



Attaching radio collar to young member of a cow-calf group in the North.

(ii) **Elephant project - Lake Manyara National Park**

**I. Douglas-Hamilton**

This project is now at the end of its fourth year with another six months to go. Data has been accumulated on the social behaviour and population dynamics; the feeding behaviour and ecological effects of this small population of approximately 500 elephants.

**Social behaviour:**

Intensive study of the social organisation based on 414 known animals, starting with the simple association of a calf with its mother, has shown that elephants are found in units of increasing complexity, from a family unit composed of related cows and their offspring, through aggregations of 2 - 3 family units (extended family units), to clans numbering over 100 elephants. Over 8,000 records of these associations show that the basic family units are stable although larger groups do gradually form sub-units which eventually split apart following increase through recruitment. This stability makes it possible to know the exact number in each family and this information can be used in ground counts.

The development of the bond between a calf and its mother and the calf's changing relationships with other members of the family as it matures have been recorded in quantitative detail. By taking nearest neighbour records for adults and calves of different ages and sexes, it is possible to

discover the strength of each bond between individuals within a group and to analyse the social forces that give the family units their cohesion.

For instance, it appears that the bond between adult siblings is often stronger than the bond between an old cow and her grown-up daughters. New family units are usually formed by one or more daughters with their offspring developing a sub-group and eventually leaving the older cows. It is unusual for two old matriarchs to drift apart, each with several generations of offspring, after the death of a common parent.

The adult bulls however leave the family unit on reaching the age of puberty largely due to active rejection by older cows. Thereafter they maintain no significant association with any particular family unit, except for brief periods when a cow is in oestrus.

#### **Distribution:**

The distribution of elephant groups has been plotted from the air every month. Knowing the exact number in each family unit, it has been possible to follow up each aerial sighting on the ground and to make accurate estimates of elephant densities in different habitat types even in areas of poor visibility. A noticeable shift during the dry season was seen away from the escarpment and *Acacia tortilis* woodlands to the ground water forest and swamps.

#### **Radio tracking and movements:**

Long term movements have been studied this year, using Mr. Howard Baldwin's equipment. Five successful immobilizations have been carried out and the fixing of a radio collar to an elephant has become a routine technique. Three elephants were tracked in Manyara, one in Tarangire and one in Serengeti. The Manyara and Tarangire studies lasted for four and two months respectively. In both areas the mean movement was less than 4 miles per day, but the Tarangire elephant living in a relatively arid environment had a range of 320 sq. km which is over four times greater than that of the Manyara elephant. The radio tracking data, taken almost every day, supports the view that the majority of the Manyara family units have a range that lies well within the park, although some "Manyara" bulls have been found up to fifteen miles outside the Park boundaries.

#### **Ecological effects:**

The destruction of the *Acacia tortilis* woodlands has continued as in former years. If the present rate remains unchanged, elephants will have completely destroyed these woodlands by 1979 at the latest. This observation should, however be seen in the context of Mr Vesey-Fitzgerald's observation that the acacia tortilis woodlands are over-mature and therefore would probably have died in the next 30 years in any case.

In contrast, the ground water forest is holding its own, although even here elephants are probably influencing the succession by suppressing the

regeneration of the dominant *Trichelia emetica*. This allows other species which are less affected by elephants to replace the dominant species. In places forest species are invading surrounding areas of grassland and the forest is extending its boundaries.

Baobabs are also relatively unaffected with only 30% slightly damaged, compared with Tarangire where 98% are severely damaged.

#### Routine studies:

Routine monitoring of the feeding habits and population dynamics have been made throughout the year.



Elephants killing *Acacia tortilis* by barking in Lake Manyara National Park.

## UNGULATE STUDIES

### (i) Buffalo ecology

A. R. E. Sinclair

Mr. Sinclair left S. R. I. at the end of September to write up his three-year study for submission to the University of Oxford as a D. Phil. thesis. He is now with the Department of Zoology at Oxford.

This project covered the following aspects of the biology of the buffalo in East Africa.

- (a) Buffalo habitat preferences in the Serengeti, Manyara and Arusha National Parks.
- (b) The ecological niche of the buffalo.
- (c) Population dynamics.
- (d) Causes of mortality.