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Understanding Your Doves

by Dr. Matthew M. Vriends
Loveland, Ohio

Doves in the Wild

Pigeons and doves belong to the avian order *Columbiformes* and, with the exception of the polar regions, they inhabit almost every corner of the earth, though the "headquarters" of the group seems to be the Oriental and Australasian regions. There is no particular scientific basis for the separation of the words "pigeon" and "dove" though the former is often colloquially applied to the domestic and larger species, the latter to the smaller species. Of the 305 or so described living species, size varies from little larger than a sparrow to larger than an average domestic hen. There are small, dainty seed eaters and plump, robust fruit eaters. However, all doves have many anatomical features in common and the group is quite homogeneous.

Looking generally at a dove, for example, the head is relatively small in relation to the body. The beak is also relatively small, short, narrow, and slightly bent down at the tip. The soft, sensitive, fleshy cere at the base of the bill is devoid of feathers. Only in the fruit eating doves are the nostrils in the cere wide open and easily visible. The legs and feet usually have three forward, sturdy toes and one smaller hind toe each provided with short, strong nails. The legs and feet are usually clearly scaled. In general, doves are either long and slender or short and plump, depending on the natural habitat. Various dove species possess so-called powder feathers. With the beak and the head, they cover their outer feathers with a very thin layer of protective powder. All doves have a well developed crop, but the gall bladder is absent; the

appendix is rudimentary or altogether absent.

The choice of habitat varies from species to species, ranging from dense, tropical rainforest to dry, arid desert or the temperate regions of Europe, Asia and North America.

The range of colors is also quite remarkable: from milky white with black tipped flight and tail feathers (Nutmeg Pigeon, *Ducula bicolor*) to blue-gray and white with a striking red breast-patch (Bleeding-heart Dove, *Gallicolumba luzonica*). Various species are extremely attractive in their pastel or metallic shades of gray, fawn, blue, pink, green and yellow.

In spite of these variations, all species have many characteristics in common. The whirring sound of the wings on takeoff is a trademark of all doves, as is their ability to suck up water through their short beaks in a long draft, rather than scooping and throwing their heads back as most other birds do.

Doves feed largely on seeds, berries and other fruits, green leaves and shoots, spiders and various insects. They often travel great distances foraging for food for their young. The green pigeons (*Treronidae*) and the fruit eating doves (*Duculidae*) (which are seldom kept in captivity), are wholly specialized in eating fruits and berries, while the tropical ground doves (*Gallicolumba*), to which the Bleeding-heart Dove (*G. luzonica*) belongs, forage for insects, spiders, worms, slugs and other invertebrates on the forest floor. The consumed food accumulates in the crop, a part of the alimentary canal that, in doves, forms a double sack. The main func-

tion of the crop is food storage but it is probable that pre-digestion also takes place here. During the breeding period when young are being reared, a nourishing material is produced by rupture of the surface cells of the crop lining. This so-called "crop milk" is essential for the rearing of the youngsters. Doves possess two stomachs; a fore stomach or proventriculus, and a muscular stomach or gizzard (or ventriculus). The gizzard grinds up the harder seeds with the help of grit. The fruit eating species have a specially developed digestive tract in which the fore stomach is extremely large, the gizzard thinly walled and the intestines relatively short.

Pigeons and doves are fairly muscular, and thickly covered with a coat of feathers that, however, are loosely attached in the skin. The base of the feathers is downy to provide good insulation. Unlike many birds, doves do not tuck the head under the wing when resting, but pull it down between the shoulders.

All members of the *Columbiformes* are monogamous which is to say that they mate for life and remain true to their mates unless they are separated permanently by some unforeseen event. Their flimsy nests consist of a platform fashioned from a few twigs placed loosely among the branches of a tree or shrub, or on a rocky ledge. In most cases, the clutch consists of just two eggs, sometimes only one. The eggs are usually a glossy white, but a few species lay tinted (brownish) eggs. In most species, both cock and hen share in nest-building and incubation, but the hen usually performing most of the latter. The time of incubation varies from 13 to 19 days. The hatchlings are blind and naked and are fed by the parent birds on a special diet known as "pigeon or crop milk" which consists of a mixture of partially digested food and a curd-like secretion from the crop lining (the dove's crop lining thickens during incubation). It takes 12 to 20 days for the young to develop sufficiently for fledging.

Reproductive Behavior

Pairing

With most dove species, it is the hen who decides if a displaying cock will make a suitable mate. The cock begins his typical head-nodding dis-

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plays at the beginning of the breeding season even when there are no hens around but should he be spotted by a sexually ripe hen she will usually reciprocate the head nodding. On perceiving the hen's interest, the cock will peck himself repeatedly behind the wings. If still interested, the hen will reach her head forward while the cock is still pecking himself. Moving closer together, the male utters his mating call and the female fans out her tail. Offering his open beak to the hen, both birds will then rub their beaks together, the hen finally placing her beak inside that of the cock in order to accept a gift of regurgitated food — or goes through the motions of doing so. These actions coupled with the mating calls are the origin of the phrase "billing and cooing" and with the head-nodding are very important parts of the courtship ceremony. Head-nodding is used also during mating and as a form of greeting when the birds meet each other, especially during the change of incubation shift. Courtship often occurs near the prospective nest site and the head-bobbing is thought to play some role in the selection of a suitable spot. Observations have shown that a hen dove will mate more readily with a cock bird if he is in possession of a suitable nesting site.

The two young nestlings in a clutch (usually one of each sex), both in the wild and in captivity, are often attracted to each other and show it by conducting a pseudo-courtship ceremony which after fledging may even end in pseudo-copulation. The reproductive drive in doves is very strong and if pairs are separated then reintroduced, copulation may take place almost immediately and the courtship ceremony almost dispensed with, though head nodding and billing may take place after, rather than before!

The Nest and Clutch

Doves occasionally use the old nests of other doves or even other birds. Safety is the prime consideration and the nest is constructed in a hole, crevice or ledge; or among the thicker part of tree foliage; anywhere hard for predators to reach. Many doves breed in colonies so that they can warn each other when danger threatens.

The actual nest is constructed from small twigs, grass, straw, roots, and

sometimes leaves. The building materials are delivered to the site by the male and the female puts them together. At first sight, the flimsy nest seems inadequate to do the job it is made for. There is barely a cup, just an almost flat platform and the construction is often so thinly made that if the nest is among foliage you can see the eggs through the gaps from below! However, the nest seems to stand up to all sorts of rigors and rarely fails. The hen lays her first egg usually in the evening after the nest is finished. The cock usually stays away from the nest so as not to attract predators. The female remains on the nest but if she has to leave it she will cover the eggs with moss or twigs to protect them from the unwelcome eyes of predators.

Though the cock usually assists with the brooding, he doesn't do a great deal of it. He often takes over around midday but by mid-afternoon the hen is usually back and continues to brood throughout the night!

Within an hour of hatching, the youngsters receive their first meal of crop milk. The chick's beak is taken into the beak of the parent who regurgitates the food. The finely ground food is given to the chicks for the first four or five days, but thereafter they begin to take more solid food. When feeding its crop milk, the parent dove ensures that nothing is wasted; any that the youngster cannot swallow is reswallowed by the parent and offered again later.

Nest Defense

Although similar in many respects, the defensive behavior of many dove species varies somewhat. Generally, the dove stands motionless with its plumage flat against its body when danger threatens. Should an enemy approach from below, the bird stands almost vertically, but if the enemy approaches from above, the dove's body is held almost horizontally. When danger approaches among groups of doves, there is a system of community warning; the first bird alarmed takes off with rapidly clapping wings, thus warning the rest of the group to do the same.

An incubating bird will stay extremely still on its nest as if hoping it will not be noticed by a prospective predator. Should the danger become too great however, the bird will take

off very noisily in the hope that the predator will be distracted away from the nest.

Feeding Behavior

Doves can be divided into three groups depending on their methods of feeding:

1. Doves that obtain practically all their food from trees and shrubs.
2. Doves that obtain their food from trees and shrubs *and* on the ground.
3. Doves that obtain practically all their food on the ground.

Those from group 1 live mainly in the tropics and subtropics and include all of the fruit-eating doves: mountain dwellers of the genus *Gymnophaps*, long-tailed pigeons of the genus *Reinwardtoena*, and many *Columba* species. The food of these species consists of a rich variety of fruits, buds, flowers, shoots, etc. A few of the species are known to eat invertebrates, including slugs and snails (as, for example, the White-crowned Pigeon, *Columba leucocephala*, from Florida and the West Indies). These species almost never descend to the ground in search of food, but will do so to obtain grit and minerals.

Group 2 contains a large number of species. They have a long, pointed beak to enable them to pick out delicacies from the foliage of trees and shrubs, or to poke around on the ground. It is believed that the Marquesas Ground Pigeon (*Gallicolumba rubescens*), from the Marquesas Islands of Fathuku and Hatutu also uses its feet to scratch for food, as do gallinaceous birds (poultry, pheasants, quail, etc.); incidentally, this fact was first observed in an aviary. It is also interesting to note that in the wild, this species has been observed jumping up at seeding grasses, pulling down the seed heads and holding them down with the feet so that the seeds can easily be picked out.

Drinking and Bathing

Most dove species require to drink once or twice per day. Fruit eating doves were once thought not to require water, but I have observed many species in the wild drinking in the evenings before going to roost. The African Ringdove (*Streptopelia roseogrisea*) has a reputation of going for months without water, but this is extremely doubtful. I was able to observe this species in the wild during

1982 and at waterholes they gave me the impression of being "heavy drinkers." Most captive pigeons and doves will drink after feeding and there is no reason to doubt that wild specimens are any different.

The only species I am aware of that drinks heavily *before* feeding is the Australian Crested Pigeon (*Geophaps lophotes*). Many members of the genera *Streptopelia* and *Columba*, and the Diamond Dove (*Geopelia cuneata*), drink before feeding their young, especially in their older stages where they are taking both normal food and crop milk. It has been observed that domestic pigeons deprived of water will become restless and will not feed their young. When water is offered, they will then drink deeply before feeding the young. It is thus assumed that most species in the wild require adequate water when rearing youngsters.

Unlike most birds that scoop up water in the lower mandible then hold the head up in order to swallow it, pigeons and doves are able to suck up water in long drafts. There is one exception, the Tooth-billed Pigeon (*Didunculus strigirostris*), which drinks similarly to other bird species. Most pigeons stand at the water's edge when drinking, but some will stand in shallow water. Some species like to bathe in the shallows or in a rain puddle where they spread their wings out over the water surface and splash water over their backs. Many species like to shower in the rain. Lying partially on one side supported by a wing, the bird holds the other wing high in order to get its flanks wet before changing sides. Once the plumage is wet, it fluffs out its feathers so that the water can get right into them. After bathing, the birds dry themselves out in a sunny spot.

Sunbathing and Preening

Many doves are extremely fond of sunbathing and will find a suitably sunny spot before spreading out the wings and fanning out the tail for maximum effect. Some species spread a single wing alternately, while others (only in the genus *Streptopelia*) spread out both wings as well as the tail. After sunbathing, the wings are pulled in, the feathers fluffed out, and preening often occurs.

Feather preening is carried out with the beak like most other birds, but

doves do not use preening oil, rather a feather powder that makes the plumage waterproof.

Some species like to wallow in a sand or dust bath especially on hot days; they spread out the wings and tail and scoop dust deeply into the plumage. This must have a cooling and soothing effect and probably gives some relief from parasite bites. After a dust bath, the dust is shaken out of the plumage which looks all the better for its "maintenance." Many doves like to lie down on their belly after bathing or taking a dust or sun bath.

Doves clean dirt from the eyes by opening and closing the third eyelid, then rubbing the eye against the shoulder. The head and beak are cleaned and preened with a foot which, unlike most birds, reaches directly to the appropriate spot rather than over the wing.

Preening and cleaning is often accompanied by peculiar stretching motions. One of these is known as the *vertical stretch*, a common phenomenon, probably designed to exercise the muscles and keep them in good order; just as we stretch ourselves

from time to time. When fluttering the wings during and after bathing, doves often also stretch the body to its full extent.

When sleeping or dozing, pigeons and doves hold their heads down tightly against the breast, rather than tuck it under the wing as do most other birds. In order to increase insulation, the feathers may be fluffed out, especially in colder weather or if the bird is feverish. At roost, the healthy bird usually sits on one foot, the other drawn up into the plumage.

The Voice

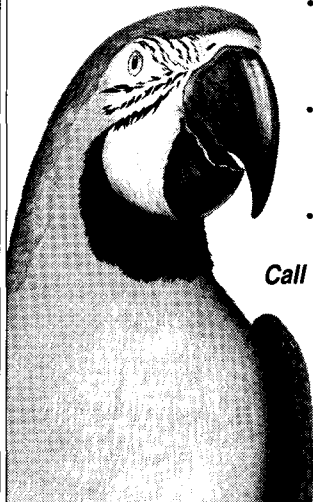
Some of the commoner aspects of social behavior in pigeons and doves have been discussed in the previous sections. With many birds, the song is an important accessory to the general and social behavior. Indeed, the splendid voices of some birds have led poets to wax lyrical about them over the centuries. Pigeons and doves, however, have been largely ignored in this area as most of them have a very limited vocabulary. Most of them "coo" with the neck stretched out. In spite of its obvious limitations, the dove's voice is used for many purposes, including contact, drawing of

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attention to certain things, attracting or appeasing a partner, etc. In general, there is little variance of call, even the mating call being similar but perhaps somewhat softer and "more passionate."

The cooing of a dove starts at a very early age and it is believed that it is an inherited rather than an acquired trait. In other words, "cooing" is not learned from the parents—it comes naturally. However, we must be cautious when saying this, as I have observed contact calls of many dove species (especially by hens as they arrive at the nest) answered by the young several days even before they have hatched from the eggs!

Adult doves have two major calls; first, there is the regular "cooing" tone which is usually uttered with the neck stretched up and the throat blown out. Second, there is the sharp, quiet tone that is uttered without inflating the throat. The unique whistling of the Green Pigeons (*Treronidae*) is a substitute for the cooings of other species.

Most species of doves have not more than four or five different calls. The "standard call" means much the same as the standard call of any bird that wants to mark out its territory and may be scarcely or clearly audible to the human ear. The contact call usually sounds practically the same as the standard call, as does the nest call, which is used by the hen when she arrives at the nest to feed the young.

Only when a bird is in pain or has been captured, does the call change to a sort of "growling" or "gasping" tone that can be described as "oerh" or "ierh." The call is used repeatedly by terrified doves and its intensity often depends on the size of the bird.

Defensive Behavior

If threatened or attacked, especially near the nest, a dove may stand its ground, spreading the tail feathers and raising one or both of its wings as if trying to make itself look bigger and more formidable.

The rock dove and some of its relatives use the stabbing motion of thrusting the head and beak forward in the direction of an adversary. Two birds using this motion will often back down quickly and go off in their own separate ways.

Head Nodding

As far as I am aware, all dove spe-

cies practice head nodding, particularly as part of the courtship ceremony and males use it extensively in order to impress a prospective partner. Some species, however, use this form of behavior as a form of aggression or defense while looking directly into the face of an adversary. When the head is lowered, most dove species expose certain color patterns on the nape. During the nodding display, the dove repeatedly utters its characteristic "cooing" call.

In many species, the beak may almost touch the ground, or the breast. The crowned pigeon has no special nape coloring but makes up for this by having a spectacular, fan-shaped crest. During display, the crowned pigeon lowers its wings towards the ground and fans out its tail. At the same time, the pupils dilate in order to show off the colorful iris.

All pigeon and dove species spread out the tail at some stage of the head nodding display and it is usually raised upwards. Tail spreading may originally have arisen as an impulse to escape; as threatened birds indeed spread the tail before taking off. Some species also raise one of the feet as part of the courtship display.

Flying Behavior

Doves exhibit a number of types of flying behavior, some of which are still poorly understood. In domestic pigeons, the male often performs a display flight in view of his mate. This includes stretching his wings right out to make him appear larger, and bringing them high over his back so that they clap together. These actions are often accompanied by an undulating flight and a spreading of the tail that clearly presents the markings on the underside. Goodwin has surmised that this flight behavior occurs:

- when the cock sees another pigeon flying;
- when he sees his mate or another pigeon performing this flight behavior in the immediate area;
- when he is at the point of flying away or returning to his cote after foraging for food, or after being transported and he is forced to fly back to his cote "under his own steam" (as in homing pigeons);
- when he flies in the company of his mate;
- immediately after copulation (in only 40% of the studied cases).

Wing Drooping

Many species of doves and pigeons allow their wings to "sag" when they are sexually aroused. This is done by separating the flight feathers so that the whole wing is partially open. This also exposes the markings on the back.

The Feathers

Doves have a full coat of feathers which is light and strong, protects the birds from inclement weather and skin injury and helps in the regulation of body temperature. This plumage is very efficient and wholly suited to its function; insulating against cold in winter and heat in the summer.

The feathers can be classified into three different types: flight feathers, contour feathers and down feathers. The flight feathers are the primaries and secondaries of the wings and the large tail feathers. These have a strong shaft or rachis that runs right to the feather tip. The vane is the wide and a narrow side of the feather, consisting of a series of barbs running the length of the rachis. The barbs interlock by a system of hooked barbules that give the vane a solid appearance. At the base of the feather near the skin, there is usually a group of free barbs that help to insulate; complementing the down feathers.

The feather shaft originates in a skin follicle that can be compared with the human hair follicle. The developing feather is supplied with nourishment by the abundant blood capillaries surrounding the follicle. The base of the shaft is called the calamus where there is a round orifice which allows nutrients to enter the shaft. When the feather is fully grown, this orifice closes up.

Though similar in construction to flight feathers, contour feathers have a weaker shaft that is much softer towards the tip. These feathers cover all parts of the wings and body that are in contact with the outside air. They streamline the bird during flight and protect against the elements.

The down feathers are very short and insulate the bird's body close to the skin surface. The barbs of down feathers are not joined by hooks, allowing the hairlike structures to spread out and form loosely matted layers. The bird can "aerate" its skin and tidy up its down feathers by fluffing out and preening.

Feathers are not evenly distributed

over the body surface but occur in so-called "feather fields." A feather field runs from the base of the lower mandible into the breast; here it divides into two more feather fields, one each side of the breastbone. These join near the ears and extend to the tail. There are no feathers in the wing and leg joints. A feather field runs over the head to the tail and another pair runs from the thighs to the base of the tail.

The Molt

All birds molt periodically and doves normally molt once per annum. The time of molting will depend on the climate but in our northern temperate climate this usually occurs from about mid-July to mid-December.

In domestic pigeons and most other species, the molt begins with the primary flight feathers. The new feathers start to grow before the old feathers fall out. This occurs when the new ones are about three-quarters grown. Groups of feathers are shed from each wing simultaneously, but not all feathers are shed at once, or the bird would be unable to fly. After the ten primaries are molted, the secondaries begin their molt. Secondaries are not always all molted each year, but numbers may vary from two or three to all of them. The tail and contour feathers are molted at about the same time, the tail feathers one by one starting in the middle. The outer tail feathers are the last to be molted, by which time the new middle feathers are almost full size. The body feathers may be molted simultaneously in large patches so that birds may sometimes have temporary bald spots, or even a bald head!

Down feathers are different in that they may be molted at any or all times of the year. In very warm weather, down feathers will be lost more quickly but are soon replaced as the weather cools down. The quality of down feathers can sometimes give indications about a bird's health. If a dove is off color, the down feathers, especially those near the ears, are stiff and hard and are not easily shed. This can arise as a result of disease, prolonged stress or exhaustion caused by an over-extended breeding season. It is thus advisable to stop birds breeding after the end of June.

Molting is a natural process that will run normally in healthy birds. Young doves have their first molt a few

weeks after fledging and it should be completed in 30 to 35 days.

Sometimes during the rearing of youngsters, the cock can become somewhat negligent because he is ready to start a new brood. This usually happens around the 14th day and can lead to so-called "growing stripes" in the plumage. This occurs as a result of a disturbance in the feather growth due to erratic feeding. If this happens, it is best to lock both parents in the shelter with the young until the first egg of the next clutch is laid.

Doves occasionally have feather growth problems which can arise from sickness, damage, or dietary deficiencies of one form or another. So-called "tube feathers" may occur when the membrane around the growing feather does not break. The barbs thus become rolled up in the follicle and can result in severe inflammation and even lead to abscesses. Birds kept in optimum conditions are unlikely to suffer from tube feathers.

So-called "blood feathers" can occur if a blood vessel in or near the feather follicle is damaged, allowing blood to flow into the shaft. This condition usually rights itself after awhile; so do

not be tempted to pull the feather out! This may lead to excessive loss of blood. Damaged "pin feathers" (often called "blood feathers" as well) must be removed immediately (pulled out). Apply pressure to the skin opening until the bleeding stops.

Longevity

Captive doves live for a relatively long time when compared with their wild counterparts. In England, a Turtle Dove (*Streptopelia turtur*) lived in captivity for 34 years, while the famous Passenger Pigeon "Martha" was 29 years old when she died in the Cincinnati Zoo on Sept. 1, 1914. In the Berlin Zoo, a Spotted Pigeon (*Columba maculosa*) lived for 25 years and a Picazuro Pigeon (*Columba picazuro*) for 15 years. A Barbary Dove (*Streptopelia roseogrisea* "risoria") lived in captivity in England for at least 23 years.

Average captive life spans are probably somewhere in the region of 10 to 12 years. Naether had a female Key West Quail Dove (*Geotrygon chrysis*) that incubated (infertile) eggs at 12 years of age. This species has not been available in the trade since about 1945. ●

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