Ostrich Egg-shell Cups of Mesopotamia and the Ostrich in Ancient and Modern Times

BY

BERTHOLD LAUFER

CURATOR OF ANTHROPOLOGY

9 Plates and 10 Text-figures

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D. C. DAVIES
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OSTRICH EGG-SHELL CUP FROM GRAVE AT KISH, MESOPOTAMIA (p. 2).
ABOUT 3000 B.C. IN FIELD MUSEUM.
About one-third actual size.

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THE OSTRICH IN MESOPOTAMIA

In his "Report on the Excavation of the 'A' Cemetery at Kish, Mesopotamia" published by Field Museum (Memoirs, Vol. I, No. 1), Ernest Mackay writes as follows: "A rare object found in grave 2 was a cup which had been made from an ostrich shell by cutting about one-third of the top of the shell away and roughly smoothing the edge. It was the only one of its kind found in the cemetery, and it was in such a very bad condition with so many pieces missing that it could neither be restored nor drawn. The remains of a similar cup were found in one of the chambers of a large building of plano-convex bricks, about a mile from the 'A' cemetery, which appears to be of the same date. The ostrich is still found in the Arabian desert, and was doubtless plentiful in early times. Its feathers as well as its eggs were utilized by the ancients."

In the course of further excavations on the ancient sites of Kish great quantities of fragments of ostrich egg-shell were brought to light and, together with other collections, mainly pottery, stone, and metal, were recently received in the Museum. Having read in Chinese records of ostrich eggs anciently sent as gifts from Persia to the emperors of China and being aware of the importance of this subject in the history of ancient trade, I took especial interest in these egg-shell fragments and induced T. Ito, a Japanese expert at treating and repairing antiquities, to restore three of these cups completely. The result of his patient and painstaking labor is shown in Plates I and II illustrating two of the cups. These restorations are true and perfect; that is, they consist of some eighty shards each, accurately and perfectly joined, without the use of other substances or recourse to filling-in. Thanks to

the admirable skill of Mr. Ito we now have these beautiful cups before us, exactly in the shape, as they were anciently used by the Sumerians. These cups, almost porcelain-like in appearance, have the distinction of representing the oldest bird-eggs of historical times in existence, and may claim an age of at least five thousand years. Being the eggs of the majestic winged camel of the desert, the largest living bird, the fleetest and most graceful of all running animals that "scorneth the horse and his rider," they are the only eggs of archæological and historical interest. But they are more than mere eggs; they are ingeniously shaped into water-vessels or drinking goblets by human hand, a small portion at the top having been cut off and the edge smoothed. They were closed by pottery lids overlaid with bitumen, one of the oldest pigments used by mankind. They are thus precious remains of the earliest civilization of which we have any knowledge. In Plate III single fragments of egg-shell are shown, as they came out of the graves, and some patched together from several pieces. These are decorated with banded zones of brown color brought out by means of bitumen. The shell is extremely hard and on an average 2 mm thick.

The trade in ostrich eggs was of considerable extent and importance in the ancient world. They have been discovered in prehistoric tombs of Greece and Italy, in Mycenæ (Fig. 3), Etruria (Fig. 9), Latium, and even in Spain, in the Punic tombs of Carthage as well as in prehistoric Egypt. We find them in ancient Persia and from Persia sent as tribute to the emperors of China. The Spartans showed the actual egg of Leda from which the Dioscuri, Castor and Pollux, were said to have issued; there is no doubt that the egg of an ostrich rendered good services for this pious fraud. In 1833, Peter Mundy, an energetic English traveler, saw ostrich (or, as he

spells, estridges) eggs hung in a mosque in India. In 1771, General Sir Eyre Coote found the cupola of a Mohammedan tomb fifty miles north-east of Palmyra adorned with ostrich eggs, and at present also, devout Moslems of the Near East are fond of honoring the sepulchre of a beloved dead with such an egg which is suspended from a tree or shrub on the burial place. Even in the Christian churches of the Copts they are reserved for the decoration of the cords from which the lamps are suspended.

Pliny writes that the eggs of the ostrich were prized on account of their large size, and were employed as vessels for certain purposes. The eggs were also eaten and found their way to the table of the Pharaohs. The Garamantes, a group of Berber tribes in the oases of the Sahara south of Tripolis, anciently had a reputation for being fond of the eggs. Peter Mundy (1634) found ostrich eggs, whose acquaintance he made at the Cape of Good Hope, "a good meate." The egg is still regarded as a rare delicacy in Africa. The contents of one egg amounts to forty fluid ounces, and in taste it does not differ from a hen's egg. An omelet prepared from one egg is sufficient for eight persons. Cuvier, the French naturalist, remarks that an ostrich egg is equal to twenty-four to twenty-eight fowl's eggs, and that he had frequently eaten of them and found them very delicate.

Arabic poetry is full of praise for the beauty of ostrich eggs, and the delicate complexion of a lovely woman is compared with the smooth and brilliant surface of an ostrich egg. The Koran, in extolling the bliss and joys of Paradise, speaks of "virgins with chaste glances and large, black eyes which resemble the hidden eggs of the ostrich."

The thickness of the egg-shell in the African species (*Struthio camelus*) varies from 1.91 to 1.98 mm; the length of the eggs from 140.01 to 156.75 mm, the

width from 121.02 to 138 mm. In *Struthio molybdophanes* (so called from the leaden color of its naked parts) of the Somali country, the egg-shell is even 2.02 mm thick; the length varies from 145 to 159.95 mm, the width from 119.50 to 125.4 mm. The weight of the full eggs is from one to two thousand grams, that of the empty ones varies from 225 to 340 grams.

The eggs of birds living in captivity differ considerably from those of wild birds, both in size, coloration, and structure. The former are frequently larger and more oblong, and have a thin shell; the colors are more lively, and the enamel layer is flat, sometimes entirely obliterated.

The egg of a domesticated ostrich from a Californian farm, 163 mm in length, is shown for comparison in Plate IV. As the Californians are all descendants of birds imported from South Africa, their eggs exhibit to a marked degree the pitting which is characteristic of the South African species and which is associated with the respiratory pores of the shell. In the egg-shell of the North African bird, according to J. E. Duerden, the pores are so small and open so close to the surface, as to be scarcely visible to the naked eye, and are mostly scattered singly, with but little grouping, hence the surface appears almost uniformly smooth. In the southern egg, the shell pores are larger, sunken below the general surface, and mostly in small groups, varying from about six to twelve in a group. It is the close grouping of the sunken pores which give rise to the pitted surface. In both types the outer enamel layer shows differences in thickness, and with it the polished character of the surface. All the eggs are a cream or yellow color when freshly laid, but fade considerably on exposure and harden in course of time.

The egg of the North African bird is larger than that of the southern, the shell is almost free from pores or pittings, and presents an ivory-like smooth surface.

The northern egg is usually rounded in shape and less oval. The egg of the southern bird is deeply pitted all over the surface, the pits often larger and more plentiful at the air-chamber end, hence the shell does not present the ivory smoothness of the northern egg. According to J. E. Duerden, who has devoted a special investigation to the two varieties, no mistake is possible in discriminating the one type from the other in a mixed lot of eggs from northern and southern birds.

In cases where the North African hen was mated with the South African cock, a peculiar feature was noted, namely, that the egg-shells of this cross-breed were only pitted in certain patches, while other patches were quite smooth.

In our Mesopotamian eggs the pores are exceedingly fine, and for this reason it may be concluded that the species represented by them is identical with, or closely allied to the present Syrian and North African ostriches. The latter extends right across the Sahara from the Sudan and Nigeria to Tunis and Algeria and from Senegal eastwards. The egg of the Syrian species, if a distinct species it is, is said to be of smaller size and higher polish than the North African one.

In ancient Elam rows of ostriches are found depicted on early pottery, closely resembling the ostriches on the pre-dynastic pottery of ancient Egypt.

In 1849 Austen H. Layard (Nineveh and Its Remains) wrote, "The only birds represented on the Assyrian monuments hitherto discovered are the eagle or vulture, the ostrich and the partridge, and a few smaller birds at Khorsabad, whose forms are too conventional to permit of any conjecture as to their species. The ostrich was only found as an ornament on the robes of figures in the most ancient edifice at Nimrud. As it is accompanied by the emblematical flower, and is frequently introduced on Babylonian and Assyrian cylinders, we may infer that it was a sacred

OSTRICH EGG-SHELL CUP FROM GRAVE AT KISH, MESOPOTAMIA (p. 2).
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bird." The statement that the ostrich is represented on an Assyrian king's robe is repeated by Perrot and Chipiez, Handcock, and Meissner; but this bird, in my

FIG. 1.
Assur Strangling Two Ostriches. Engraved on an Assyrian Seal-cylinder. After Dorow.

opinion, is not an ostrich; it has a short neck, and its head is entirely different from that of an ostrich. The fact, however, remains that the latter is clearly represented on seals and cylinders.

FIG. 2.
The God Marduk Executing an Ostrich. Engraved on an Assyrian Seal-cylinder. After W. Houghton.

One of these seals is shown in Fig. 1. It was the seal of Urzana, king of Musasir, a contemporary of King Sargon (eighth century B.C.), and represents

Assur, king of the great Assyrian gods, with four wings, in the act of strangling two ostriches. On another seal (Fig. 2) the god Marduk is shown in the act of executing vengeance on an ostrich. With his left hand he firmly grasps the bird's long neck, and in his right he holds a scimitar which will apparently be used to sever the bird's head. These illustrations apparently hint at a ritual act and seem to indicate that the ostrich was also a sacrificial bird and that its flesh was solemnly offered to the gods. Perrot and Chipiez (History of Art in Chaldea and Assyria, II, p. 153) figure a scene from a chalcedony cylinder in Paris, which represents an ostrich about to attack a man with outspread wings and raised left foot; the man tries to lure the bird with a fruit which he holds in his right hand, while behind his back he hides a deadly scimitar in his left.

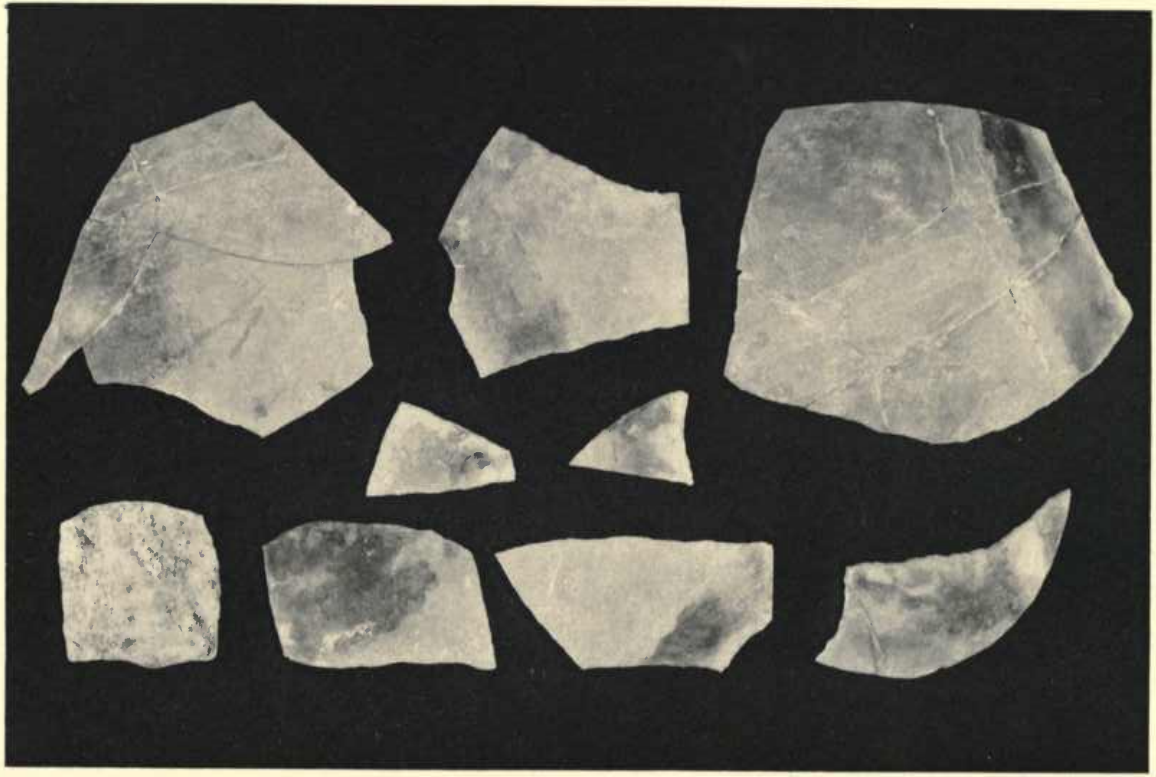
In the language of the Sumerians the ostrich was known under the names *gir-gid-da,* which is explained as "the long-legged bird" and *gam-gam,* which means as much as "benefactor" or "well disposed." The latter name was borrowed by the Assyrians in the form *gam-gam-mu.* Other Assyrian designations of the bird are *sha-ka-tuv* and *se-ip-a-rik,* the latter also meaning "long-legged."

THE OSTRICH IN PALESTINE, SYRIA, AND ARABIA

The ostrich was well known to the Hebrews, and as attested by several allusions to the bird in the Old Testament, must in ancient times have been frequent in Palestine. It is included among unclean birds in the Mosaic code (Leviticus XI, 16; Deuteronomy XIV, 15), and its flesh was prohibited. This may hint at the fact that the ostrich had occasionally served as food to the Hebrews, although we have no positive information on this point. The reason for the interdiction is not revealed. The ancient apostolic fathers explain that it was forbidden, because the ostrich cannot rise from the earth; modern commentators, because it is a voracious animal and hunting it is cruel. Those who assert that it was abhorred as an exotic animal in Palestine err in a point of zoogeography. The simplest interpretation seems to be that, like other unclean animals of the Mosaic legislation, it was tabooed by Moses, because the surrounding pagan nations availed themselves of its flesh both as a sacrifice to their gods (see above, p. 8) and for their own use. The Arabs of ancient and modern times feast on the bird, and as related by Leo Africanus of the sixteenth century, its flesh was consumed to a large extent in Numidia, where young birds were captured and fattened for this purpose. There are other tribes like the Shilluks of the Sudan who for superstitious reasons abstain from ostrich flesh. Those who have tasted it state unanimously that it is both wholesome and palatable, although in the wild bird, as might be expected, it is somewhat lean and tough. The meat of domesticated birds, however, especially those fed on alfalfa and grain, becomes juicy and tender. Dr. Duncan of the Department of Agriculture recommends it as a New Year or Easter bird.

Job (XXX, 29) laments, "A brother I have become to the jackals, and a companion to the young ostriches." And the prophet Micah (I, 8) exclaims in a similar vein, "Like jackals will I mourn, like ostriches make lamentation." The comparison alludes to the plaintive voices of these animals. The jackal and ostrich are again combined in a passage of Isaiah (XXXIV, 13): "And it shall be an habitation of jackals, and a court for ostriches." The cry of the ostrich has been described variously by observers: some define it as a loud, mournful kind of bellowing roar, very like that of a lion; others define the common sounds of the cock as a dull lowing which consists of two shorter tones followed by a longer note; in a state of excitement he will give a hissing sound, and his warning cry is an abrupt, shrill note. The Hebrew word *renanim* used for the female ostrich means literally "cries, calls," and refers to the twanging cry of the female. Another designation of the ostrich, *bath haya'anah*, signifies literally "daughter of the desert"; that is to say, a desert-dweller, a very appropriate name for the bird. A parallel term occurs in Arabic with the meaning "father of the desert." Isaiah (XIII, 21), in his prediction of the fate of Babylon, says, "But wild beasts of the desert shall lie there; and their houses shall be full of doleful creatures; and ostriches shall dwell there, and satyrs shall dance there."

The famous passage in Job (XXXIX, 13-18) is thus rendered in the Revised Version: "The wing of the ostrich rejoiceth; but are her pinions and feathers kindly (or, as the stork's)? which leaveth her eggs in the earth, and warmeth them in dust, and forgetteth that the foot may crush them, or that the wild beast may break them. She is hardened against her young ones, as though they were not hers: her labour is in vain without fear; because God hath deprived her of wisdom, neither hath He imparted to her understand-



OSTRICH EGG-SHELL FRAGMENTS PAINTED WITH BITUMEN, FROM GRAVE AT KISH, MESOPOTAMIA (p. 3). IN FIELD MUSEUM.

ing. What time she lifteth up herself on high, she scorneth the horse and his rider."

The text is difficult, especially in the opening paragraph, and various translations have been proposed, thus, for instance: "The wing of the ostriches is raised joyfully; but is it a pinion and feather as kindly as that of the stork? No, the ostrich hen leaves her eggs to the earth," etc.

Professor J. M. Powis Smith of the University of Chicago has been good enough to communicate to me his own translation prepared for his coming version of the Old Testament. It runs thus:

> Is the wing of the ostrich joyful,
> Or has she a kindly pinion and feathers,
> That she leaves her eggs on the ground,
> And warms them on the dust,
> And forgets that the foot may crush them,
> Or the beast of the field trample them?
> She is hard to her young, as though not her own;
> For nothing is her labour; she has no anxiety.
> For God has made her oblivious of wisdom,
> And has not given her a share in understanding.
> When she flaps her wings aloft,
> She laughs at the horse and his rider.

According to those scholars who translate the word *chasidah* by "stork," the Hebrew poet contrasts the ostrich with the stork. The stork, as indicated by its name *chasidah* ("the pious one"), was the symbol of kindness and piety, and was regarded as a model of filial love; for this reason it is venerated by all Oriental peoples. The ostrich may resemble the stork in some respects, but differs from it in the care for its young. The description that follows is based on the widely spread, but erroneous assumption that the ostrich is in the habit of leaving its eggs in the sand to be hatched by the sun. The Hebrew poet is intent on making the point that in spite of the careless treatment of the eggs the bird is propagated as a striking evidence of God's constant solicitude for his creatures. To make amends

for the lack of wisdom, fleetness of foot has been granted the ostrich. In case its life is endangered, it leashes the air with its wings which assist in running, and derides horse and rider who are in pursuit of it,—a sign that the ostrich, after all, is not so stupid.

The alleged cruelty of the ostrich to its young is also referred to in the passage, "Even the sea monsters draw out the breast, they give suck to their young ones: the daughter of my people is become cruel, like the ostriches in the wilderness" (Lamentations IV, 3).

The observation made in the book of Job that the ostrich treats her offspring harshly does not conform with the real facts. The birds, on the contrary, are tender parents and feed and watch their young ones very carefully. The eggs are laid in a shallow pit or depression of the soil scraped out by the feet of the old birds with the earth heaped around to form a wall or rampart. The female incubates the eggs during the day, while the male takes her place at night. As eggs are sometimes dropped in the neighborhood of the nest or scattered around, the popular belief in the carelessness of the birds and in the hatching of the eggs by the heat of the sun may have arisen. Any eggs not hatched are broken by the parents and fed to the young for whom they display great solicitude, and whom they defend in case of danger.

As to Palestine, the ostrich still occurs in the farther parts of the Belka, the eastern plains of Moab, and is still obtained near Damascus. It is no doubt now but a straggler from central Arabia, though formerly far more abundant (Tristram, Fauna and Flora of Palestine). The portion of the Syrian desert lying east of Damascus denotes the northernmost limit of the range of the ostrich. According to Burckhardt, it inhabits the great Syrian Desert, some being found in Hauran, and a few being taken almost every year, even within two days' journey from Damascus.

As regards ancient Syria, the ostrich is attested by relief-pictures in the theatre at Hierapolis of Roman times, one of these depicting a lioness seizing an ostrich by the neck, and by its introduction into the Syriac version of the Physiologus.

In the Physiologus, a Greek allegorical natural history, which originated at Alexandria in the second century of our era, the following story is told: "The ostrich looks up to heaven in order to see when her time has come to lay her eggs. She does not lay before the Pleiades rise, at the time of the greatest heat. She lays her eggs in the sand and covers them with sand; thereupon she goes away and forgets them, and the heat of the sun hatches them in the sand. Since the ostrich knows her time, man ought to know his to a still higher degree: we have to look up toward heaven, forget worldly existence, and follow Christ."

This story has doubtless been formed by combining Job XXXIX, 14, with Jeremiah VIII, 7 ("the stork in the heaven knoweth her appointed time"). From the Hebrew name of the stork, *chasidah,* the Greek text of the Physiologus has derived the word *asida* in the sense of ostrich. In mediæval Europe the notion still prevailed that the ostrich hatches her eggs merely by glancing at them or by the steadfast gaze of maternal affection. In consequence of this imaginary exploit the bird was chosen as an emblem of faith.

The great outlets from Syria for the ostrich plumes are Aleppo, Damascus, and Smyrna, where the bazars always contain a good supply.

The Janizaries of Turkey who had excelled in battle had the privilege of adorning their turbans with an ostrich feather. At the time of the Ottoman empire there was an imperial ostrich-park in Beylerbey Serai on the Bosporus.

From times immemorial the ostrich has been an inhabitant of Arabia. Heraclides and Xenophon, sub-

sequently Agatharchides and Diodorus mention it as a native of the peninsula. The valuable white plumes of the wings and tail are in great demand among the Arabs for their own wants in the decoration of tents and spears of the sheikhs. Ostrich hunting is alluded to in early Arabic poetry, and has always been a popular sport with the Arabs, who rely on the speed of their horses and run the birds down. As these are in the habit of circling their favorite haunts, the horsemen hunt in relays, and are apt to overtake the birds by pursuing in a straight line.

Kazwini (1203-83), the Arabic author of a Cosmography in which a section is devoted to animals, tells this story: "When the ostrich has laid her eggs, twenty in number or more, she buries them under the sand, leaving one third in one place, exposing another third to the sun, and hatching another third. When the chicks have come out, she breaks the hidden eggs and feeds her young with them. And when the chicks have grown strong, she breaks the last third on which vermin will collect, and this serves as food for the young until they are able to graze." There is a germ of truth underlying this story, and this is that the old birds feed their young on the contents of eggs which they trample down for them. When the eggs are left during the heat of the day, they are covered up with sand, and the occasional finding of such eggs may have given rise to Kazwini's story. He relates another anecdote to the effect that the ostrich, when it has withdrawn from its own eggs and spies other birds' eggs, will hatch the latter and desert its own.

There is a Moslem legend in explanation of the bird's inability to fly. "Once upon a time the ostrich was winged, and like other birds, was capable of flight. He once laid a wager with the bustard, but relying on his strength he forgot before rising to invoke Allah's assistance. He flew in the direction of the sun which

scorched his pinions, so that he pitifully plunged down to earth. His progeny has since suffered from the curse which befell its ancestor, and restlessly roves about in the desert."

The Arabs have many names for the ostrich like camel-bird, father of the desert, the magician, the strong one, the fugitive one, the stupid one, and the gray one (for a young bird). Ostrich fat is regarded as a powerful remedy for both external and internal use.

FIG. 3.
Engraving on an Ostrich Egg from Mycenae, Greece.
After Perrot and Chipiez.

THE OSTRICH IN ANCIENT EGYPT

The ancient Eygptians received the ostrich and its products from Nubia, Ethiopia, and the country Punt on the east coast of Africa. An expedition to Punt, probably of a peaceful nature, is recorded on the wall connecting the two Karnak pylons of King Harmhab of the nineteenth dynasty. A relief shows the king at the right, holding audience, receiving the chiefs of Punt approaching from the left, bearing sacks of gold dust, ostrich feathers, etc. (Breasted, Ancient Records of Egypt, III, 37).

In the rock temple of Abu Simbel are represented scenes depicting a war of Ramses II against the Libyans and the Nubian war. In one of these scenes Ramses sits enthroned on the right side; approaching from the left are two long lines of Negroes, bringing furniture of ebony and ivory, panther hides, gold in large rings, bows, myrrh, shields, elephants' tusks, billets of ebony, ostrich feathers, ostrich eggs, live animals, including monkeys, panthers, a giraffe, ibexes, a dog, oxen with carved horns, and an ostrich (Breasted, op. cit., III, 475).

Fig. 4 illustrates a very instructive Egyptian scene. The man on the left leads a captured ostrich, grasping its neck with his right hand, while his left holds a rope slung around the bird's neck; this double precaution hints well at the strength of the powerful avian giant. The man on the right carries three ostrich feathers and a basket filled with three ostrich eggs. The ostrich was sometimes used as a riding-beast, as may be seen from the scene in Fig. 5. Oppianus remarks that it can easily carry a boy on its back. Heuglin says that the possibility of riding the ostrich has often been doubted, but he assures us that the animal is able to carry a heavy man, but not for a long

time, and after a brief run will throw itself on the ground. A prehistoric serpentine figure of a seated ostrich is illustrated by Flinders Petrie (Amulets, No. 246).

Ostrich eggs showing traces of painting and engraving have been found in prehistoric tombs of Egypt, and are figured by Jean Capart (Primitive Art in Egypt, p. 40). They were also imitated in clay and decorated with black zigzag lines in imitation of cords or simply painted with white spots. In the Egyptian department of the British Museum is shown an enor-

FIG. 4.
Egyptian Scene Showing a Captured Ostrich and Man with Ostrich Feathers and Eggs. After O. Keller.

mous marble egg which is apparently intended for an enlarged ostrich egg, and which was once deposited in a sacred place. During the historic period, ostrich eggs and feathers were imported from the land of Punt and probably also from Asia.

Imitations of ostrich eggs in terracotta have been found in the tombs of Vulci in Italy, which, according to G. Dennis (Cities and Cemeteries of Etruria), seems to indicate that the demand was greater than the supply.

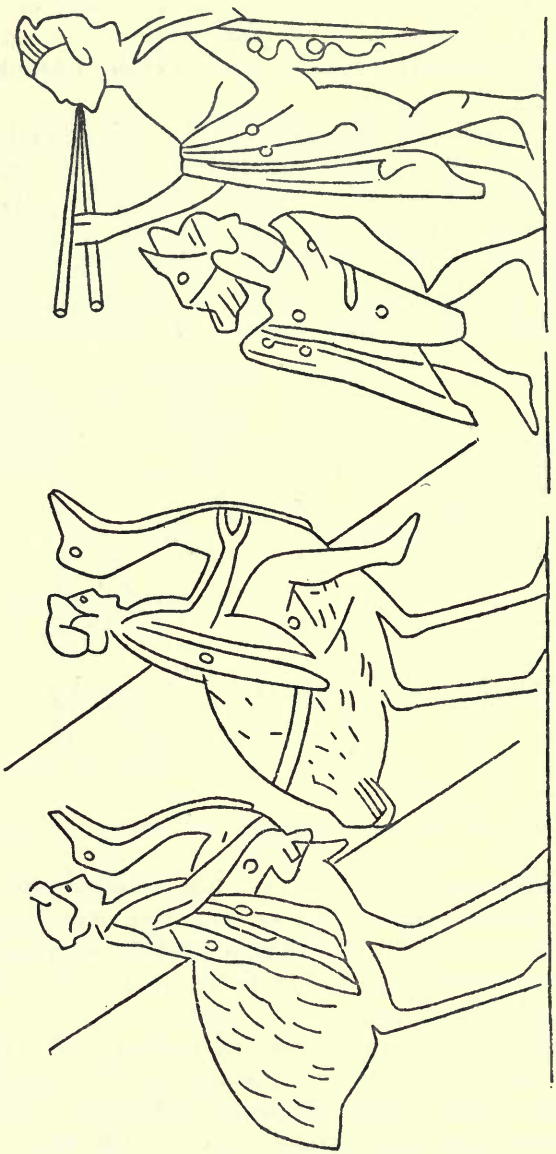
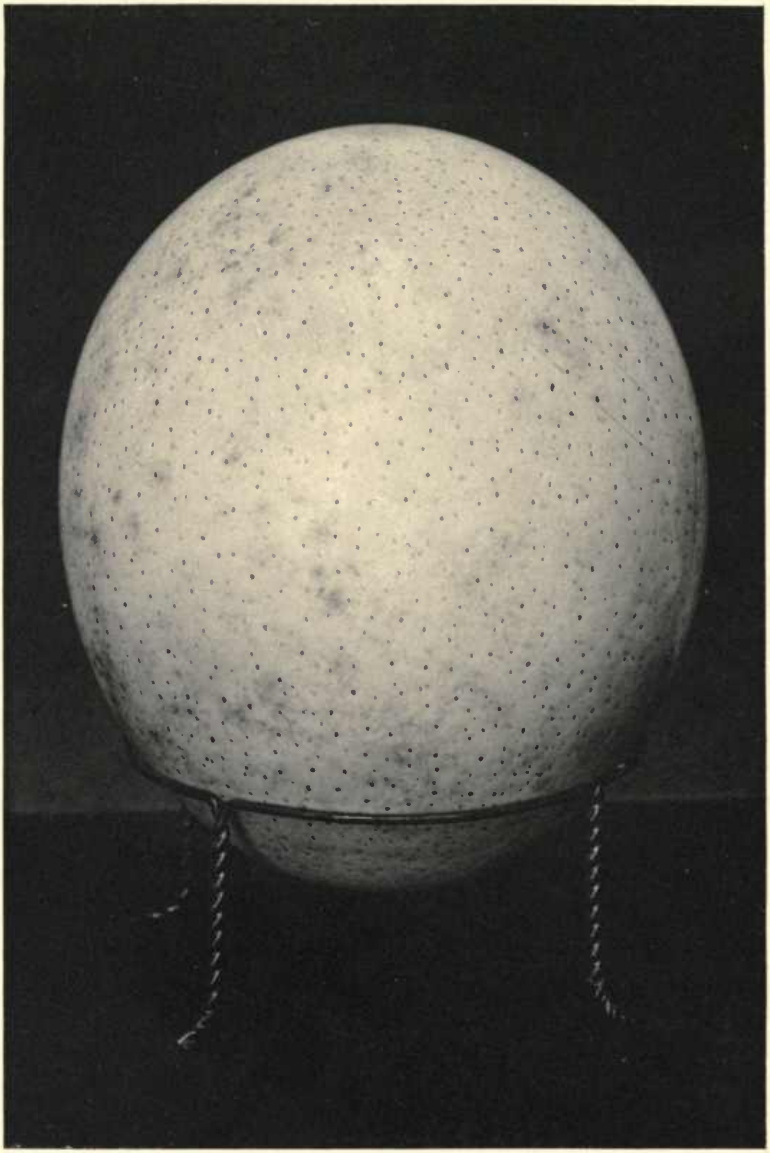


FIG. 5.
Chorus of a Comedy with Spear-men astride Ostriches. Painting on a Greek Vase.
After Daremberg and Saglio.



EGG OF DOMESTICATED OSTRICH FROM OSTRICH FARM IN CALIFORNIA (p. 5). IN FIELD MUSEUM.

About two-thirds actual size.

Flinders Petrie (Naukratis, part 1, p. 14) recovered from the temple of Apollo at Naukratis a piece of an ostrich egg-shell with a pattern of wreath etched out of the inside, and the upper part stained red; the etching was probably done by drawing the wreath with wax on the shell and then eating out the background with vinegar; and the higher surface of the wreath was polished, like the rest of the inside, before etching.

Ostrich feathers were worn by men in ancient Egypt, being stuck in their hair, and a religious significance was possibly connected with this custom. Such feathers are invariably found in the hair of lightly-equipped soldiers of ancient times, and there is a hieroglyph showing a warrior thus adorned. An ostrich plume symbolized truth and justice, and was the emblem of the goddess Ma'at who personified these virtues, and who was the patron-saint of the judges. Her head is adorned with an ostrich feather, her eyes are closed, similarly as Justice is blindfolded. The image of this goddess was the most precious offering for the gods, and was attached to the necklace of the chief judge as a badge of office.

Subsequently when the insignia of the various ranks in the court ceremonial were regulated, the ostrich feather became the exclusive prerogative of the kings, and these and the princes of royal blood exclusively were permitted to wear it. Those decorated with the ostrich feather are designated as "fan-carriers on the left of the king" in the inscriptions of the monuments.

The princesses had fans made from ostrich feathers. In the tomb of the queen Aa Hotep, mother of Amasis I (about 1703 B.C.) was discovered a semicircular fan decorated all over with gold plates and provided along its edge with perforations for receiving the feathers. When the Pharaoh showed himself to the people, high dignitaries carried ostrich-feather fans

attached to long poles alongside the royal palanquin.

Among the amulets of power conferred upon the dead were two ostrich plumes supposed to fly away in the wind, bearing the king's soul, and the pair of plumes therefore were provided as a vehicle for the soul of the deceased (Flinders Petrie, Amulets).

The British Museum has a terracotta from Naucratis representing a goddess on horseback with a lyre, wearing a head-dress surmounted by the solar disk, horns, and ostrich feathers (Walters, Cat. of the Terracottas in the British Museum, p. 256, with illustration).

In the eighteenth and first part of the nineteenth century the ostrich still lived in the plains of northern Egypt and along the Arabic coast of the Red Sea (Heuglin). Near the oases of middle Egypt it still occurs at present, likewise along the south-eastern frontier of the country.

THE OSTRICH IN THE TRADITIONS OF THE ANCIENTS

The ancients knew the bird as an inhabitant of northern Africa, upper Egypt, and Arabia.

The first Greek author who mentions the ostrich is Herodotus (IV, 175, 192). With reference to the Macæ who inhabited the coast of Libya, he states that they wore the skins of ostriches as a protection in war. He terms the ostrich "the bird remaining on the ground."

The skin of the ostrich is very thick, and still serves as a cuirass to Arabic tribes. Pierre Belon, a famous French naturalist of the sixteenth century, saw large numbers of ostrich skins with the feathers on in the shops of Alexandria, where they had arrived from Ethiopia. In northern Africa an ostrich skin is valued at about $75.

Xenophon (Anabasis I, 5), when he accompanied the army of Cyrus through the desert along the Euphrates, in northern Arabia, noticed numerous wild asses and many ostriches which he calls "large sparrows," as well as bustards and antelopes; and these animals were sometimes hunted by the horsemen of the army. While they succeeded in catching some asses, no one succeeded in capturing an ostrich. The horsemen who hunted that bird soon desisted from the pursuit; for it far outstripped them in its flight, using its feet for running and raising its wings like a sail. This description is quite to the point. Macaulay said of John Dryden, "His imagination resembled the wings of an ostrich. It enabled him to run, though not to soar." The wings serve the ostrich, while running, as poy and rudder, and it has been observed that with favorable wind they are even used as sails. Xenophon confirms the fact that in ancient times the ostrich ranged right up to the Euphrates. The last record of ostriches in

the region of this river was in 1797 when Oliver mentioned them in the desert west of Rehaba, about twenty-three miles due south of Deir-ez-Zor.

Strabo (XVI, 4, 11), the Greek geographer (63 B.C.-A.D. 19), speaks of a tribe of Elephant-eaters near the city Darada in Ethiopia. Above this nation, he continues, is a small tribe, the Struthophagi ("Bird-eaters"), in whose territory there are birds of the size of a deer, which are unable to fly, but run with the swiftness of an ostrich. Some of the people hunt these birds with bows and arrows, others by putting on the skins of the birds. They hide their right arm in the neck of the skin and move the neck as the birds use to do. With their left hand they scatter grain from a bag suspended to the side. They thus lure the birds, driving them into ravines where they are slain with cudgels. Their skins are used both as clothes and as coverings for beds.

This method of hunting by means of a decoy-bird is perfectly credible and universally employed. In South Africa the native hunters hide in a hole which they dig close to the nest of the birds. Having accounted for one bird, they stick up its skin on a pole near the nest, and in this way decoy another ostrich. Other tribesmen who keep tame ostriches avail themselves of the latter to approach wild ones and shoot them with poisoned arrows.

George W. Stow (Native Races of South Africa) gives the following graphic account of the Bushmen's method of hunting (compare Plate V): "In stalking the quagga (*Equus quagga*), the Bushmen generally disguised themselves in skins of the ostrich, with a long pliant stick run through the neck to keep the head erect, and which also enabled them to give it its natural movement as they walked along. Most of them were very expert in imitating the actions of the living bird. When they sighted a herd of quaggas which they

BUSHMAN PAINTING IN A CAVE OF THE HERSCHEL DISTRICT, CAPE COLONY, SHOWING BUSHMAN DISGUISED AS OSTRICH HUNTING OSTRICHES (p. 22).

After G. W. Stow.

wished to attack, they did not move directly toward them, but leisurely made a circuit about them, gradually approaching nearer and nearer. While doing so, the mock-bird would appear to feed and pick at the various bushes as it went along, or rub its head ever and anon upon its feathers, now standing to gaze, now moving stealthily toward the game, until at length the apparently friendly ostrich appeared, as was its wont in its natural state, to be feeding among them. Singling out his victim, the hunter let fly his fatal shaft, and immediately continued feeding; the wounded animal sprang forward for a short distance, the others made a few startled paces, but seeing nothing to alarm them, and only the apparently friendly ostrich quietly feeding, they also resumed their tranquillity, thus enabling the dexterous huntsman to mark a second head, if he felt so inclined. But as these primitive hunters never wantonly slaughtered for the mere sake of killing the game, like those who boast a higher degree of civilization, they generally rested satisfied with securing such a sufficiency as would afford a grand feast for themselves and their families, quite content with knowing that as long as the supply lasted, their feasting, dancing, and rejoicing would continue also."

According to Pliny, the feathers of the wings and tail were used as ornaments for the crests and helmets of warriors. The Athenian general Lamarchus wore two fine, white ostrich feathers on his helmet. The British Museum has a bronze statuette of Harpocrates wearing the Egyptian head-dress known as *atef*, resting on goat's horns; it is composed of three ostrich feathers, flanked by two *uraei* and surmounted by disks. Likewise a bronze statuette of Fortune has on her head a stephane surmounted by a disk, on each side of which is an ostrich plume, resting between a pair of wings (Walters, Catalogue of the Bronzes in the British Museum, Nos. 1494, 1540).

The ostrich was known to Aristotle as the bird who lays the largest number of eggs. He describes it as an animal which has the feathers in common with birds, but shares with the quadrupeds hairs, eyelashes, and the inability to fly; like the birds, it has two feet, but like many quadrupeds, cloven feet, and also resembles them in size; for this reason it has no toes, but claws, for a bird must be small in size, as it is not easy that a large bodily mass moves soaring in the air. Aristotle, accordingly, conceives the ostrich as a connecting link between birds and mammals.

In a similar manner Pliny opens his book on birds with a tolerably exact description of the ostrich which he terms *struthiocamelus* ("sparrow camel"), and which he calls the largest of birds almost approaching the nature of quadrupeds. He assigns it to Africa or Ethiopia and writes, "It exceeds in height a man sitting on horseback, and can surpass him in swiftness, as it is provided with wings to aid it in running. In other respects ostriches cannot be considered as birds, and do not rise from the ground. They have cloven talons, very similar to the hoof of a stag; with these they fight and also use them in seizing stones for the purpose of throwing them at their pursuers. They have the marvellous property of being able to digest every substance without distinction."

The ostrich stands about seven or eight feet high when full-grown, weighs upward of two hundred pounds, and in the wild state defies the horse and rider. At full speed it is said to make about twenty-six miles an hour. The family to which the ostrich proper, the rhea of South America, the emu of Australia, and the cassowary of the Malay Archipelago, South Pacific, and northern Australia belong, differs from other birds in having only small and rudimentary wings unadapted to flight, though they assist greatly in running; the barbs of the feathers are of equal length on each side of the

quill and of such a nature as to deprive the animal of the power of flight. The breast is rounded instead of being like a keel as in birds of flight. Aristotle and Pliny are right in attributing to it cloven feet; indeed, it has only two toes, the third and fourth in the pentadactyl system, but unequal in size and not covered with hoofs; the outer toe is much smaller and has no claw. The other members of the family have three toes.

The ostrich, as Pliny points out, is a good fighter. When wounded and hard pressed, it will attack a man, raise its leg to the height of his head, and kick him with its feet, which are hard like steel and yet elastic. A blow from this foot may rip open any animal on which it may fall. The notion that the bird hurls stones at its pursuers (according to Burton, prevailing throughout Arabia) may have been prompted by the observation that when it runs at great speed, it kicks up the stones behind with such violence that they would almost seem to be flung at the hunters in pursuit.

Although the ostrich will swallow almost anything, it is by no means able to digest everything, as Pliny thought. It demands stones instead of bread and swallows them in the same manner as other birds do gravel. They act as mill-stones and assist the gizzard in its function. In the South-African ostrich farms a certain amount of bone and grit is supplied to the birds. White quartz has been found to give excellent results. Grit is so essential that in some parts of the country it is carted by wagon or by rail for many miles, as it was found that without it the birds could not thrive—in fact, could not exist (Thornton).

The fondness for metals has obtained for the bird the name of the "iron-eating ostrich." In 1579 Lyly wrote in his Euphues that "the ostrich disgesteth harde yron to preserve his health." In Shakespeare's Henry VI Jack Cade thus threatens Iden: "I'll make thee eat

iron like an ostrich, and swallow my sword like a great pin, ere thou and I part."

The ancients entertained no high idea of the intelligence of ostriches. Pliny comments that their stupidity is remarkable; for, although their body is so large, they imagine that when they have thrust their heads into a bush, the whole of their body is concealed. Diodorus from Sicily, a Greek historian of the first century B.C., was much wiser in remarking that so far from displaying stupidity in thus acting, it adopts a prudent precaution, its head being its weakest part. The same author regarded the ostrich as a missing link between a bird and a camel. The ancient legend is still reflected in our phrases "ostrich policy" and "ostrichism."

In *The Birds* of Aristophanes (415 B.C.), the great Greek writer of comedy, the chorus sings thus:

> To the bird of awful stature,
> Mother of gods, mother of man;
> Great Cybele! Nurse of nature!
> Glorious ostrich, hear our cry!
> Fearful and enormous creature,
> Hugest of all things that fly,
> Oh preserve and prosper us,
> Thou mother of Cleocritus!

Nothing is known about Cleocritus, except that he was unfortunate in his figure, which was supposed to resemble that of an ostrich, while his mother had feet as large as those of an ostrich.

Cornelius Fido, a son-in-law of the poet Naso, is said to have burst into tears when Corbulo called him a bare-skinned or plucked ostrich (struthocamelum depilatum). Seneca who relates this anecdote thinks it funny that a man should lose his temper over so absurd a phrase.

The Arabs have a saying "more stupid than an ostrich," and the French use their *autruche* in the sense of a tall, idiotic fellow. The sweeping judgment of the ancients, however, is based on crude and limited

observation of the animal, and on erroneous interpretation of what they did not understand.

In his Report on Ostrich Farming in America Dr. T. C. Duncan (1888) writes that despite its proportionately small brain the bird is anything but stupid, as every one must own who has seen it breaking open the shell to let out a chick that is fast inside, or has seen it managing its chicks.

The Romans indulged in roast-ostrich, and especially enjoyed the wings as a delicacy. Paulus of Aegina, a celebrated physician of the seventh century A.D., writes that they are as juicy and savory as those of other birds. Caelius Apicius, a renowned gormandizer at the time of Augustus and Tiberius, who committed suicide when he saw his fortune shrunk to two million and a half sestertii, has handed down several culinary recipes as to how to prepare good ostrich meat. The emperor Heliogabalus (A.D. 218-222) once served at a banquet six hundred ostrich heads, the brains of which were to be eaten, and was extremely fond of roast-ostrich. The usurper Firmus, who rebelled in Egypt against Aurelianus, performed the *tour de force* to do away with an entire ostrich in the course of a day. Ostrich fat was recommended by physicians as a remedy for all sorts of pain, and the stones found in its gizzard were believed to be a powerful medicine in eye diseases.

Toward the end of the Roman empire ostriches were sometimes shown in the arena of the circus. Three hundred birds are mentioned on one occasion, and a thousand on another as participants in a circus game. A Roman mosaic shows an ostrich acting in the amphitheatre. Eight ostrich teams figured in the triumphal procession of Ptolemy Philadelphus at Alexandria. The Roman emperor Firmus rode with an ostrich team and conveyed the impression as if he were flying. Amor is represented on an engraved gem as

being drawn by two ostriches (Fig. 6). A picture on a Greek vase illustrates a comical chorus of spearmen astride on ostriches (Fig. 5). A cut gem of Oriental, perhaps Gnostic origin, shows a running ostrich surrounded by symbolic designs, among these a star with apples (Fig. 7).

FIG. 6.
Amor with a Team of Two Ostriches. Cut Gem of Green Jasper.
After Imhoof-Blumer.

FIG. 7.
Cut Gem of Serpentine Representing a Running Ostrich, Surrounded by Symbolic Designs, among these Star with Apples. Oriental, perhaps Gnostic.
After Imhoof-Blumer.

THE OSTRICH IN THE RECORDS AND MONUMENTS OF THE CHINESE

The ostrich was first discovered for the Chinese by the renowned general Chang K'ien during his memorable mission to the nations of the west (138-126 B.C.). He returned to China with the report that in the countries west of Parthia there were "great birds with eggs of the size of a pottery jar." The "great bird" is the common name of the ostrich among all early Greek writers, while the name "camel-sparrow" or "camel-bird" is found at a later time in Diodorus and Strabo. When Chang K'ien had negotiated his treaties with the Iranian countries in the west, the king of Parthia (called Arsak by the Chinese after the ruling dynasty, the Arsacides) sent an embassy to the Chinese court, and offered as tribute eggs of the Great Bird. In A.D. 101 live specimens of ostriches, together with lions, were despatched from Parthia to China, and at that time were styled "Arsak (that is, Parthian) birds," also "great horse birds." On becoming acquainted with the Persia of the Sasanian dynasty, the Chinese Annals mention ostrich eggs as products of Persia, and describe the bird as being shaped like a camel, equipped with two wings, able to fly, but incapable of rising high, subsisting on grass and flesh, also able to swallow fire. Another account says quite correctly that the birds eat barley. When an attempt was made in Algeria to domesticate them, it was found that they thrive well on barley, fresh grass, cabbage, leaves of the cactus or Barbary leaves chopped fine; and three pounds of barley a day was recommended for each bird, green food according to circumstances.

To the north of Persia, the Annals of the Wei dynasty mention a country Fu-lu-ni, where there is a great river flowing southward; this territory harbors

a bird resembling a man, but also like a camel. Again, under the T'ang dynasty, in A.D. 650, the country Tokhara offered to China "large birds seven feet in height, black in color, with feet resembling those of a camel, marching with outstretched wings and able to run three hundred (Chinese) miles a day and to swallow iron." They were then called "camel birds," in accordance with the Greek, Arabic, and Persian designations. Again, in the first part of the eighth century, ostrich eggs were sent to China from Sogdiana. We have to assume that the live birds transported from Persia to the capital of China over a route of several thousand miles must have been extraordinarily tame, and it was a remarkable feat at that. These birds must have been kept in the parks of the Chinese emperors who were always fond of strange animals and plants. What is still more astounding is the fact that in the mausolea of the T'ang emperors near Li-t'süan in Shen-si Province there are beautiful, naturalistic representations of ostriches carved in high relief in stone (Plates VI-VII and Fig. 8). The two sculptured slabs shown in the Plates were erected on the tomb of the emperor Kao Tsung, who died in A.D. 683; the one in Fig. 8 was placed on the tomb of the emperor Jui Tsung, who died in A.D. 712. The artists of the period doubtless received an imperial command to portray the ostriches of the imperial park in commemoration of the vast expansion of the empire over Central Asia during that epoch. As shown by their results, they did not copy any foreign artistic models, but they witnessed and carefully observed and studied live specimens. Their ostriches, in fact, belong to the best ever executed and known in the history of art, and are far superior to any representations of the bird in Assyria, Egypt, and Greece, which are conventional and stiff. The Chinese ostriches are correct in their accentuation of motion and action. The formation and length of the neck allow the bird

CHINESE STONE SCULPTURE OF OSTRICH ON THE TOMB OF THE EMPEROR KAO TSUNG (p. 30). T'ANG PERIOD, SEVENTH CENTURY A.D.

After E. Chavannes.

to turn its head completely around, a characteristic skilfully brought to life in stone by the unknown Chinese sculptor (Fig. 8).

For comparison the sketch of an ostrich by Albrecht Dürer is reproduced in Plate VIII. It is dated 1508 with the addition of the monogram A. D. It is supposed that during his stay in Venice the artist may

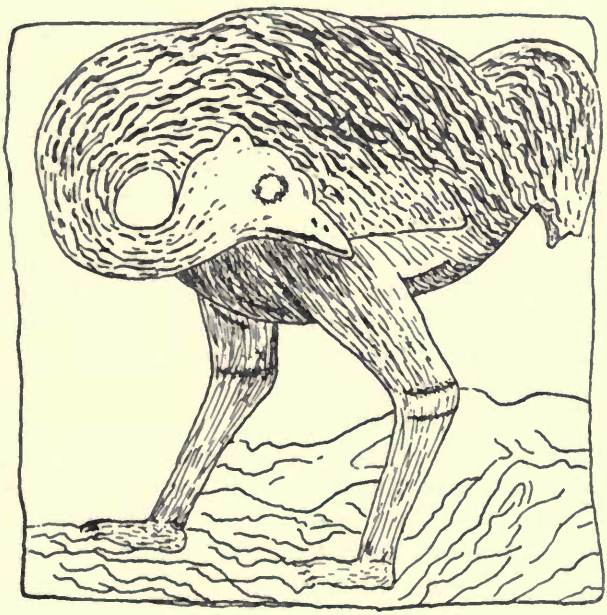


FIG. 8.
Chinese Stone Sculpture of Ostrich from the Tomb of the Emperor Jui Tsung.
T'ang Period, Eighth Century.
After E. Chavannes.

have had occasion to view a live ostrich. His sketch is better than that of his contemporary, the naturalist C. Gesner, who had evidently never seen the bird. In the museum of Nuremberg there is a painting of Wohlgemut representing the adoration of the Three Magi; the Moor offers an ostrich egg filled with spices and bordered with gold or silver. The initials A.D. on the

egg possibly refer to Dürer, and may hint at his collaboration.

Under the T'ang, the Chinese were also informed of the fact that the ostrich was a native of Arabia. It is on record that "the camel-bird who inhabits Arabia is four feet and more in height, its feet resembling those of a camel; its neck is very strong, and men are able to ride on its back (compare p. 16); the birds thus walk for five or six miles. Its eggs have the capacity of two pints."

When, during the middle ages, the Chinese became slightly acquainted with the east coast of Africa, they learned also that the ostrich was at home in the Somali country. Then they styled it "camel crane," and compared its eggs not unfittingly with a coconut. They even report that the natives of Africa heat copper or iron red and give it to the birds to eat; if the eggs are broken, they give a ring like pottery vessels. In the fifteenth century, under the Ming, ostriches are reported also from Aden and Hormuz.

While in general the Chinese accounts are sensible and make an interesting contribution to the geographical distribution of the species in ancient times, it is noteworthy that they never allude to the bird's plumage; and it seems that its feathers were never utilized in China. We are well acquainted with all articles of trade imported into China by the enterprising Arabs from the early middle ages down to more recent times, but ostrich plumes are never mentioned. Feathers of pheasants were used by the Chinese for the decoration of head-dresses, peacock and eagle feathers for fans, the blue feather of the kingfisher for inlaying in ornaments and screens.

The area of the habitat of the ostrich was formerly much more extended than at present; continued persecution of the bird for the sake of its precious plumage has exterminated it in certain districts or decreased its

numbers. It may still occur in some parts of southern Persia, and still lingers in the wastes of Kirwan in eastern Persia, whence individuals may occasionally stray northward to those of Turkestan, even as far as the lower course of the Oxus. No representation of the bird has as yet been found in Persian art.

THE OSTRICH IN AFRICA

The ostrich has reached its greatest extension in the vast grass steppes of Africa, especially those covered with brushwood, where it finds the best conditions for living and satisfying its nomadic habits. There it migrates from pasture to pasture, and may appear and disappear in a certain locality, particularly when forced by lack of food or droughts to move. A gregarious animal, it wanders about in flocks of twenty and thirty and keeps strictly to the steppe, but avoids altogether forests, high tablelands, and damp and swampy tracts. It associates also with other species, like giraffes, zebras, and antelopes (Plate IX), who look upon the ostrich as their guardian. On account of its tallness and far-sightedness the bird is the first to give them a danger signal. The ostrich is extraordinarily keen-sighted, and on its native plains is extremely wary. The whole tribe is characterized by excessive shyness and timidity without which in the struggle for self-preservation it would ere this have ceased to exist.

The ostrich lives on cereals, seeds of grasses, vegetables, leaves, buds, berries, dates, fruits of the tamarind and palms, young birds, lizards, beetles, grasshoppers, etc. In general frugal and capable of withstanding hunger and thirst for days, it becomes greedy and indiscriminately voracious at times. The birds perform strange dances in the sunshine, run around in a circle, flap their wings, and endeavor to rise into the air. During the mating season the male always wooes the female with wild and eccentric dances. He is the original inventor of the Charleston. Ostriches are fond of bathing and swimming, and have been observed to take to the brine. In more than one respect they are almost human, and in their mobility and peregrinations

CHINESE STONE SCULPTURE OF OSTRICH ON THE TOMB OF THE EMPEROR KAO TSUNG (p. 30). T'ANG PERIOD, SEVENTH CENTURY A.D.

After E. Chavannes.

over vast stretches of land they are typical, restless nomads given to a life of hustle and bustle.

The natives of Africa have at all times appreciated both its feathers and flesh. The former are used as fly-whisks and as ornaments on lances, in the kingdom of Congo as war standards, by the Somali as head-ornaments. The empty egg-shells serve as water-vessels, and are suspended in tents and mosques. The roofs of straw huts in the Sudan are adorned with the eggs. Many Negro tribes cut the shell into small button-like

FIG. 9.
Painted Ostrich Egg from Etruscan Tomb of Isis.
After G. Dennis.

pieces which they perforate and string, wearing such strands as necklaces. Perforated and decorated ostrich egg-shells, together with implements of the stone age, were unearthed by Foureau in the Sahara.

Painted ostrich eggs were discovered in the Punic tombs of Carthage and even in the tomb of the valley of Betis in Spain. In the tomb of Isis opened at Vulci, Italy, in 1839, and so called on account of the Egyptian articles found in it, but in fact the sepulchre of two Etruscan ladies of rank, were found six ostrich eggs, one of these being painted with a winged camel or, more

probably, a fabulous creature (Fig. 9). G. Dennis (Cities and Cemeteries of Etruria) is inclined to think that these eggs were imported from Egypt, but others assume that they testify to the ancient commercial relations between Etruria and Carthage. There is a fragmentary cup of plated silver, presumably imported from Carthage into Etruria, which is adorned with rows of fantastic and real animals, among these unmistakable ostriches.

The trans-Saharan trade in ostrich eggs has persisted to the present day. The eggs are sent along with the consignment of feathers and emerge at the towns of the Mediterranean coasts of Tunis and Tripolis, where they are in request as pendant ornaments in the mosques.

Richard F. Burton (Lake Regions of Central Africa) wrote in 1860, "The ostrich extends through Unyamwezi and Usukuma to Ujiji. The eggs are sold, sometimes fresh, but more generally stale. Emptied and dried, they form the principal circulating-medium between the Arab merchants and the coffee-growing races near the Nyanza Lake, who cut them up and grind them into ornamental disks and crescents. The young birds are caught, but are rarely tamed. In Usukuma the bright and glossy feathers of the old male are much esteemed for adorning the hair; yet, curious to say, the bird is seldom hunted. Moreover, these East Africans have never attempted to export the feathers, which, when white and uninjured, are sold, even by the Somal, for eight dollars a pound. The birds are at once wild and stupid, timid, and headstrong; their lengthened strides and backward glances announce terror at the sight of man, and it is impossible to stalk them in the open grounds, which they prefer."

The Nandi in eastern equatorial Africa wear a cockade of ostrich feather in times of war. It is with them also an emblem of peace; when after war peace is

desired, an ostrich feather is placed in a high-road in a prominent position. The Nandi have the following riddle: "What is the thing which, though so weak that it is blown about by the wind, is able to herd oxen?" Answer: "The ostrich-feather head-dress." The grass in the Nandi country is so high that only a warrior's head-dress can be seen above it, and at first sight it often appears as if a herd of oxen were being guarded by the ostrich feathers, which are the plaything of every gust of wind (A. C. Hollis).

Among the Somalis the ostrich feather is universally used as a sign and symbol of victory. Every man hangs to his saddle-bow an ostrich feather, and generally the white feather only is stuck in the hair. All the clans wear it in the back hair, but each has its own rules. Some make it a standard decoration, others discard it after the first few days. The learned have an aversion to the custom, stigmatizing it as pagan and idolatrous; the vulgar look upon it as the highest mark of honor (R. F. Burton).

In the Lango country the white ostrich feathers are dyed red with iron ochre and worn as head-ornaments. The greater part of the feathers now exported from the Sudan are furnished by ostriches taken young and reared by the Shilluks and Bagaras. These birds become as tame as chickens; in the morning they go to the fields with the cattle, and return home in the evening.

The ostrich-hunters par excellence were the Bushmen of South Africa, now extinct. Their legends prove that they had an intimate knowledge of the life of the ostrich. Two of these are recorded in the "Specimens of Bushman Folklore" by Bleek and Lloyd (1911). One of these, entitled the Resurrection of the Ostrich, gives a good picture of the bird's mating habits and winds up thus: "He will drive away the jackal, when he thinks that the jackal is coming to the eggs, the jackal will

push the eggs. Therefore he takes care of the eggs, because they are indeed his children. Therefore, he also takes care of them, that he may drive away the jackal, that the jackal may not kill his children, that he may kick the jackal with his feet."

Fig. 10 represents two sketches of ostriches made by the Bushmen living in the west corner of the Orange

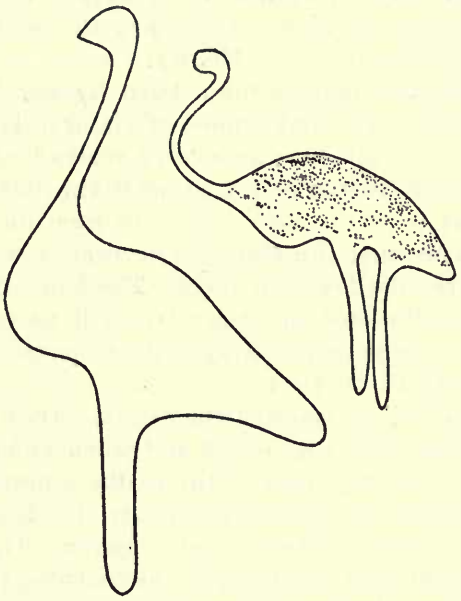


FIG. 10.
Bushmen Rock Carvings of Ostriches.
After M. Helen Tongue.

River Colony. They are reproduced from the work of M. Helen Tongue, "Bushman Paintings" (Oxford, 1909). These pictures are carved in rocks by means of a stone. The markings indicating feathers in the sketch on the right are chipped in the scraped-out surface of the flat stone. The curved neck and the outline of the body testify to good observation. The other sketch is more primitive and not so good. A fine example of

Bushman paintings of ostriches is reproduced in Plate V.

In excavating the diamond-bearing deposits at Du Toit's Pan, in Griqualand West, numerous Bushman beads made of ostrich egg-shell were found at various depths ranging from six to eight feet, and in several spots resting on the bed of calcareous tufa. These local accumulations had evidently been very gradual in their formation. Multitudes of minute land-shells were interspersed throughout them, the animals which inhabited them having evidently perished and been entombed while traversing the arid sand. This place had obviously been a great station for the Bushmen, in the midst of the ostrich country, and had in all probability been a locality, where the manufacture of ostrich egg-shell beads had been carried on for generations. Some were found in various stages of manufacture. Some of those dug out from the lowest depths had become perfectly fossilized, and adhered to the tongue.

A belt from three to six or seven inches in width, formerly worn by young Bushman women, consisted of small circular pieces of ostrich egg-shell bored in the centre and strung like buttons with their flat sides together. Necklaces were made in a similar manner. After the stronger peoples came in contact with the Bushmen bead-makers, they used to purchase these pierced disks of egg-shell from the latter for small bits of iron. Ostrich egg-shells also furnished the Bushmen with water-bottles in which to carry water to the place of their haunt. The openings were closed with a bunch of grass. The women carried twenty or thirty of such egg-shells in a bag or net on their backs.

Spears and poles dressed with black ostrich feathers were stuck in the ground around places, where the Bushmen halted during their hunting expeditions, in order to frighten away lions, which, from their experience, it was discovered were not fond of their ap-

pearance (G. W. Stow, Native Races of South Africa).

The Bushmen, further, used the breastbone of the ostrich as a dish, made threads of its sinews and wrought these into nets and bags.

From the remains of ostrich egg-shells is prepared a powder which is also regarded by the Boers as an excellent remedy for man and cattle; it is even said to protect one from blindness.

In South Africa the ostrich exists now only in the domesticated state. In the Kalahari desert, however, in the tablelands of South-west Africa, Matabele and northern Rhodesia it still occurs wild.

THE DOMESTICATION OF THE OSTRICH

The ostrich is the most recent of all domesticated animals, and its complete domestication was accomplished by the white farmers of South Africa as late as the latter part of the nineteenth century. It is the only domestication that occured in modern times, and the only one to which, with certain reservations, our own civilization may lay claim; all other domestications of large mammals and birds were brought about ages ago, either in Asia or Africa, and were simply adopted by the nations of Europe. The first step toward domestication is taming and training, but a tamed animal is not necessarily domesticated. In India, for instance, the elephant has been tamed and schooled as a laborer to a high degree of perfection, but does not propagate in captivity; for this reason it is not classed among domesticated animals. In the stage of domestication the animal propagates its species, and in its breeding is to a great extent influenced by human interference; it will gradually lose many of its savage instincts and acquire new useful qualities. In this manner are formed numerous new varieties which exhibit many differences from the original type and greatly vary in size, color, habits, even in anatomical and mental traits.

Long before the advent of the white man, the natives of Africa had kept ostriches in captivity and tamed them to a certain extent, but they did not succeed in domesticating them. A few examples may suffice to illustrate this point.

In the Uganda Protectorate, where the ostrich is a native of the northern and eastern districts, its eggs and recently hatched young are constantly brought in by the natives for sale. Boyd Alexander (From the Niger to the Nile) writes that in Bornu the ostrich is not much

hunted, because it is very difficult to get near, but that the natives catch the young which become domesticated, most of the big men in Bornu owning three or four. The word "domesticated" is here used in a loose fashion, not in the strictly scientific sense.

For generations the Arabs and Berbers of North Africa have kept the ostrich in small kraals and ruthlessly plucked its feathers. These are birds captured as chicks from the nest of the wild bird, but chicks were never bred in captivity.

In Kordofan in the Egyptian Sudan young ostriches are frequently reared, fattened, and slaughtered; the flesh is eaten either fresh or dried. In the Arabic villages of Central Africa ostriches are kept for their feathers; they are hatched from eggs accidentally discovered. In the Sudan chicks are caught, raised by hand and kept until the birds become too old to produce feathers of paying quality, when they are killed and eaten. The system of farming these birds is to enclose each in a small circular mud wall or enclosure, about eight feet in diameter. The birds are never given an opportunity to breed; and this practice, being continued for centuries, has led to the belief that the ostrich will not breed in captivity. The method of removing the feathers from these captive birds was atrocious and the crudest possible; whenever the native farmer required money, he pulled as many feathers from the bird as he could remove in order to turn them into cash. The stage of the growth of the feathers was not considered, the feather sockets were damaged, and in the course of two or three years the birds produced only worthless feathers. It was a system of spoliation inspired by the most sordid greed of profit.

In the eighteenth century ostriches were still plentiful in southern Africa. Peter Kolbe, who spent ten years there on scientific research, wrote in 1742, "These birds occur in the Cape Territory in so large a number

SKETCH OF OSTRICH BY ALBRECHT DÜRER, DATED 1508 (p. 31).
After S. Killermann.

that you cannot travel for a quarter of a mile without seeing some of them. They can easily be tamed, and many are kept in the Citadel of the Cape."

As early as 1662, Jan van Riebeek, Dutch commander of the Cape Colony (1652-62), directed his successor's attention to the taming of young ostriches. On several occasions tame ostriches had been sent to the Indies, where they had proved acceptable presents to native potentates. Their feathers were saleable, but it does not seem to have occured to any one in those days that it would pay to tame the bird for the sake of its plumage (G. M. Theal, History of Africa South of the Zambesi).

When in 1865 the domestication was first attempted in South Africa, natives who had some experience in managing the birds were employed as trainers; but when it has been recognized that the domestication is historically connected with the crude efforts of the natives, it must be frankly admitted, on the other hand, that the success of the actual domestication is solely to the merit of the Africanders. They certainly availed themselves, as it could not be expected otherwise, of some of the experiences previously accumulated for many centuries, not as mere imitators, however, but as novel investigators who grasped the situation with open eyes and energetically applied themselves to a minute study of the bird's life-habits. By creating for their favorite its natural surroundings, by reserving to it vast spaces for movement and exercise, and by proper feeding and care-taking, above all, by sympathy and understanding, their success was permanently insured. Just because these simple farmers were simply human and humane, they achieved what was denied to the Egyptians, Romans, or Arabs with their vain conceit. The barbarous treatment which the poor bird had hitherto received from the hands of African savages

gave way to a charitable attitude and an enlightened method prompted by truly scientific research.

The domesticated stocks of South Africa were produced from captured wild chicks who, on reaching the age of maturity, were allowed to breed. Due to careful handling and selected breeding, the quality of the feathers has vastly improved.

The following figures may illustrate the rapid progress made by the industry in South Africa since ostriches were first domesticated. In 1865 there were in South Africa 80 domesticated ostriches; the weight of feathers exported in that year was 17,000 lbs., most of which were feathers of wild birds, valued at £65,000. Ten years later, in 1875, there were 32,000 domesticated birds, and the export of feathers amounted to 100,000 lbs., to the value of £300,000. In 1891 the number of domesticated birds had increased to 154,000; weight of feathers exported was 212,000 lbs., probably including a small amount of wild birds' feathers, to the value of £563,000. In 1904 there were 307,000 domesticated ostriches; the export of feathers was 470,000 lbs., valued at £1,058,000. In 1908 a maximum of 700,000 domesticated ostriches was reached; the weight in feathers exported came to 800,000 lbs., valued at £2,098,000. In 1913 a million pounds of feathers were exported, valued at £2,750,000. There is, accordingly, the remarkable result that during a period of forty-eight years the industry has risen from an export value of £65,000 to £2,750,000; that is, an increase of 4130 per cent.

In mediæval Europe ostrich plumes decked the helmets of knights, later the hats of cavaliers, and the fashion came in again for a time at the Restoration. The fashion of the seventeenth century was dominated by a large felt hat decorated with ostrich plumes laid around the brim. Their natural beauty, particularly

the graceful curve taken toward the tip, has always had a strange fascination for the human heart.

The feathers are now utilized for the decoration of ladies' hats, as well as for the making of fans and boas. For the latter the flue or soft portion of the feathers only, also damaged and inferior feathers, are used. The flue of inferior feathers serves also for padding clothes and quilts. The market, of course, is subject to fluctuations due to changes of fashion, but it is very unlikely that the demand for ostrich feathers will ever completely die out.

Each bird has twenty-five white plumes in each wing with a row of protectors, floss feathers underneath. Above these are a row of black feathers and still another row of shorter ones which are black in the adult male and drab in the hen. The feathers are removed by clipping; at the age of six months the birds receive their first clipping, and thereafter are clipped at intervals of nine months. The bird will continue to produce good feathers for practically an indefinite period. This method is perfectly humane, the bird does not receive any injury whatever. Feeding was found to have a very marked effect on the feather growth. This led to the pampering of the bird to such an extent that it is now fed on everything it desires. This method of humorizing its appetite has produced the best results. The fact that the highly-fed ostrich gave the greatest financial return was the cause of erecting the majority of the largest irrigation-works undertaken in South Africa. The return was so enormous that many irrigation-works which could not have been undertaken otherwise were carried out as paying propositions, and are at present a source of immense wealth to the country.

The farmer of South Africa, as R. W. Thornton justly says, is under an inestimable debt of gratitude to the ostrich as being the means by which the best areas of arid land have been converted under irrigation into

highly productive fodder-producing areas, which, even if the industry were to fail, would be of incalculable value as fodder-producing areas for any class of farming.

Experiments to introduce ostrich domestication into Algeria in 1881 were unsuccessful. Egypt has an ostrich farm near Matarieh north of Cairo.

In view of the similar climatic and soil conditions of South Africa and Australia and considering the fact that the camel introduced in 1846 was rapidly acclimatized in Australia, it was suggested to naturalize there also the South African ostrich. Its breeding was started in 1880 in the southern part of the continent, but has thus far not been very successful. The statistics of the Australian Government for the year 1922 give the number of ostriches in the Commonwealth as 780, which is a small figure as compared, for instance, with 11,738 camels. Good results were attained on an ostrich farm near Christchurch in New Zealand. Near Buenos Ayres, in Montevideo, Argentina, and Patagonia ostrich farms were also founded.

WILD AFRICAN OSTRICHES WITH EGGS AND CHICKS, IN ASSOCIATION WITH ZEBRAS AND ANTELOPES (p. 34).
After O. Schmeil.

THE OSTRICH IN AMERICA

In 1882 Dr. Charles J. Sketchly, one of the greatest ostrich-farmers in South Africa, transported a troop of two hundred picked ostriches from Cape Town via Buenos Ayres to New York. From there the birds were forwarded by railroad via Chicago and Omaha to the Pacific coast, having covered a distance of 23,000 miles. Twenty-two arrived in California in fair condition, and were at once taken to Anaheim. The California Ostrich Company was soon formed with a capital of $30,000, and Dr. Sketchly was made superintendent. The first year these birds resided in America they presented the company from April to October with 270 eggs.

At the same time the American Ostrich Company was organized in Maine with E. J. Johnson as manager. He went to Africa and spent there a year, studying the habits and management of the birds. He started with twenty-three of them and landed at New Orleans in December, 1884, after a voyage of fifty-three days, with all the birds alive,—a remarkable result, as the usual loss at sea is about 25 per cent. He settled in the valley of the San Luis Rey, about seven miles from the town of Fallbrook, north of San Diego, in southern California. The clear, dry air, the excellent water, and the shelter afforded by the Santa Rosa hills furnished suitable conditions for the establishment of an ostrich farm. The birds took kindly to their adopted home, and have thriven well, the old ones maintaining their natural vigor, and the American-born being at two years unusually fine, both in size and quality of feathers. The breeding birds are kept paired in corrals of an acre in extent. Those one and two years old are left a range of some thirty acres on the mesa, while the young chicks are allowed to run with the other barnyard fowls. The

ostrich is now perfectly acclimatized in this country, and it is even asserted that the American birds are finer and larger than their African progenitors.

Other farms soon followed, and are now established near Los Angeles, San Diego, and San José, California; Hot Springs, Arkansas; Jacksonville, Florida; Phoenix, Arizona, also in Oklahoma and Texas. Ostrich farming has developed into an industry of great importance.

The scientist is gratified at the domestication of the ostrich, because it supplies the demands of the feather trade and will therefore lessen or ultimately stop the reckless slaughter of wild ostriches and, let us hope, also the killing of song-birds formerly sought for their feathers. It will enable us, further, to obtain an accurate account of the bird's life history and habits and to render it justice and correct the numerous errors to which the ill-founded fables of past centuries have subjected it. Until recent times it was believed, for instance, that the ostrich is polygamous and mates with from two to five or more females. A. Reichenow (1900) is the first who observed that the wild cock pairs only with a single hen, and I am inclined to assume that he is right; for it has been found that the birds reared in captivity are monogamous, and it can hardly be supposed that the ostrich, perhaps under the influence of American environment, should have suddenly repented and changed from harem habits to a state of monogamy. Some years ago F. J. Haskin, after studying an ostrich farm near Los Angeles, reported, "The ostrich is abnormally finicky about mating. Some birds remain determined bachelors all their lives, and every one chooses his mate only with great delay and caution. Usually it takes two or three years of earnest and patient courtship on the part of the hen before she ensnares her prey. But once captured, the male ostrich is her devoted slave for life. He flutters anxiously

about her while she sits on the family eggs and takes up an unnecessarily combatant attitude, one deadly toe-nail raised for fight, whenever another bird or the keeper ventures within ten feet of her. If she dies, moreover, he remains a melancholy widower to the end of his days. When one of the males was widowed as a result of his wife getting her head caught in the fence, the keeper picked out the finest female in the flock and offered her as a substitute. She was in the pen just three seconds when the keeper had to risk his life to get her out. As it was, she received such a hard kick that she nearly died and had to be removed to the hospital pen. The hen has no such scruples when it comes to remarrying, and is polite, if not enthusiastic, to every suitor introduced to her. Once in a long while, also, a male bird is found who is not so sternly monogamous. There is one of this type at the farm who has condescended to espouse two wives. They call him 'Brigham Young'."

Captivity has brought about a remarkable change in the attitude of the old birds toward their young. Whereas in the wild state they are good and tender parents, they apparently do not recognize the young bred at the farms under the incubator system. They cherish no affection for their offspring which has thus not been hatched or raised by them, and their impulse usually is to kill the young on sight. What is said in the book of Job about the ostrich's want of regard for its young now sounds like a true prophecy. Pliny, however, if he could come back to life and would visit one of our ostrich farms, would doubtless offer an apology for his somewhat hasty verdict. Civilization, after all, advances: from a mercilessly persecuted and tormented creature we have transformed the ostrich into a happy and contented bird and an eminently useful denizen of our soil. The domestication of the ostrich is a positive contribution to the progress of humanity and

humaneness, and may be designated one of the great achievements of modern civilization of which the Africander may justly be proud and for which we have every reason to be grateful to him.

B. LAUFER.

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