts of the Mau Plateau show traces of once numerous villages, which are now without a single human inhabitant. I have dilated at some length on the good qualities of the Baganda at the present day, yet if the unwritten history of Central Africa were known they may have at times made themselves loathed and detested as cruel raiders and pitiless conquerors, their utmost concession to the conquered race no doubt being the sparing of the women as the wives of the conquerors, the men and

children being ruthlessly killed. The raids and ravages of Kabarega alone were sufficient excuse for the substitution of European control. He in quite recent years had completely depopulated many parts of Unyoro and Toro, and a portion of Uganda.

When I visited the snows of Ruwenzori I obtained as guides some of the Bakongo people, who inhabit the forested slopes of that mountain range. These people seemed to me at first unthinking savages of simple geniality, completely ignorant of everything outside their forest world. I asked them what they thought of the white men, and whether they were vexed or otherwise at our having assumed the mastery. They spoke, in reply, with an emphasis and a vigour of diction that surprised me. They said, "The white man is good; we would do anything for him. Did he not take away Kabarega, who for more years than we can remember made our lives too miserable to be borne? The Bakonjo were once a powerful and numerous tribe. They dwelt in the plains at the base of the mountain, fearing no one. We always had plenty of food, and we possessed large herds of sheep and goats, and some cattle. Kabarega came upon us with his soldiers, and they destroyed all we possessed, and killed many of our people, driving the rest of us into the forests, to live without houses, and without sheep or goats. We dared not make a fire lest its smoke should draw down on us Kabarega's raiders. They followed us even into our forests, and we then had to go and live on the rocks amongst the 'white stuff' (snow). Here many of our members died of the chest complaint (pneumonia). We should all of us have died finally had not the white man taken away Kabarega and brought peace into the land. Now we shall descend into the plains once more, into the warm country, where we can have our bananas, and even keep cattle. Why, So-and-so (a Mukonjo chief) has actually got two cows, and they are not taken from him by the Banyoro!"

Africa No. 7 (1901)

APPENDIX C Brigadier General Swayne's rough estimate of numbers of animals in the Somaliland Protectorate in November 1905

1. Mountain zebra	None within the Protectorate; 1,000 between the Webbe and the Juba.
2. Giraffe	None within the Protectorate; 200 between the Webbe and the Juba.
3. Eland	Nil.
4. White-tailed gnu	Nil.
5. Wild ass	10,000 in the maritime hills of the eastern part of the Protectorate.
6. Buffalo	Nil. A few have been seen on the Webbe.
7. Elephant	100-1,000 in the Ogaden country beyond the British boundary.
8. Vulture	20,000.
9. Secretary-bird	Nil.
(a) Greater bustard	500. Very greatly diminished; requires protection.
(b) Florican	5,000.
10. Owl	100,000 small grey. 5,000 large horned.
11. Rhinoceros-bird	5,000,000. A pest—attacks the sores on camels and horses and makes incurable wounds.
12. Ostrich	1,000-20,000 beyond the Protectorate; very greatly diminished, as witness the reduced export of feathers.
13. Oryx beisa	5,000. Greatly reduced.
14. Greater kudu	1,000 in the Golis range and in the Gaḡabursi and Jibril-Aboker country; mostly females and in danger of decadence.
15. Lesser kudu	2,000 in the foot-hills of the Golis range and in the hilly Gadabursi and Jibril-Aboker countries.
16. Hare	1,000,000.
17. Grant's gazelle	Nil.
18. Thomson's gazelle	Nil.

APPENDIX C

19. Clarke's gazelle dibatag	5,000 (mostly beyond our borders in the "Haud"). Only found in Somaliland and, I fear doomed, owing to necessity of arming the tribes.
20. Waller's gazelle	10,000. Diminished.
21. Hartebeeste (Swaynei)	800. Very greatly diminished and in danger of extermination.
22. Klipspringer	1,000. Diminished and require protection.
23. Aoul (Seommerring's gazelle)	500,000.
24. Dero (Speke's gazelle)	500,000.
25. Dik-Dik (Arabic) (Segaro-Somali)	600,000.
26. Cheetah	5,000.
27. Aard-wolf	500. (Rare. Perhaps to be found in "Sorl.")
28. Hyaena (the large spotted variety)	200,000. Very destructive to young game and to children. Arrangements have been made to decrease the numbers by offering a reward.
29. Jackals	500,000. Very destructive to young deer during the few days following birth. The numbers should be diminished.
30. Lion	3,000.
31. Leopard	5,000.
32. Wart-hog	5,000. Diminished considerably.
33. Bush-pig	Nil.
34. Small cats	5,000. (Civet, the genet, and yellow striped and also the Egyptian "tabby.")
35. Baboons	100,000.
36. Apes	20,000.
37. Ant-eaters	2,000.
38. Hyrax Abyssinicus	100,000.
39. Foxes (three varieties)	20,000.
40. Porcupine	10,000.
41. Badger	2,000.
42. Beira (Klipspringer)	1,000.

Note.—The beira, hartebeeste Swaynei, and Clarke's gazelle are not, I believe, to be found outside Somaliland, and, therefore, require special watchfulness. Every effort will be made to induce the armed tribesmen to spare the beautiful dibatag Clarke's gazelles, and, as they live in thick patches of dur grass seven feet high, they may have a chance of escaping destruction, but I doubt it.

APPENDIX D Analysis of Baobab Samples

	A	B	C
MOISTURE	70.6	75.8	74.9
ASH	14.8	7.6	13.3
CRUDE PROTEIN	4.3	3.5	3.9
ETHER EXTRACT	2.4	0.7	0.9
CRUDE FIBRE	36.5	57.5	52.6
CARBOHYDRATE	42.0	30.7	29.3
COPPER (ppm)	4.8	2.8	3.9
PHOSPHOROUS (P_2O_5)	0.137	0.174	0.137
CALCIUM (CaO)	5.47	2.35	4.16
MAGNESIUM (MgO)	0.374	0.374	0.260
CaO/ P_2O_5	39.9 : 1	16.1 : 1	28.5 : 1

The analysis was undertaken in November, 1961, by Dr. M. L. Sapiro and Mr. D. A. Howard at the Veterinary Laboratories, Kabete, who comment: "In relation to Kenya pastures:

Copper: A & C similar to slightly deficient pastures. B would be considered deficient.

P_2O_5 : Equivalent to poor, deficient pastures.

MgO: Equivalent to satisfactory pastures.

CaO: Up to ten times higher than the average Kenya pastures. This high Calcium content produces very high CaO : P_2O_5 ratios, the ideal being between 1-2 : 1. There would be cause for concern if cattle were receiving large quantities of fodder with such a high CaO : P_2O_5 ratio.

Crude Protein: The crude protein levels above are very low, and it has been shown by Duthie and Glover (1958)¹ that the percentage of digestible

¹"The Digestible Protein of Ruminant Feeds by Calculation" by D. W. Duthie and J. Glover. *E. A. Agric. J.*, 24, 33 (1958).

APPENDIX D

protein falls sharply when the crude protein contents are as low as the above, e.g., when the C.P. % is 4, the percentage digestible protein is only 1.1% (or 27.5% of the protein), but when the C.P. % is 10, the percentage digestible protein is 5.5% (or 55% of the protein)."

A further seven samples of baobab stem and bark were analysed by Dr. H. W. Dougall of the Agricultural Grassland Research Station, Kitale, and his results coincided very closely to these.

Glossary of Scientific Names

PLANTS

Aloes, wild
Bamboo
Baobab
Cedar, East African
Coffee, wild
Desert rose
Fig, wild
Gall acacia
Groundsel, giant
Hadama (Orma (Galla))
Heath, giant
Henna, wild
Landolphia
Leleshwa
Lichen
Lobelia, giant
Mimosa
Mpaga (Swahili)
Mvuli
Olive, wild
Podocarpus
Sansevieria
Setyot (Kipsigis)
Strychnos
Thorn, "wait-a-bit"

Aloe spp.
Arundinaria alpina
Adansonia digitata
Juniperus procera
Coffea spp.
Adenium coëtaneum
Ficus spp.
Acacia drepanolobium
Senecio (Dendrosenecio) spp.
Euphorbia robecchii
Erica arborea
Lawsonia inermis
Landolphia sp.
Tarchonanthus camphoratus
Usnea sp.
Lobelia spp.
Acacia spp.
Adenia globosa
Chlorophora excelsa
Olea spp.
Podocarpus sp.
Sansevieria spp.
Mimulopsis solmsii
Strychnos sp.
Acacia mellifera

Plants from which poisons or antidotes are prepared

Arrow poisons

Acokanthera friesiorum
Acokanthera longiflora
Acokanthera schimperi
Acokanthera venenata
Adenium sp.
Dioscorea dumetorum

GLOSSARY

Arrow poisons (cont'd)

Strophanthus eminii
Strophanthus kombe
Urginea brachystachys

Coagulents

Euphorbia sp.
Fagara sp.

Arrow poison antidotes (reputed)

Agauria salicifolia
Fadogia erythrophloea
Fadogia sp.
Temnocalyx obovatus

Fish poisons

Mundulea sericea
Neorautenenia pseudopachyrhiza
Tephrosia vogelii

MOLLUSCS

Giant land snail
 Giant land snail

Archachatina degneri
Achatina achatina

FISH

Barbel
 Goby
 Lung-fish
 Tilapia

Barbus spp.
Gobius spp.
Protopterus spp.
Tilapia spp.

REPTILES

Crocodile
 Mamba, black
 Monitor lizard
 Puff-adder

Crocodylus niloticus
Dendroaspis polylepis
Varanus niloticus
Bitis arietans

BIRDS

Cormorant, long-tailed
 Darter
 Flamingo, greater
 Flamingo, James's

Phalacrocorax africanus
Anhinga rufa
Phoenicopterus ruber
Phoenicoparrus jamesi

Flamingo, lesser
 Francolin, yellow-necked
 Griffon, Rüppell's
 Guineafowl, helmeted
 Kori bustard
 Lammergeyer
 Lanner falcon
 Marabou stork
 Ostrich, Masai
 Ostrich, Somali
 Plover, Egyptian
 Plover, spurwing
 Quail, harlequin
 Sand grouse, chestnut-bellied
 Secretary bird
 Tick bird (Red-billed ox-pecker)
 Verreaux's eagle
 Vulture, white-backed

MAMMALS

Aardvark
 Aard wolf
 Addax
 Ass, wild
 Aoul (Soemmerring's gazelle)
 Baboon
 Beaver
 Blau-bok
 Bongo
 Bontebok
 Buffalo, American
 Buffalo, East African
 Bushbuck
 Bush pig
 Camel
 Cane rat
 Caracal
 Cheetah
 Colobus, black-and-white
 Colobus, red
 Dibatag
 Dikdik
 Dog, wild
 Dugong

Phoeniconaias minor
Pternistis leucoscepus
Gyps rüppellii
Numida mitrata
Ardeotis kori
Gypaëtus barbatus
Falco biamicus
Leptoptilos crumeniferus
Struthio camelus massaicus
Struthio camelus molybdophanes
Pluvianus aegyptius
Hoplopterus spinosus
Coturnix delegorguei
Pterocles exustus
Sagittarius serpentarius
Buphagus erythrorhynchus
Aquila verreauxii
Pseudogyps africanus

Orycteropus afer
Proteles cristatus
Addax nasomaculatus
Equus asinus somaliensis
Gazella soemmerringii
Papio spp.
Castor canadensis canadensis
Hippotragus leucophaeus
Boocercus eurycerus
Damaliscus pygargus
Bison bison americanus
Syncerus caffer
Tragelaphus scriptus
Potamochoerus porcus
Camelus dromedarius
Thryonomys swinderianus
Felis caracal
Acinonyx jubatus
Colobus abyssinicus
Colobus badius
Ammodorcas clarkei
Madoqua kirki
Lycaon pictus
Dugong dugon

GLOSSARY

Duiker, common
 Duiker, yellow-backed
 Eland
 Elephant
 Fox, bat-eared
 Genet cat
 Gerenuk (Waller's gazelle)
 Giant forest hog
 Giraffe, reticulated
 Giraffe, Masai
 Giraffe, Rothschild's
 Grant's gazelle

Races

Gnu, white-tailed
 Golden cat
 Guanaco
 Hare
 Hartebeest

Races	}	Coke's
		Jackson's
		Lelwel
Hybrids	}	Tora
		Kenya
		Nakuru
		Neumann's

Hippopotamus
 Hunter's antelope
 Hyaena, spotted
 Hyaena, striped
 Hyrax, rock
 Hyrax, tree
 Impala
 Jackal, side-striped
 Jackal, golden
 Jackal, silver-backed
 Klipspringer
 Kob, Thomas's
 Kudu, greater

Sylvicapra grimmia
Cephalophus silvicultor
Taurotragus oryx
Loxodonta africana
Otocyon megalotis
Genetta tigrina
Litocranius walleri
Hylochoerus meinertzhageni
Giraffa reticulata
Giraffa camelopardalis tippelskirchi
Giraffa camelopardalis rothschildi
Gazella granti brighti
Gazella granti lacuum
Gazella granti notata
Gazella granti petersii
Gazella granti raineyi
Gazella granti robertsi
Gazella granti roosevelti
Gazella granti serengetae
Connochaetes gnou
Felis aurata
Lama guanicoe
Lepus capensis
Alcelaphus buselaphus cokii
Alcelaphus buselaphus jacksoni
Alcelaphus buselaphus lelwel (Syn.
Bubalis niediecki)
Alcelaphus buselaphus tora
A. b. jacksoni x cokii
A. b. lelwel x tora
Hippopotamus amphibius
Damaliscus hunteri
Crocuta crocuta
Hyaena hyaena
Procavia habessinica
Dendrohyrax arboreus
Aepyceros melampus
Canis adustus
Canis aureus
Canis mesomelas
Oreotragus oreotragus
Adenota kob thomasi
Tragelaphus strepsiceros

- Kudu, lesser
 Lechwe, black
 Lechwe, red
 Leopard
 Lion
 Mongoose, black-tipped
 Mongoose, marsh
 Monkey, copper-tailed
 Monkey, Sykes (or blue)
 Monkey, vervet
 Muskrat
 Oribi
 Oryx, beisa
 Oryx, fringe-eared
 Oryx, white
 Otter, clawless
 Prong-horn antelope
 Quagga
 Reedbuck, bohor
 Reedbuck, Chanler's
 Roan antelope
 Roe deer
 Rhinoceros, Asiatic two-horned
 Rhinoceros, black
 Rhinoceros, white (or square-lipped)
 Sable antelope
 Saiga antelope
 Serval
 Shrew
 Sitatunga
 Speke's gazelle
 Springbok
 Steinbok
 Topi
 Thomson's gazelle
 Vicuña
 Wart hog
 Waterbuck, common
 Waterbuck, defassa
 Wildebeest, blue
 Wolf
 Zebra, Burchell's
 Zebra, Grevy's
- Tragelaphus imberbis*
Kobus leche smithemani
Kobus leche leche
Panthera pardus
Panthera leo
Herpestes sanguineus
Atilax paludinosus
Cercopithecus nictitans schmidti
Cercopithecus mitis
Cercopithecus aethiops
Ondatra zibethica alba
Ourebia ourebi
Oryx beisa annectens
Oryx beisa callotis
Oryx leucoryx
Aonyx capensis
Antilocapra americana
Equus quagga
Redunca redunca redunca
Redunca fulvorufula chanleri
Hippotragus equinus
Capreolus capreolus
Didermocerus sumatrensis
Diceros bicornis
Diceros simus
Hippotragus niger
Saiga tatarica
Felis serval
Crocidura spp.
Tragelaphus spekei
Gazella spekei
Antidorcas marsupialis
Raphicerus campestris
Damaliscus korrigum
Gazella thomsoni
Vicugna vicugna
Phacochoerus aethiopicus
Kobus ellipsiprymnus
Kobus defassa
Connochaetes taurinus
Canis lupus
Equus burchelli
Equus grevyi

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On each map the shaded areas indicate those parts of Kenya inhabited by the species concerned. Shading and hatching are used to indicate the relative abundance of that species in different parts of the country. The terms "frequent" and "occasional" may be criticised on the grounds that they are the result of subjective choice, since they are not related to actual numbers of animals but rather to observation of the frequency of occurrence of the species in different areas. However, they provide useful information which is not available on a map showing presence or absence alone. The maps do not show any numerical comparisons between species, but simply between different areas inhabited by the same species. When referring to wildebeest, for example, the term "frequent" implies an order of numbers very different from the same term used for rhinoceros. The status and distribution of many species vary from year to year. The originals of the maps, which are retained at the headquarters of the Kenya Game Department, are therefore frequently amended to keep them up to date. I greatly appreciate being permitted to reproduce them here.

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