

CHAPTER 8

Caroline Pond
Department of Biological Sciences
Open University

The scientific background to parrots in literature.

Do not all charms fly
At the mere touch of cold philosophy?

...

Philosophy will clip an angel's wings,
Conquer all mysteries by rule and line.

Lamia: Keats 1820

Romantic poets like Keats denounce 'philosophy', the rational analysis that we now call science because it prevents or spoils emotional responses to beauty and mystery. As a scientist, I, like Professor Richard Dawkins,¹ disagree profoundly with Keats: we believe that 'philosophy' is not necessarily 'cold' and it can enhance rather than mar the 'charms' of the natural world. The scientific study of birds, including parrots, has advanced

enormously in the past half century, but readers may be comforted with the knowledge that far from ‘conquering all mysteries by rule and line’, ‘philosophy’ has barely scratched the surface of parrots’ ‘wings’. Scientists have described the birds’ habits and abilities, and used techniques developed for similar studies of other animals and people to identify underlying principles and possible physiological mechanisms. Such research highlights many of the traits celebrated by poets and novelists that attract (or repel) people to parrots (and to many other birds). But science has not explained all features of each bird, any more than it can explain each and every human personality. Literature retains its ability to fascinate us with accounts of interactions between individual people and birds.

Intimacy between people and animals.

Fascination with animals, especially birds, mammals and reptiles, is very ancient. Indeed, one might almost say that interactions with animals that are not sources of food and do not pose a threat of predation are among the defining characteristics of human culture. Paleolithic people, particularly but not exclusively in Western Europe, drew lifelike pictures of animals on cave walls. Right up to the present day, shamans invoke ‘animal spirits’ and dress up in animal products such as skins, horns, antlers, beaks and feathers for a wide range of rituals. Living and freshly killed animals are used to predict future events (for example, by examination of the entrails of domestic animals), as aids to healing, particularly of handicaps and mental illnesses, and as sacrifices and scapegoats to appease gods and devils.

The practice of keeping wild animals in captivity as tribal or personal totems and companions is also very ancient. The Ancient Egyptian pharaohs' priests kept large numbers of crocodiles, cats, baboons and other sacred animals for religious purposes. Providing suitable accommodation and food for such large and powerful animals must have been expensive and demanding but was evidently cost-effective for their spiritual beliefs. Such sacred animals were valued and maintained as we treat our pets: harming them, even accidentally, was regarded as shameful and inauspicious and some were embalmed after death in the same way as human bodies were preserved.

Keeping pets² may now be most conspicuous in affluent westerners, but the habit is by no means restricted to such people: sixteenth and seventeenth century explorers reported that several North American Indian tribes tamed dogs, birds and even bear cubs, moose or bison calves. Many of the peoples of the Amazon rain forest tamed monkeys, agoutis, sloths and several kinds of wild birds, particularly parrots, upon which they lavished hours of attention. In some tribes, valued pets were buried following rituals similar to those used for dead infants. Polynesians were (and still are) enthusiastic pet keepers: when first visited by Europeans, Fijians were keeping parrots, bats and lizards, as well as dogs, and Samoans had pet pigeons and even eels. The pets were fed and fondled. They shared people's homes and/or lived in specially built accommodation. Seasonal migration did not preclude the pleasures of pet-keeping: those that could not follow their owners on journeys were carried, along with other valued possessions.

In most polytheistic religions, certain animals and plants are believed to have mystical influences over human affairs. Hinduism, Buddhism and most other oriental religions still venerate certain animals and pet-keeping, i.e. intimate relationships with animals for pleasure, has long been tolerated, sometimes encouraged. The Kama Sutra extols the relaxation and pleasure that can be derived from frolicking with parrots and teaching them to talk and perform tricks.³ Judaism is unusual among ancient religions in its active opposition to the worship of animals or images of animals almost from the start, though animal sacrifice continued until the last two millennia.

Christianity and Islam adopted the Jewish attitudes to animals; official doctrines of both religions firmly relegated them to subservient roles as beasts of burden and as food. Although a few birds such as doves, pelicans and eagles were assigned iconic or symbolic roles, the priesthood was suspicious of intimacy with animals, especially wild and, by extension, exotic species, fearing its association with hell, the devil and animistic beliefs. Among medieval saints, St. Francis of Assisi (1181-1226) stands out as exceptional in his advocacy of wild animals, especially birds, as sources of spiritual inspiration and in the promotion of what we would now call conservation and animal welfare. For him, animals were not mysterious influences or mere ancillaries but participants in human affairs; their roles were similar to those of pets in the modern world. Although St. Francis was canonized in record time after his death, the medieval church preferred to emphasise his contributions to monasticism, charity to the sick and the idealization of personal poverty rather than his teaching about animals.

Throughout medieval Europe, royalty, aristocracy and other educated people kept animals as pets as well as for hunting and other sports.⁴ They could afford the enormous expense of importing exotic animals alive and providing them with the appropriate diet and accommodation. The church deemed such people capable of resisting the spiritual hazards that could arise from excessive intimacy with animals, but was less lenient towards the lower social classes who nonetheless often defied the religious authorities' attempts to expunge animals entirely from their beliefs and rituals. Witchcraft invoked mystical roles for cats, bats, crows, toads and other common animals and remained widespread in Europe until the late seventeenth century in spite of vicious, ruthless attempts to exterminate it. Indictments for 'unnatural' association with cats, rabbits and various wild animals and birds are a special feature of British trials for witchcraft: pet-keeping is not mentioned in reports of similar trials in other parts of Western Europe. Although 'unauthorized' pet-keepers were viewed with suspicion and risked persecution as witches, many people, especially widows, spinsters and others who were socially isolated, sought solace in the companionship of pets bred and tamed from wild and domesticated animals.

Several social developments promoted pet keeping in Europe during the eighteenth century and laid the foundations for the modern attitude towards companion animals in general. The persecution of witches ended and the Church quietly abandoned its opposition to intimacy between people and their pets. Scientists and philosophers encouraged exploration and the study of the natural world. The collection and study of 'curiosities' became fashionable hobbies for leisured, wealthy gentlemen. Explorers, traders and colonists brought back various novel and amusing animals and plants,

including colourful parrots, and some expertise in their husbandry. Ver-vert (see John Gilmore, Chapter three) is an obvious example of the Enlightenment attitude towards exotic pets. Even novice nuns were allowed to enjoy his charms. Church discipline was indeed imposed upon him for swearing, but in the middle ages, punishment for both the pet and its keepers would have been much more severe.

By the eighteenth century, secular philosophers as well as theologians were discussing the origin of consciousness and the place of humans in the natural order. Detailed study of non-European languages, especially those of India, revealed fundamental similarities indicating that speech and individual recognition were specifically human abilities. Scholars took an active interest in ‘idiots’, people born with hearing and the capacity to make sounds who never acquire speech. The rare cases of mentally and physically normal children who grew up without contact with other people attracted particular interest.

The existence of birds that could mimic, and in some cases use, speech as efficiently as children challenged theological concepts of the uniqueness and intellectual superiority of humans. As explained below, scientists are still actively exploring the nature of animal consciousness and comparing the learning and reasoning abilities of apes (especially chimpanzees), dolphins and other marine mammals with those of parrots. The possibility of meaningful ‘conversation’ with animals is still an enduring theme of children’s literature. Polynesian, the parrot in Hugh Lofting’s Doctor Dolittle stories, teaches his owner to understand animal languages, thus enabling

direct communication between people and animals.⁵ The African Grey parrot in the excellent children's story *Harry's Mad*⁶ passes on human knowledge from its former owner to its new owners who inherit him.

Biological similarities between humans and birds.

In spite of many apparent similarities, warm blood, sociality, parental care etc., birds and mammals are not closely related. Their last common ancestor was a primitive reptile (or possibly an amphibian) that lived during the Carboniferous age, about 350 million years ago. Among the important contrasts between birds and mammals are feathers (instead of hair), breeding by laying large eggs (instead of viviparity), and their senses. Almost all birds have large eyes and good colour vision (they can probably see a wider range of colours than we can) and very acute hearing. With a few exceptions (notably vultures, kiwis and certain petrels, fulmars and shearwaters) the sense of smell is weak, and touch is important only in certain social contexts. The great majority of birds, including nearly all parrots, are diurnal (owls and nightjars are among the exceptions). They are active only in daylight and roost quietly in holes or on branches during darkness.

Most mammals are nocturnal and their dominant senses are smell, touch (mediated by whiskers and other hairs) and hearing. Vision is often weak, with only a few groups definitely known to be able to see a full range of colours. Monkeys, apes and humans are exceptional among mammals in having very good vision, including colour perception and binocular vision made possible by forward-pointing eyes. Hearing is also well developed but the sense of smell often weak, a trait possibly associated with living in trees rather than on or in the ground (where smells are easier to track). Like most

birds, most monkeys are also diurnal, feeding and socialising during the day and resting at night. In summary, people, along with their primate ancestors, have sensory capacities convergent with those of the majority of birds including parrots.

The modalities of social communication are based on the senses. So, while scents and smells are central to long-distance communication in most mammals (e.g. rats, cattle, horses, dogs, cats, etc.), higher primates (monkeys, apes and humans) make extensive use of vision. Individuals recognise each other and assess their moods and intentions using facial expressions, gestures and actions. Birds, especially social species including parrots, also communicate by expressions such as altering eye shape and extending or hiding certain feathers especially those of the head, and actions such as head bobbing, wing flapping and dancing.

Almost all birds produce and respond to sounds, including vocalisations, and 'drumming' of beak or foot on trees or other hard surface. Species-specific calls are central to flocking, including alerting other flock members to danger, courtship and parental behaviour and defending feeding grounds and nest sites against rivals and predators. Communication by sound within and between groups is particularly important for birds and mammals such as monkeys and apes that are adapted to living in forests or other places where lines of sight are often obstructed. In a word, people are unusual among mammals in having sensory modalities and systems of communication that are very similar to those of diurnal social birds. With a little effort and imagination, people can 'tune in' to birds' natural means of communication

with their own species and thus interpret their moods and intentions.

Flying birds have many adaptations that save weight, including feathers, hollow bones, teeth replaced by a lightweight keratinous beak and the physiological capacity to manage with the minimum of water. Living birds seem ethereally light when sitting quietly on a shoulder or arm, but remarkably strong when attacking or struggling. Most birds are small enough to desiccate and become stiff after death, especially if protected from flesh-eating insects. The feathers remain in place as the skin dries and even very crude taxidermy can produce a lifelike appearance in a variety of realistic postures. The apparent incorruptibility of birds' bodies must have seemed mysterious to people who believed in bodily resurrection and were much concerned with life after death.

Like other innately social animals, people respond instinctively to human and human-like appearances and actions. The nineteenth century biologist Charles Darwin, who proposed the theory of evolution by natural selection, drew attention to the universality of features that express emotions, especially fear, and elicit emotional responses in others. In the 1950s, the Austrian ethnologist Konrad Lorenz took up a similar theme, identifying anatomical features that, by resembling those of human infants, elicit parental behaviour in people.⁷ A relatively large, rounded head on a short neck, with large round eyes positioned forward on the face, relatively small ears, mouth and jaws and a rotund body on relatively short legs render puppies, kittens, lambs and calves more attractive to people than the corresponding adult animals. Pugs, pekineses and Chihuahuas that are bred

specifically for use as lapdogs retain juvenile characters such as short snout, large eyes and floppy ears, while the heads of working breeds have more typical adult proportions, even in dogs that have been bred to be small (e.g. dachshunds, terriers).

Parrot biology.

Cockatoos, galahs, rosellas, budgerigars, cockatiels, eclectus parrots, ring-necked parakeets, lorries and lorikeets from India, South-East Asia, New Guinea, Australia and Polynesia, and macaws, Amazon parrots, parrotlets, conures and caiques (the latter three groups often called parakeets⁸) from South and Central America and the Caribbean, keas, kakapos and a few other atypical species in New Zealand and lovebirds and grey parrots in Africa belong to a distinctive group of birds known to scientists as the Order Psittaciformes. The name is derived from the Latin word for parrot, *psittacus*, which is borrowed from the Greek, *psittacos*, itself a corruption of a Sanskrit word. This term was introduced to the classical world by Ctesias, a Greek physician and scholar who visited northern India around 400 BC and was astonished to encounter captive birds that spoke in Sanskrit, and could even be taught Greek words. His description is accurate enough to enable us to deduce that the species he saw was probably the plum-headed parakeet (*Psittacula cyanocephala*) that is found over much of the Indian subcontinent and is still a popular pet.

The Order Psittaciformes includes over 330 described species of which two-thirds are native to tropical America and the Caribbean. The only species native to North America, the Carolina parakeet (*Conuropsis carolinensis*),

was hunted to extinction a century ago (the last survivor died in a zoo in 1918). Although the African climate and habitats are apparently similar to South America, the continent has fewer than a dozen species of Psittaciformes, mostly lovebirds (*Agapornis*), some now rare, and just one true parrot, the African Grey (*Psittacus erithacus*), which resembles macaws in various ways, most noticeably the area of bald, usually pale skin that extends from the stout, dark beak to around the eyes. So, while the many species of American macaws have overlapping ranges and even fly in mixed flocks, *Psittacus erithacus* is the only parrot in the vast rainforests of west and central Africa. An atypical parrot in many ways, the African Grey's importance in Western culture arises from over 2000 years of trade in luxury goods, including animals, spices, ivory and gold, between southwest Europe and West Africa, and the birds' extraordinary powers of imitation and intelligence.

Europe and Antarctica have had no native parrot-like birds during the Quaternary Period (i.e. within the last few million years) but things were not always so: the oldest known fossil parrot was found in France, and the birds were once widespread over what is now Eastern Europe. Climate does not seem to be the major reason for their absence. Some native parrots breed at high altitudes in Australia, New Zealand and New Guinea and often forage on snow. Many exotic parrots and smaller species including budgerigars can be kept in outdoor cages throughout the year in Britain.

Psittaciformes are among the more anatomically advanced groups of birds. Analysis of their genes suggests that their closest relatives are pigeons, doves

and the recently extinct dodo. Their strong, hooked beaks, large eyes and brain, short, thick neck on a compact body, sturdy, prehensile feet used for handling food as well as perching, powerful flight and, above all, their high intelligence are features in common with raptors (predatory birds including hawks, eagles and falcons). The upper bill of raptors, parrots and certain other birds is hinged on the skull so that it, as well as the lower bill, can move relative to the head. The upper bill thus forms a movable hook that is important for feeding, especially tearing or cracking foods, carrying objects, preening and for climbing, when the beak is used for grasping branches. Almost all parrots can support their own weight on the upper bill alone.

Parrots have four functional toes (the maximum for modern birds) arranged so that the middle two point forwards and the outer ones backwards. The powerful, prehensile grip so formed is used for perching on branches, climbing, and manipulating food and nesting materials. The foot can flatten out but, especially in those whose feet are relatively large (e.g. macaws, African Greys), walking on a flat surface is slow and clumsy. Most American, Asian and African parrots fly through or just above the forest canopy and have fairly short, rounded wings which, together with a long, mobile tail, assist manoeuvrability in a cluttered environment. Budgerigars (*Melopsittacus undulatus*), cockatiels (*Nymphicus hollandicus*), galahs (*Eolophus roseicapillus*) and other species adapted to savannah or desert have longer, narrower wings suitable for flying long distances.

The majority of the many different groups of birds are partially or entirely meat-eaters, preying on worms, snails, creeping, burrowing and flying

insects, fish, frogs, other birds as well as small mammals (e.g. raptors, owls, crows, gulls, storks, herons, woodpeckers, penguins, auks, swifts and many more). With a very few exceptions, birds of the Order Psittaciformes are herbivores, eating mainly seeds, fruits and flowers. Some species function as plant pollinators and seed dispersers. Although primarily herbivores, most of the larger species eat some animal food, often in the form of wood-boring grubs or other large insects or carrion. Other mostly herbivorous groups of birds include the ostriches, rheas, cassowaries and their relatives, ducks and geese, pigeons and doves, pheasants, turkeys, peafowl and domestic chickens, hummingbirds, and finches, sparrows and their many relatives.

Most parrots fly in flocks between flowering or fruiting trees, often covering up to 100 kilometres in a day. Most species normally feed in large groups though they may split into pairs while breeding. Australian galahs form the largest flocks, sometimes consisting of thousands of birds that can devastate crops. Flocking entails watching and exchanging calls with the other birds, habits that foster elaborate social behaviour and communication.

In many common bird species, only adult males sing, though both sexes recognise and respond to the species-specific calls. The nestlings learn songs and calls early, often from their own fathers, and thereafter their repertoire and many of their responses are fixed. Performance remains unchanged or deteriorates with age but cannot be extended or improved by learning. But some kinds of birds, including parrots and mynahs, retain the capacity and indeed the inclination to learn new sound into old age. Exactly how, physiologically, and why, functionally, these groups have this capacity

remains to be established. Although individuals differ greatly in the sounds they make, and how often, and their ability to communicate with humans, sex is not a determinant. Adult males and females seem to have similar capacities for learning and vocalisation, which suggests that activities such as territorial behaviour are more equally shared between the sexes than is the case with many other groups of birds.

In the wild, mated pairs of birds and/or holders of adjoining territories sing 'duets'. One bird starts singing and on hearing the song, the other bird(s) quickly joins in. This natural habit underlies the capacity of many captive birds to associate particular people with particular phrases, sounds and actions. Such birds learn to make sounds appropriate to particular situations and people, including 'greeting' people promptly with appropriate sounds.

Most small garden birds such as robins, thrushes and tits try to attract a mate and nest in the year following their hatching. Nests typically contain large clutches of eggs and the parents attempt to feed many chicks. Few adults survive more than five breeding seasons, many only one or two. Many larger birds, especially those with more specialized diets and feeding habits such as owls and seabirds including gulls, gannets, fulmars and albatrosses, grow to full adult size while on the nest or shortly afterwards, but do not attempt to breed for several years. Fully-grown but sexually immature gulls are easily recognized by their distinctive plumage and are a common sight in winter, feeding with the breeding adults.

In such species, egg predation and juvenile mortality are usually quite high: in some breeding seasons, over 90% of pairs fail to raise even one chick. But once birds reach adulthood, life expectancy improves and average and maximum longevity is much longer than that of mammals of similar size. A long life enables the birds to attempt breeding many times, with the same or with different partners, even though the success rate for any particular pair or season may be very low. They lay small clutches of eggs (penguins and albatrosses usually lay only one egg), and the hatchlings remain dependent on food provided by the parents for a long time, often many months. In some species, the 'baby' can be heavier than its parents before it is finally abandoned to fend for itself.

All the larger parrots have life histories of this type, characterized by 'delayed maturity', small clutch size, prolonged dependency of the chicks and low recruitment into the adult population. In addition, many parrots are slow to establish viable pairs and are fussy about where and when they construct a nest. Many species nest only in deep holes in tall trees, and suitable nest sites are vigorously defended against potential rivals. The parents feed the nestlings on food regurgitated from their own guts. The composition of the food, and the degree to which the parents digest it before passing it on to the chick change as the young grow. Although relatively small, African Grey parrots remain in the nest for more than two months and are dependent upon their parents until the age of six months, very much longer than most other birds and mammals of similar size, and as long as the large macaws. Consequently, most of the larger macaws and parrots breed very slowly, even under ideal conditions, and populations can be severely affected by prolonged adverse weather, habitat destruction and human

hunting. However, slow-breeding animals, including parrots, usually live a long time as adults, and retain into old age the capacity to breed and an interest in sexual behaviour.

Budgerigars and cockatiels are exceptional among parrots in that they are adapted to breeding rapidly and in large groups, taking advantage of brief periods when food is plentiful in the arid Australian outback. Carolina parakeets probably had similar habits, breeding as well as feeding in large flocks. Their very rapid decline from huge flocks to extinction in barely a century may have been due to birds being unable to reproduce efficiently after flocks were fragmented by hunting and from the destruction of their natural habitat for agriculture.

Parrots as pets.

A relatively large, rounded head on a short neck, with large, active eyes positioned forward on the face and a rotund body on relatively short legs are characteristics of parrot-like birds that enhance their attractiveness as pets. The beak is relatively large, and people usually regard large mouths as repellent rather than attractive. However, the psittacine ability to open both jaws relative to the skull resembles the involvement of the upper and lower lips in the human smile. This feature, together with their habits of carrying objects and handling food with the foot and beak, and the flat-footed, clown-like gait when walking on a flat surface with relatively large feet, contribute to the child-like demeanour of parrots, and hence to their attraction as pets. In addition, many parrots have brightly coloured feathers and, as well as mimicking human speech and sounds, they also imitate gestures and use

them in social communication, as infants do.

The herbivorous habit renders parrots and parrot-like birds more suitable as pets than starlings or birds of the family Corvidae (crows, jackdaws, ravens, magpies, jays etc.) In the wild, almost all parrots have a varied diet and are itinerant, flying between fruiting trees or other sources of food as they become available. If their natural diet is not available, many can be weaned onto alternative foods, including grains, pulses (peas and beans) and fruits that people cultivate for their own consumption. Appropriate food for parrot-like birds (and for other seed-eaters, notably pigeons, pheasants and canaries) is easier to obtain and store, and less messy in the eating - though any parrot keeper can testify to the mess the birds can still make! Although parrots are easier to feed than most wild animals, inadequate nutrition and/or feeding potentially toxic foods are common causes of poor health and breeding failure in captivity. Research into ways of improving their diet is still ongoing.

Parrot beaks are adapted to peeling, shelling and crushing fruits and seeds, while those of carnivores are used for stabbing and tearing. Consequently, parrots are less dangerous to their keepers than raptors, crows or herons of similar size. However, the hooked beak is much stronger and more versatile than it looks and all the larger species of parrots can inflict nasty bites and pinches. Many specimens seem to undergo abrupt changes of mood and can suddenly attack people who have been petting them moments earlier as well as being persistently vicious towards people they associate with pain, fear or confinement. Their habit of stripping and gnawing makes parrots very

destructive of living vegetation, furniture and textiles. African Grey parrots that weigh at most 0.5 kg can fragment a chicken thigh bone in minutes and rip soft pine wood to splinters. However, human ingenuity, persistence and experience have developed ways of housing parrots to the best advantage while minimizing the risk to people and birds.

The congruence of diet, diurnal rhythms of activity, sensory capacities and many aspects of social behaviour between humans and parrot-like birds enable them to establish a long-term *modus vivendi* that extends beyond just displaying them in a menagerie: parrots are exceptionally suitable as indoor pets with which people can establish prolonged, intimate relationships. Many are colourful and handsome as well. Mynah birds are fruit and seed-eating relatives of starlings (family Sturnidae, order Passeriformes). The smaller species especially, such as the Indian Hill Mynah (*Gracula religiosa*), make good pets for many of the same reasons that parrots do, although they are messier, less colourful and do not live as long, a maximum of only 8 years in captivity, compared to decades for many parrots. Doves, pigeons and their relatives, canaries, goldfinches and other finches and many sparrow-like and pheasant-like birds have some of their qualities and so might be described as *proxime accesserunt*.

In many parrots (and mynah birds) including the species most often kept in captivity such as African Greys (exceptions include budgerigars and ring-necked parakeets), the sexes appear so similar, at least to our eyes, that they cannot easily be distinguished. There is also little obvious difference in temperament or habits. This sexual ambiguity was well known to early

parrot owners and their fictional counterparts: although always referred to as 'she', Long John Silver's parrot is named Captain Flint and has some distinctly masculine traits (see Chapter 5).¹⁰ The sex of Loulou in Flaubert's famous short story⁹ is undetermined and irrelevant to its role in the lives of its human carers (see Chapter 4).

The birds themselves appear to be able to identify each other quite easily, but exactly what clues they are using remain to be explored. Until DNA technology for identifying genes became available in the 1990s, the only certain way of establishing the sex of captive birds was surgery (opening the abdomen to inspect the reproductive organs), with all its attendant distress and risks. Many owners, including the author, believed that such intervention was not justifiable, and the sex of many pet birds remained uncertain. The ambiguity is sometimes settled abruptly and definitively when the bird produces an egg. Sexual arousal alone can stimulate the maturation of eggs; actual mating is not essential to egg-laying, though of course unfertilized eggs cannot develop into chicks.

Captive parrots can form pairs with other birds of either sex and not necessarily of their own species and/or direct courtship behaviour towards humans. Many parrots develop strong preferences for a particular person or category of people (e.g. favouring men over women) even if their advances are not reciprocated. They may reject the attention of certain people, including long-familiar carers and food providers, and become jealous, sometimes vicious, towards anyone who appears to be competing for their 'mate'; an example is Coco in *Wide Sargasso Sea* who monopolises

Antoinette's mother and attacks others who approach her.

In most parrots, courtship includes passing regurgitated food between the pair, a behaviour derived from chick feeding. Such 'kissing' behaviour is particularly prominent in lovebirds, African relatives of parakeets: they usually make good pets if tamed from fledging but they can be vicious as well as noisy. Some owners find the habit very endearing and encourage it, among them Félicité and her parrot Loulou.¹⁰ Artificially reared birds are much more likely to 'court' humans than those raised by their own parents, and may do so to the exclusion of normal responses towards members of their own species. For birds that are bred in captivity with the intention of returning them to the wild, elaborate precautions, including feeding with puppets that resemble the parent's head, are taken to prevent young birds from forming attachments to people.

Until quite recently, all pet parrots were caught in the wild, usually as fledgling chicks. Those tamed individually usually prospered for decades in captivity, even when transferred between owners. Seafarers bought hand-tamed specimens from native traders and kept them as pets during long voyages. Some such birds were given to settled, urban families, where their attractive appearance and habits stimulated consumer demand for parrots far beyond that which could be satisfied by hand-me-downs from passing sailors. Loulou is treasured by uneducated, working-class Félicité after being discarded by a roving diplomat and then by Madame Aubain.¹⁰ In having comparatively varied, luxurious and rewarding lives, both of Loulou's previous keepers were much more typical of previous generations

of parrot-owners but nonetheless Félicité is as bereft and socially isolated as any mariner, celibate priest or, for that matter, bored bourgeoisie such as Madame Aubain.

The rapidly expanding market for pet birds led to over-collecting, cruelty and very high losses during transport. Many of the survivors were so traumatized by their early experiences of captivity that they became aggressive, noisy or withdrawn. The fact that it is difficult, in some species almost impossible, to distinguish young adult parrots from older ones (in contrast to mammals that can usually be aged from their teeth), enabled unscrupulous traders to sell birds that were irrevocably unsuitable as pets.¹⁰ The cliché ‘sick as a parrot’ came to mean depressed and unhappy. Parrots that adjust poorly to captivity are prone to self-mutilation and to infectious diseases, of which the most widely discussed is psittacosis, also known as ‘parrot fever’. This pneumonia-like infection of the lungs is caused by the bacterium *Chlamydia psittaci* and in untreated birds is usually fatal within days, though the pathogen is easily destroyed by common antibiotics. Contrary to popular belief, the disease is not specific to parrots, or even to the Order Psittaciformes. It occurs in canaries, domestic poultry and pigeons and can be particularly troublesome among the latter, as birds can be infectious without themselves showing symptoms. Psittacosis is associated with parrots, parakeets, budgerigars and lovebirds simply because intimacy between owners and their pets promotes cross-infection. Human to human transmission is extremely rare.

Captive breeding was the obvious solution to the problems arising from

importing wild birds and the decline in abundance of many species in their natural range. For the reasons described above, breeding parrots in captivity proved extremely difficult and for many species was until recently regarded as almost impossible. Even well-established pairs can fail to breed through lack of appropriate nest sites, not providing appropriate foods for the parents to bring to the nestlings and parents abandoning or even killing their offspring. Hand rearing abandoned chicks on synthetic diets has taken many years to perfect. Macaws and other large parrots proved particularly intractable, but even small, highly social species were difficult: more than thirty years of attempts at captive breeding failed to save the Carolina parakeet from extinction.

The first species of the Order Psittaciformes to be bred in captivity in large numbers were budgerigars. Their nomadic, gregarious habits enable them to pair, breed and raise their young in simple, tightly packed nest-boxes surrounded by many other birds that form a dense, noisy crowd. The sexes are easily distinguished, and the chicks mature comparatively quickly. Unknown in Europe or America until 1840, by the twentieth century, budgerigars had replaced canaries (a fast-breeding, finch-like bird) as the most popular indoor cage-bird. Fanciers produced a range of artificial varieties for the pet trade. Wild budgerigars are green with a yellow head and neck and barred wings but selective breeding in captivity has produced blue, violet, mauve, white and yellow forms. Success with budgerigars was followed by large-scale captive breeding of several other small parrots, especially cockatiels whose natural habits and habitat closely resemble those of budgerigars. From the 1950s, almost anyone could find the space and resources for a pet budgerigar and huge numbers were kept especially by

children and the elderly. At last, parrot-keeping extended from an expensive luxury for the rich and dedicated to a popular hobby accessible to everyone.

Large-scale captive breeding of most other psittacines became economically viable only after the establishment and enforcement of the convention on international trade in endangered species (CITES) in 1975, which greatly reduced the numbers of wild-caught birds that were exported from their native habitats. Dwarf macaws and some species of lovebirds, conures, parakeets and cockatoos are now widely bred in captivity for use as pets, but all the large parrots, especially African Greys, naturally breed so slowly that they are very expensive to produce. Because progress in captive breeding has been slow, deliberate selection to create artificial varieties has only very recently been applied to parrot-like birds other than budgerigars. For a few species, breeding outside their natural habitat has become too successful. Since the 1960s, feral breeding populations of budgerigars and at least five other species of parrot-like birds derived from escaped pets have become established in Florida, Hawaii, California, the coast of Oregon and several other areas in USA. The birds often become a nuisance to crops and homes and controlling their numbers and activities has proved surprisingly difficult. Since the early 1970s, rose-ringed parakeets (*Psittacula krameri*), which are native to India, Sri Lanka and parts of Southeast Asia and east Africa, have established feral populations in several places in and around London and Manchester.

Breeding parrots in captivity has greatly improved knowledge of their husbandry, particularly in relation to diet and maintaining good mental

health. Consequently, pet birds are living much longer: up to 75 years has been claimed for Amazon parrots in captivity, at least 50 for African Greys and the larger macaws, 40 for sulphur-crested cockatoos (*Cacatua galerita*) and 18 for budgerigars. Even in ancient Rome, captive parrots lived long enough for funerals marking their death to be deemed appropriate (see Chapter 1). However, veterinary records show that through mismanagement and neglect, the average longevities are only 20-30% of the maxima for each species.

Some parrots that thrive in captivity live long enough to be inherited as heirlooms,¹¹ but others become irretrievably attached to their owners. The fact that Frances, Duchess of Richmond and Lennox, a particularly wealthy, glamorous and witty mistress of King Charles II owned an African Grey for at least forty years is testimony to both the robustness of these birds and seventeenth century parrot-keeping technology. The bird died a few days after its mistress, to which it was devoted, in 1702.

Talking parrots.

The western world has associated parrots with astonishingly accurate imitation of human speech for 2.5 millennia. Birds that could mimic human speech were fascinating and they also flattered their owners' vanity. Imitation is often accurate enough to be recognizable as a particular person's voice, and whole phrases or sentences are repeated with appropriate and realistic intonation. Before sound recording devices were invented at the end of the nineteenth century, imitation by a talking bird was the nearest anyone came to hearing his or her own voice. Alleviation of loneliness by accurate

voice mimicry was the main basis for Robinson Crusoe's devotion to his parrot Poll (see Chapter 6).

The ability is not unique to parrot-like birds. A wide range of birds, especially starlings, mynahs, crows, jays, magpies and ravens, mockingbirds and species of warblers and birds of paradise, mimic the calls of other birds in the wild and thus can, under special circumstances learn to reproduce human-generated sounds. The capacity for imitating sounds differs enormously between species, and within a single species, between individuals. A few individuals of most of the species of cockatoos, macaws, parakeets and lovebirds that have been kept in captivity for some time have been reported to produce recognizable imitations of human voice, although the ability is unknown in solitary species such as the New Zealand kakapos. Aviculturists agree that the best talkers, in terms of the probability that they learn readily and the accuracy of imitation, are the African Grey parrot, a few of the 50 or more species of the genus *Amazona* including the yellow-naped Amazon parrot (*A. auropalliata*) and the (mostly green) blue-fronted Amazon (*A. aestiva*) of Central and South America (to which Ver-Vert belonged, see Chapter 3), the Australian budgerigar and certain Indian parakeets (*Psittacula*) (to which Skelton's parrot belonged, see Chapter 2). Since they are native to different continents, these good talkers are not closely related to each other. Perhaps even more surprising is the fact that they share much common ancestry and many habits with species that imitate human speech rarely, poorly or reluctantly.

All talking parrots are naturally social and spend at least part of their time in

large flocks, but many other bird species with social behaviour as elaborate as that of talking parrots imitate human sounds very little or not at all, even with intensive training. The capacity for mimicry is not consistently associated with body size (the best talkers are all intermediate-sized or small species), diet, sexual behaviour, breeding and social habits, longevity, colour or quality of plumage, or the loudness and frequency of calls in the wild. The sound of flocks of African Grey parrots in West Africa are described as a medley of screams and whistles, and surprisingly little mimicry of other birds can be detected among their natural calls.¹² The long-lived, elaborately coloured macaws scream a lot but are generally poor talkers. The capacity also develops surprisingly late: even the best talkers do not start to imitate human voices until months after they become independent of their parents, often not until they are over a year old. Parrots kept in flocks, or even in pairs, usually do not talk readily, and isolation from other birds, especially conspecifics, promotes the imitation of human sounds.

How, if at all, the capacity for imitation improves the birds' survival in the wild and how, when and why it evolved remains obscure. Sounds produced by people who are rivals for the attention of a bird's 'favourite' seem to be more readily learnt than others, and at least African Greys 'answer' the calls of local birds, and those of more exotic species that reach them via television or radio. Both these observations suggest that the ability might serve for attracting and keeping a mate or defending a nest site or a food source against potential rivals. However, most birds defend mates and territories while breeding (and sometimes continuously) but lack psittacine capacity for mimicry. The birds have been so little studied in the wild, or even under natural conditions in captivity, that the explanations remain speculative.

Most parrots cannot be ‘trained’ to talk by reward and punishment in the same way as psychologists teach rats or pigeons to perform a task for a food reward: the traditional concept of *ferula* does not work. All the trainer can do is repeat a word or phrase and hope that the bird decides to say it. Parrots that are caged above disturbing or threatening people and other animals usually seem happier and often interact better with people; birds that are frequently alarmed by objects moving overhead, loud noise or assaults may become severely depressed and unresponsive. But some apparently healthy specimens kept under optimum circumstances talk rarely and indistinctly, sometimes not at all, even after many years in human company. For example, Loulou in Flaubert’s *Un Coeur Simple*, Captain Flint in Stevenson’s *Treasure Island* and Coco in *Wide Sargasso Sea* could say only a very few phrases. Both loquacious and aphasic parrots can respond to human-generated sounds including words by orienting to particular objects or people or obeying orders to perform an action. This ability seems to have little or nothing to do with mimicry: a bird may obviously recognize an important word in a long, unfamiliar sentence or act upon a command that it never pronounces.

Short phrases that stand out from longer trains of speech, single words such as names and expletives and sounds that herald the start of communication after a period of silence are particularly readily learnt (hence parrots’ tendency to pick up expletives and swear words). Women’s and children’s voices seem to be easier to reproduce than the deeper tones of men, though good talkers can mimic the voices of several different people. Certain phonemes may be more difficult to say than others, and producing loud

sounds seems to be very tiring. Consonants that a bird finds particularly difficult may simply be omitted from a phrase, or replaced with a pause of appropriate length. Contrary to popular belief, many parrots do not just ‘parrot’ human speech, but often say fragments of words or phrases reassembled in various ways and in a range of realistic intonations. Such prattle often sounds remarkably like garbled human conversation overheard from a distance, and, especially before recorded, broadcast and telephonic speech became commonplace, can be disturbing, as in the case of Skelton’s parrot (see Chapter 2).

To the embarrassment of many owners, parrots seem equally adept at learning non-speech noises such as coughs, screams, laughs, hiccups and farts and mechanical sounds associated with people such as telephones, door bells, alarms, sirens and the broadcast time signal (the ‘pips’). They also readily imitate other animals such as dogs barking and the calls of wild birds. Although the distinction between ‘speech’ and ‘noises’ is fundamental to humans, parrots (and other mimetic birds) do not recognize the categories in quite the same way. Pet birds are thus as likely to greet a person with a realistic imitation of his cough, fart or mobile phone ring-tone as with ‘hello’ in his own voice.

Scientists ¹³ have used rigorous acoustical analysis and some of the most modern instruments for medical investigations, including magnetic resonance imaging (MRI) and several forms of computed tomography, to explore the anatomical and physiological mechanisms that enable the birds to imitate human speech and other ‘non-natural’ sounds. Sonograms (images

that display the relative intensity and duration of all the frequencies that contribute to a complex sound) show that words and other sounds produced by the trainer and the trained bird are very similar, as would be expected, since the human ear also hears them as very similar. How such resemblance is achieved with very different anatomical structures is still a mystery: birds do not have lips or teeth, both essential to people for saying many consonants, and the mouth and throat are much smaller, which should make deep sounds more difficult. Parrots clearly move the lower bill while talking and the stout muscular tongue probably helps to modulate certain sounds, but the mouth cannot be as adjustable as the soft, muscular lips and cheeks of mammals. Several contrasts between Grey parrots and other birds in the structure of the tongue and voice box were noted, but exactly how, if at all, they contribute to sound production remains to be established.

Most parrot owners notice a remarkable lack of association between which sounds their birds are 'taught' and what they learn to imitate. A bird may repeat a word or phrase, or say an established phrase in a new person's voice, after hearing it only a few times, while 'refusing' to say other apparently similar phrases that it has heard scores, even hundreds, of times. Such 'habits' are manifestations of some subtle differences in the ways that parrots and human children learn to talk. From an early age, infants can discern the referential intentions of the people around them. They learn most names for objects and people using cues that parents and siblings provide such as direction of gaze, gestures like pointing and the social context in which the word appears, rather than by simple association. Humans, albeit usually unconsciously, direct their children's attention towards particular sounds, thus promoting selective learning and establishing the distinction between

language and other noises. Although parrots make eye contact and can imitate gestures, their attention is not easily directed to particular sounds or objects. Their speech may include sounds that people would not have ‘taught’ to their infants, and birds often ‘refuse’ to say words that children learn easily.

Voices and phrases that the birds do not hear for months gradually drop out of the repertoire, but those associated with a particular person or situation can reappear within minutes in the relevant situation, in my experience after an absence of several years. A parrot may suddenly produce with startling accuracy the voices of people who have long been absent or even dead. Before photography and sound recording made recreating images of the deceased commonplace, this ability must have seemed supernatural.

Talking seems to be prompted more by boredom and, in parrots accustomed to human company, the desire to elicit attention than by fear, pain, thirst or hunger. Thus C.J. Sansom’s ¹⁴ fictional account of a parrot warehouse in Tudor London does not quite ring true: injured, stressed and thirsty birds would scream (or, more likely, suffer in silence) but would be unlikely to talk. Many parrots are attracted to novelty, selectively repeating newly learnt sounds, voices and phrases in place of the long-established repertoire. Although they sometimes ‘practise’ phrases by repeating them softly, parrots have an unnerving habit of suddenly producing a new phrase or sound almost perfectly.

Infants start with saying single syllables or short words and only slowly learn to express additional meaning by organising several words into sentences

and by modulating the tone of phrases, as in forming a question. Children have a vocabulary of many hundreds of words before becoming adept in the use of syntax, a uniquely human capacity of obscure evolutionary origin. Use of syntax is often impaired in people suffering from congenital disorders of communication such as severe autism, or damage following strokes or head injuries, even when their vocabulary is extensive and they can communicate well by gestures. Talking parrots thus seem to have a command of syntax equivalent to that of an unusually precocious child. Such performance is extremely gratifying to pet-keepers intent upon 'educating' their bird as they would a child. Linguists and psychologists believe that singing and other forms of musicality have much in common with the capacity to use syntax (though how and when they evolved in humans remain controversial). Most parrots that talk well can also sing without special training, producing more or less accurate arpeggios as well as repeating tunes that they have heard.

Scientific analysis of parrot intelligence.

Intelligence has many definitions and dimensions, but roughly it is the capacity to adapt one's behaviour to a novel situation using information and principles derived from experience, the mental flexibility to transfer skills from one domain of action to another. Intelligence is quite different from memory or the ability to mimic human speech, though the latter ability greatly facilitates its recognition and its experimental analysis.

The contribution of animals' intelligence to their relationships with humans

is complex. People are strongly attracted to animals that display intelligence similar to that of humans, hence the elevation of monkeys and apes above 'dumb beasts'. Intelligence can help animals to adapt to captivity by enabling them to adjust to new types and sources of foods and to deal with unfamiliar or frightening environments, but it can also render the animal more susceptible to depression and destructive behaviour.

Comparative studies on many different groups of birds during the past century concluded that species that sing a wide range of songs performed better on auditory discrimination tasks, while those (such as woodpeckers) that cached food did better on spatial tasks. Migratory species learn to orientate themselves to landmarks, etc. and pigeons have an almost unique (and still poorly understood) ability to 'home'. However, birds that perform spectacular feats of memory for certain modalities could be remarkably stupid, and often almost untrainable, on other tasks. Neurological studies revealed some association between the relative sizes of certain areas of the brain and specific learning abilities. Broadly, the conclusion was that no one kind of bird had generalized superior intelligence comparable to that of higher primates or dolphins among mammals.

During the last twenty five years, the perceptual abilities and intelligence of parrots that fascinate writers and artists has been subject to rigorous physiological and psychological analysis. The prime mover in this field is the American scientist, Dr Irene Pepperberg, who with various colleagues has produced more than sixty publications in *Journal of Comparative Psychology* and other scientific journals reporting mainly but not exclusively

experimental studies of the behaviour of her African Grey Parrot, Alex, who has been with her since 1977.¹⁵ A theoretical chemist by training, Pepperberg has pioneered the use on parrots of experimental designs and analytical techniques that were first developed for studying perception, reasoning and learning in young children. It would not be appropriate here to do more than summarise the principal methods and conclusions of this unique research.

Alex is trained by watching a trainer 'teach' a (human) trainee, who, on correctly stating the name of an object receives it as a reward. Then Alex is offered the object and is given it to play with (which usually takes the form of chewing it to bits) if he says the right word. So the bird has to both learn to identify the object, and to articulate the word(s). This ability may seem commonplace to us, as young children learn it without effort, but it is in fact very unusual among animals, and key to revealing parrots' intellect. Chimpanzees and some monkeys make calls that signal food or danger, often indicating specific types of food or sources of danger, but it is (almost) impossible to teach them to produce an arbitrary sequence of sounds (i.e. an English word) to convey the same meanings. Screams, barks, howls, hoots, whistles and other calls are indelibly associated with fear, aggression, desire or particular situations in non-human mammals, but humans readily learn to de-couple the neural commands to the muscles of the mouth etc. that generate speech from emotional state. Such voluntary control of sound production enables the use of referential words and is acquired gradually during childhood. Its perfection is almost the hallmark of a mature adult, though, as everyone knows, extreme emotion, especially pain and fear, and certain drugs including alcohol can make almost anyone 'cry like a baby' or

say things involuntarily. African Greys and perhaps other parrots can also be taught to decouple their emotions from instinctive sounds and recouple them to learnt words.

Under carefully controlled conditions and with many ‘distractors’, Alex has learnt to say English words that identify over fifty items, achieving 80% accuracy. This proficiency is about the same as chimpanzees trained to identify objects by pointing to keys, not by speaking. He can also name properties of items, including seven colours, five shapes (with up to six corners), relative sizes, and quantities of items up to six, and grasp concepts such as ‘different’ and ‘zero’. Such feats are more difficult than they seem to us as they require selective concentration on certain features of the task, while disregarding others: thus when shown a mixture of red and blue structurally assorted items and asked ‘How many red?’, he has to disregard shape and material, and base his response only on colour.

The trainers need enormous patience: attempts at saying the appropriate word rarely appear before at least 20 training sessions each lasting several hours, and Alex often gets bored and refuses to cooperate. Pepperberg’s research showed that psittacine intellectual abilities are not confined to aural and oral: they can also see very well and can interpret, classify and remember visual information, and can be trained to express their ‘conclusions’ in words. These intellectual abilities are recognizable even in untrained birds, which may, for example, respond to the presentation of a food by saying the name of an edible item, even if the word is not exactly correct (e.g. saying ‘orange’ when an apple is offered) or confuse ‘good

morning' with 'good night' more often than with 'good-bye'. People also learn vocabulary in categories so such mistakes make parrots seem almost uncannily human.

The 'best' talking parrots, especially African Greys, combine their intelligence with their power of mimicry to produce sounds appropriate to situations, or specific for people, animals or machines that they can see or hear, such as asking for particular items of food or soliciting services such as petting or being picked up. They obviously 'try' to communicate with people by participating in 'conversations' of alternating phrases and by supplementing speech with other sounds such as banging the beak on hard surfaces, throwing things etc., and by gestures of the feathers, head, wings and feet. If a phrase or action fails to produce the desired outcome after a few repetitions, they may switch to an alternative phrase, then a third, and so on, sometimes persisting for many minutes using tones of voice of increasing urgency. Usually but not invariably, each phrase is closer to actual human usage than the one before. This ability is the basis for the anecdote concerning an African Grey belonging to King Henry VIII: on falling into the Thames, it successfully attracted rescuers by producing the phrases by which intending passengers summoned the ferry.¹⁶ I can believe it. They can show remarkable 'presence of mind' when lost or distressed.

The combination of accurate mimicry, using several modalities of communication, including the visual abilities demonstrated by Pepperberg's research, has an intense impact on people that contributes greatly to their attractiveness as pets: although obviously very different, parrots seem to

behave like a close family member. The larger parrots seem to have a detailed mental image of their normal surroundings, especially their sleeping and eating quarters. If changes are introduced while they are absent, they obviously notice, responding first with anxiety, then curiosity and finally detailed inspection of the new structure, usually including chewing it. People would respond in much the same way to changes in their home.

Parrots often explore objects by manipulating them in the foot or beak. Such behaviours can produce what appears to be 'tool use' or even 'tool manufacture', the shaping of objects for use in actions such as reaching food and grooming themselves,¹⁷ another intellectual ability that until the mid twentieth century was believed to be specifically human. Pepperberg developed a computer-based enrichment system for Alex that enabling him to play to himself up to four different styles of music, video clips, games or pictures. At first he would 'work' alone with this system for hours, but then seemed bored with it. Interest was revived after the content was changed, so he could choose between four new pieces of music etc. These and other findings help to explain why without company, toys, objects to chew and climb on intelligent parrots can become depressed, aggressive, noisy or destructive. It should prompt improvement in the husbandry of captive birds.

After eighteen years as his trainers' only subject, Alex was joined by a much younger conspecific. The younger bird learnt some tricks by watching the more proficient Alex, thus placing African Greys in the select groups of animals, including chimpanzees and certain whales that can learn from each other: they can acquire new skills by observing their performance, without

actually practising them. They do not, however, seem to be able to learn from watching videos, at least not those adjusted for human perception.

African Grey, and perhaps other parrots, can recognize familiar individuals by sight from a distance of several hundred metres, seeking to attract attention with gestures and sounds. This impression is reinforced by their apparently indelible likes and dislikes. Even if they do not appear very distressed at the time, parrots remember unpleasant experiences and become hostile to associated people and places, often for years afterwards. As many owners and their families have found, very minor ‘misdemeanors’ can condemn certain individuals to *persona non grata* status with their pet, sometimes irredeemably, as parrots have very long memories and do not readily forgive. Conversely, everlasting affection may be lavished on certain people including infrequent visitors who have only a minor role in the bird’s life.

The bird seems to have a powerful ‘personality’ that can attract and hold their owners’ attention, and demonstrates many of the virtues valued by pet-keepers, including affection, loyalty and recognition, as well as many dogs. Unlike dogs and primates, it seems to be impossible to instill a sense of shame using speech alone. A bird may shout associated phrases such as ‘Stop it’ or ‘Bad bird’ in an appropriate tone of voice while, or even just before, biting, tearing something up or making a mess, but continue the offending behaviour. They may celebrate rather than conceal terminating their actions with apt phrases such as ‘You’re in disgrace’ or ‘Now you be

good’.

The brain of an African Grey parrot is about the size of a walnut. Relative to body mass, its size is slightly larger than that of other birds, but the intellectual feats achieved still seem remarkable for something so small. Apes and a few other kinds of exceptionally intelligent mammals resemble humans in preferentially using one hand. Studies of people with localized tumours, injuries or impairment due to strokes reveal that, although roughly symmetrical in appearance, the adult brain is far from being functionally symmetrical. In particular, control of speech and manual dexterity are controlled on different sides of the brain. The link between speech and dexterity was suggested from the observation that naturally left-handed children, especially boys, who were forced to favour the right hand (following injury or at the behest of educators) frequently developed stammers and other impediments of speech.

The forelimbs of birds have become wings, which always function symmetrically. But in some groups, especially raptors and parrots, the feet are used like hands for manipulating food and other objects. Many adult birds show a marked preference for using the same foot for food ‘handling’, a habit that is believed to originate from the mechanics of hatching from the egg. At least since the mid-nineteenth century, ‘footedness’ in parrots had been linked with their powers of mimicry and intelligence. Among African Greys in USA, recent research found that left-footed and right-footed birds were equally abundant but the latter tended to have slightly larger vocabularies.¹⁸ This conclusion does not apply to all parrots: more than

80% of Australian cockatoos are left-footed. Neurological studies have revealed evidence of lateralization for the analysis of various stimuli and long-term memory consolidation. The parallels between handedness, 'footedness' and intellectual ability in humans and these birds are too obvious to be dismissed, but hard evidence for a direct connection is as yet vague.

In assessing the feats of intelligence and memory in demonstrated parrots, it is important to keep in mind that the possibility that other kinds of birds could match or even exceed their achievements is not excluded. Pigeons and domestic chickens have been widely used as experimental subjects for psychological studies since the middle of the twentieth century. So far, we humans have been unable to accommodate the requirements of, for example, owls, albatrosses, pelicans or penguins well enough to study their intellectual abilities to anywhere near the depth that has been achieved with parrots, pigeons and domestic poultry. In view of the similarity in genes mentioned above, it is interesting that the intellectual abilities of pigeons turn out to be much greater than those of poultry.

Birds continue to surprise us by revealing unanticipated intelligence and versatility comparable to that of parrots in captivity. Pepperberg has shown that Alex can enumerate items up to at least six, but as the late Hon. Miriam Rothschild reported,¹⁹ cormorants trained and managed by traditional fishermen in southern China consistently refuse to cooperate with their handlers unless allowed to swallow every eighth fish that they catch. Cormorants belong to the Order Pelecaniformes (that also includes pelicans,

gannets and boobies) and on almost every criterion are more primitive than parrots, raptors and song-birds, with raucous calls, unglamorous plumage and apparently unsophisticated social behaviour. Corvids (crows, jackdaws, ravens, magpies, jays) are known to be among the most intelligent of the song-birds. However, the ability of an unexceptional-looking crow (*Corvus moneduloides*) that is endemic to the tiny, remote Pacific island of New Caledonia to fabricate hooks and other complex tools from twigs, moulted feathers and other natural and synthetic materials and use them for extracting food came to light from the study of a captive specimen in Oxford.²⁰

The scientific study of parrots integrates into mainstream science folk tales, anecdotes and literary accounts of parrot biology that were previously viewed with scepticism. It systematizes and quantifies the perceptual, intellectual and mimetic abilities of parrots that fascinate writers, artists and attract ordinary people to the birds. The notion that intelligence requires a larger brain has been central to almost all scientific theories about the origin of humans for more than a century, yet parrots seem to undermine it. How can such a small brain be capable of intellectual feats that evolved relatively very recently (within the past million years) and entail a brain hundreds of times larger?

In appearance and in their extraordinary ability to imitate speech, parrots resemble substitute infants and are thus ideal pets. Trained parrots seem almost to mirror humans, but their behaviour is not completely predictable or controllable. Like oracles, court jesters and shamans, parrots say and do things outside the normal social conventions. The ecological and

physiological bases for mimicry remain intriguingly cryptic. Parrots' sexual ambiguity and difficulties of breeding them in captivity contribute to the impression that, like ancient deities, they can speak to people and influence their lives, but they are fundamentally mysterious and supernatural.

Many parrot species are declining very fast through habitat destruction and over collecting. We hope that better understanding of their unique contribution to human culture will prompt people to value both wild and captive specimens more highly.

Caroline Pond found a stray African Grey parrot on Magdalen Bridge in Oxford during a snowstorm in June, 1975. They have lived together ever since. This chapter owes much to what they have learnt from each other.

NOTES

¹ R. Dawkins, *Unweaving the Rainbow Science, Delusion and the Appetite for Wonder* (London: Allen Lane, The Penguin Press, 1998)

² A general account of the history of pet keeping can be found in J. Serpell, *In the Company of Animals* (Oxford: Basil Blackwell, 1986)

³ *The Complete Kama Sutra*, trans. A. Danie'lou, (Park Street Press, Rochester, Vt, USA (1994) Ch. 4 The Conduct of the Well-Bred Townsman, pp. 61-62.

⁴ Detailed information about parrots in European art and literature can be found in B.T. Boehrer, *Parrot Culture* (University of Pennsylvania Press, Philadelphia, PA, 2004)

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- ⁵ H.J. Lofting, *The Story of Doctor Dolittle: Being the History of His Peculiar Life at Home and Astonishing Adventures in Foreign Parts Never Before Printed* (1920)
- ⁶ Dick King-Smith, *Harry's Mad* (Puffin books, 1984)
- ⁷ A general summary is found in K.Z. Lorenz, (1952) *King Solomon's Ring* Re-issued by Routledge 2002.
- ⁸ The term parakeet is often colloquially applied to any small parrot-like bird, including, in USA, budgerigars.
- ⁹ Gustave Flaubert, *Trois Contes* (1877) (see Chapter four). Loulou was mostly green so almost certainly from the Caribbean or Central America, probably one of the many species of the genera *Amazona* or *Aratinga*.
- ¹⁰ Nestlings always have distinctive appearance, and in many species, there are subtle differences in eye colour, wing shape or plumage between independent but immature birds and adults. The plumage of some parrots changes in old age, in a manner similar to grey hair forming on elderly humans, dogs and other mammals. Many African Greys develop ectopic pink feathers after the age of about thirty years.
- ¹¹ For example, Loulou in *Un Coeur simple*, and Madison in *Harry's Mad*.
- ¹² A.J. Cruickshank, J-P. Gautier, C. Chappuis, Vocal mimicry in wild African Gray parrots *Psittacus erithacus*. *Ibis* **135**: 293-299. (1993)
- ¹³ Led by Irene Pepperberg, see the following section.
- ¹⁴ C.J. Sansom, *Dissolution – a Novel of Tudor England* (London: Viking Penguin, 2003)
- ¹⁵ Much of the research is summarised in: I.M. Pepperberg, *The Alex Studies: Cognitive and Communicative Abilities of Grey Parrots* (Harvard University Press, Cambridge MA, 1999)
- ¹⁶ C. Gesner, (1551-8) *History of Animals*.
- ¹⁷ M.P. Janzen, D.H. Janzen and C.M. Pond Tool using by an African Grey Parrot (*Psittacus erithacus*). *Biotropica* **8**: 7. (1976)
- ¹⁸ P.J. Snyder and L.J. Harris, Lexicon size and foot preference in the African Grey parrot (*Psittacus erithacus*). *Brain and Cognition* **37**: 160-163. (1998)
- ¹⁹ P. Egremont and M. Rothschild, The calculating cormorants. *Biological Journal of the Linnean Society* **12**: 181-186. (1979)
- ²⁰ A.A.S. Weir, J. Chappell and A. Kacelnik, Shaping of hooks in New Caledonian crows. *Science* **297**: 981. (2002)