The Pygmy Elephant: A Myth and a Mystery

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INTRODUCTION

For decades a debate has flourished over whether or riot there is a pygmy elephant (Morrison-Scott, T 947; Offerman, 195 T; Pfeffer, T 960; Biancou, 1962), a race sympatric with yet smaller than the forest elephant. Noack first described the 200 cm-tall race with tong straight tusks and small rounded ears in 1906. Reports of its existence, but no definite proof, are as perennial as ever. That proof one way or another is lacking is testimony to our biological ignorance of forest elephants.

In the course of a forest elephant survey in January and February 1986,1 had arm opportunity to hook into reports of the pygmy elephant.

The survey combined 12000 km of aerial reconniasance over Zaire, Central African Republic, Cameroun, Gabon, Congo Republic and western Uganda, with more detailed ground work at five locations in three countries — CAR., Gabon and Zaire. Peter Matthiessen accompanied me on the entire trip, and Richard Barnes, who is conducting a detailed study of forest elephant for New York Zoological Society, joined us in C.A.R. and Gabon.

PYGMY ELEPHANT

I did riot expect to see many elephants, and certainly not clearly, knowing the difficulty of seeing them in demise forests. As t was, we were fortunate in getting a clear view of about a hundred and twenty elephants in three different locations in C.A.R. and Gabon.

At Dzhanga, am open pan in the Bayanga Forest of south-western C.A.R., we observed a number of herds on two afternoons. A few individuals fitted Noack's (1906) description of **Loxodonta africana pumillio** and later accounts, including that of Haltenorth and Diller (1980). The pygmy elephants had small round ears, straight to slightly bowed backs, sloping foreheads and long tusks projecting vertically from the jaw. Shoulder height varied from around 140cm to 180 cm. In keeping with their reputation for aggressiveness one pygmy elephant trying to take over a small salt lick gave aggressive head threats to a savanna bull nearly twice his height.

Our observations gave us every reason to believe these were genuine pygmy elephants. However, aside from mature tusk development, I felt sure these were juvenile elephants. None had young of their own. This was confirmed when several adult females entering the clearing were joined by the pygmy elephants, which showed affiliate behaviour. I saw this happen on three separate occasions. Each juvenile stayed with its respective female as t left the clearing.

Our direct observations confirm what several authors (Morrison-Scott, 1947; Pfetter, 1958; Pfeffer,1960) have conjectured without first-hand observations — the pygmy elephant is a juvenile forest elephant.

But why should tusk development be so precocial in these "pygmy" elephants, and why should they leave their mothers so early?

Spinage (1959) has already noted that precocial tusk development may confuse age determination and explain the myth of the pygmy elephant.

A juvenile bush elephant he photographed shows much less tusk advancement than juvenile forest elephants at Bayanga, where 5-to 7-year-olds (based on estimated back height and Pfeffer's (1960) growth curve), with tusks almost to the ground, can easily be mistaken for adults. Tusk development is undoubtedly far faster in some forest elephants than in the bush race. Why is unclear. The answer may lie in the calf's early detachment from the mother.

I observed tiny calves, some no more than 3 years old, some alone, some in herds, quite detached from adult females. Why the partial independence at a far younger age than in savannas is unclear. Perhaps there is more incentive to separate and less risk in doing so in forests. Food scarcity may provide the incentive, and lack of predators the freedom of risk.

Tropical rain forests are no more productive than moist savannas (Whittaker and Likens, 1973). The production available to large mammals is far less, both because a large proportion is indigestible wood, and because so little is within reach of ground-hiving herbivores. Secondary compounds may further limit digestible forage. Elephant densities in forests are consequently far lower than in moist savannas (Short, 1983; Mertz, 1986). The small herds typical of forest elephants (Mertz, 1982) suggest that food competition is high. Food spacing would therefore be advantageous. That being so, weaned infants with sufficient foraging skills would benefit from extended feeding forays from their parent herd.

Despite their separation, immatures may well remain in contact with their mothers if, as Katy Payne (pers. comm.) has shown recently, elephants are capable of infrasound (how frequency) communication over considerable distances.

The absence of lions and hyenas in central African rainforests must make the early separation of elephant calves relatively safe. At Bayanga we watched a number of three- to four-year-old bush elephant calves, which would be vulnerable to predators in the savannas, wandering alone or in juvenile groups.

In conclusion, I can well see why young forest elephants can be regarded as a race different from and smaller than **cyclotis**. The confusion contributes in part to the belief in a pygmy elephant. It is revealing that both the type specimen of **pumillio** — an animal imported to the Bronx Zoo in 1904—— and every other elephant imported to zoos as the supposed pygmy race, subsequently continued to grow to normal forest elephant stature (Pfeffer, 1960; Crandall, 1964; Bridges, 1966).

BUT TWO RACES DO EXIST IN FORESTS

Pygmy elephant reports do not rest solely, or even mainly on mistaken age identity of forest elephants. After direct observations of elephants in C.A.R., Gabon and Zaire, in discussion with field biologists, indigenous forest peoples and hunters, and after reviewing the literature and looking at photos taken of elephants throughout these countries, I believe there is a far more compelling reason for the belief in a pygmy elephant: there are genuinely two races of elephant in the forest.

Two elephants, a big one and a small one, are recognised by almost all indigenous hunters throughout the central African forests. The names may vary in different locations. In Gabon and C.A.R. the big one is Ie gros, the small one assala. Assala is, according to naturalists and hunters in the region, the pygmy elephant.

At Bayanga we observed both Ie gros and assala, as pointed out to us by our Babinga Pygmy guides. Yet the bigger form was the regular bush elephant, the smaller one the forest elephant. I suspected at first that Bayanga's bush elephants were recent refugees from the savannas 200 km or so north, where poaching has been heavy, and that our guides were confused. Later, however, scrutiny of 70 or so animals showed otherwise; adults 40 years or more old, showed hybrid characters of both races. Hybrids showed variations in tusk, head, and ear shape, and in size.

The sympathy was not, as it turned out, an edge effect. In Gabon, as far removed from the savannas as one can get, bush elephant traits and a considerable size variation are still evident. Some el-

ephants have thin vertical tusks, others thicker and horizontal. Through cyclotis characters dominate, variation in ear, back and head shape can be seen.

Offerman (1935) reports, and his photos show that both large, predominantly bush forms and small forest elephants co-exist in eastern Zaire.

The sympatry of two forest-dwelling races is most surprising and quite unexpected. It raises a number of questions and has several conservation implications.

DISCUSSION

The Pygmy peoples are correct about there being a big and small race of elephants in the forest. It is the naturalists who have wrongly deduced that two sympatric races of elephant in the forest must mean that there are two races of forest elephant. That assumption logically leads to the conclusion that the two forms must be the regular forest elephant and a smaller pygmy race, rather than the bush and forest elephant and their hybrid forms. No doubt the precocial forest elephant calves have done much to foster the myth. But, if there were a pygmy elephant, the pygmies would report three, not two, races.

The intriguing question is why bush elephants occur so deep in the forest. Either the incursion is relatively recent, induced perhaps by hunting in the last several hundred years, or it is more ancient and the result of past habitat changes.

The nature of bush and forest elephant overlap belies the hunting hypothesis. The overlap is very broad, with forest elephants occurring along the savanna margins and in the thin gallery forests which run well into it in C.A.R. and Zaire. Forest elephants would be unlikely to expand in the direction of bush elephant retreat from hunting. Furthermore, bush elephant traits occur deep in the forest, not merely at the periphery, as one might expect in a forced retreat from the savannas. Finally, from evidence gathered at almost every location we visited, it became clear that poaching was quite as severe in remote forests as in the savannas. Remoteness from humanity gives no immunity from hunting.

Bush elephant influence declines from forest periphery to centre, but unevenly, with hybrid traits occurring throughout. Two non-exclusive explanations are possible. First, one can postulate a broach hybrid zone between a deep-forest, pure **cyclotis** race and a pure bush race in the savannas remote from the forest edge. Second, a mosaic of the two races and their hybrids may occur throughout the forest, a mosaic formed in drier times when the forest was interspersed with savanna. If an exclusive cyclotis zone exists, it can only do so in a small region of eastern Zaire and western Congo Republic. All other regions show both traits. My guess is that the present mosaic of both races stems from a former dry phase when the forest was fragmented much as the 1.5 million km2 savanna—forest mosaic stretching from eastern Zaire to West Africa is today. Here **cyclotis** predominate in gallery forests and **africana in the open** savannas. A wetter climate would induce rapid forest advancement and the envelopment of bush elephants. This may well have occurred over much of the central African forest in the last few thousand years. John and Terrese H hart (pers. comm.) have identified extensive 2 000-year-old charcoal deposits under the Ituri Forest, indicating woodland or savanna conditions.

Such climatic and habitat oscillations are not exceptional. Vanzolini (1973) believes that there is no time in the last 10000 years when Africa's equatorial vegetation has been stable for more than a thousand years. Climatically induced fragmentation and re-afforestation would account for bush elephant traits in forests. Assortative mating might show down the rate of hybridization and bush trait disappearance.

THE IMPLICATIONS

The sympatry and hybridization of cyclotis and africana in central African forests and forest-savanna mosaic (a combined area of over 3.5 million km2), has numerous implications for elephant biology and conservation. I will touch on a few.

First, detailed surveys are needed to sort out the complicated distribution and hybridization mosaic of bush and forest elephants, and to look at their habitat, feeding and mating patterns.

Second, **cyclotis** and **africana** tusk and body growth curves are different, so one cannot infer age of the former from tusks of the latter. Separate tusk growth-curves for forest elephant are needed. Furthermore, because many small forest elephants have **africana rather** than **cyclotis** tusk shape, tusk-inferred age is dubious for bush elephant tusks originating in central Africa, whether from forest or forest-savanna.

Third, with such extensive hybridization, t is difficult to know which growth curve applies to a given tusk. Tooth eruption times are also likely to differ between the two races, which will further complicate age estimates.

Finally, the **cyclotis** and **africana** distribution mosaic and extensive hybridization throughout central Africa invalidates tusk shape as a method of estimating the proportion of forest-origin elephants entering the trade.

CONCLUSION

There is no reason to believe that a pygmy elephant exists. The origins of such a belief — the developmental and tusk precocity of forest elephants and the sympatry of both **cyclotis** and **africana** races in the forest — are, however, fascinating and puzzling phenomena in need of detailed study. A clear geographic and morphological distinction between the two races can no longer be upheld. Rather, we need to focus on why the overlap is so extensive, whether the two races coexist in equilibrium due to a degree of ecological separation and assortative mating, or whether the genetic balance is shifting due to climatic and habitat changes over the last few thousand years.

The forest—savanna mosaic, which is so extensive that ot should be viewed as a biome rather than arm ecological transition zone, is, and perhaps has been evolutionarily important in explaining species fragmentation and hybridization patterns in the equatorial region. A study of the ecology and behaviour of both elephant races in the northern forest savanna mosaic would give valuable insights on these questions, and on the impact of future deforestation on forest ecosystems.

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