LIBRARY
OF THE
AMERICAN MUSEUM
OF NATURAL HISTORY

Birds *and* Man

By FRANK M. CHAPMAN

#115

THE AMERICAN MUSEUM OF NATURAL HISTORY

Issued under the direction
of the
COMMITTEE ON POPULAR PUBLICATIONS
ROY W. MINER, *Chairman*

Background painted by Francis Lee Jaques

BIRDS AND MAN

by

FRANK M. CHAPMAN

A Guide to the Exhibit

Illustrating the Relations between Birds and Man

Shown on the First Floor of the Whitney Wing

GUIDE LEAFLET SERIES, No. 115

THE AMERICAN MUSEUM OF NATURAL HISTORY

NEW YORK CITY

ACKNOWLEDGMENTS

In gathering material for and planning the group on which this leaflet is based the author had the cordial support of his colleagues in the Bird Department. With especial pleasure he also acknowledges the indispensable cooperation of William Patten Osborn as artist and exhibitor. Mr. Osborn was assisted by Mr. Charles Tamkin, E. Thomas Gilliard, Paul Richard and others. The birds were mounted by Raymond B. Potter and George Adams. The vegetation was prepared by George E. Petersen of the Department of Preparation. The lettering was done by Margaret Gilliard and Roger O. Siege. The photographs were made by Thane L. Bierwert.

FRANK M. CHAPMAN

Copyright
The American Museum of Natural History
1943

SYNOPSIS OF THE EXHIBIT*

		PAGE
SEC. I	BIRDS AS FOOD	7, **11**
	The Native Hunter	7
	The Market Hunter	8
	Hunting for Sport	9
SEC. II	BIRDS AS CLOTHING AND IN ADORNMENT	12, **15**
	BIRDS AS OMENS AND SYMBOLS; IN MYTHOLOGY AND TRADITION	12
SEC. III	BIRDS AS EMBLEMS AND INSIGNIA	13, **19**
	BIRDS AS HIEROGLYPHS	17
SEC. IV	BIRDS IN BOOKS	20, **25**
	Literature	20
	History	22
	Science	22
SEC. V	BIRDS IN ART	26, **29**
SEC. VI	ECONOMIC ORNITHOLOGY I	27, **33**
	THE FOOD OF BIRDS	27
SEC. VII	ECONOMIC ORNITHOLOGY II	34, **37**
	DOMESTICATION	34
SEC. VIII	ECONOMIC ORNITHOLOGY III	42, **45**
	The Flight of Birds	42
	The Feather Trade	42
	Birds' Eggs	46
	Guano	46
	Fishing with Cormorants	46
	Birds as Pets	46
	Extinction and Introduction of Birds	47
SEC. IX	THE SENTIMENT OF ORNITHOLOGY	48, **51**
	Bird Songs	48
	Bird Study and Conservation	49
	The Friendship of Birds	49
	Bird Sanctuaries	49

* Page numbers in heavy face refer to full page plates illustrating the nine sections of the exhibit.

INTRODUCTORY

There are many parts of the earth occupied by birds where man is unknown; but there is no place inhabited by man where birds are not also found. Their flesh, their feathers, their forms and flight, their habits, their food, their travels, their songs and companionship all may enter into our lives. From the beginning of this association birds have been essentially as they are today but man has risen from the primitive condition, in which some races still remain, to the high stage of civilization his leaders have now reached. We believe that a review of our present and past relations with birds will show that they have played, and continue to play, an inestimably important part in both our mental and physical existence. This review we have attempted to make in the exhibit, "Birds and Man," which this pamphlet has been prepared to accompany.

BIRDS AND MAN

by

FRANK M. CHAPMAN

SECTION I

BIRDS AS FOOD

. CAPE YORK ESKIMO NETTING DOVEKIES. This is drawn by W. P. Osborn from photo-raphs by Donald B. MacMillan.

The Native Hunter. – Most birds are edible; some of them are exceptionally palatable. It has always been their fate to serve as food. Primitive man is sometimes dependent on them for subsistence. It is probable, for example, that the early Tehuelche could not have lived in Patagonia without the support of the Rhea and its eggs; while the Eskimo could not inhabit Cape York, Greenland, if the Dovekie was removed from his larder. In both these instances, it should be noted, agriculture is impossible or not practiced and the indigenes exist mainly, or wholly, on a fare of flesh. But it is significant to observe that in continental areas, at least, the wants of the native rarely, if ever, caused a serious diminution in the numbers of birds. Should this fall below the point of support or profitable pursuit, change in the pursuer's food or habitat automatically gives his prey an opportunity to regain its status.

II. THE CHRISTMAS SEASON—GAME STAND IN FULTON MARKET, NEW YORK. Drawn by A. B. Frost. (A print from Harpers Weekly, 1878.)

The Market Hunter. — With the increase in population following the white man's appearance and improvement in transportation which made trade-centers accessible, the Market Hunter arose and his efforts to supply the demand for edible birds mark one of the most destructive periods of our relation with birds. In North America, Wild Pigeons, exceptionally vulnerable because of their communal habits, in spite of their incredible abundance, were among the first to disappear. Other species, which could be killed by wholesale, were on their way to follow them. Our markets were glutted with game birds as our copies of contemporary prints demonstrate. Obviously we were recklessly squandering an invaluable asset that could never be replaced.

For example:

In 1864, one shipment of Prairie Hens weighed 20 tons. (D. G. Elliot.)

In 1861, 14,850,000 wild Passenger Pigeons were shipped from the Petoskey, Mich., "nesting."

In 1909, 5,719,214 game birds were sold in the markets of New Orleans.

Fortunately, the danger was seen by true sportsmen who, as the first step in reform, secured the passage of laws prohibiting the sale of birds for food. This ended the day of the Market Hunter.

Hunting for Sport. – The Market Hunter was succeeded by the Hunter for Sport. He gratified his inherent love of the chase but created and obeyed the laws shortening the open season, limiting the size of the daily bag, and aiming to restrict the annual kill to not more than the annual increase. He advocated enlargement of suitable habitat with additions to the food supply; in short, spared no effort to augment the parent stock. Of recent years the lives of an increasing number of sportsmen give an encouraging forecast of a change of heart among their kind. As they become older, interest in the living bird replaces the desire to capture it, and the inborn love of the chase finds an outlet in bird photography. It requires more skill to secure a satisfactory picture of a bird than to shoot it, and the trophy obtained is proof of one's patience and ingenuity often of value to science and sometimes to art. Compare the brace of dead Quail bagged by the sportsman with the camera hunter's unique photograph of a colony of nesting Flamingoes and this point becomes clear.

Falconry. – Asia is the home of Falconry. It appears to have been known in China some 2000 B.C. It was practiced in Japan in 600 B.C. and at an equally early period in India, Arabia, Persia and Syria. It was a sport of Ancient Egypt and other parts of northern Africa and was mentioned by Aristotle. It was introduced into England from the Continent about 860 A.D. and was that country's leading sport up to the middle of the 17th Century.

With the increasing use of firearms in hunting, Falconry declined but it is still followed throughout the world, chiefly in Asia. Of recent years a growing interest has been shown in Falconry in America. It is a true sport and the performance of the Falcon and the paraphernalia employed are of greater importance than the quarry pursued.

Falconry has a literature of its own with volumes devoted to its various phases. For a general review of its history and methods read the article in the Encyclopaedia Britannica.

References

1871. Musters, George Chaworth. At Home with the Patagonians. London, Murray.

1914. Hornaday, William T. Wild Life Conservation in Theory and Practice. With a chapter on Private Game Preserves by Frederic C. Walcott. Yale University Press.

1925. Macmillan, Donald B. Four Years in the White North. Boston: The Medici Society of America.

1933. Gross, A. O. History and Progress of Bird Photography in America. Fifty Years Progress of American Ornithology. American Ornithologists' Union.

SECTION I

BIRDS AS FOOD

(See opposite page)

Patagonia Tehuelches pursuing Rhea with bolas. Partly drawn by W. P. Osborn from a photograph of gauchos by Martin Munkacsi.

A Rhea's egg is also shown.

Cape York, Greenland Eskimo netting Dovekies. Drawn by W. P. Osborn from photographs by Donald B. Macmillan.

Dovekie is also shown.

Display of Dakota game birds by Market Hunters about 1875. A contemporary print.

Game in a New York City market. A print from Harpers Weekly, 1878.

The Quail Hunter. Drawn by W. P. Osborn,
and (below) his bag.

The Camera Hunter and (below) his "bag" of Flamingoes. By F. M. Chapman.

Peregrine Falcon or Duck Hawk Hooded for Hunting.

BIRDS AND MAN

MAN HAS ALWAYS BEEN ASSOCIATED TH BIRDS. HIS DEVELOPMENT, FROM VAGERY TO CIVILIZATION, HAS BEEN ACCOMPANIED BY AN INCREASING REALIZATION OF THEIR POWER TO ADD TO HIS WELL-BEING. AT FIRST KILLED FOR FOOD THEY ARE NOW PROTECTED AS FRIENDS. THIS ALCOVE PRESENTS AN OUTLINE OF THIS CHANGE IN THEIR RELATIONS.

SYNOPSIS

CTION I — BIRDS AS FOOD
THE NATIVE HUNTER
THE MARKET HUNTER
HUNTING FOR SPORT

CTION II — BIRDS AS CLOTHING AND IN ADORNMENT
BIRDS AS OMENS AND SYMBOLS; IN MYTHOLOGY AND TRADITION

CTION III — BIRDS AS EMBLEMS AND INSIGNIA
BIRDS AS HIEROGLYPHS

SECTION IV — BIRDS IN BOOKS
LITERATURE
HISTORY
SCIENCE

SECTION V — BIRDS IN ART

SECTION VI — ECONOMIC ORNITHOLOGY I
THE FOOD OF BIRDS

SECTION VII — ECONOMIC ORNITHOLOGY II
DOMESTICATION

SECTION VIII — ECONOMIC ORNITHOLOGY III
INTRODUCTION OF BIRDS
THE FEATHER TRADE
GUANO
BIRDS AS PETS

SECTION IX — THE SENTIMENT OF BIRDS
BIRD SONG
BIRDS AS FRIENDS
BIRD SANCTUARIES

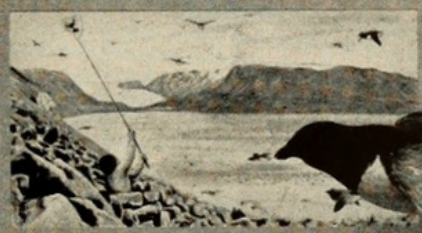
BIRDS AS FOOD

THE NATIVE HUNTER

ON MAINLANDS BIRDS HAVE ALWAYS MET THE DEMANDS OF NATIVE MAN FOR FOOD. EVEN WHEN HE HAS BEEN DEPENDENT ON THEM FOR HIS EXISTENCE THEY HAVE CONTINUED TO FILL HIS NEEDS.

FOR EXAMPLE, THE ESKIMO COULD NOT LIVE IN THE MORE NORTHERN PARTS OF GREENLAND WITHOUT THE AID OF THE DOVEKIE FOR FOOD. AND THE TEHUELCHÉ INDIANS COULD NOT HAVE OCCUPIED PATAGONIA WITHOUT FEEDING ON THE FLESH AND EGGS OF THE RHEA.

NOTE THAT IN EACH REGION AGRICULTURE IS IMPOSSIBLE OR UNPRACTICED.



THE MARKET HUNTER

WITH INCREASE IN POPULATION AND CIVILIZATION THE DEMANDS OF MEN FOR BIRDS AS FOOD BECAME LARGER, THE PROFESSIONAL HUNTER AROSE, IMPROVED TRANSPORTATION CREATED NEW MARKETS AND THE DEMAND WAS UNLIMITED. THE RESULT WAS GREAT DECREASE OR EXTINCTION OF THE BIRDS CONCERNED.

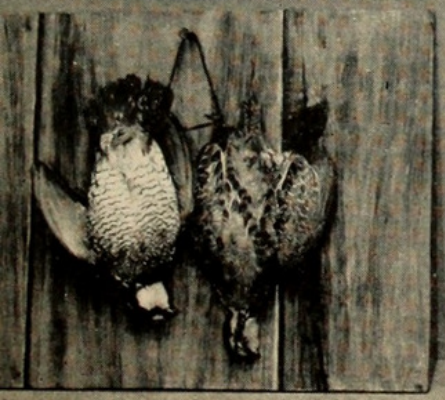
IN 1864, ONE SHIPMENT OF PRAIRIE HENS WEIGHED 20 TONS.
IN 1881, 14,850,000 WILD PASSENGER PIGEONS WERE SHIPPED FROM THE PETOSKEY, MICH., 'NESTING'.
IN 1909, 3,719,214 GAME BIRDS WERE SOLD IN THE MARKETS OF NEW ORLEANS.

THEREFORE, TO PRESERVE BIRDS FROM EXTERMINATION THEIR SALE AS FOOD HAS BEEN PROHIBITED BY LAW.

HUNTING FOR SPORT

IN THIS COUNTRY MARKET-HUNTING HAS BEEN ELIMINATED, BUT HUNTING FOR SPORT REMAINS. THE MANIFOLD CHARMS OF BIRDS MAY MAKE INCREASING CLAIMS ON THE SPORTSMAN'S AFFECTIONS, BUT LOVE OF HUNTING IS TOO DEEP-ROOTED TO YIELD COMPLETELY TO THE MORE RECENTLY DEVELOPED SENSE OF KINSHIP AND SYMPATHY WITH THEM.

IN SOME INSTANCES THE CAMERA MAY REPLACE THE GUN, BUT, AS A CLASS, THE SPORTSMA[illegible] TO THE INSTINCTS OF HIS ANCESTORS, PLUS THE AD[illegible] OF THE DOG AND MODERN EQUIPMENT, SOMETIMES EVEN [illegible] FALCONS. THERE ARE NOT LESS THAN TEN MILLIO[illegible]S IN THIS COUNTRY. IN SPITE OF BAG RESTRICTIONS [illegible]TSY KILL TWELVE MILLION WILD-FOWL ANNUALLY. IF [illegible] MAN CONTINUES TO GRATIFY HIS INHERENT [illegible]'S BIRDS FOR SPORT, HE MUST ENLARGE THEIR H[illegible] THEIR NUMBERS, AND IMPROVE THEIR PROTECTIO[illegible]



SECTION II

BIRDS AS CLOTHING AND IN ADORNMENT

Fur, rather than feathers, has clothed man. The innumerable instances in which the skins of mammals tanned, as in buckskin, or natural, as in a guanaco pelt, are pertinent illustrations. But the down-lined skins of diving-birds, like the Murre and Dovekie, make warm soft garments and are widely employed by the natives of northern latitudes. Note the Eskimo's hooded shirt of Murre's skins in our exhibit.

Woven feather-garments may also be used but in by far the greater number of cases feathers are worn for meaningless display or as insignia rather than as clothing. I except here the wearing by civilized man, or rather woman, of ostrich boas, swans-down cloaks and similar semi-display apparel as more properly to be considered under the Feather Trade rather than with the use of feathers by indigenes. In considering the employment of feathers for adornment it is difficult to draw the line between casual, meaningless display and actual significance. The necklace of South American parrots' feathers shown was probably only an expression of its wearer's sense of beauty; but it may have indicated rank or profession.

Doubtless feathers only gradually acquired a significance that restricted their use to the man. It was not until symbolism gave way to fashion that feathers were widely worn by woman. Here again we leave primeval, for modern conditions, to be treated as an outcome of the Feather Trade, not as a custom of the indigenes.

BIRDS AS OMENS AND SYMBOLS: IN MYTHOLOGY AND IN TRADITION

The remainder of this, and all the next section, belong primarily in the province of ethnology. Nevertheless birds supply so many of the facts on which the superstitions, beliefs and actions of man are founded that the ornithologist may at least be permitted to name the characteristics that, in his opinion, have exerted the widest and most pronounced influence. Possibly first among them, is the voice of birds, particularly of birds possessing loud, striking notes. The *hoot* of an Owl may reach a hundred or more pairs of ears while the bird remains unseen. So deep and lasting has been the significance attached to Owls' notes, and other ominous bird-calls, that belief in their effectiveness enters into our current superstitions. Doubtless the chief reason for

Owls' invisibility is their nocturnal habits. Their weird cries gain in impressiveness from the mystery of the night.

Following the calls of birds in their power over the untrained mind, we place flight with its marvelous mobility; migration, and its accompanying inexplicable appearances and disappearances; plumage and its varied uses; human-like habits that reflect the customs of men; all have played their parts in the life of primitive man. The depth of his belief in the significance of the traits of birds may be measured by the degree of his ignorance. With the mental development that accompanied increasing knowledge, ritual and augury followed superstition and they faded, in time, to the fable, legend and tradition of today.

Aristophanes was inspired by more than a "Comedy" when he wrote (Frere's translation):

"For every oracular temple and shrine,
The birds are a substitute equal and fair
For on us you depend and to us you repair
For counsel and aid when a marriage is made,
A purchase, a bargain, a venture in trade.
Unlucky or lucky, whatever has struck ye,
An ox or an ass that may happen to pass,
A voice in the street, or a slave you may meet,
A name or a word, by chance overheard,
If you deem it an omen, you call it a Bird,
And if birds are your omens, it clearly will follow
That birds are a proper prophetic Apollo."

The 2300 years, more or less, that have passed since the time of Aristophanes have not removed birds from our fables and folk-lore. We may not interpret literally the significance of an Owl's call at our door, but we wish that the bird had chosen some other person's door! The cry of the Cuckoo, or "Rain-Crow," may not actually arouse our faith in an approaching storm but, at least, it may increase the chances of a shower. And when we speak of the stork as the bearer of babies, or a "Little Bird" as our source of information, we are perpetuating pleasant custom. Countless similar instances of inherited tradition might be cited. Doubtless the reader will recall some of his own.

Section III

BIRDS AS EMBLEMS AND INSIGNIA

Entering Section III of our exhibit we find more definite relations between birds and man than those described in the latter part of the preceding section. Feathers have now acquired recognized meanings and specified uses.

SECTION II

BIRDS AS CLOTHING AND ADORNMENT

(See opposite page)

An Eskimo hooded cape of Murre's skins.

A South American necklace of Parrots' feathers.

BIRDS AS OMENS AND SYMBOLS

Barn Owl.

Jove.

European Cuckoo.

Minerva.

Pegasus.

European Kingfisher.

The Stork races the Doctor.

The Winged Sun.

Totem capped by Raven.

Totem capped by Raven.

Raven a bird of ill-omen.

BIRDS AS CLOTHING AND IN ADORNMENT

ORNAMENT OF GUINEA BIRDS

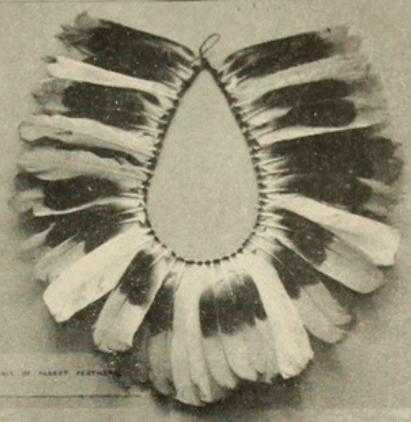
CLOTHING

FUR, RATHER THAN FEATHERS, HAS SERVED TO CLOTHE MAN. NEVERTHELESS, THE DENSELY FEATHERED, DOWN-LINED SKINS OF DIVING BIRDS FORM AN IMPORTANT PART OF ESKIMO CLOTHING.

IN WARMER PARTS OF THE WORLD THE USE OF FEATHERED GARMENTS IS CHIEFLY FOR ORNAMENTAL OR CEREMONIAL PURPOSES, AS IN THE FEATHERED CAPE OF HAWAII.

ADORNMENT

FEATHERS WERE DOUBTLESS FIRST EMPLOYED BY MAN SOLELY FOR CASUAL, MEANINGLESS ADORNMENT. FROM THE BEGINNING THEY GRADUALLY ACQUIRED A SIGNIFICANCE WHICH RESTRICTED THEIR USE TO THE MALE. IT WAS NOT UNTIL SYMBOLISM GAVE WAY TO FASHION THAT FEATHERS WERE WIDELY USED BY WOMEN. WITH THIS CHANGE CAME A FAR WIDER DEMAND FOR CERTAIN FEATHERS, SOMETIMES THREATENING THE EXISTENCE OF THE BIRDS THAT BORE THEM. PARADISE BIRDS MIGHT INDEFINITELY SUPPLY PLUMES FOR THE NATIVES OF NEW GUINEA BUT THEY COULD NOT MEET THE MARKET OF MILLINERS. IT WAS NOT UNTIL AIGRETTES BECAME FASHIONABLE THAT THE HERONS FROM WHICH THEY WERE TAKEN BECAME RARE.



SOUTH AMERICAN INDIAN HEADDRESS OF MACAW FEATHERS

BIRDS AS OMENS AND SYMBOLS; IN MYTHOLOGY AND TRADITION

TO THE BIRDS' POWER OF FLIGHT, THEIR MYSTERIOUS COMINGS AND GOINGS, THEIR VOICE, VARIED PLUMAGE, AND HUMAN-LIKE CHARACTERISTICS, WE MAY ATTRIBUTE THE INFLUENCE THEY HAVE EXERTED ON THE MIND AND CUSTOMS OF PRIMITIVE AND EVEN MODERN MAN. THIS IS SHOWN IN THE USE OF BIRDS AND FEATHERS AS SYMBOLS AND EMBLEMS IN COUNTLESS MYTHS AND LEGENDS, IN RITES, CEREMONIES AND AUGURIES, AND EVEN IN CURRENT SUPERSTITIONS, IN FABLE AND FOLK-LORE.

BARN OWL

JOVE

OMENS

UMAN-FACED, NOCTURNAL, WEIRD-VOICED MYSTERY, OWLS APPEALED STRONGLY TO INATION OF EARLY MAN. TO THIS DAY CONSIDERED BIRDS OF ILL OMEN. THE PLUMAGE AND RAUCOUS CROAK OF AVE CAUSED COUNTLESS SUPERSTITIONS. KOOS' LOUD NOTES ARE VARIOUSLY INTER- FABLE AND FOLK-LORE, AND WHERE THE KNOWN AS 'RAIN-CROWS' THEY SERVE THE THE LOCAL PROPHETS WHO BASE THEIR S, SOMETIMES WITH REASON, ON THE OF BIRDS.

EUROPEAN CUCKOO

MINERVA

MYTHOLOGY

IN MYTHOLOGY CERTAIN BIRDS WERE ASSOCIATED WITH THE GOD OR GODDESS WHOM IN CHARACTER OR APPEARANCE THEY WERE BELIEVED TO TYPIFY. THUS IT WAS THE POWER OF THE EAGLE THAT MADE IT THE BIRD OF JOVE; THE BEAUTY OF THE PEACOCK THAT CONNECTED IT WITH JUNO; THE ALLEGED WISDOM OF THE OWL THAT MADE IT THE BIRD OF MINERVA.

SYMBOLS

PEGASUS

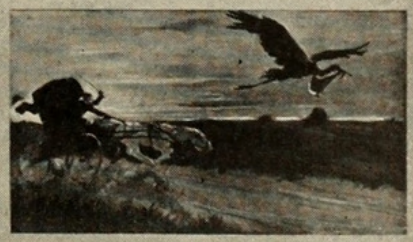
EGYPTIAN WINGED SUN

EUROPEAN KINGFISHER

WINGS, AS BIRDS' MOST DISTINCTIVE CHARACTER AND AS INDICATIVE OF THEIR MASTERY OF THE AIR, ARE WIDELY USED AS SYMBOLS. THEY ARE GIVEN TO MERCURY AND PEGASUS AS WELL AS TO ANGELS AND EVEN TO THE WIND, AND THE DAY MAY BE BORNE ON THE WINGS OF THE MORNING.

THE ALLEGED HEAD-HIDING OSTRICH IS SYMBOLIC OF SELF-DECEPTION; THE GOOSE OF STUPIDITY; THE GAME-COCK OF AGGRESSIVENESS; THE PEACOCK OF PRIDE; AND HALCYON, THE EUROPEAN KINGFISHER, IS SYMBOLIC OF CALM WEATHER.

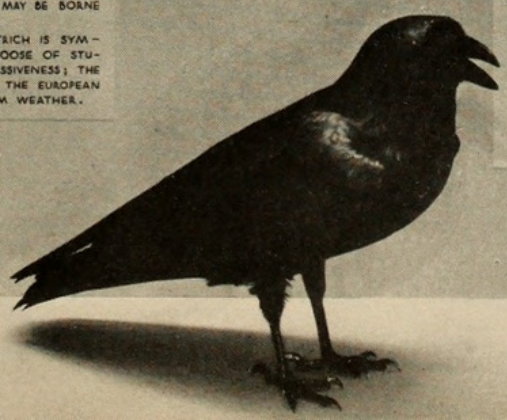
CURRENT FOLK-LORE; TRADITION



A SURVIVING TRADITION

THE DEPTH OF PRIMITIVE MAN'S BELIEF IN THE SIGNIFICANCE OF THE WAYS OF BIRDS IS MEASURED BY THE DEGREE OF HIS IGNORANCE. WITH INCREASING KNOWLEDGE RITUAL WAS FORGOTTEN, UNQUESTIONED OMENS FADED TO SUPERSTITIONS. THESE, IN TURN, BECAME FABLE AND LEGEND AND EVENTUALLY THE INHERITED HABIT OR TRADITION OF TODAY.

THUS WHEN A MAN GRAVELY TIPS HIS HAT TO A MAGPIE, HE FOLLOWS ANCESTRAL CUSTOM, WHEN WE SPEAK OF STORKS AS BEARERS OF BABIES, OR OF 'LITTLE BIRDS' AS BEARERS OF INFORMATION, WE ARE GOVERNED BY TRADITION.



The majestic appearance and predatory habits of Eagles have everywhere made them the emblems of war, and Eagles' plumes are no longer merely feathers, but are worn by the warrior as indicating his "calling" or as evidence of his achievements.

More specifically, feathers give wings to the arrow, messenger of war, and feathers also provide the pen of peace, though it may also be used to promote far from peaceful purposes.

As insignia of profession or rank, feathers are used throughout the world. The Black Cock's quill of the Swiss guide plays a minor rôle but is no less significant than the Peacock's plumes of the Far East potentate. It is singular that in Hawaii, where birds are small and few in species, the most elaborate native feather-work in the world should have been perfected. Only a limited number of the woven feather cloaks worn by Hawaiian nobility are now in existence. They are valued at $10,000 or more.

Incidentally, it is a tribute to the widespread influence of birds that man should have selected characteristic species to be figured on the stamps and coinage of his country. But when the philatelist refers the Dove and the Dovekie to the same bird family he obviously is in need of the services of an ornithologist!

As birds made deeper and more varied impressions on the mind of man they played a more important part in his life. The imitation of birds' calls may have become words in our spoken language, but it is certain that the birds themselves have helped to form a written language. Serving at first as pictographs or ideographs, they later became hieroglyphs and were consistently used as low reliefs on slabs or murals, on papyrus scroll, in codex as interpretable records of contemporary history.

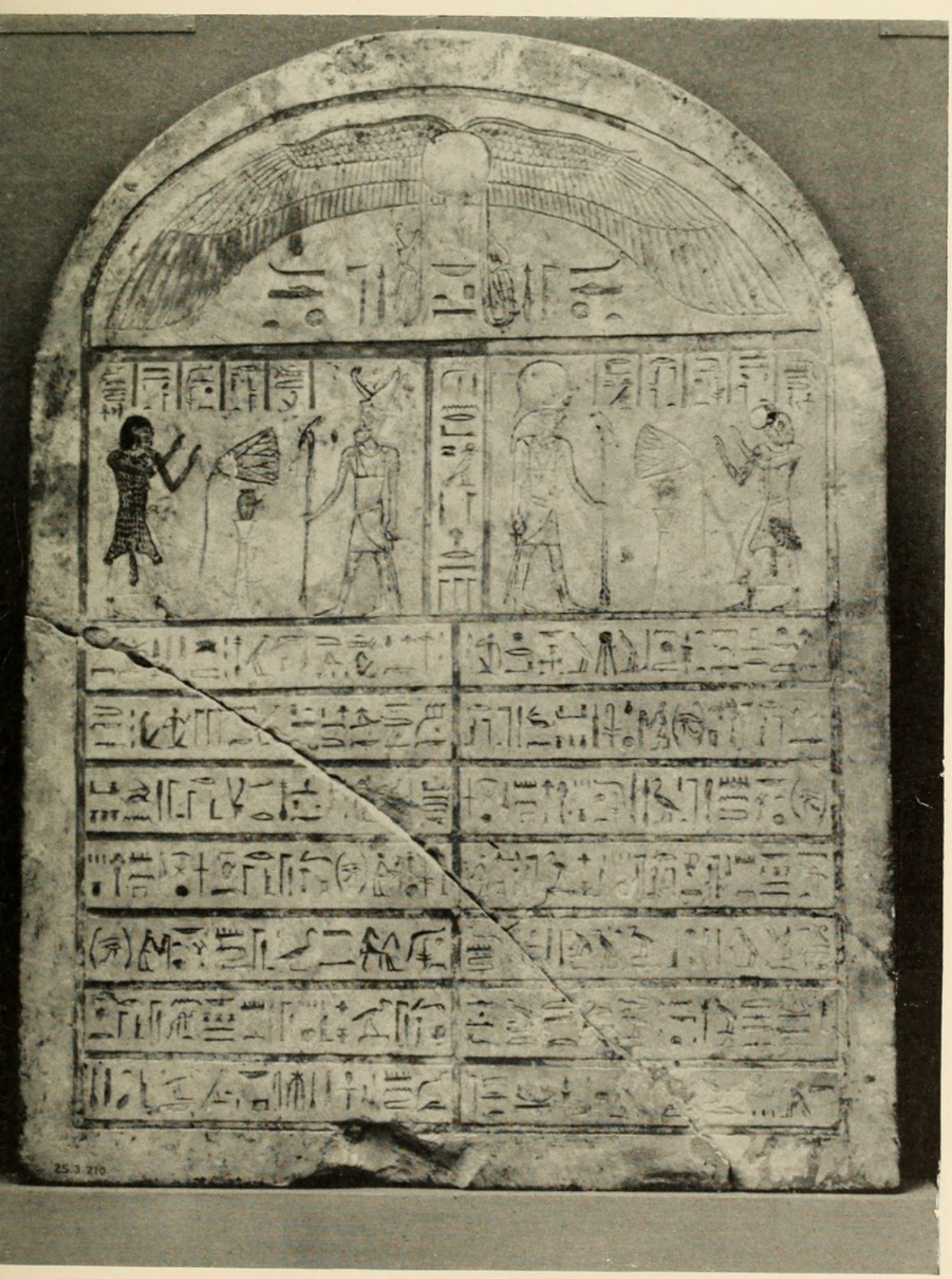
Moreau, who writes with the authority of an ornithologist on the ground, states that 12 named and 4 unnamed species of birds appear in Egyptian hieroglyphs; while Tozzer and Allen, speaking of the three Mayan codices still in existence, write: "These remains of a once extensive literature show evidence not only of considerable intellectual attainments on the part of their authors but also a high degree of artistic skill in the drawings and hieroglyphics" (p. 283). Here is a subject that might be pursued through the beginnings of all languages.

References

1910. Tozzer, A. M., and Allen, G. M. Animal Figures in the Maya Codices. Peabody Mus. Amer. Arch. and Ethn. IV, 3, pp. 283-372.

1923. Ingersoll, Ernest. Birds in Legend Fable and Folklore. Longman, Green & Co.

1930. Moreau, R. E. The Birds of Ancient Egypt. (Meinertzhagen, Richard E., "Nicoll's Birds of Egypt," Chapter III, pp. 58-77).



III. EGYPTIAN FUNERARY STELA. Funerary Stela of Nesi-Khonsu showing bird hieroglyphs painted on limestone. Loaned by Metropolitan Museum of Art from its collections excavated at Deir El Bahri, Thebes, XXVI Dynasty (663-525 B.C.).

SECTION III

BIRDS AS EMBLEMS AND INSIGNIA

(See opposite page)

Indian War Bonnet of Eagle feathers.

The Dove of peace.

Feathered Arrow.
Quill Pen.

Kiowa Eagle dance.

Hawaiian Chieftain's feather cloak and the bird that supplies the feathers.

Alaskan ceremonial mask.

A Medicine Man's plume.

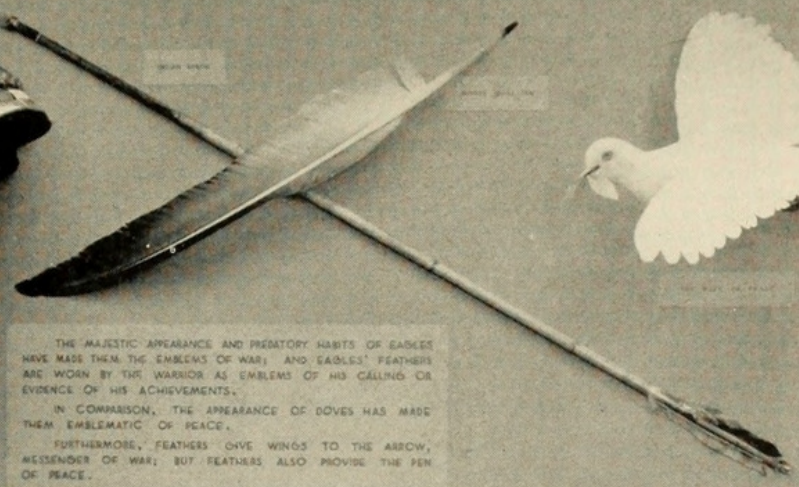
Mayan bird hieroglyphs.

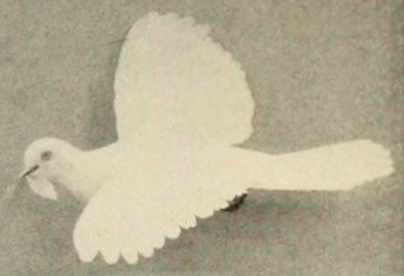
Native birds as Emblems on stamps and coins.

Egyptian bird and other glyphs. Egyptian funerary stela of Nesi-Khonsu showing bird hieroglyphs painted on limestone. Loaned by Metropolitan Museum of Art from its collections excavated at Deir El Bahri, Thebes, XXVI Dynasty (663-525 B.C.)

BIRDS AS EMBLEMS AND INSIGNIA

EMBLEMS OF WAR AND PEACE





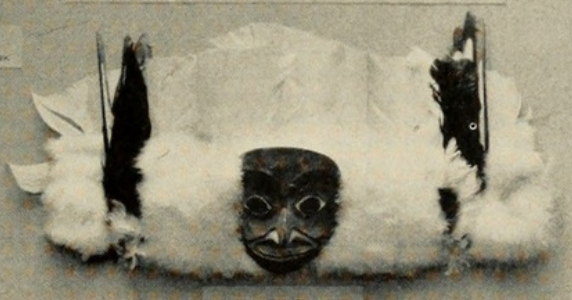
THE MAJESTIC APPEARANCE AND PREDATORY HABITS OF EAGLES HAVE MADE THEM THE EMBLEMS OF WAR; AND EAGLES' FEATHERS ARE WORN BY THE WARRIOR AS EMBLEMS OF HIS CALLING OR EVIDENCE OF HIS ACHIEVEMENTS.

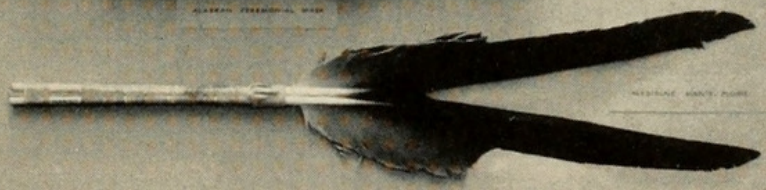
IN COMPARISON, THE APPEARANCE OF DOVES HAS MADE THEM EMBLEMATIC OF PEACE.

FURTHERMORE, FEATHERS GIVE WINGS TO THE ARROW, MESSENGER OF WAR; BUT FEATHERS ALSO PROVIDE THE PEN OF PEACE.

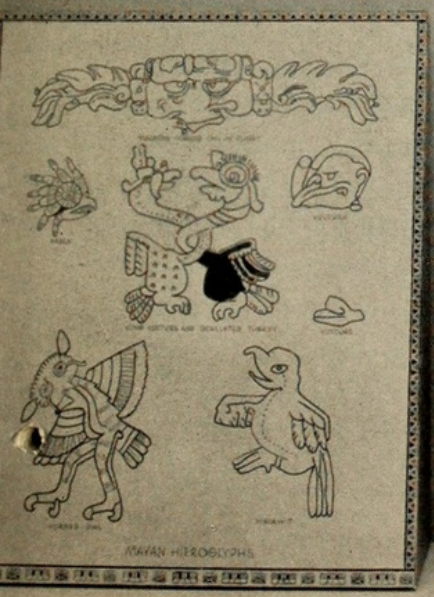
EMBLEMS OF RANK AND OFFICE

FROM MONARCH TO MEDICINE MAN AND WARRIOR, FEATHERS HAVE SERVED AS EMBLEMS OF RANK AND OFFICE, OR AS BADGES OF PERSONAL ACHIEVEMENT. IN THE AHUULA OR CLOAKS, AND CAPES AND HELMETS OF HAWAIIAN CHIEFS FEATHER WORK REACHES ITS HIGHEST DEVELOPMENT. THE UPPER TAIL-COVERTS OF THE PEACOCK, MOST MAGNIFICENT OF ALL FEATHERS, HAVE HAD MANY DIVERSE OFFICIAL USES. THE FEATHER INSIGNIA OF THE MEDICINE MAN MAY REFLECT THE TOTEMISM OF HIS TRIBE.

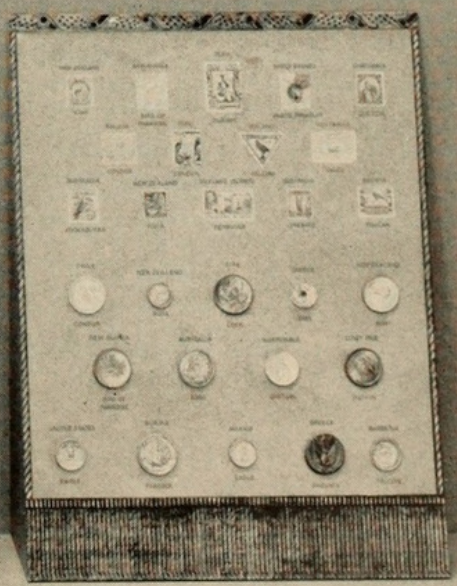




BIRDS AS HIEROGLYPHS



BIRDS ON STAMPS AND COINS



SECTION IV

BIRDS IN BOOKS

Literature. – In considering Birds in Books we accord first place chronologically and historically to the birds of the bible. There is a surprising amount of bird-lore in the bible, chiefly in the Old Testament. About 25 of the larger species are mentioned by name. Smaller ones are referred to under group terms.

Primarily there is a division (Leviticus) into "clean" (= edible) and "unclean" (= inedible) groups in which existing standards are more or less closely followed. The Mosaic law of bird protection, however, contains provisions which to us seem inconsistent. It reads:

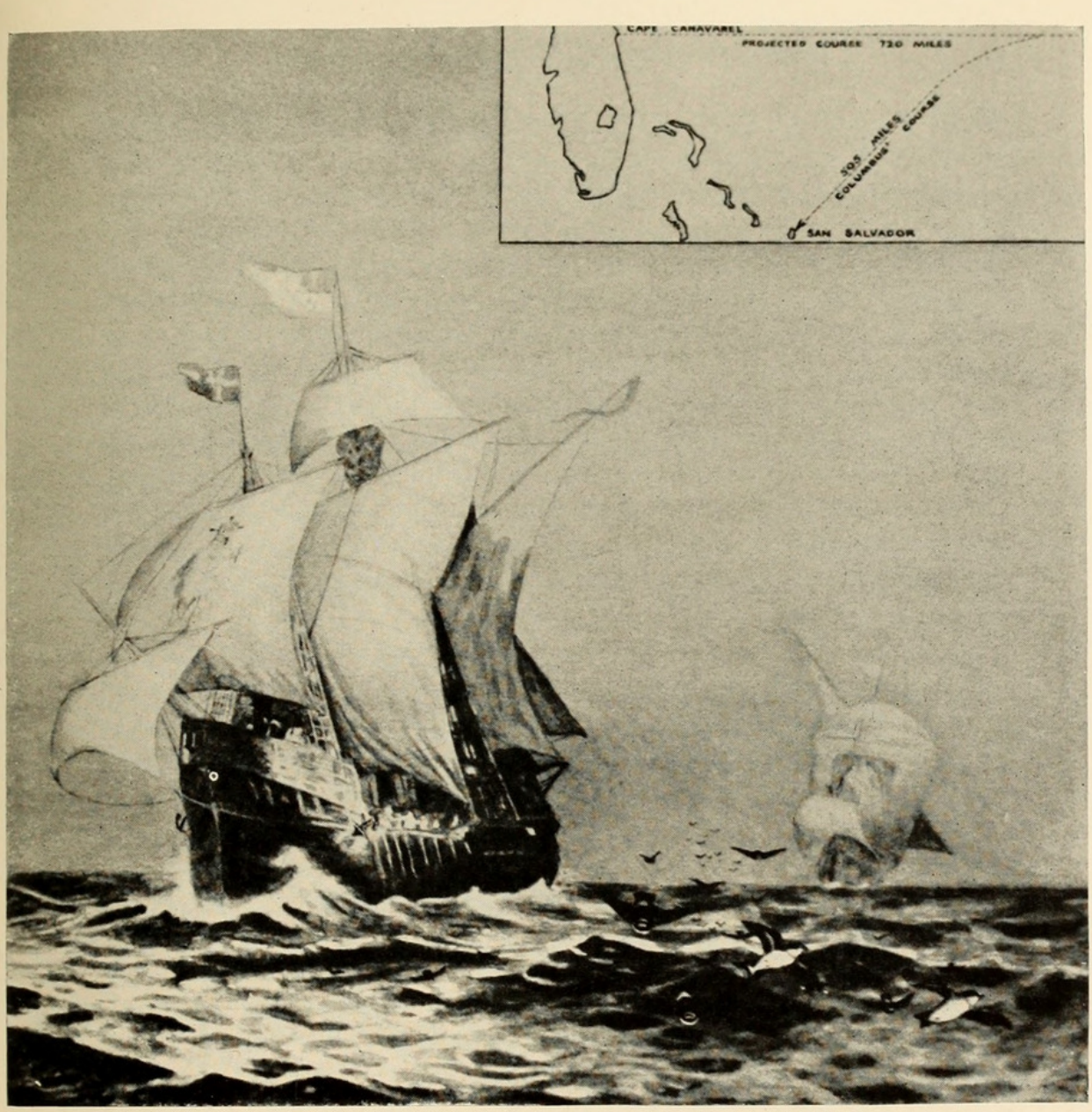
"If a bird's nest chance to be before thee in the way in any tree, or on the ground, whether they be young ones, or eggs, and the dam sitting upon the young, or upon the eggs, thou shalt not take the dam with the young:

"But thou shalt in any wise let the dam go, and take the young to thee; that it may be well with thee, and that thou mayest prolong thy days." (Deut. XXII, 6 and 7).

Nesting, migration and song are alluded to usually metaphorically or poetically. Thus Jeremiah (VIII; 7) wrote: "Yea, the stork in the heaven knoweth her appointed times; and the turtle [dove] and the crane and the swallow observe the time of their coming," and Solomon (Song, II, 12) writing, "the time of the singing of birds is come," is a poet and herald of spring.

Thus from the beginnings of literature the sensitive mind of the poet has responded to the influence of birds. It was apparently a popular interest in birds that induced Aristophanes (B.C. 448-385) to use them as the subjects of his comedy, "Birds"; and later, poets "Singing hymns unbidden 'Til the world was wrought to sympathy with hopes and fears it headed not" have most eloquently expressed the emotions birds arouse within us. We have only to recall the works of Chaucer, Shakespeare, Shelley, Wordsworth, Coleridge, Burns and Keats in England, and in America, Bryant, Emerson, Longfellow, Lowell and Whitman to realize how birds have inspired the poets.

Writing some 300 years ago, how well Izaak Walton expressed man's varied debts to birds and, with the prescience of the poet, predicted their future relations. "The very birds of the air," he said, "those that be not hawks, are both so many and so useful and pleasant to mankind that I must not let them pass without some observations. They both feed and refresh him – feed him with their choice bodies and refresh him with their heavenly voices"· a point of view more appreciative than consistent.



IV. BIRDS PLAYING A PART IN HISTORY. October 7, 1492, Columbus changed his course to follow land birds, thus shortening his route by 200 miles.

The prose of bird literature is devoted largely to descriptions of bird-life and to experiences with birds in nature. Much of it is to be classed with the science or biography of ornithology. But in America we have as contributors to the prose literature of birds Thoreau, Torrey, Burroughs and many others. Certainly none among them has responded more deeply to the bird in its haunts than Burroughs writing in Wake Robin: "Mounting toward the upland again, I pause reverently as the hush and stillness of twilight come upon the woods. It is the sweetest, ripest hour of day, and as the Hermit's evening hymn goes up from the deep solitude below me, I experience that serene exaltation of

sentiment of which music, literature, and religion are but the faint types and symbols".

History. — It is interesting that the birds of history should so often be recorded as saving man from disaster — starvation, conquest, and the perils of the sea. It was migratory Quail that came to the rescue of the Children of Israel, cackling Geese that saved Rome; southbound migrants that guided Columbus when his discouraged crew was on the verge of mutiny. The event doubtless influenced the history of our continent and is of sufficient interest and importance to be briefly recorded here. On October 7, 1492, Columbus was 720 miles northeast of the Bahamas, when numerous small land-birds, flying southwest, crossed his route. They were the most promising evidences of land that he had encountered, and he altered his course to follow them, thereby shortening his voyage 200 miles and landing in San Salvador, Bahamas, instead of Florida.

Science. — Birds are such many-sided exponents of their environment; they are so abundant and so easily observed that they have induced man not alone to establish a literature and a history of ornithology but to create also a science of birds for the reception of what he learns concerning their structure, relationships, and habits.

Aristotle (B.C. 385-322) is the first ornithologist of record. But birds occupied too important a place in the art and life of the Egyptians not to have also figured in their literature. Indeed, we need go no further back than Aristophanes to find apparent common knowledge of at least our everyday birds. Whether or not Aristotle had predecessors, for the following nearly 2000 years he had no comparable successors. So far was he in advance of his time that, as Warde Fowler remarks, naturalists were content to follow him alike when he was right and when he was wrong. The bibliographer is referred to Alfred Newton's scholarly review of the history of bird literature (Dictionary of Birds, 1896). I mention, therefore, the names of only such outstanding contributors to ornithology during this period as Willoughby and Ray (1676), Edwards (1743), Buffon (1749), Linnaeus (1758) and Brisson (1760).

Provided now with a classification and nomenclature, we may leave the avifauna of the Old World to pass to that of the New.

At about this time Mark Catesby (1731-1743) was producing in London his two great folios on the *Natural History of Carolina*, a work which, after 200 years, is still a notable publication. It was followed by Pennant's *Arctic Zoology* (1784-1787), but the earliest attempt to treat of all the birds of the North America of that day was that of Alexander Wilson (1808-1814), the Scotch poet and weaver, since well-called the Father of American Ornithology.

Wilson's pioneer work laid the foundation for Audubon's incomparable *Birds of America* (1827-1839). Combining in one man the artist, explorer, field student, writer and publisher, Audubon's achievements will always command the world's unstinted admiration. His influence on the growth of bird study was profound. Works on American birds by Baird, Cassin, Coues, Ridgway and others now brought the possibilities of bird study within the reach of everyone. All parts of our country had their bird students and in 1883 they founded the American Ornithologists' Union, which, since its organization, has published *The Auk,* an authoritative quarterly (address, American Museum of Natural History).

From the A.O.U. grew the first Audubon Society (1886) and the Bureau of Economic Mammalogy and Ornithology (now included in the Fish and Wildlife Service). And in these two educational and research institutions we have the roots of the popular and technical phases of the bird study and conservation. The visitor is referred to other parts of this hall for exhibits illustrating the ornithology of today.

At the bottom of this section copies of three different standard works on ornithology are shown: Roberts' *Birds of Minnesota,* Coues' *Key to North American Birds,* and Murphy's *Oceanic Birds of South America.*

SOME BOOKS ON EASTERN NORTH AMERICAN BIRDS

With any of these works the student has made a beginning. But let him visit the Museum's library (5th floor) before making a choice.

*1808-1814. Wilson, A. American Ornithology. Many Editions.
*1831-1839. Audubon, J. J. The Birds of America. Plates, 4 vols. text.
1872. Coues, E. Key to N. A. Birds. Later editions; Last, 1903.
1886. Am. Orn. Union Check List of N. A. Birds. Rev. Editions, 1910, 1931.
1874-1895. Bendire, C. E. Life Histories N. A. Birds. 2 vols.
*1895-1932. Chapman, F. M. Handbook of Birds of Eastern North America.
1901-1942. Ridgway, R., Friedmann, H. Birds of North and Middle America. 9 parts.
*1910. Eaton, E. H. Birds of New York. 2 vols.
1918-1942. Cory, C. B., Hellmayr, C. E., Conover, B., Catalogue of Birds of the Americas. 11 parts.
1919-19—. Bent, A. C. Life Histories N. A. Birds. 14 parts.
*1925-1929. Forbush, E. H. Birds of Mass. and other N. E. States. 3 vols.
*1932. Howell, A. H. Birds of Florida.
*1932. Roberts, T. S. Birds of Minnesota. 2 vols.
*1934. Taverner, P. A. Birds of Canada.
*1937. Stone, W. Bird Studies at Old Cape May. 2 vols.
*1939. Peterson, R. T. A Field Guide to the Birds.
*1940. Todd, W. E. C. Birds of Western Pennsylvania.
1942. Cruickshank, A. L. Birds Around New York City.
*1942. Pearson, T. G., Brimley, C. S. and H. H. Birds of North Carolina.

---

* Colored illustrations.

Skylark. Bobolink.

Section IV

BIRDS IN BOOKS

(See opposite page)

Nightingale. Hermit Thrush.

Columbus' vessel the "Santa Maria."

Aristotle. Linnaeus.

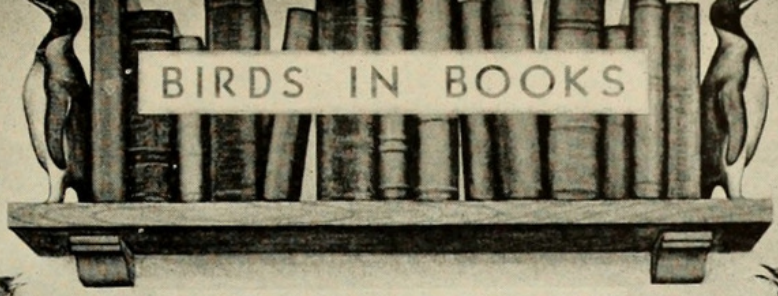
Alexander Wilson. John James Audubon

Annual Meeting of the American Ornithologists' Union, Washington, D. C. Nov. 1892.

Roberts' "The Birds of Minnesota."

Murphy's "Oceanic Birds of South America."

Coues' "Key to North American Birds."



MAN'S MANY AND VARIED CONTACTS WITH BIRDS ARE REFLECTED IN WHAT HE HAS WRITTEN ABOUT THEM. A REPRESENTATIVE LIBRARY OF ORNITHOLOGY CONTAINS THOUSANDS OF VOLUMES. THEY MAY BE CLASSIFIED UNDER LITERATURE, HISTORY, AND SCIENCE.

LITERATURE

FIRST ON OUR LIST OF BOOKS REFERRING TO BIRDS IS THE BIBLE. BIBLICAL REFERENCES TO BIRDS ARE FOUND CHIEFLY IN THE OLD TESTAMENT. ABOUT 25 LARGER SPECIES ARE MENTIONED BY NAME, SMALLER ONES BY GROUP TERMS. THE DOMESTIC FOWL IS REFERRED TO IN THE NEW, BUT NOT IN THE OLD TESTAMENT. ASIDE FROM A DIVISION INTO 'CLEAN' (EDIBLE) AND 'UNCLEAN' (INEDIBLE) GROUPS, WHICH CLOSELY FOLLOWS EXISTING STANDARDS, AND THE MOSAIC LAW OF PARTIAL BIRD PROTECTION, BIRDS ARE USUALLY REFERRED TO IN THE BIBLE METAPHORICALLY OR POETICALLY. SOLOMON (SONGS, II) WRITING "THE TIME OF THE SINGING OF THE BIRDS IS COME" IS A POET AND HERALD OF SPRING RATHER THAN A RECORDER OF MIGRATION. THUS FROM THE BEGINNINGS OF LITERATURE THE SENSITIVE MIND OF THE POET HAS RESPONDED TO THE INFLUENCE OF BIRDS.

IT WAS APPARENTLY A POPULAR INTEREST IN BIRDS THAT INDUCED ARISTOPHANES (448-385 B.C.) TO USE THEM AS THE SUBJECTS OF A COMEDY, AND ENGLISH POETS OF A LATER PERIOD SEEM TO HAVE BEEN EVEN MORE DEEPLY MOVED BY THE CHARM AN SIGNIFICANCE OF BIRD-LIFE. RECALL THE WORKS O CHAUCER, SHAKESPEARE, COLERIDGE, WORDSWORTH KEATS, SHELLEY, AND BURNS.

THE PROSE OF BIRD LITERATURE RELATES CHIEFL TO BIRDS' HABITS AND IS USUALLY CLASSED WIT BIRD BIOGRAPHIES OR ORNITHOLOGY. BUT TO ME LIKE BURROUGHS, HUDSON AND MANY OTHERS, TH BIRD IS AN INSPIRATION RATHER THAN A SPECIME AND WHAT THEY WRITE IS LITERATURE RATHER THA SCIENCE.

HISTORY

HISTORY CONTAINS RECORDS OF INCIDENTS AND EVENTS WHICH BIRDS HAVE PLAYED A PART IN SHAPING THE OURSE OF HUMAN AFFAIRS. THUS IN 338 B.C. THE SACRED EESE THAT GAVE THE ALARM WHICH SAVED ROME MAY ACCORDED A PLACE IN HISTORY; WHILE THE MIGRANT RDS THAT DIRECTED THE COURSE OF COLUMBUS MAY AVE INFLUENCED THE DEVELOPMENT OF A CONTI-ENT.

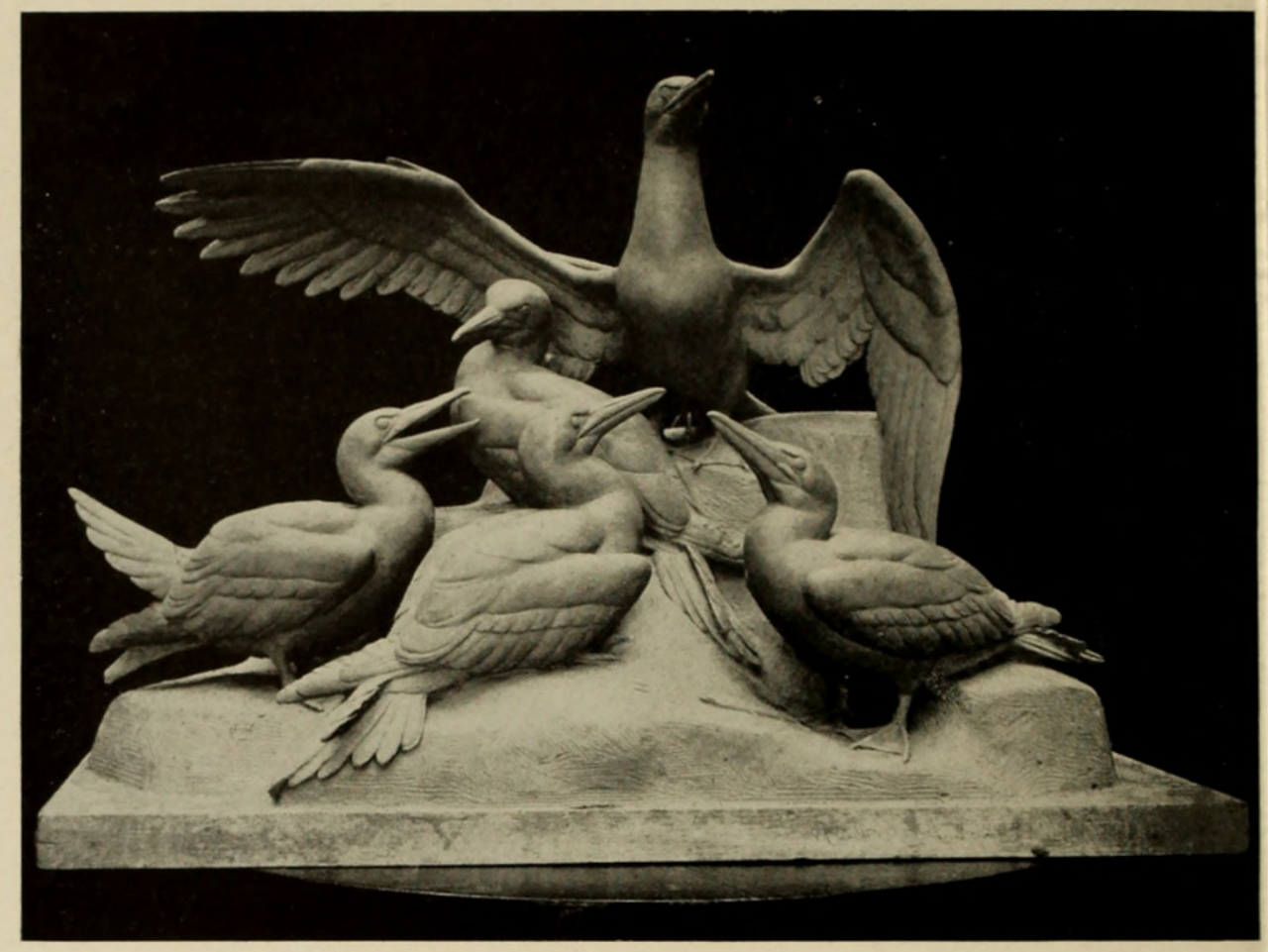
ON OCTOBER 7, 1492, COLUMBUS WAS 720 M EAST OF FLORIDA AND 505 MILES NORTHEAST OF BAHAMAS. HIS DISCOURAGED MEN WERE ON THE V OF MUTINY WHEN NUMEROUS SMALL LAND-BIRDS, ING SOUTHWEST, CROSSED HIS ROUTE. HE ALTERED COURSE TO FOLLOW THEM, THEREBY SHORTENING VOYAGE 200 MILES AND LANDED AT SAN SALVAD BAHAMAS, INSTEAD OF FLORIDA.

SCIENCE

ARISTOTLE (385-322 B.C.) IS THE FIRST ORNITHOLOGIST RECORD. DOUBTLESS HE HAD PREDECESSORS, BUT FOR THE FOLLOWING NEARLY 2000 YEARS HE HAD NO COMPARABLE SUCCESSORS. THE OUTSTANDING ORNITHOLOGICAL LANDMARKS DURING THIS PERIOD WERE THE WORKS OF WILLUGHBY AND RAY (1676), EDWARDS (1743), BUFFON (1749), LINNAEUS (1758), BRISSON (1760).

IN AMERICA, CATESBY'S 'NATURAL HISTORY OF SOUTH CAROLINA' (1731-1743) WAS THE FIRST MAJOR WORK ON BIRDS. IT WAS FOLLOWED BY PENNANT'S 'ARCTIC ZOOLOGY' (1784-1787) BUT THE EARLIEST ATTEMPT AT A COMPLETE NORTH AMERICAN ORNITHOLOGY WAS THAT OF ALEXANDER WILSON (1808-1814), SINCE CALLED "FATHER OF AMERICAN ORNITHOLOGY." WILSON'S WORK LAID THE FOUNDATION FOR AUDUBON'S INCOMPARABLE 'BIRDS OF AMERICA' (1827-1839) WHICH EXERTED AN IMMEASURABLE INFLUENCE ON THE STUDY OF BIRD BIRD STUDENTS AND WORKS ON AMERICAN BIRDS BAIRD, CASSIN, COUES, RIDGWAY AND OTHE HAVE STEADILY INCREASED IN NUMBERS, LEADIN IN 1884, TO THE FOUNDING OF THE AMERICAN ORNIT OLOGISTS' UNION. THIS ORGANIZATION GAVE BIR TO THE AUDUBON SOCIETY AND STILL WIDELY PROMOT THE STUDY AND CONSERVATION OF BIRDS.

ANNUAL CONGRESS OF THE AMERICAN ORNITHOLOGISTS' UNION
WASHINGTON, D.C., NOV. 1892



V. GANNETS. Modeled by Thomas Famiglietti.

SECTION V

BIRDS IN ART

In addition to their manifold claims on the artist, the designer and decorator, birds doubtless receive more attention from the illustrator than any other forms of wild life. Such illustrations may rank high as art, nevertheless they are made primarily to accompany text in either book or portfolio. The author, therefore, both popular or scientific, is an effective promoter of bird art.

It is the crude outlines of birds in the caves of France and Spain that are our oldest records of man's contact with birds. They were made, it is said, about 15,000 years ago.

Compare them with our next exhibit, the geese of Medum, Egypt. Here, as far as art is concerned, we have the difference between savagery and civilization. In time, if our chronology is approximately correct, the cave drawings are 12,000 years the older.

Whether the creator of the goose mural was an Audubon or a Fuertes of his time, or whether he merely represented the average bird painter, is unknown. But certain it is that his work is comparable with that of the best bird muralists of our own day.

Our specimens of the work of America's two greatest bird artists show them as illustrators; Audubon, by a slightly reduced reproduction of the Carolina Paroquet plate in his *Birds of North America;* Fuertes, by the original water-color of European Starlings, made by him to serve as the frontispiece of the latest (1903) edition of Coues' *Key*. It is shown as printed in a copy of this work at the bottom of the preceding section. The discriminating critic will, we believe, find the character of each artist reflected in his work.

The paintings of the great Swedish bird artist, Liljefors, were pure art untrammelled by the needs or restrictions of science. Our example is from *Ute I Markerna*. Frank W. Benson has presented us with an etching in a field he has made his own, and we conclude this brief exhibit with a drawing characteristic of the Japanese school.

Lovers of bird art will find exhibits of the work of Louis Fuertes and of Joseph Wolf in the gallery of bird paintings on the 4th floor, Whitney Wing.

Sculptors have not drawn widely on birds as subjects and we are therefore privileged to demonstrate the possibilities in this field by the "Gannets" of Thomas Famiglietti, formerly of the Museum staff.

References

1933. Sutton, G. M. Fifty Years of Progress in American Bird-Art. (Fifty Years Progress in American Ornithology, Amer. Orn. Union.)

1942. Peterson, Roger T. Bird Painting in America. Audubon Magazine, Vol. XLIV, No. 3, May-June, pp. 166-176.

Section VI

ECONOMIC ORNITHOLOGY I

THE FOOD OF BIRDS

Economic Ornithology treats of the ways in which birds affect the food-supply, health and financial resources of man. These ways are so numerous, so varied, and so contradictory that the status of any bird can be determined only by a study of its habits throughout its range and at all seasons.

Man, the agriculturist, exhibits so great an influence on his environment that wherever he exercises his potentialities he creates a world of his own. His relations to birds, therefore, should always be viewed in the light of conditions for which he himself is largely responsible.

SECTION V

BIRDS IN ART

(See opposite page)

Drawings of Caveman.

Drawings of Caveman.

These outlines are from Salomon Reinach's "Repertoire de l'Art Quarternaire" (1913).

The Geese of Medum, Egypt, 3000 B.C. White-fronted, Bean and Red-breasted Geese. The original is in the Museum at Cairo. A facsimile is in the Metropolitan Museum of Art, N. Y.

Carolina Paroquets.
Reduced from Audubon.

European Starlings.
Fuertes' frontispiece for Coues' "Key" (See Section IV).

Swans.
By Bruno Lijefors. From his "Ute I Markerna."

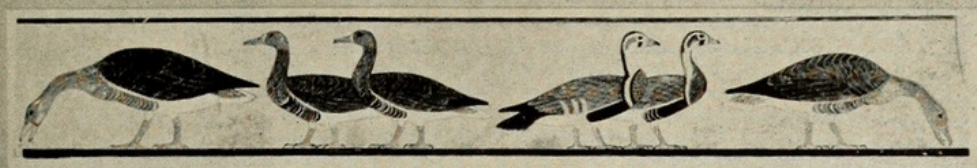
Mallards.
Etching by Frank W. Benson.
Presented by Artist.

Goshawk.

Japanese Print.

Gannets.
Thomas Famiglietti.

BIRDS IN ART



THE MEDUM MURAL.
EGYPT B.C. 3000
WHITE-FRONTED GEESE AND
RED-BREASTED GEESE.
ORIGINAL IN THE MUSEUM AT CAIRO.
A FACSIMILE IN THE METROPOLITAN MUSEUM.

THE FIRST KNOWN BIRD DRAWINGS ARE THE CRUDE OUTLINES MADE ABOUT 15,000 B.C. BY THE CAVEMEN OF SOUTHERN FRANCE AND NORTHERN SPAIN ON THE WALLS OF THEIR DWELLINGS. BY 3000 B.C. BIRD ART HAD REACHED A DEGREE OF PERFECTION SHOWN BY THE BEAUTIFUL MURAL OF THE MEDUM GEESE AND OTHER EARLY EGYPTIAN PAINTINGS. THIS STAGE OF DEVELOPMENT WAS NOT AGAIN APPROACHED UNTIL THE TIME OF AUDUBON, 4500 YEARS LATER.

BIRD ART HAS FOUND ITS WIDEST OPPORTUNITY FOR EXPRESSION IN ILLUSTRATING WORKS ON ORNITHOLOGY. SUCH ILLUSTRATIONS MAY VARY FROM A PEN-AND-INK OUTLINE TO PAINTINGS BY AN AUDUBON OR A FUERTES. IN ANY CASE, ACCURACY IS ESSENTIAL.

ASIDE FROM FROM FILLING THE NEEDS OF SCIENCE, BIRDS' BEAUTY, GRACE OF FORM AND MOTION MAKE THEIR OWN APPEAL TO THE PAINTER AND SCULPTOR.

IN COUNTLESS WAYS BIRDS ALSO SERVE THE DESIGNER AND DECORATOR WHOSE SKILLFUL EMPLOYMENT OF HERON AND CRANE MOTIF GIVE CHARM TO SCREEN OR MURAL.

CAROLINA PARQUET
EXPLORER TRAVEL AUDUBON'S FOLIO PLATE.

EUROPEAN STARLING
GRAVEL OF PURPLE FRINGE
IN COLOR "NEW" 1930 (SEE CASE 4)

BRONZE
BY SCULPTOR

WOODCUTS
MODELLED FOR THIS EXHIBIT
BY THOMAS FUNNELLETTI.

This means a study as wide as the birds' range and as endless as the constantly changing activities of man. His alteration of the character of the country, planting of new crops, introduction of foreign species, all produce new ecologic conditions calling for constant study of the native fauna.

This situation cannot be easily treated in a museum exhibition, so we have selected the Food of Birds as a subject in which we can illustrate the greatest service birds render man. From the ranks of the Insect-, Seed- and Rodent-eaters and the scavengers we have chosen small representative groups to show the nature of their food and method of securing it. The air-feeders include both nocturnal as well as diurnal birds; Swallows, Swifts, and Nighthawks among the latter, the Whip-poor-will and Chuck-wills-widow among the former. All are almost exclusively insectivorous.

The Redstart is a good connecting link between those birds that feed wholly on the wing and those that, like Flycatchers, make sallies from a perch to which they return.

Vireos, Warblers, Thrushes and Wrens are gleaners from tree-top to earth and are particularly valuable in our gardens, a favorite resort for insects. If some of them add fruit to their fare they probably have earned it.

The seed-eaters, Sparrows, Goldfinch, Cardinal and many other members of the great Finch family, perform a service of incalculable value in destroying seeds of weeds that follow in the wake of cultivation. In "Useful Birds" Forbush lists 41 kinds of noxious seeds eaten by birds.

When we say "Rodents" we usually mean rats and mice, meaning chiefly the foreign species, for the presence of which man is responsible. But neither Hawks nor Owls ask the nativity of their prey. They take what they find and if they are hunting in man's haunts they are apt to capture the species that are more or less parasitic on man. Farther afield they may get a larger proportion of native species; but all are destructive unless held in balance by nature's means.

There is a widespread prejudice against Hawks and Owls, but if we except the Great Horned Owl, Cooper's and the Sharp-shinned Hawk, we are safe in accepting the remaining commoner members of these families as friends rather than as foes.

The food of most water-frequenting birds is somewhat beyond our present limits but the Gulls, scavenging along our coasts, take the edible refuse from our shores and waters; while the Black Vulture and Turkey Buzzard are equally valuable on the land. The impossibility of presenting here anything like an adequate exhibit showing the economic relations of birds and man is obvious. It is hoped, how-

ever, that some conception of the extent and importance of the subject may be gained from the appended summary.

ECONOMIC RELATIONS OF BIRDS TO MAN

A. *Beneficial Relations.*

Feeding on injurious insects, seeds and rodents; scavenging.
Pollination of plants.

B. *Harmful Relations.*

Destructive to grains, crops, fruits.
Destroyers of beneficial insects and birds, fowls.
Devourers of fish, chiefly in hatcheries.
Distributors of disease-bearing parasites.

ECONOMIC RELATIONS OF MAN TO BIRDS

A. *Beneficial Relations.*

(a) Intentional

Protection by law and creation of a conserving sentiment: bird study in schools and colleges.
Enlarging and improving all-season habitats; increasing food supply.
Creation of refuges.
Preparing nesting-sites and boxes; maintaining feeding stations and baths.
Organized study of ecology.
Development of domestic breeds.

(b) Unintentional

Planting crops and raising fruit on which birds feed.
Leaving undergrowth that may serve for nesting sites, shelter and food.
Irrigation; parks; lawns.
Garbage dumps.
Destruction of predatory birds and mammals.

B. *Harmful Relations.*

(a) Intentional

Killing for flesh or feathers for self-use or sale, or for other reasons.
Killing for sport.
Killing in defense of crops, etc.
Trapping.
Egging.

Section VI

ECONOMIC ORNITHOLOGY I

(See opposite page)

Barn Swallow.

Chimney Swift.

Redstart.

White-breasted Nuthatch.

Red-eyed Vireo

Downy Woodpecker.

Yellow-billed Cuckoo.

Flicker.

Tree Sparrow.

Red-shouldered Hawk.

Goldfinch.

Screech Owl.

Cardinal.

Black Vulture.

Herring Gull.

ECONOMIC ORNITHOLOGY I

ECONOMIC ORNITHOLOGY TREATS OF THE WAYS IN WHICH BIRDS AFFECT MAN'S FOOD-SUPPLY, HEALTH AND FINANCIAL RESOURCES.

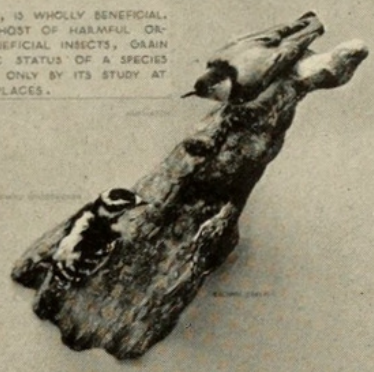
THE FOOD OF BIRDS

A BIRD'S MOST IMPORTANT ECONOMIC RELATION TO MAN IS DETERMINED BY THE NATURE OF ITS FOOD.

BIRDS THAT DEVOUR INJURIOUS INSECTS, RODENTS, AND THE SEEDS OF NOXIOUS WEEDS, ARE NATURE'S PROTECTORS OF OUR CROPS.

BIRDS THAT ACT AS SCAVENGERS, AND THOSE THAT DESTROY FLIES AND MOSQUITOES AND OTHER HOSTS OF DISEASE-CREATING ORGANISMS ARE DEFENDERS OF OUR HEALTH.

NOT EVERY BIRD, HOWEVER, IS WHOLLY BENEFICIAL. IT MAY ITSELF SERVE AS THE HOST OF HARMFUL ORGANISMS; IT MAY DESTROY BENEFICIAL INSECTS, GRAIN OR FRUIT. THE EXACT ECONOMIC STATUS OF A SPECIES CAN BE LEARNED, THEREFORE, ONLY BY ITS STUDY AT ALL SEASONS AND IN MANY PLACES.



THE INSECT EATERS

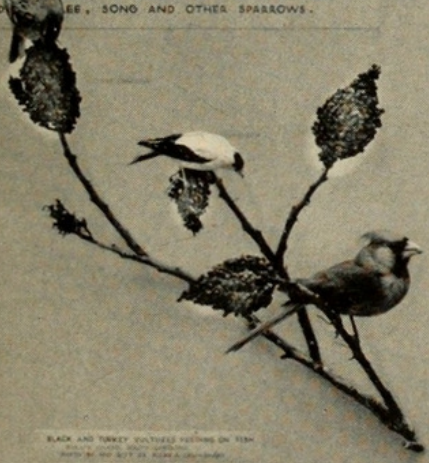
BIRDS' BILLS SEEM CLOSELY ADAPTED TO THEIR MANNER OF PROCURING FOOD. THOSE OF INSECT-EATERS SEEM ESPECIALLY FITTED TO CAPTURE INSECTS, THEIR EGGS, AND LARVÆ. WHETHER THEY INHABIT AIR, EARTH, OR WATER, TRUNK, BARK OR LEAF, INSECTS HAVE THEIR BIRD ENEMIES. EXAMPLES ARE (1) BARN SWALLOW AND (2) CHIMNEY SWIFT, (3) FLICKER, (4) DOWNY WOODPECKER, (5) BROWN CREEPER AND (6) NUTHATCH, (7) YELLOW-BILLED CUCKOO, (8) RED-EYED VIREO AND (9) REDSTART.

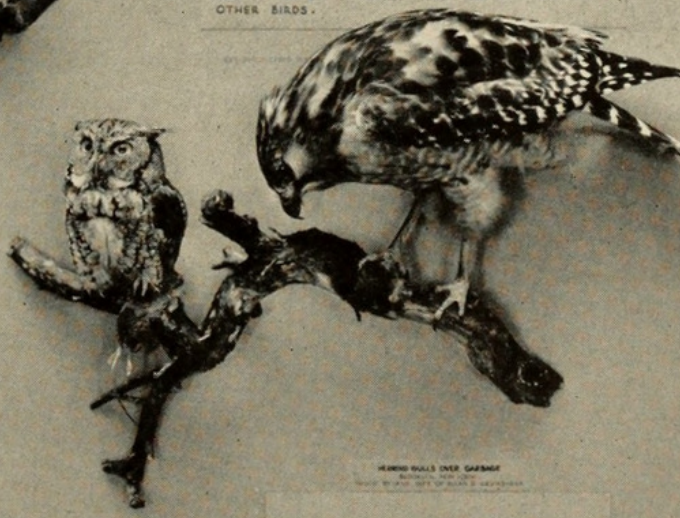
THE SEED EATERS

THE BILLS OF SPARROWS AND OTHER HARD-BILLED BIRDS SERVE AS CRACKERS OR CRUSHERS AND ENABLE THESE BIRDS TO FEED ON SEEDS WHICH MIGHT PRODUCE WEEDS INJURIOUS TO AGRICULTURE. EXAMPLES ARE THE CARDINAL, BEE, SONG AND OTHER SPARROWS.

THE RODENT EATERS

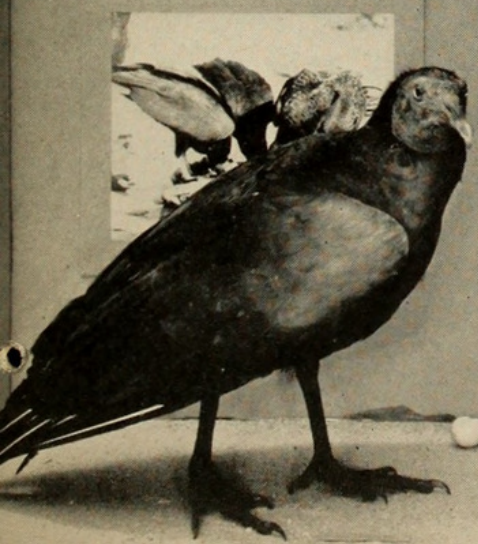
RATS, MICE AND OTHER INJURIOUS SMALL RODENTS ARE DESTROYED BY OWLS AND HAWKS AND SOME OTHER BIRDS.

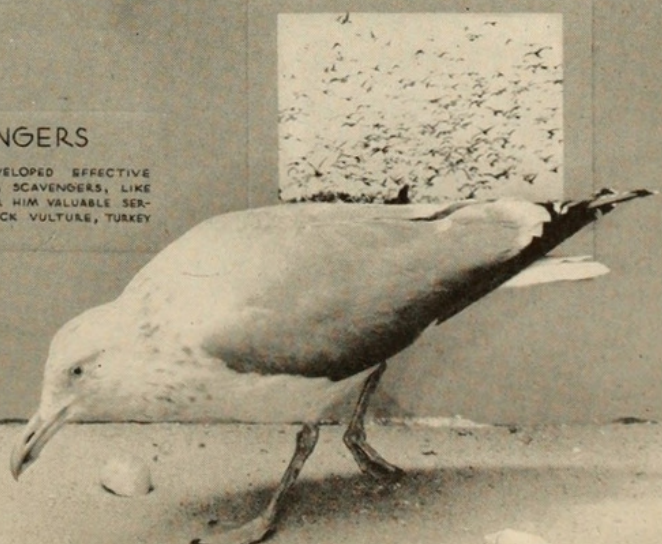




BLACK AND TURKEY VULTURES FEEDING ON FISH

HERRING GULLS OVER GARBAGE





THE SCAVENGERS

WHERE MAN HAS NOT DEVELOPED EFFECTIVE METHODS OF GARBAGE DISPOSAL, SCAVENGERS, LIKE VULTURES AND GULLS, RENDER HIM VALUABLE SERVICE. EXAMPLES ARE THE BLACK VULTURE, TURKEY BUZZARD AND HERRING GULL.

(b) Unintentional

Increasing human population, new settlements, with consequences.

Alteration of haunts by deforestation, drainage, stream pollution, discharge of oil on coastal waters.

Use of poisons for insects or rodents, etc.

Predatory house cats; rats.

Introduction of competing birds; sparrows; starlings.

Erection of obstructions to flight.

References

1907. Forbush, E. H. Useful Birds and Their Protection. (Massachusetts Board of Agriculture.)

1927. Henderson, J. The Practical Value of Birds (Macmillan).

1933. Storer, T. I. Relations Between Man and Birds in California. The Condor, pp. 55-59.

Section VII

ECONOMIC ORNITHOLOGY II

DOMESTICATION

It is not improbable that the domestication of birds began when man first established a permanent home for himself. He could then care for an injured or young bird that chanced to come into his possession. If the bird accepted human association and became, as it were, a member of the family, the first stage in its domestication was passed. But there was a limit to man's hospitality. Birds that were wholly dependent on him for food were less desirable than those that in part, at least, could care for themselves. A chicken, for example, might scratch up a living about its home, or a duck might seek its fare in the mud and waters of a neighboring marsh, while both could find protection near man for the night. Their habitat and food were thus so natural that they mated with other individuals of their kind, tame or wild, and produced young which accepted as normal their parents' association with man. This is the second stage in our possible history of domestication. As further requirements the bird should be big enough for both its body and eggs to make a worth while source of food, and it should be fecund. If its feathers were useful, so much the better, but this was not indispensable.

These are the elements of successful domestication in the country of which the bird is a native. But to fulfill all the possibilities of domestication the bird should be prepared to live in any part of the world inhabited by man.

It is a common experience to see, for example, Chachalacas, Guans and Tree Ducks in their own land as tame as barnyard fowls; but they would not stand climatic change and their economic value is therefore limited by the extent of their range.

When, therefore, we consider the essentials of temperament, edibility, fertility and adaptability that enter into the making of a wholly successful domesticated bird we discover that there are surprisingly few kinds of birds that possess them all. The Jungle Fowl, Lag Goose and Mallard from the Old World, the Musk Duck and Turkey from the New, are the only ancestral forms that really deserve a place on our list. Peafowls, Guinea Fowls and Swans are not to be classed with them. Pigeons hold a quite different relation to man. Let us briefly consider all these birds in the order named.

The Chicken. — The Chicken, or Barnyard Fowl, stands at the head of our list of domesticated birds. Descended from the Red Jungle Fowl *(Gallus bankiva)* of Eastern India, Burma, Siam and Sumatra, early home of the human race, it seems probable that the Chicken was the first bird to be domesticated by man.

The Chicken possesses in a highly developed degree all the essential qualifications of domestication. To them it adds a lust for fighting which has endeared it to man and may have played no small part in promoting its domestication. No other bird has the aggressiveness and courage of the game cock. No other sport has had a larger following than cockfighting. It is within range of both rich and poor and has at times exerted so wide and undesirable an influence that it has been suppressed or prohibited by law.

In view of the countless varieties of fowls that are believed to have originated from the Jungle Fowl, it is remarkable that the Game Fowl should still resemble its ancestor. But as much care has been taken to preserve its original characters as to develop and establish those of its promising variants. Wherever the hen is found there may appear mutants or "sports" from which new races are bred. Among the better known are the Brahmin and Cochin from Asia, the Leghorn from Italy, the Houdan from France, the Dorking and Orpington from England, the Plymouth Rock and Rhode Island Red from North America and, as late as 1914, the Araucana, a race of unknown origin, was discovered in Chile. It is rumpless, has eartufts, and lays blue eggs. Who knows whence the next new race will come?

Directed by the laws of inheritance which a study of Mendelism and genetics has revealed, we may now hasten the processes of nature by definitely directing them. So remarkable have been the results attending this type of applied ornithology that governments, state and agricultural colleges, now have thousands of students experimenting in

SECTION VII

ECONOMIC ORNITHOLOGY II

ANCESTRAL FORMS OF DOMESTIC BIRDS

(See opposite page)

Peacock.
India, including Ceylon, eastward through Malay Peninsula to Java.

Rock Dove.
A Typical Homing Pigeon. (The Homer is shown because of its importance.)
British Isles to North Africa, Burma and China.

Jungle Fowl.
(Cock and Hen.)
Indian-Malayan region.

Guinea Fowl.
Africa and Madagascar.

Mallard.
Northern Hemisphere.

Musk Duck.
Tropical America.

Grey-Lag Goose.
Northern Europe to Eastern Asia.

Mexican Turkey (Hen).
Mexican Tableland from Chihuahua to Colima.

ECONOMIC ORNITHOLOGY II

DOMESTICATION

MAN'S LOVE OF PETS HAS INDUCED HIM TO ADOPT BIRDS THAT WOULD ACCEPT HIS HOSPITALITY. CERTAIN EDIBLE SPECIES, WHICH BRED FREELY IN THIS ASSOCIATION, HAVE THUS BECOME AMONG NATURES MOST VALUABLE GIFTS TO MAN. TO THIS GROUP THE OLD WORLD HAS CONTRIBUTED THE ANCESTORS OF CHICKENS, GUINEA FOWL, PEACOCKS, PIGEONS AND MOST OF THE DUCKS AND GEESE; WHILE THE NEW WORLD HAS GIVEN HIM THE TURKEY AND THE MUSK DUCK.

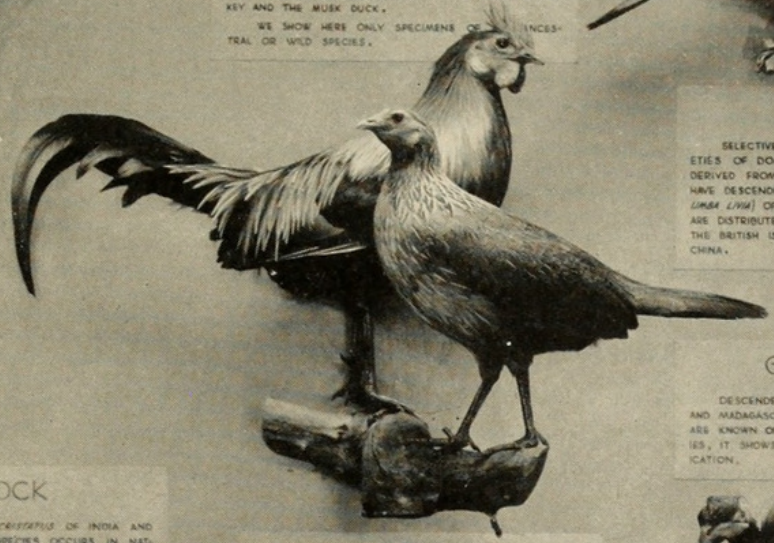
WE SHOW HERE ONLY SPECIMENS OF ANCESTRAL OR WILD SPECIES.

WILD ROCK DOVE FROM N. AFRICA

(A TYPICAL HOMING PIGEON)

PIGEON

SELECTIVE BREEDING HAS DEVELOPED MORE VARIETIES OF DOMESTICATED PIGEONS THAN HAVE BEEN DERIVED FROM ANY OTHER BIRD. ALL ARE BELIEVED TO HAVE DESCENDED FROM THE WILD ROCK PIGEON (*COLUMBA LIVIA*) OF WHICH THE 14 RECOGNIZED SUBSPECIES ARE DISTRIBUTED IN THEIR RESPECTIVE RANGES FROM THE BRITISH ISLES TO NORTHERN AFRICA, BURMA AND CHINA.



GUINEA FOWL

DESCENDED FROM THE GUINEA FOWL OF AFRICA AND MADAGASCAR. ALTHOUGH IN NATURE 21 SUBSPECIES ARE KNOWN OF *NUMIDA MELEAGRIS*, THE ANCESTRAL SPECIES, IT SHOWS BUT LITTLE VARIATION UNDER DOMESTICATION.

PEACOCK

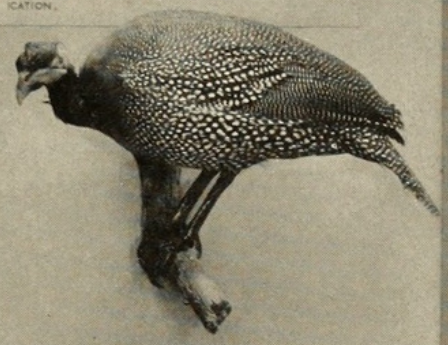
DESCENDED FROM *PAVO CRISTATUS* OF INDIA AND CEYLON. ONLY ONE OTHER SPECIES OCCURS IN NATURE, *PAVO MUTICUS* OF BURMA AND MALAYA.

CHICKEN

THE MANY VARIETIES OF BARNYARD FOWL, FROM BANTAM TO BRAHMA, ARE DESCENDED FROM THE JUNGLE FOWL (*GALLUS GALLUS*) OF THE INDIAN-MALAYAN REGION WHICH WAS DOMESTICATED AS EARLY AS 2700 B.C. ITS DESCENDANTS ARE MENTIONED IN THE NEW, BUT NOT IN THE OLD TESTAMENT. THEY WERE KNOWN TO THE EARLY EGYPTIANS BY 1400 B.C., AND REACHED GREECE BY 500 B.C. THENCE THEY SPREAD WESTWARD, REACHING BRITAIN BEFORE THE ROMANS AND THE NEW WORLD WITH THE EARLY COLONISTS.

THE CHICKEN IS THE MOST VALUABLE BIRD IN THE WORLD. IN 1937 THE UNITED STATES DEPARTMENT OF AGRICULTURE REPORTED THAT THERE WERE 424,444,000 CHICKENS IN THE COUNTRY. THE ANNUAL VALUE OF THEIR EGGS WAS $641,171,000; OF THEIR FLESH, $352,610,000, MAKING A TOTAL OF OVER $1,000,000,000 YEARLY.

SOME OF THE MANY BREEDS AND COUNTLESS VARIETIES OF CHICKENS ARE SHOWN IN THE DARWIN HALL.



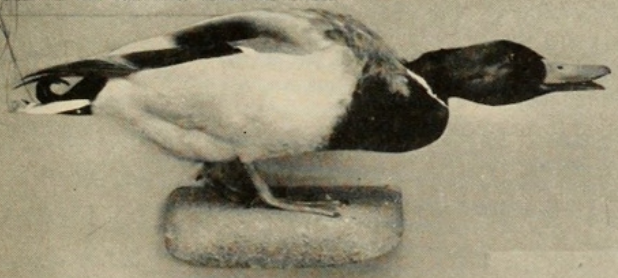
MALLARD

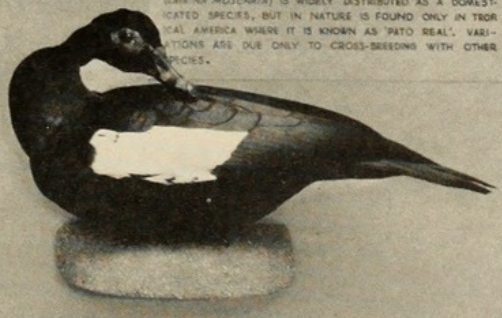
THE MALLARD (*ANAS PLATYRHYNCHOS*) INHABITS THE NORTHERN HEMISPHERE. ONLY TWO SUBSPECIES ARE KNOWN IN NATURE. THE DOMESTICATED MALLARD RESEMBLES ITS WILD ANCESTOR IN COLOR BUT IS HEAVIER AND DOES NOT FLY.

THE ROUEN, AYLESBURY, CALL, HOOKED-BILL, TUFTED, AND PENGUIN DUCKS ARE POSSIBLY MUTANTS OF THE DOMESTICATED MALLARD, WITH WHICH THEY INTERBREED. ALL HAVE CURLY-TIPPED CENTRAL TAIL-FEATHERS.

MUSK DUCK

THE "MUSCOVY" OR, MORE PROPERLY, MUSK DUCK (*CAIRINA MOSCHATA*) IS WIDELY DISTRIBUTED AS A DOMESTICATED SPECIES, BUT IN NATURE IS FOUND ONLY IN TROPICAL AMERICA WHERE IT IS KNOWN AS 'PATO REAL'. VARIATIONS ARE DUE ONLY TO CROSS-BREEDING WITH OTHER SPECIES.





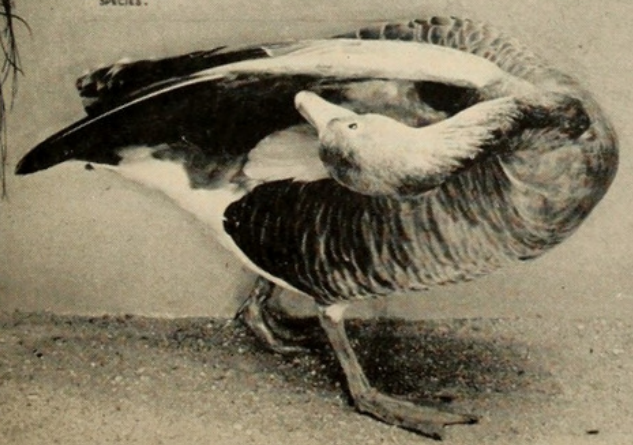
GOOSE

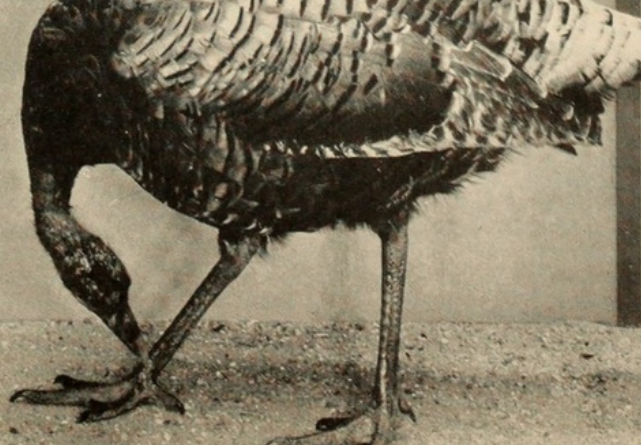
THE WILD ANCESTOR OF THE DOMESTIC GOOSE IS THE GREY-LAG GOOSE (*ANSER ANSER*), AN OLD WORLD SPECIES WHICH, IN NATURE, NESTS FROM ICELAND TO EASTERN ASIA. THERE IS ONLY ONE FORM OF THE DOMESTIC RACE. IT VARIES IN COLOR FROM GRAY TO WHITE AND IS HEAVIER THAN THE WILD SPECIES.

TURKEY

FIVE RACES OF WILD TURKEY ARE KNOWN: 1. EASTERN WILD TURKEY (*MELEAGRIS GALLOPAVO SILVESTRIS*), PENNSYLVANIA TO EASTERN TEXAS. 2. FLORIDA WILD TURKEY (*M. G. OSCEOLA*), SOUTHERN FLORIDA. 3. SENNETT'S WILD TURKEY (*M. G. INTERMEDIA*), MIDDLE TEXAS TO NORTHEAST MEXICO. 4. MERRIAM'S WILD TURKEY (*M. G. MERRIAMI*), SOUTHERN COLORADO, MTS. OF ARIZONA TO NORTHERN MEXICO. 5. MEXICAN WILD TURKEY (*M. G. GALLOPAVO*), MEXICAN TABLELAND FROM CHIHUAHUA TO COLIMA.

YARD BIRD IS DESCENDED FROM NO. 5, THE MEXICAN RACE. IT WAS FOUND DOMESTICATED BY THE EARLY SPANIARDS AND BY THEM BROUGHT TO SPAIN. IT REACHED ENGLAND AS EARLY AS 1541 AND LATER WAS BROUGHT BY ENGLISH COLONISTS TO NORTH AMERICA. THE DOMESTIC BIRD HAS THE TAIL AND TAIL-COVERTS TIPPED WITH WHITE; IN THE EASTERN WILD BIRD THEY ARE [illegible] WERE 8,567,000 [illegible] THEY





well-equipped laboratories where comparatively few years ago only the commercial breeder was working blindly in the poultry yard. The marvel of today will soon be the commonplace of tomorrow, and it will in turn be succeeded by conditions we cannot even imagine. The United States has taken the lead in this practical biology. Already the annual value of the hen and its eggs is over a billion dollars, and H. R. Lewis, writing in the *National Geographic Magazine* for April 1927, states that poultry products rank sixth in our annual agricultural income, and if one may judge the future by the past, they will in due time take first place.

The hen owes much to her egg. In 1937, the U. S. Department of Agriculture tells us that the value of hens' eggs was double that of their flesh, and in view of the enormous increase in egg-laying production for which the breeders and raisers of hens are responsible, it seems probable that no small part of the hen's increase in value will be made as an egg-layer.

We see now the importance of having selected a fertile bird in the beginning. Assuming that the wild Jungle Fowl had two broods annually, it produced about 25 eggs yearly. Compare that with the exceptional record of a British Columbia hen that laid 351 eggs in 365 days and the possibilities of the future are apparent.

Goose. — There is a wide difference between the Gamecock and the Gander but they agree in accepting the conditions of domesticity imposed by life with man. That is, they will abandon the forest or marsh for the barnyard. The Goose is neither a fighter nor a fertile egg-layer, but it has a large body of highly edible flesh, it bears a quantity of valuable down and its quills long supplied the world with pens (Sec. III). Geese are herbivorous and may be driven to pasture by a gooseherd.

The Gray Lag Goose *(Anser anser)*, from which the Domestic Goose has descended, ranges from Iceland to Eastern Asia. If the possibility of human contacts are indicated by the extent of its distribution, it may have been domesticated at several places independently. There is but one race of Gray Lag in nature and the common domestic goose differs from its wild progenitor only in being larger, more fecund and locally whiter. Other forms of the domestic goose are the Toulouse, the Brown and the White Chinese, the Embden and Gray African. There is a domesticated descendant of the Egyptian goose *(Chenalopex aegyptiacus)* which is found in Europe, north to Scotland. It resembles its ancestor.

The Canada Goose *(Branta canadensis)* seems to be on its way to complete domestication but at present it lives with man sporadically and is raised chiefly for parks and as decoys. It crosses with the Gray

Lag. The wild form is somewhat variable, several races being known. The tame bird resembles its ancestor.

Mallard. — The Mallard *(Anas platyrhynchos)*, most widespread of ducks, inhabits the greater part of the Northern Hemisphere, southward in winter, in the Old World, to India, in the New, to Panama. The Mallard readily associates with man, and in a few generations a maimed wild bird will become too heavy to fly and will join other ducks in the barnyard. In a sense, therefore, we see domestication taking place before our eyes.

In spite of its great range, the Mallard is a remarkably stable bird. In nature, only two races are known. Under the varying conditions of domestication, however, it has given rise to a number of birds and varieties including the Runner, Aylesbury, Rouen, Penguin, Buff and Pekin. The latter, an all-white duck, was introduced into the United States from Shanghai in 1873 and is now widely raised here. In all descendants of the Mallard, the drake has the four recurved tail-coverts shown by the parent species.

It is said that the wild Mallard is monogamous, while the tame Mallard is polygamous, a change in habits possibly due to the more crowded life of the barnyard.

The Mallard is prolific and is therefore of value to man, not only for its flesh but also for its eggs.

The Musk Duck *(Cairina moschata)*, miscalled Muscovy Duck, *Pato Real* of the natives, is found in the American Tropical Zone from northern Tamaulipas, Mexico, south to central Argentina. There is but one race in nature. It is a tree-inhabiting duck but in domestication loses the power of flight and becomes terrestrial. The Musk Duck differs from the Mallard in having a bare space about the eye, no recurved tail-coverts, and it does not quack; nevertheless, it hybridizes with the Mallard, a fact that doubtless accounts for the number of variations it shows when domesticated.

Turkey. — Cortez found the domesticated Turkey *(Meleagris gallopavo gallopavo)* in the possession of the Aztecs, and the specimens of it that he sent back to Spain have proved to be of greater value to the world than all the other treasure he secured in Mexico. From Spain, the Turkey is said to have reached England as early as 1541. It soon became established in England and thence accompanied the colonists to New England to serve as food on the voyage and in their new homes.

This, in outline, is the story of the introduction of the domesticated Turkey into the United States. But the history is far from complete. At the time the Mexican bird reached this country from England the Eastern Wild Turkey was a common bird in the Eastern United States as far north as southern Maine. So far as we know, it had not been

domesticated, and it was the bird brought from England that the colonists put in their poultry yards. There its descendants remain, but the Wild Turkey is now extinct in New England, indeed is not found north of central Pennsylvania and only locally southward.

Fortunately for the student of their history, the Mexican Wild Turkey and the Eastern Wild Turkey differ in color from each other enough to be distinguished at sight. The Mexican bird and its domesticated descendants have the tips of the tail and of the tail-coverts whitish (see the female in the group and photograph) while in the Eastern Wild Turkey these parts are chestnut. But as we go from one country to the other we find that these characters gradually change and the two extremes are connected by intergrades; a good example of subspecific geographic variation. Thus, beginning at the South, we have: (1) Mexican Wild Turkey *(Meleagris gallopavo gallopavo)*, Mexican Tableland from Colima to Chihuahua. This is the ancestral race. (2) Moore's Wild Turkey *(M. g. onusta)*, western slopes of the Sierra Madre in southeastern Sonora and Sinaloa. (3) Merriam's Wild Turkey *(M. g. merriami)*, southern Colorado to mountains of Arizona and northern Mexico. (4) Sennett's Wild Turkey *(M. g. intermedia)*, middle Texas to northeastern Mexico. (5) Florida Wild Turkey *(M. g. osceola)*, southern Florida. (6) Eastern Wild Turkey *(M. g. silvestris)*, eastern Texas and northern Florida, locally, to central Pennsylvania.

In domestication, Turkeys vary in color from black to white, six varieties being recognized. At present the experimental Bureaus of the United States Department of Agriculture are breeding a turkey small enough to be roasted in the average apartment-house oven. According to this Department, on January 1, 1940, there were 8,567,000 turkeys on our farms, valued at $18,679,000.

Peacock. — Peacocks are found from India, including Ceylon, eastward through the Malay Peninsula to Java. There are two species, *Pavo cristatus* and *P. muticus*. The former is the more common and is the ancestor of our lawn bird. A mutant race of *P. cristatus*, called *Pavo nigripennis*, appears only in domestication and may at times revert to the parent stock. White individuals occasionally occur.

The Peacock does not take well to domestication. It seems to consider itself superior to the usual barnyard fowl; moreover it is not fertile. Doubtless, without the attractions of its marvellous plumes, it would not have found its way with man.

The Peacock and Jungle Fowl are natives of the same region where they both have doubtless been associated with man from the period of their domestication. The former is chiefly ornamental and has a limited place in man's economy. The latter is the most valuable animal in the world. Nevertheless, the Peacock, and not the fowl, is mentioned

in the Old Testament and as the bird of Juno it had a place in Grecian mythology that the humble fowl was not given.

If the Peacock's tongue formed part of Roman feasts, it was evidently display of wealth rather than palatability that gave it a place as food.

Guinea Fowl. — The Guinea Fowl is said to have descended from *Numida meleagris* of west central Africa. Although there are 21 races of this bird extending eastward to Madagascar, the domesticated bird shows but little variation, a tendency to whiteness being its principal change from its ancestor.

The Guinea Fowl never becomes thoroughly familiar with man and its excited cry of alarm when disturbed is a familiar note. Where the surroundings are favorable, it is apt to run wild. Then it is hunted as a game bird.

Pigeon. — Darwin's belief that the Rock Pigeon *(Columba livia)* is the ancestor of the Domestic Pigeon and its many breeds and varieties is still the prevailing opinion. This fine bird, represented by 14 subspecies, ranges from Great Britain south to northern Africa east to China. In spite of the countless races to which it has given rise, individuals that essentially resemble the parent form are still frequently found among our domestic birds.

Aside from its distinguished place in the past, the Pigeon of today holds increasingly important relations with man. To the pigeon fancier the bird gives a hobby or occupation of world-wide interest with the development of the Homing Pigeon as its outstanding achievement. Signals, telegraph, telephone, radio yield more and more effective service, but the Homer still fills a unique place as a means of communication among men. Both adult and young Pigeons occupy growing space in our markets. In the laboratory the birds are the faithful servants of research.

But comparatively few of us know much about variation and inheritance, artificial selection and breeding, or the raising of squabs, and fewer still conduct experiments in genetics. But we all see the pigeons of our parks and the cliffs of our skyscrapers who own no master. They are really worth more to man than those of all the other classes combined. They come to our window sills, feed on the lawns at our feet, or perch on our hands or shoulders. They are free to come and go, or to fly for the joy of flying, but their confidence in us makes them part of our lives.

The earthbound mind may protest against the use of our walls and roofs and the crevices that architects have so fortunately, but so unwittingly provided, but to him who rejoices in the birds' sweeping

circles overhead and lightning flashes past our windows, their wings spell freedom.

References

1868. Darwin, C. The Variation of Animals and Plants Under Domestication. 2 vols. John Murray, London.

1927. Jull, Morley A. The Races of Domestic Fowl. 96 illus., 29 in color. Nat. Geog. Mag., Vol. 51, No. 4, April, pp. 379-452.

Lewis, Harry R. America's Debt to the Hen. 15 illus. Nat. Geog. Mag., Vol. 51, No. 4, April, pp. 453-467.

1930. Jull, Morley A. Fowls of Forest and Stream Tamed by Man. 43 illus., 16 colored. Nat. Geog. Mag., Vol. 57, No. 3, March, pp. 327-371.

1941. Levi, W. M. The Pigeon. R. L. Bryan, Columbia, S. C. Indispensable to the pigeon-minded.

Section VIII

ECONOMIC ORNITHOLOGY III

In this section we have placed facts and feathers which bear little or no relation to one another but are closely related to man.

Flight. – It may be argued that man never would have flown without the example of birds to stimulate his imagination and arouse his ambition. Certain it is that the earlier aëronauts took the birds as a model. Lilienthal lost his life in the attempt to fly like a bird. The subject of birds' flight will be treated elsewhere in this hall, but we pause here to pay a tribute to him as one of a band of fearless adventurers who tried to conquer the air.

The Feather Trade. – From the beginning of their contact with man birds have been cursed by their flesh and their feathers. The former was perishable and the market correspondingly restricted. The latter are light, easily transportable, long-lived. They could be safely sent from the most remote parts of the earth. From milliner to hunter, the trade was strongly organized. Paradise plumes were fashionable in London and in New Guinea; aigrettes were the mode in Paris and on the Orinoco. The birds of our gardens were not spared.

Perhaps in no other one way can our change of heart toward birds be more convincingly shown than by comparing the trimming of the hats of today with those of over fifty years ago. Here is a list of the species of birds I saw on women's hats in 1885 on Fourteenth Street, then the shopping district of New York.

Robin, four
Brown Thrasher, one
Bluebird, three
Blackburnian Warbler, one
Blackpoll Warbler, three
Swallow-tailed Flycatcher, one

Kingbird, one
Kingfisher, one
Pileated Woodpecker, one
Red-headed Woodpecker, two
Wilson's Warbler, three
Scarlet Tanager, three
Tree Swallow, one
Bohemian Waxwing, one
Cedar Waxwing, twenty-three
Northern Shrike, one
Pine Grosbeak, one
Snow Bunting, fifteen
Tree Sparrow, two
White-throated Sparrow, one
Bobolink, one
Meadowlark, two
Baltimore Oriole, nine
Purple Grackle, five
Blue Jay, five
Flicker, twenty-one
Saw-whet Owl, one
Mourning Dove, one
Prairie Hen, one
Ruffed Grouse, two
Bob-white, sixteen
California Valley Quail, two
Sanderling, five
Greater Yellowlegs, one
Green Heron, one
Virginia Rail, one
Laughing Gull, one
Common Tern, twenty-one
Black Tern, one
Grebe, seven

Today, if you can find one of these on a hat in any shopping district in this city or elsewhere, and can name the offender, I am sure that the Audubon Society will arrest her and reward you.

In America, organized bird study was the first step in the control of the feather trade. You cannot arouse support for a cause that is only a name. On September 26, 1883, the American Ornithologists' Union was formed. Two years later it gave birth to the first Audubon Society. From that seed have grown the flourishing conditions of today.

Condor. — Recently there was an attempt to revive the fashion of wearing large quills, among them those of the Condor. It was quickly suppressed by the Audubon Society.

Some years ago a Condor hunter, whom I met in Mendoza, Argentina, at the foot of the Andes, told me that he had sent the wings and tails of 16,000 Condors to milliners in Paris. For them he had received twenty dollars gold per bird. Because of the war, the price had fallen to ten dollars per bird. This fact thoroughly aroused the hunter's indignation and with fine dramatic display he said, "I refuse to take part in the destruction of such a noble bird for such a low price!"

Swan. — Powder-puffs are in themselves harmless things but countless swans have been killed to supply them. A Museum man reports finding the skins of hundreds of thousands of Black-necked Swans awaiting shipment in an Argentine warehouse.

The Rhea as a Feather Duster. — A Rhea that gives its life to prevent a Tehuelche from starving, dies a not unworthy death (Sect. I); but a Rhea that is killed to make a feather duster is shamelessly sacri-

SECTION VIII

ECONOMIC ORNITHOLOGY III

(See opposite page)

Otto Lilienthal.
Born, 1848; Died, 1896.

Egret plumes still attached to the skin.

Bird of Paradise.

Condor Wing Quill.

Powder Puff.

Fish "Flies."

New Hebrides Money.

Feather-duster.

Egger on Bempton Cliff.
(Man at end of rope in
middle of picture.)

Murre's Egg.

Chilean Pelicans nesting on island off Peru.

Tame and Wild
Canary.

Fishing with Cormorants.

Guano Fleet off Chincha Is., Peru, in
1860.

Gray Partridge.

Starling.
House Sparrow.

Ring-necked Pheasant.
(Female and Male.)

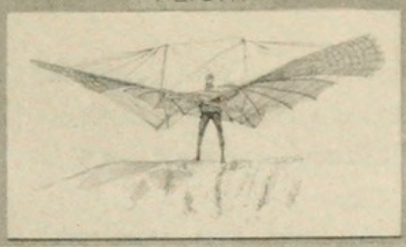
ECONOMIC ORNITHOLOGY III

EGRET

CONDOR WING QUIL

FISHING "FLIES" OF FEATHERS

FLIGHT



OTTO LILIENTHAL
BORN, 1848; DIED, 1896

INSPIRED BY THE FLIGHT OF BIRDS HE WAS A PIONEER IN MAN'S FINALLY SUCCESSFUL EFFORT TO MASTER THE AIR.
(SEE ALCOVE ON FLIGHT)

THE FEATHER TRADE

MAN'S USE OF BIRDS FOR FOOD HAS BEEN FAR EXCEEDED BY HIS DEMAND FOR THEIR FEATHERS. WITH RUTHLESS DISREGARD FOR LIFE HE HAS SCOURED THE EARTH FOR BIRDS BEARING SALEABLE PLUMAGE. NATIVE HUNTERS WERE HIS AGENTS; MILLINERS WERE HIS LARGEST CUSTOMERS. SO DESTRUCTIVE WAS THIS TRADE THAT ITS VICTIMS HAVE BEEN SAVED FROM EXTERMINATION ONLY BY THE ORGANIZATION OF BIRD PROTECTORS.

IN THIS COUNTRY THE TRAFFIC IN FEATHERS HAS NEARLY CEASED; ELSEWHERE IT IS NOW CONTROLLED. IN A FEW CASES, NOTABLY OSTRICH, GOOSE AND EIDER, THE FEATHERS USED ARE TAKEN FROM LIVING BIRDS.

NATIVE BIRDS WHOSE FEATHERS WERE SEEN ON WOMEN'S HATS IN 14TH STREET, NEW YORK CITY, IN 1885.

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

ficed for an ignoble purpose. The extent of the trade in Rhea feathers threatens the bird's extinction. Sixty tons of them were found in a single Buenos Aires warehouse, bound for New York, by a museum representative.

It appears that in the Argentine the Rhea is called "Avestruz" or Ostrich, and as our laws permit the importation of Ostrich plumage, no way has yet been discovered to prevent the entrance of Rhea feathers into this country.

Birds' Eggs. — Man has levied not alone on domesticated, but on wild birds for their eggs. Murres, Gulls and Terns that nest in colonies are most often preyed on. If the eggs are gathered only during the early part of the laying season and the birds are then unmolested, no harm may be done and a natural asset is wisely used. But when Gulls are present in numbers they rob the exposed nests of other birds without regard to season and with disastrous results. In this way the Murres of the Farallone Islands, that once supplied San Francisco with eggs, have been driven from the islands.

Guano. — Certain sea birds living on oceanic islands feed on fish and transform it into guano, the fertilizing properties of which are retained in rainless areas. The most notable examples of these conditions are found on islets in the Humboldt Current off the coast of Peru. There, the annual deposit of countless Cormorants, Boobies and Pelicans, wards of the Peruvian Government, is valued at over seven millions of dollars. It is estimated that the value of the entire deposit found there is about one billion dollars.

Fishing with Cormorants. — In both China and Japan fish form a staple diet and Cormorants are employed for their capture.

The bird is held captive by a leash but is given sufficient freedom to pursue its game. A band or ring around its neck permits it to swallow only its smaller prey. This custom was at one time followed in England.

Birds as Pets. — Birds' vocal gifts, beauty, friendliness and vitality create a universal desire for their companionship. From the most primitive, to the most civilized man birds are therefore valued as pets. When their temperament and surroundings permit, they may be free, but in most instances the need for confinement and protection compels the use of a cage. It may contain only one bird or the swarming life of an aviary.

The growing demand, local and foreign, for Mockingbirds, Cardinals and other American birds as pets, resulted in the passage of a law prohibiting their capture. In this country, therefore, only foreign birds may be legally caged. First among them is the Canary of which, in 1920, we imported, chiefly from Germany, 589,251 individuals. Be-

lieved to have been introduced into Europe from the Canary Islands about 1550, breeders have since developed many varieties.

Extinction: Introduction. – During the past century the following North American birds have become extinct: Great Auk, Labrador Duck, Guadalupe Caracara, Heath Hen, Eskimo Curlew, Passenger Pigeon and Carolina Paroquet. The Whooping Crane, Ivory-billed Woodpecker and several others are near extinction.

The conservationist arrived on the scene at too late a date to save any of the first seven of these birds; it is doubtful if he can preserve the last two. But he has learned of the diverse dangers to wild life that follow in man's wake. Not the least among them is the introduction of foreign species.

Fortunately, we have passed the day when everyone was free to introduce any bird that he pleased. The well-meaning philanthropist who, in 1864, released House Sparrows in Madison Square, New York City, continued to import foreign birds to the end of his life. Skylarks, European Goldfinches, Chaffinches and Song Thrushes were among his attempts to add to our bird-life. The Lark lived for a time and we still see an occasional Goldfinch. But it was not until 1890, when the importer had 60 Starlings freed in Central Park, that he laid the foundation for what he considered his second great success.

One must indeed be an enthusiastic bird-lover to find much that is admirable in the House Sparrow. But if the Starling were a native of this country and occupied its alloted place, I believe that it would be a popular bird. It is attractive in appearance, has interesting habits, has a musical and varied voice, is of some economic value and in the fall, when it spreads its scroll across the sky, it moves with marvellous precision. Thousands of birds act as one. There appears to be no leader; no note of command. How can we explain the community of feeling that controls them? It is a pure expression of *joie de vivre* which raises the industrious plotter to an ethereal realm where nationalities are unknown, and the glorious heritage of flight is the universal emblem of bird-life.

At present our attitude toward foreign species has so completely changed that it is more difficult for a bird than for a man to secure permission to enter this country. At the best, one cannot predict the part the newcomer will play. How can one tell what rivalries or disagreements it will arouse? Is there an unoccupied habitat awaiting it, or must it make one of its own at the expense of a native species?

There are no ready-made answers to these questions. "Yes" in one place may be "No" in another. Only an actual test will tell us whether we win or lose. In either event we should realize the risk that we are taking.

The English, or Ring-necked Pheasant *(Phasianus torquatus)*, has both foes and friends. The former claim that it is destructive to crops and an enemy to our native grouse. The latter say that its value as a game bird far outweighs any harm it may do. In any event, the removal of the laws that now protect it would effectively prevent its undue increase.

The much smaller European Partridge *(Perdix perdix)* has apparently found a favorable habitat in our plains and prairies and their grain-fields where, if desirable, its spread can always be controlled.

References

1917. Crandall, Lee S. Pets: Their History and Care. Illus. Henry Holt and Co., New York.

1926. Gudger, E. W. Fishing with the Cormorant in China. Amer. Nat., Vol. 60, pp. 5-41.

1929. Gudger, E. W. Fishing with the Cormorant in Japan. Scientific Monthly, Vol. 29, July, pp. 5-38.

1933. Leopold, Aldo. Game Management. Scribner's.

1936. Murphy, Robert Cushman. Oceanic Birds of South America. 2 vols. American Museum of Natural History, New York.

Section IX

THE SENTIMENT OF ORNITHOLOGY

The Song of Birds. — Birds exercise their greatest influence on the mind of man through their voice. It was their wild calls that reached the ear of savage man; it is their songs that stir our hearts today. How remarkable it is that the tiny syrinx of some inconspicuous, perhaps unseen, songster has the power to inspire the poets' noblest utterances! Poets, indeed, were the first ornithologists, as any anthology of bird verse proves. Long before the zoologist was describing and classifying, the poet was writing of the birds that he knew. Aristophanes preceded Aristotle; Shakespeare was nearly a century before Linnaeus. The naturalist's works are replaced by better ones. What the poet writes remains as he wrote it.

This section of our exhibit might well have followed Section IV, "Birds in Books." But it has been placed after, rather than before, "Economics" in order that we might end our review on a subject which we believe to express the highest relation between bird and man.

To the Hermit Thrush and Bobolink, shown under the Literature of Birds, we add here three more representative American songbirds,

the Mockingbird, Cardinal and Wood Thrush. Each one is a noted songster in his own right but when, some spring morning in the South, their voices are joined, one exclaims with Izaak Walton:

"Lord, what music hast Thou provided for the Saints in heaven, when Thou affordest bad men such music on earth?"

Bird Study and Conservation. — "Know your bird!" should be the motto of the bird conservationist. Before he ventures to apply the principles of his profession to the living bird he should have a thorough knowledge of it in its environment. This means not only its haunts but its neighbors. Few birds are wholly good and fewer still are wholly bad. It is for the conservationist to determine just where a bird stands in the economic scale and value him accordingly.

Here comes the need for education. The trained conservationist is a specialist to whom the legislator applies, or should apply, for expert advice before exercising his functions as a lawmaker. We begin, therefore, at the beginning and first learn our bird. This is the plan the Audubon Society (1006 Fifth Avenue) has long followed. Since 1911 it has enrolled over six million pupils in its Junior Bird Classes. From that start bird study has entered the colleges where courses have for years been given that prepare the student to serve either State or Federal Government as a professional conservationist.

The Friendship of Birds. — The window feeding-shelf makes a bond between bird and man that is valuable to them both. Birds' shyness prevents that close association which begets friendship, but when birds accept our hospitality and, as it were, break bread with us, then we have a feeling of intimacy with them that brings them definitely into our lives. Children, particularly, love to welcome birds and never tire of watching them; and the association thus begun lasts through the years.

Bird baths, especially in summer, may also be provided, and nesting-boxes will usually find tenants. The attractiveness of our gardens may also be increased by the proper kind of planting. There are many books that tell just how to do this.

The next step in making the world better for birds, and hence for man, is the bird sanctuary. Here we have a larger area, on selected ground, and exercise more complete control. In the adjoining hall of the Roosevelt Wing there is a Habitat Group of the Roosevelt Bird Sanctuary, established by the National Audubon Society at Oyster Bay, New York, in honor of a great bird-lover. Note particularly, at the left of the group, the original of a letter written by Colonel Roosevelt to the New York State Audubon Society in 1898 at the time of its foundation.

SECTION IX

THE SENTIMENT OF ORNITHOLOGY

(See opposite page)

Mockingbird. Cardinal. Wood Thrush.

Nuthatch.

Blue Jay. Downy Woodpecker.

Nuthatch.

Purple Finch Chickadee. Tree Sparrow. Junco.

Myrtle Warbler.

House Sparrow.

Bob-white. Junco.

THE SENTIMENT OF ORNITHOLO

CARDINAL

MOCKINGBIRD

WOODPECKER

THE SONGS OF BIRDS

AS T[illegible] THE POETS BECOME REALITIES, MAN RECOGNIZES T[illegible] HE "MOST ELOQUENT EXPRESSION OF NATURE'S BEA TY, JOY AND FREEDOM." IT WAS THEIR POWER OF FLIGHT THA STIMULATED HIS AMBITION TO MASTER THE AIR. IT WAS THROUGH THEIR WILD CALLS THAT BIRDS CLAIMED ATTENTION OF SAVAGE MAN; IT IS THROUGH THEIR SONGS THAT THEY REACH OUR HEARTS TODAY.

UDY AND CONSERVATI

CATION IS THE BASIS OF ION. APPLIED CONSERVATION EFFORTS TO ATONE FOR HIS GHTED DESTRUCTION OF NAT- OURCES AND TO MAKE THE ABITABLE FOR THE LIFE D. IN 1911 THE AUDUBON 1006 FIFTH AVENUE) BEGAN JUNIOR BIRD CLASSES IN HAS SINCE ENROLLED OVER ON PUPILS. FROM THAT BEG- IRD STUDY ENTERED THE S WHERE COURSES ARE VEN WHICH PREPARE UDENT TO SERVE EITHER OR FEDERAL GOVERN AS A PROFESSIONA VATIONIST.

THE FRIENDSHIP OF BIR

LOVE OF BIRDS PROMPTS TO MAKE FRIENDS WITH THEM. WE OFFER THEM NESTING A BATHING PLACES IN SUMMER, A IN WINTER PROVIDE THEM WI FOOD AT OUR WINDOWS.

WITH OTHER BIRD-LOVERS DEVELOP FAVORABLE AREAS BIRD SANCTUARIES; SUCH, FOR AMPLE, IS THE ROOSEVELT BI SANCTUARY AT OYSTER BAY, BEA FULLY REPRODUCED IN THE ADJ ING HALL.

LOOKING BACKWARD

Even in our own time there has been an almost unbelievable change in our relations to birds. Countless illustrations in proof of this statement will occur to every bird-lover. In my youth feeding-stands and bird baths were rare and interest in birds was largely limited to sportsmen and gunners. Primarily in their own behalf, they secured the passage of laws designed to protect game birds; "game laws" they were called, and game commissioners and game wardens were appointed to enforce them. Laws for the protection of song and insectivorous birds were as unknown as the birds themselves. These birds were shot at any season. Witness the list of hat birds in the preceding section. Compare the Quail in Sections I and IX.

Birds sang just as sweetly then as they do now, but we did not hear them. They were just as beautiful as they are today, but we did not see them. They were just as ready to make friends, but we did not heed them. It is man, not the birds, who has changed. The place that they have won in his life is a measure of his increasing awareness of his environment as birds have helped reveal it to him.

References

1916. Ladd, Neil Morrow. How to Make Friends With Birds. What to Do to Make One's Home Grounds Attractive to Bird Life. From Nesting Boxes to Winter Feeding. Doubleday, Page & Co.

1939. McKenny, Margaret. Birds in the Garden and How to Attract Them. Reynal & Hitchcock. New York.

1941. Baker, John H. (Editor). The Audubon Guide to Attracting Birds. Doubleday, Doran and Company.

Biodiversity Heritage Library

Chapman, Frank M. 1945. "Birds and Man." *Guide leaflet* 115, Page 1–52.

View This Item Online: https://www.biodiversitylibrary.org/item/136232
Permalink: https://www.biodiversitylibrary.org/partpdf/366324

Holding Institution
American Museum of Natural History Library

Sponsored by
IMLS / LSTA / METRO

Copyright & Reuse
Copyright Status: Copyright American Museum of Natural History. Materials in this collection are made available for personal, non-commercial, and educational use. Images and text may not be used for any commercial purposes without prior written permission from the American Museum of Natural History.

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at https://www.biodiversitylibrary.org.

This file was generated 7 October 2023 at 03:34 UTC