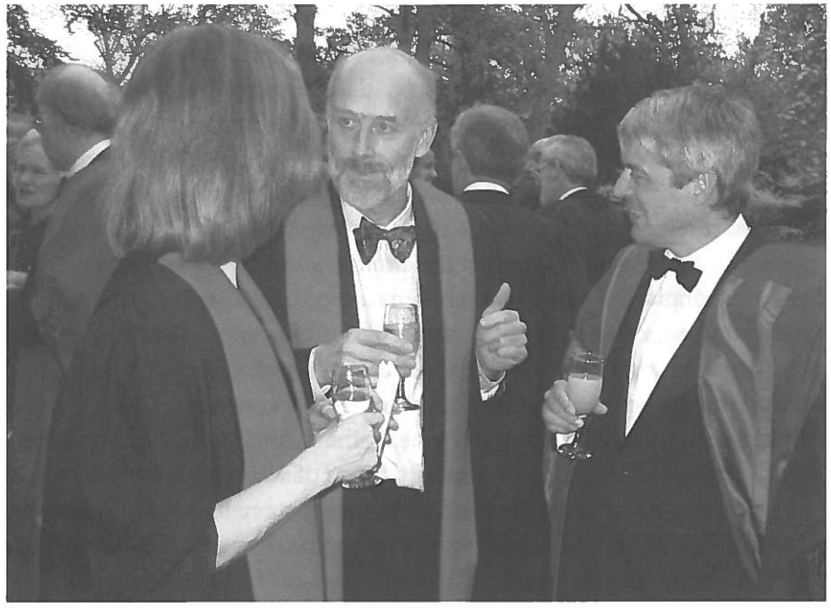
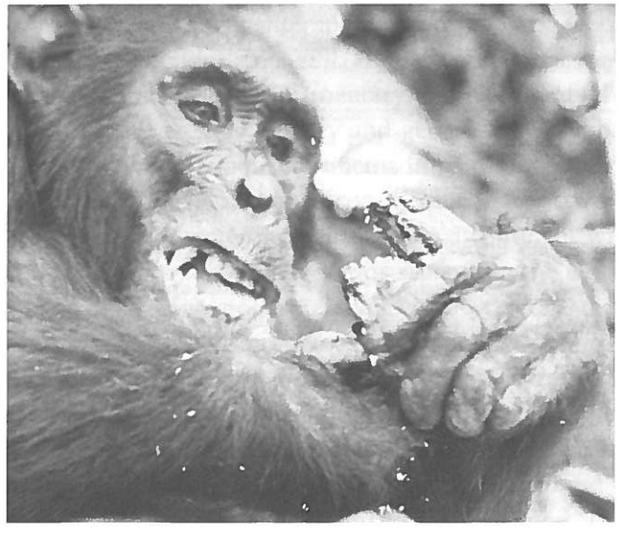




2. The author, gathering together with dining companions at the start of a Cambridge college feast. (*top*)

3. An adult male chimpanzee in the Gombe reserve, consuming the head of a red colobus monkey. (*bottom*)

2

ARE WE SO DIFFERENT? HOW APES EAT

Location: Gombe National Park, Tanzania, September 1980

As Passion and her family approach the strychnos tree, Pom, who is leading, turns, pant-grunts softly, and touches her mother's brow. She runs on ahead; Passion, with a small sound of threat, rushes after. They reach the tree together. Passion climbs at once and three year old Pax follows, but Pom, after gazing at the sparse crop, moves on. Passion feeds for ten minutes, banging the hard fruits against the trunk to crack them open, then picking out the flesh with her lips. The fruits are unripe and bitter and as she feeds, she salivates copiously. Pax picks out a few but is too young to be able to open them. Presently Passion climbs down, carrying four unopened strychnos, and sits to eat them in comfort. Pax begs and eventually gets a tiny piece. As he chews, a dribble of saliva trickles down his chin; instantly he picks a blade of grass and dabs at the sticky juice. As he continues to feed, he repeatedly wipes his mouth with tiny pieces of grass. He uses nine of these napkins in the five minutes it takes him to consume the morsel. Passion does not clean herself at all and at the end of her meal has a mess of saliva and fruit juice all over her chin, chest and hands.[1]

At a discrete distance from this family of chimpanzees, a human being looks on, a member of the *Gombe Stream Research Centre*, observing carefully and taking these notes. It may be some time before she returns to the Centre to share food with members of her own species; these chimpanzee 'follows' start early in the morning and finish

late. Observational sessions can continue for days, even weeks. Back at the Centre, the meal she shares with other researchers is less intimately connected with the surrounding forest than Passion's strychnos feast. While Passion sat at the base of the very tree that produced her fruits, ingredients of the humans' meal will have travelled at least from the far side of Lake Tanganyika. Others ingredients will have been carried in tin cans yet further distances, even from different continents. Such human meals are separated from the environments that produced them, not just by distances, but also by architecture and chemistry. The walls and roofs of the Research Centre enclose them, and in the kitchen, a range of chemical and pyrotechnic wizardry transforms leaves, seeds, and flesh into culinary creations. Yet for all this physical and chemical separation that lend to it a particular ecological remoteness, the human meal is also characterized by a surprising intimacy for which it is hard to find parallel in the natural world.[2]

Passion and Pom are mother and daughter. They certainly cooperate in their quest for food, but we can sense a certain tension, an ambiguity about who will get the strychnos fruits. Passion and Pax are mother and young dependant son, but he still has to beg and wait for his morsels of food. Back at the Research Centre, their human observer will freely pass and receive plates of food. She will not be surprised to sit alongside a fellow diner she had met only a month, a week, or a day earlier, and to share food from a common dish. There may be any number of unrelated diners sitting around the meal table, face to face, an attitude that many species would find very threatening. The thing that allows this unusual intimacy of a human meal is a quintessentially human attribute, an ingredient of the meal at least as important as the food itself—endless lively conversation.

There are nonetheless several features of Passion's meal that resonate with that of her human observer. While Passion's diet did not draw from the same global ecosystem as her observers, it did draw extensively from the fauna and flora of the Gombe forest in Tanzania where she lived. Of over 600 plants recognized by humans in the Gombe forest, round about a quarter are recognized by its chimpanzee population as sources of food. Some of those foods, soft leaves and flower heads for example, are fairly straightforward to eat. Others, such as pods, hard fruits, and stems,

require a certain amount of dextrous unpacking, for which the jaws are assisted by that characteristic feature of primates, their nimble hands. As the soft interior of many of these unpacked food plants does not remain edible for long, they also require a certain sense of timing and of natural life cycles.[3]

In addition to these features of manual dexterity and awareness of 'natural history', Passion's meal also displayed a social dimension. It is true that a competitive tension can be sensed between mother and daughter, between Passion and Pom, in relation to the strychnos tree. Viewed, however, in the context of how many species feed, they had engaged in quite a complex social negotiation. It might be misleading to describe either Pom's pant-grunt or Passion's threat call as 'language'; at least it seems clear that such sounds are never woven together into 'sentences'. The Gombe researchers have learnt over the years to recognize a range of vocal calls and bodily signals, a number of which relate specifically to the enjoyment of food. In more masculine chimp meals, an alpha male at the centre of the action might let forth a loud 'food aaa call' which will draw other diners to the scene, who in turn will issue a repertoire of softer 'food grunts' as they tuck in. In the strychnos meal of Passion's family, Pom's soft 'pant-grunting' is a more general and personal token of respect; it acknowledges her mother's higher social rank as they both catch sight of the strychnos tree. The slight sound of threat from Passion conversely emphasizes her daughter's inferior rank, and the implicit message is: 'Don't start on that meal before your mother reaches the tree!' As we see, the net result is that Pom deferentially leaves the meal to her mother and younger brother. Passion's relationship with her 3-year old son is quite different from that with her daughter. If Pax were a little older, the age of his absent 9-year-old brother Prof, then he might well be competing with his mother for food, exchanging the occasional threatening sound and posture. Prof is still spending a lot of time with his blood relatives, but is significantly out of the frame during this meal. He may well have temporarily joined up with a few other males, jostling for rank and generally 'out on the razzle'. His younger brother still looks to his mother for food and protection. These various communications established a clear social relationship between dominant and submissive parties within the family that set the stage

4. Passion, a chimpanzee in the Gombe reserve, together with two of her offspring, Pax and Pom, observed in November 1978.

for the meal quite as definitively as a paterfamilias taking his place at the head of the table to carve the Sunday roast. Passion was, however, very far from being the most sociable of chimps. The more closely the whole community of Gombe forest chimps is observed, the more clear the social dimension of food-sharing becomes.

Going back to the year before the birth of the infant Pax, it was Passion's turn to be closely observed through a 'long follow', as she roamed with her two older offspring across ridge and ravine through the rich variety of trees that clothe the rugged slopes that descend to Lake Tanganyika. Even though this long follow took place towards the end of the dry season, the air remained moist and hot. Each evening, as the air cooled, Passion and Pom prepared for the night by stripping oil palm trees of their fronds. They would use these high up in the trees, to build their night nest. Each following day, the small family roamed for several kilometres, and around half their waking hours

would be spent feeding. A great deal of that time, the chimps would move from tree to tree plucking leaves, and in the appropriate seasons, blossoms, fruits, insect galls. Bark, pith, and resin were also occasionally consumed. In this way chimps acquire food from around 150 plant species, around a quarter of the entire recorded flora of the Gombe forest.[4]

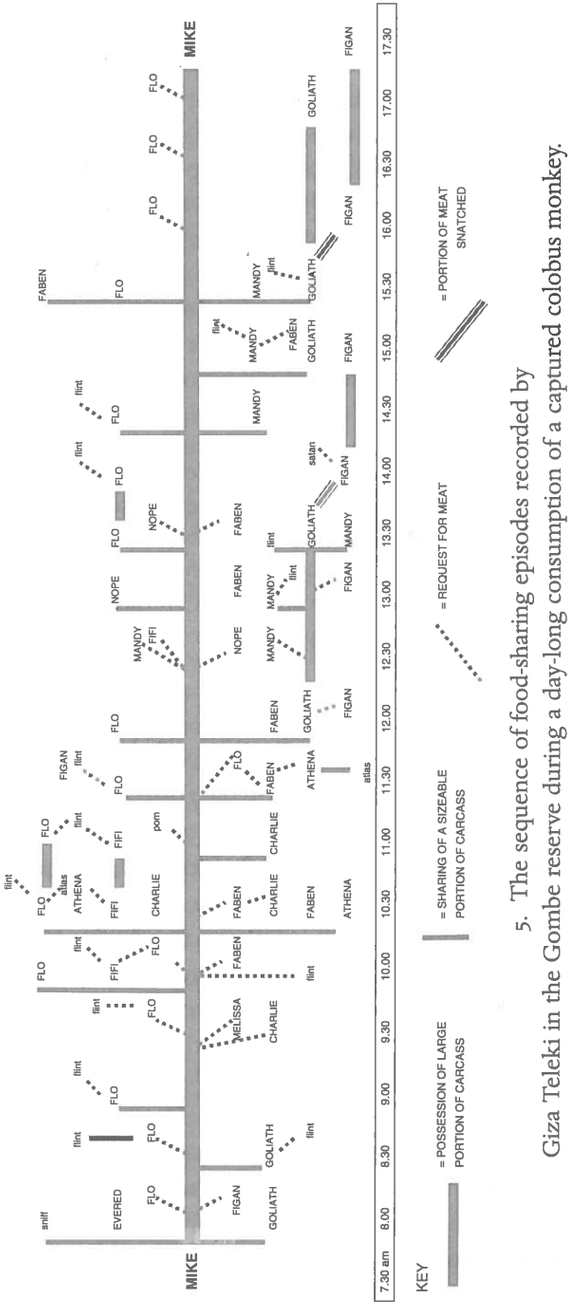
For all this diversity of plant foods, Passion was certainly not a vegetarian. Back in the 1960s, she was one of the first chimps that Jane Goodall had watched 'termite-fishing'. In this delicate and skilful procedure, the chimps would insert some suitable tool, such as a grass stem, into a carefully opened termite mound, and slowly withdraw the stem together with its clinging prey. During the long follow she was also seen killing and consuming two newly born fawns of a deer-like creature called the 'bushbuck', and sharing the tasty meal of meat, blood, and brains with her children, Prof and Pom. All the time, a member of the Gombe Stream Research Centre would be taking notes, recording distances travelled, nesting sites, food species consumed, and so on. They looked at the remains of nests, of tracks on the ground, the broken and discarded shells of the strychnos and other fruits, and the 'scats' or faeces. With the aid of a makeshift tin, holes punched in the bottom, these scats could be 'dung-swirled' down by the stream. After the water dispersed the more digested food, some quite large fragments remained, of meat, fruit-stones, and the like which contributed greatly to our understanding of chimpanzee diet. Jane Goodall had come to know the individual chimpanzees sufficiently well to give them names and to record their biographies. In this way, they were able to check who was travelling with whom, which chimps were coming together to share food, to threaten each other, and who was engaged in sexual relations with whom. The different chimpanzee groups dispersed and reassembled in various ways, bringing together feeding, tenderness, violence, and bloodshed in a variety of permutations. By the time of Passion's long follow, she had become fairly antisocial, sticking with her own immediate family, avoiding, and being avoided by, many of the other female chimps in the nearby woods. They had good reason to steer well clear. While many enjoyed eating bushbuck, bushpig, baboon, or colobus monkey, Passion and her teenage daughter Pom had acquired a taste for the flesh of their

own species, and had spent the last few years intermittently terrorizing local chimp mothers, brutally wresting their newborns from their breast, and consuming them in full view of the bereaved, wounded, and traumatized parent.[5]

Turning back, just over a decade before Passion, Pom, and Pax reached the strychnos tree, to a time before Pax was born and Pom was no older than he, we can get a glimpse of some rather less antisocial meals among the Gombe chimps. As well as being a bit of a rough diamond in later years, Passion did not strike Jane Goodall as the ideal textbook mother when Pom was growing up, and her infant daughter was known to roam fairly free. On one such occasion, she happened upon an elaborate feast that lasted from 8.00 a.m. in the morning til 5.30 p.m. in the afternoon.[6]

All the great and the good from the Kasakela community were there. This name was given by the researchers to the community of chimps which ranges across the Kasakela and Kakombe river valleys, in the middle stretch of the Gombe reserve, in the middle of which the Research Centre is located. At the heart of the feast was the community's alpha male, the temperamental and rather unlikely figure of Mike. He seems to have risen through the ranks from a quite lowly position by a combination of guts, intelligence, and threatening use of the empty kerosene cans that he found around the Research Centre. Mike had captured a young colobus monkey, and this tasty treat was to become the focus of the ensuing feast. The kill had attracted other males that would experience high rank at some stage in their lives. There was a previous alpha male, Goliath, who Mike had displaced from the top, yet with whom he would become friends. Also there was a future alpha male who would displace Mike's own successor and rule for several years. His name was Figan, who would before long be propelled to the top with the help of his brother and sidekick, the disabled Faban, and the help of his mother, to whom we shall return. Then came Charlie, who would never make it to alpha male in the Kasakela community itself, but in a couple of years would reach the top in a breakaway community centred on the Kahama valley further to the south.

Some powerful females had also gathered to the feast, such as the adolescents Melissa and Nope, along with Mandy and Athena, who



5. The sequence of food-sharing episodes recorded by Giza Teleki in the Gombe reserve during a day-long consumption of a captured colobus monkey.

arrived with her one-year-old daughter, Atlas. The most notable female in their presence was twice the age of these adolescents, and had quite a hold on the assembled community, male and female alike. The matriarchal figure of Flo, now approaching her fortieth year, was mother to four of the other feasters, the future alpha male Figan and his brother Faben, their 10-year-old sister Fifi, and 4-year-old brother Flint. At many points in her life she had exerted a strong sexual hold on many of the community's males. At the time Flint was conceived, she could be seen with a retinue of as many as fourteen males, one of whom was the current alpha male, Mike. Eight years on, she became the first non-human to earn an obituary in the Sunday Times, from which the following is an extract:

> Even now a month later it is hard to believe that Flo is dead. For more than ten years this old chimpanzee had been an integral part of life at the Gombe stream, with her torn ears and bulbous nose, her occasional spells of wild sexual activity, her dauntless, forceful personality... She was lying at the edge of the Kakombe stream. When I turned her over, her face was peaceful and relaxed without sign of fear or pain. Her eyes were still bright and her body supple.[7]

At the centre of this far from anonymous group, the slightly uncertain Mike clung to his dying colobus monkey. Possibly because of his less than certain grip on his current alpha male position, Mike tended to be a generous food sharer. Over the following nine hours, around forty food-sharing negotiations were observed with Mike himself, and around the same number of negotiations on the periphery for subdivided portions. Those negotiations occasionally involved a snatch, but were mostly achieved through supplicant behaviour, peering or touching, or even throwing an infantile tantrum. In response to these, the higher-ranking individual would either diffidently refuse, or give freely to the lower-ranking individual.

The 3-year-old Pom, wandering away from her mother to find this feast, made just one, inconsequential request to Mike. In general, the four infants at the feast only got food by way of a female, or some more compliant male, such as the has-been, Goliath. The one infant to succeed in getting food direct from Mike was Flint, but he was well connected.

His mother was the most successful recipient of all. On twelve occasions during the day, sometimes sizeable portions of meat passed from Mike to Flo.

At the end of the day, thirteen out of the seventeen chimpanzees assembled had succeeded in sharing in the colobus monkey feast. A careful recording of each food-sharing event revealed a full spectrum of relationships in which a higher-ranking individual passes a share of the food to a lower-ranking individual, in response to some form of begging or supplicant behaviour that both signifies and reinforces each relationship. In this way, food is passed from the alpha male to males of a lower rank. It is passed from male to female, sometimes in the context of sexual engagement. It is passed from adult to child, and particularly from mother to child, the primary engagement which all the others, in some way, echo.

A stranger species still

Reading through these remarkable accounts of the shared meals of our closest living relatives, accounts that bring together tenderness and hostility, minute dexterity, and bloody violence, my thoughts turned occasionally to a Cambridge college feast I myself had recently attended. That too was characterized by an enormous diversity of leaves, seeds, fruits, roots, tubers, and flavourings from a very long list of plant species. Against this vegetative backcloth, a drama was also enacted with the flesh of a smaller number of animal species in starring role, a drama at least in the presentation, if not the actual kill. Like the Gombe chimps, I too gather with members of my own species in different permutations to share food on different occasions, in each case acknowledging rank and status in a variety of ways.

Many of the diners at that college feast I had not previously met—they were complete strangers to me. In the context of the natural world, that is a most unusual state of affairs. Close kin yes, but we know of no other species that will gather to share food with a complete stranger, and I am not always so intimate with strangers. If I take my packed lunch to a busy park, I create my own personal space along with many other lunchers,

our virtual boundaries around individual patches of grass, rather like a field of grazing animals. My human meals are yet more socially bounded, and certainly more emphatically enshrined in architectural space. At the same time they are more ecologically open, reaching far and wide into a global ecosystem.

Those boundaries subdivide the totality of our human existence in a variety of ways. Sex and death may be more repeatedly alluded to, but have not been welcome in material form at any meal to which I have recently been invited. Bodily contact in general is rule-bound, as is contact between my body and my food, and the different foods with each other. At that recent college feast, scanning the cutlery, crockery, table linen, and so on, I counted thirty-three items of food-sharing technology around my own seat, provided to ensure that none of those boundaries was breached. Beyond that, the most elaborate architectural provisions for food preparation, consumption, and disposal opened up around me, all suitably partitioned and separated by walls and doors. In the language of anthropologist Mary Douglas, the rules of punctuation are strict indeed. I had furthermore enclosed my own body in ten items of attire to ensure that my personal visual signals and boundaries were in place, including such things as an academic gown, a dinner suit, and the associated, shirt cuff links, and tie. Seven of these ten items I reserve entirely for the purpose of feasting.

Adhering to those rules and manoeuvring through those social boundaries, we find that in ecological terms the food we eventually reach at our feast is conspicuously open-ended. The chimp meals in Gombe forest display a similar diversity, but they are bounded by the perimeters of the forest itself. The Mahale mountains run alongside Lake Tanganyika only 140 km to the south of the Gombe forest. Here too, another long-term chimpanzee observation project has been carried out. The Mahale mountains also support a large number of plant species, in this case a third to a half of which are recognized by chimpanzees as sources of food. What is really interesting about the comparison between the Mahale and Gombe chimp diets is the range of mismatches. Bringing the two recorded food lists together, we can assemble a list of potential food plants for chimps. Of these, less than 60 per cent are consumed in both areas. As the Tanzanian chimps move through their home woodlands,

they repeatedly encounter plants that chimps readily consume in remote communities, but pass them by. These 'cultural' differences between communities are revealed in other ways, for example in differences in the items used as wands for termite fishing. The more we learn about chimpanzee communities, the more we appreciate how bounded their practices are in ecological space.[8]

More or less bounded or immobilized at my predetermined college seat, the feast unfolding before me situated the diners within a food chain that spanned the world. At various stages during the meal we sampled several of the species that dominate the global human food chain in calorific terms: wheat, originally from south-west Asia, potatoes originally from South America, and rice, originally from China. We ranged omnivorously, up and down that food chain, consuming the flesh of herbivores and carnivores from sea and air, and the rivers and land-surfaces of several continents. Not much is known about the response of the different African forests to the grazing by chimps of so many of their component species. At the same time, the world's human community, by gathering around meal tables, hammers planet earth, day by day, with an environmental force comparable with the movement of glaciers, the eruption of major volcanoes, and the impact of comets.

I do not share food in that elaborate manner very often, but similar themes may be observed at meal tables that are more ordinary by far, such as the one to which our observer of Passion's family looked forward, back at the Research Centre. In her various books, Jane Goodall alludes to such simple fare on many occasions, from a hastily snatched breakfast of toast and coffee at 5.30 in the morning, through to restful evening meals on the veranda, or alternatively, like the chimps, alfresco under the night sky. Even those alfresco meals around the campfire share many of the hallmarks of this uniquely human institution. Just like the college feast, they sit around in a 'conversational circle' facing each other, accompanying the food with leisurely talk, gossip, and laughter. Goodall might be accompanied by familiar kin, her husband Hugo and mother Vanne, fellow researchers and other non-kin, some of whom may have been new to Tanzania and the Centre. There was a drama to these simple meals; they might start with drinks and taped music, and end with coffee and the playing of games. In between, the sequence and assembly

of such ordinary ingredients as baked beans, tinned bully beef, tomatoes, onions, and bananas would be stage-managed accordingly to culturally familiar culinary practice, taking the diners through a preordained sequence of 'courses'. At Christmas, this culinary drama would intensify to connect this remote and unusual African community with a large part of the English-speaking world. A meal of stuffed roast chicken and plum pudding would connect Goodall simultaneously to her own roots and to Britain's heritage. The ingredients of the plum pudding alone, figs, raisins, and brandy from Europe, sugar from the Caribbean, cinnamon and cloves from Sri Lanka, nutmeg from the Spice Islands, read like a map of Britain's global colonial history.

As in these meals in the Gombe reserve, so our college feast simultaneously unfolded as a rich social drama. One of the more unusual items of my dining attire is an academic gown. Its style and length, as well as odd bits of appliqué fabric, signal to the initiated with whom I am about to share food what degrees I hold, and by which university they were awarded. The complex trajectory of initiation processes and rites of passages, within educational and academic institutions, that had brought me to that particular table wearing that gown, stretch over a large part of my life and have absorbed a significant portion of my energies. Around me I could see seats I might have occupied at an earlier stage in my life, a few rites of passage back. There are clearly some newcomers, staying close to their host and cautiously attentive for discreet guidance on any idiosyncratic elements of protocol. I could also look round to points around the table I remain too junior to occupy. Occupying a prominent position at the centre of this elite group was our alpha male. We waited until he was seated before we took our seats, and waited until he commenced each course before we did the same. Similarly, he rose from the table first, and we followed. We rose and sat following this slightly staggered sequence at certain points within the meal. On such occasions, and sometimes clasping a preparation of the narcotic my society uses, we cried out to higher beings whose presence around the table lacked material form. One was the constitutional head of our tribe. Another was the deity to whom our elders subscribe and pay homage. A third was the ancestor whose benefaction had allowed this feast to take place on an annual cycle stretching from here to eternity.

Intimacy among dinosaurs?

After four decades of observation in the Gombe reserve, in which individual chimps are recognized and named by their human observers, quite a lot is known about their blood relationships, and it seems quite clear from these observations that food-sharing goes well beyond maternal care and courtship. But what about the wider world of nature? How social are the meals of other species?

When dinosaurs roamed, we suspect that mother and child would have become quite independent feeders soon after the infant dinosaur had hatched. At least that is what we infer from living reptiles. In a rather more diminutive group of living lizards, the 'skinks', the mothers will allow their newborn to snatch food from under her in the first fortnight of their lives, but that is about as far as it goes. Among crocodiles and alligators, the care of nests of eggs will extend as far as helping the newly hatching offspring to break out of the egg, but from then on, they fend for themselves. In many turtles and iguanas, the independence is greater still. A moist place is found, under rocks, debris, or mud, in which to deposit the eggs and then the mother moves on; the next generation is on its own. Among these reptiles, as with most amphibians, fish, and much of the animal kingdom, feeding is a self-interested thing, an individual quest in the struggle for survival. Yet, as the great dinosaurs dwindled, other animals diversified, and went on to dominate the exposed surface of the planet, and the skies above. With the domination of the land and the skies came a break in an age-old pattern of self-interest.

For a period after a baby mammal has emerged from the womb, or a baby bird from its egg, its mother's behaviour will not be competitive, but instead may be described as 'pro-social'. She will actively devote time and energy, not to her own welfare, but to the well-being of her offspring, by protecting them, sheltering them, and passing food from her own mouth, or beak, to those of her children. Particularly in birds, the father may also play a key role in gathering food for mother and offspring, or even take over all parental care. All the evidence suggests that the sharing of food finds its origin in this pro-social relationship between parent and child, the only really widespread forms of pro-active

food-sharing in nature. Such pro-social feed relationships are certainly seen among our immediate relatives, the primates, in this case, aided and elaborated by unusually dextrous forelimbs. Such limbs with their nimble digits allow mouth-to-mouth food-sharing to be supplemented by hand-to-mouth and hand-to-hand sharing. Mouth-to-mouth sharing remains the predominant mode among mammals and birds. Among the Kalahari !Kung, and the Highland peoples of Papua New Guinea, we can find the human version of this, sometimes known as 'kiss-feeding', in which a mother affectionately passes a morsel of food from her own mouth to her infants.[9]

Food and sex

Parental care quite often displays features in common with courtship. It is as if the parental behaviour in caring for a young child is 'borrowed' by courting couples. This is certainly true of the meeting of mouths or beaks during food-sharing. A very wide range of birds, from ravens to parrots, herring gulls to woodpeckers, pass food from beak to beak, not just from parent to offspring, but between courting couples. In courtship, the actual transfer of food may have disappeared, and affection be communicated by the meeting of mouths alone. A sea lion will rub snouts with its young offspring, and employ the same behaviour during courtship. A female shrew will allow saliva to be licked from its mouth, by its young offspring, or alternatively by a courting male. In some human societies, the kiss-feeding of infants is known, and the behaviour may also occur without the actual transfer of food. In other human societies, mouth to mouth kissing becomes the sole reserve of courtship.[10]

The intimate relationship between feeding and courtship may be understood in the evolutionary context of reproductive success, but sexual encounter is not invariably connected to courtship and mating. Food and sex may also come together in a more immediate way, through the sensual pleasure that each provides. Indeed, the one may be implicitly or explicitly traded for the other. We can observe this in our own species, and in another of our close relatives, a species in the same genus as the chimpanzee, and sometimes referred to as the 'pygmy chimpanzee'. It is better known as the bonobo.

This diminutive primate, first mistaken for an immature chimp, was only recognized as an independent species in 1933. Since then, its study has revealed a number of similarities to humans in terms of sexual behaviour. Females are sexually receptive throughout their cycle. A number of sexual positions are adopted, involving both same-sex and mixed-sex unions, and are used pleasurably to relieve tension and generally socialize. Not surprisingly, many bonobo activities, including the sharing of food, involve some aspect of sex. Field researchers in the Lomako forest of central Zaire carried their dictaphone, camcorder, portable balance, and tape measure to the feeding grounds of the Eyengo community of bonobos. They watched closely and recorded as these animals sought out and then shared breadfruits, the occasional catch of squirrel or some other small prey, and charted the associated behaviour, which was frequently sexual. The most common behaviour was the rubbing of genitals between two females as a prelude to sharing the breadfruit's tasty orange seeds. Copulation was also a recurrent element of negotiations over food, though not always on equal terms. One of their records describes the sustained sexual activity between a vigorously begging female, and a male in possession of food. After seven successive copulations, he still would not give her a bite of his breadfruit.[11]

This may all seem a long way from the Cambridge college feast, but that meal too displays an intimate association with sex, not by way of its engagement, but conversely of its prohibition. Acts of sex are commonly excluded from contemporary human meals, and for several centuries Cambridge college meals placed certain limits on such possibilities by excluding one sex altogether. When in the 1960s Jane Goodall arrived in Cambridge to undertake her doctoral research, she was not eligible to enrol at the college of her supervisor, and certainly not to join him at the feasts of his own college. Had she lived half a century earlier, she would not have been eligible to join the Cambridge academic community at all. Half a century earlier still, the fellows dining at college feasts would have been expected to abstain from sex and matrimony altogether.

Meals that are as strictly bounded by moral code are by no means confined to these rather rarefied circumstances, but are widespread among human societies around the world. Indeed, human meals of all

kinds are framed within moral codes about sex, age, rank, and ethnicity, and the diners do not typically sense that these rules are negotiable. They are set at some other time, by some other authority, part human and part divine. The rules of conduct are passed down from each generation to the next.

This seems to mark us apart from our closest relatives. Chimps and bonobos clearly have a social structure and a mutual sense of rank. They evidently move and feed in groups that are broadly single sex from time to time. Our general sense, nonetheless, is of a series of strategies that are negotiable, that can be constantly reassembled in different ways in different places. It may normally be the case that 3-year-olds feed with their mother, but the 'lightly parented' Pom may nonetheless wander off to join a 'power feast'. It may generally be true that the males do the hunting, and share the kill widely, while the female chimps fish for termites and gather, eating in intimate groups of kin. However, such females as Passion also hunted occasionally, and some plant foods have been shared beyond the family. The lives of chimps and bonobos are framed by two interwoven strands of social norm and ecological reality. Within that fluid frame, they inhabit their bounded ecosystems amply and flexibly, and with far less instruction from the previous generation. Contemporary humans inhabit a much more open and global ecosystem, but through the bounds of a more rigid social 'architecture'. The use of the word 'architecture' emphasizes that these bounds have a permanency, and a source beyond those who move within them, and passed down in detail from one generation to the next. The architectural spaces of the modern human world separate our activities into different types. In some spaces, we are social persons, listening to each other's words and music, creating and consuming cultural artefacts. In other spaces, we are biological organisms, taking care of bodily needs, sleeping, defecating, washing, and recovering from illness. Elsewhere we are economic beings, turning the soil, working the machine, creating the wealth that underpins our existence as social persons or biological organisms. However, some of our activities refuse to be thus compartmented, to be removed to separate realms of existence. These are activities in which person and organism remain intimately connected within a common whole. For all their social shaping

and ritualization, they remain as gateways that interconnect our compartmented selves, points at which social person and biological organism inextricably combine.

Origins

Close observation of chimps and bonobos provides us with something of an observation post, from which we reflect upon our own species and its peculiarities. But it is important to remember that, in evolutionary terms, these two species are our close cousins, not our ancestors. They are level tips of the same evolutionary bush rather than points beneath us on our own evolutionary tree. They too have an evolutionary history of changing circumstances and changing responses. That much is clear from comparing and contrasting what chimps eat in two distinct forests. Looking beyond chimps and bonobos on the living tips of our evolutionary bush, we encounter around 200 species of living primates, each of which also has its own evolutionary history. What we can do by viewing the living tips of the evolutionary bush is draw upon some commonalities which, in conjunction with the fossil record, allow us to project a certain amount back in time.

One clear commonality is that most primates are conspicuously social animals, recognizing and engaging with a significantly larger group than immediate parents and offspring. The branch of primates that includes monkeys and apes and ourselves displays a very diverse range of social patterns sometimes involving social networks measured in tens of individuals, occasionally running into three figures. We can reasonably assume that the degree of social complexity apes and monkeys share was also shared by their common ancestor. Fragments of that ancestor, or at least something quite close to it, have occasionally emerged from quarries within the Fayum depression of Egypt, and the genus name *Propliopithecus* has been ascribed to them. Their teeth and bones were laid down near to the tall trees that flourished in the hot humid lagoonal rainforest that occupied the depression 32–5 million years ago. Some of the fossilized tree trunks also survived. These skeletal fragments belonged to a small monkey-like primate, its limb bones indicating

the manual dexterity which is typical of primates and with which it ascended into the tall trees, to unpeel soft fruits with delicate fingers and teeth. Its somewhat dog-like skull had space for a brain of around 30 cubic centimetres. That was an unremarkable size for primates, but substantial in comparison with most animal species. Brain size was to become a significant attribute when it came to managing a complex social life.[12]

It is not for another 10 million years that we can add much definition to those complex social lives. From this point our evolutionary line differentiates into monkeys and apes, allowing us to focus in upon these two related groups. The majority of species of forest-dwelling monkeys in Africa today build their social groups around female lineages. Mothers, sisters, and daughters cluster around sources of food, and a variable number of males cluster around them. There is an ecological logic to this pattern, concerning the different constraints of being a mother and a father. A mother has a tough time reproducing, from conception, through gestation, lactation, and upbringing to the eventual independence of their offspring. All this needs a lot of energy, and places heavy demands upon food supply. Food is a limiting factor for the mother, and one way of maximizing evolutionary success is for related females to club together around a food source and cooperate on feeding and defence. Reproduction is theoretically less of a challenge for the father, who can assure a future for his genes simply by impregnating as many females as possible. That assumes of course that sexual engagement itself presents no challenges, something that is not true for every male. In order to win a mate, he may need to compete with others and prove himself in food-sharing largesse such as has been observed in the Gombe forest. It seems that for many species, food is limiting for reproductive females, while access to females is limiting for reproductive males, and that may account for the kind of social structure seen in many species of forest-dwelling monkey today, in which related females cluster around food, and unrelated males around them. A similar pattern might be projected back to their common forest-dwelling ancestor 25 million years ago. What was happening in our particular sub-branch, the apes, is more complex.

Living apes do not fall into the kind of recurrent social pattern which would allow a simple projection back to their common

ancestor. Orang-utans lead relatively solitary existences; gibbons form monogamous families, with the sexes sharing equal roles in the defence of territory; male gorillas connect with 'harems' of females, while chimps and bonobos can disaggregate and reaggregate in multiple social groupings. It may indeed be that flexibility rather than any one social norm is what characterizes the evolution of apes, a flexibility observed both between species and within some species of ape, including our own. Negotiating with large social groups of recognizable individuals places considerable demands on the capacity of the brain to manage that information. Flexibility in the relationships that are formed between those large groups places yet more demands on the managerial capacity of the brain. It is indeed within some of the apes that brain size grows to truly unusual levels, notably within a genus that differentiated around two million years ago, our own genus *Homo*.[13]

What are our distinguishing features?

There have been a number of ideas about distinguishing features of humans, separating us from the animal world, that have one by one fallen by the wayside as observations of our primate relatives intensified. The best known among these was the use of tools, which are certainly central to the manner in which we humans prepare and consume a meal. However, it is now clear that tool use is widespread among our close relatives, and also encountered in a number of other mammals and birds.[14] A deep and intricate knowledge of natural history is another feature that has in the past been linked specifically to humans. The remarkable diversity of the human diet, comprising thousands of species of reasonably familiar organisms, and many more obscure foods, has been connected with our ability to classify, recognize, and experiment. Feeding observations of primates have repeatedly demonstrated their vast awareness of natural history and the species around them, and the manner in which their food acquisition varies from place to place, presumably arising from a propensity to experiment. Much of these diets is made up of plant foods, but observations since the time of Jane

Goodall have repeatedly witnessed primates hunting other mammals, also robbing 'man the hunter' of his singular place in nature. Linked to the hunting of sizeable beasts is the sharing and negotiation of food beyond the parent–child union, and here too, evidence of such negotiations within other species can be found.

The emergence of none of the above features is entirely unique to the genus *Homo*. They were in the primate line long before early humans differentiated into a distinct line. The differences are no longer absolute; instead they differ in scale and diversity. However, those changes of scale and diversity are in many cases immense. Our tools are considerably more complex and our natural histories more intricate. The change in scale with greatest archaeological visibility is the size of the beasts we cull. Early in the history of our genus, these beasts may exceed the size of a chimp's prey by a factor of twenty or more. We can find later prehistoric deposits in which many such beasts have been slaughtered together for a feast. The social groups that gather on such occasions probably numbered thousands.

In addition to these quantitative differences, it does seem that there remain some distinctions of a qualitative kind. These bring us back to Mary Douglas's consideration of the meal as a kind of structured language. Our close relatives the chimps spend a great deal of time feeding, and it is broadly continuous and opportunistic. We humans have cycles of eating, which are diurnal, weekly/monthly, seasonal, annual, and biographical. Each meal has a beginning and end and a certain drama and sequence, not just the Cambridge feast but also the working meal at the Gombe Research Centre. In time, this intensive structuring and ordering of consumption unfolds into a rigid architecture around food, not just the physical spaces in which dining is permitted (or not), but also the food-producing landscape, partitioned off into plots and fields. Indeed, the practice of agriculture upon which most contemporary meals depend may be seen as the rigorous organization of plants, animals, and people into precise blocks of space and time.

That was not a particular issue of note when Passion, Pom, and Pax happened upon a strychnos tree one day in 1980. Neither did it really figure a decade earlier, when the whole day was spent negotiating meat

from a colobus monkey. That monkey was around 20 kilo in weight. Nor was it likely to have been a significant issue for the early humans. It is, however, within the archaeology of early human species that we witness the consumption of beasts of several hundred kilos in weight by primates with unusually large brains. The following chapters explore those two significant changes in biological scale, and ask questions about parallel changes in the scale of social organization, questions about structure, order, and the focus of the greatest scalar change of all, communication.