

They would rather impatiently call attention to themselves by giving utterance to two high pitched clear notes similar in tone and interval to the beginning of the song of the mature bird.

To summarize briefly the information gained by this series of observations: March 23, nest partially built; March 25, nest completed; March 31, one egg in the nest; April 1, two eggs in the nest; April 2, three eggs in the nest; April 5, brooding began; April 20, all eggs hatched, incubation thus requiring 15 days, or, at most, 18 days; April 26, young open mouths at a slight noise although feeding had not been observed, and they show well-developed hair-like pin feathers; May 4, young well feathered out, and are fed on an average of 16 times an hour; May 6, birds flew from the nest, 16 days after hatching.

Berkeley, California, January 20, 1916.

THE NEW MUSEUM OF COMPARATIVE OÖLOGY

By WILLIAM LEON DAWSON, Director

ON THE 27th of January last, a state charter was granted to the Museum of Comparative Oölogy of Santa Barbara. This was the first notice to the public of a movement which had been quietly launched several months before and which, needless to say, had profited by much private counsel, both scientific and lay, before making its corporate bow. At the request of the Editor of THE CONDOR, I am writing at some length of the *raison d'être* and purposes of the new institution and, more briefly, of its proposed methods and its personnel, of its building plans and its more immediate program.

An institution, like an invention, is the realization of a dream. Now it is of the very nature of dreams to appear fantastic, impractical, "visionary". But Professor Langley's dream of a heavier-than-air flying machine has become a substantial, if not a "sober", reality; and Mr. Smithson's vision of an institution "for the increase and diffusion of knowledge among men" has become the bulwark of science in America. However, the dreamer of the Museum of Comparative Oölogy claims no kinship with these illustrious men. He is only one of the crowd, dreaming over again a very ancient and most fantastic dream. For what farmer boy, seduced from the furrow by the warm breath of spring, has not turned aside to witness the drama of springtime as it was being enacted in a neighboring hedgerow! Those painted oval souvenirs, did they not symbolize for him his very interest in life? And what red-blooded youth, poring over his "cabinet" of birds' eggs, has not dreamed of a collection which should embrace not only the birds of his township or state or country, but the nests and eggs of the birds of the entire world? Of all who started down the vista of that golden dream, some few only persisted until their hoardings began to take on a faint color of value, scientific value. Finally one said, "It cannot be done by one alone. It cannot be done in a lifetime, not even by a millionaire. Come on, boys, let's do it *together!*" Coöperation, then, is to be the keynote of the Museum of Comparative Oölogy.

But is it an altogether fantastic task, this heaping together of all kinds of birds' eggs? Not a bit of it! *Qui bono?* To what end, then? To the end that we may interpret *life*. Some day it will appear as comical as it really is, that

anyone should ever have attempted to classify birds on the strength of variation in any single set of characters, whether of feather arrangement (pterylosis), feather structure, arrangement of muscles, or even of the bony structure itself. Position in any scheme of classification, that is, relationship and phylogenetic history, is determined by the sum of characters; and determination of the value of any one factor in development involves a knowledge of the rate of change. Certain strongly marked characters may have been so recently, that is, so rapidly, acquired as to be almost valueless in determining the deeper, truer, historical relationship. Other characters, apparently no more distinctive, may yet really be so deep-seated, so little subject to change, as to yield conclusive testimony as to cousinships in the hoary old. Now it appears that in the complex of evolved characters which go to make up a bird, although subject itself to a high variation, no single element is more stable, more conservative, more phylogenetically eloquent, than that of the egg. No single character of the egg, viewed externally, is negligible. Size, color, shape, texture, surface, number even,—all are eloquent of relationship and history. Save in the order Passeres, where the tendency to vary, long latent or suppressed in the egg, has burst into sudden and highly complicated efflorescence, a comparison of egg-shells is exceedingly instructive. This does not mean that comparative oölogy is a substitute for comparative myology, or comparative osteology, or even pterylosis; but it does mean that the egg has its own testimony to offer, and that it is able to throw a powerful side light upon history, and so upon the scheme of classification.

So important is this claim that I pause to note a few instances. The classical example is that of the Laro-Limicolae. The older science, content with appearances, and deceived by homoplasy (that is, the concurrence of forms superficially similar, issuing from diverse stocks, which have been acted upon by uniform conditions), had, in a sort of childish helplessness, ranged the Gulls and Terns alongside the Albatrosses and Petrels. Whereas a glance into any egg cabinet shows that the heavily-colored eggs of the Gulls and of the Shore-birds are so similar as, in so far forth, to proclaim unity of origin in the parents; while the single white egg of the Tube-nosed bird is at the farthest remove of an entirely different line of development. The oölogist could have told (and did tell) at a glance what the older ornithology failed to discover. In like manner, the close relationship between the Herons and the Cormorants, testified now by the anatomist, but difficult of comprehension on the part of the casual observer because of the birds' very dissimilar appearance, finds instant confirmation in the drawer of the oölogist. Eggs of the Black-crowned Night Heron could be palmed off for those of Baird's Cormorant, and vice versa. To take but a single instance of a claim to which the anatomist has not yet consented: The oölogist knows that the heavily-colored egg of a Loon represents age-long differentiation from the primitive uncolored type exhibited by a Grebe's egg. The separation between Loons and Grebes is a very ancient one; yet the anatomist, deceived again by homoplasy, and underestimating his own data of diverse osteological characters, allows the two groups, *Gaviidae* and *Podicipedidae*, to subsist in a single order, *Pygopodes*.

That such facts are significant, there can be no question. They have by no means escaped notice; but they have not had a sufficient or an exhaustive consideration. The Museum of Comparative Oölogy proposes for its first task the assembling of such abundant and representative material as will enable Science to work out these problems with some degree of intelligence.

We venture to hope, also, that the acquisition of really cosmopolitan material may enable us to shed some light upon the unsolved problem of the causes of variation in the eggs of the Passerine forms. We conceive this in itself to be a not unworthy task.

Besides these phylogenetic matters, a score of lesser problems, all of strictly scientific import, group themselves under the head of comparative oölogy proper. For example:

The mechanics and chemistry of pigmentation.

The effect of climate upon color—the progressive darkening of northern eggs; the reduction of spotting in desert-haunting species.

Homoplasy, or the tendency to similarity in eggs, independent of that of the parents.

Degeneration of pigment. Albinism and reversion to white, gradual or sudden. "Economy". Persistence of and reversion to primitive characters.

The range of individual, specific, and generic variation.

The relation of number and size in eggs to food-quality or abundance.

The relation of number and size to the forage radius of the parent.

The relation of bulk to precocity, or preparedness in the chick.

The effects of isolation, persecution, competition, degeneration and senescence.

"Psychological" control of the reproductive cycle.

Does the high coloring of eggs in the Passerine forms evidence a dawning esthetic interest in the parents?

These and a dozen other lines of inquiry of equal moment suggest themselves to the student of comparative oölogy. We hold it, then, to be well worth while to assemble with painstaking care material adequate for the solution of these problems. Those pseudo-scientists who affect to despise the opportunity for research offered by a comparative study of birds' eggs are simply airing their own ignorance.

But of course these problems connect themselves with a vastly wider realm of inquiry. The egg is merely the focal point about which gather the highly complicated and indubitably fascinating interests of the reproductive cycle. Although named after this focal point, it is farthest from the purpose of the Museum of Comparative Oölogy to confine itself to a study of the egg alone. The nest is of at least equal, perhaps of greater, interest. Although its phylogenetic value may be small, there is nothing else in nature so eloquent, so concretely revealing of the hidden life, of "animal psychology", as the nest of a bird. It is an epitome of history, an aspiration, of intelligence, and of all besides that goes to make up the charm of a living bird. It is to our discredit that the study of nidology has been so much neglected in America,—for no better reason, apparently, than that nests "take up a lot of room". This glaring defect in our study apparatus, the Museum of Comparative Oölogy proposes to remedy. Our plans are drafted about the central idea of providing storage space for representative nests of all the world's birds.

And here, again, our interest does not stop. Since the higher manifestations of avian activity group themselves about the reproductive cycle, or, in effect, focus upon the nest and its contents, it would be idle for us to single out the center and neglect the rest. As Terence said, *Humani nihil a me alienum puto*, we can say *Aviarii nihil a nobis alienum putamus*, for we hold that nothing which pertains to birds is foreign to our interest. The Museum of Comparative Oölogy will devote itself to the fullest exploitation of the claims of the bird. Our choice of a title, then, is a matter of emphasis and distinction rather than of exclusion. Study of the bird afield, photography, the recording of data, whether

of migration, distribution, or behavior characters,—these are just as much a part of our task as the collecting of birds' eggs. A quotation from our articles of incorporation will, I trust, make this point clear, and should justify our endeavor in the eyes of those who might otherwise be inclined to look askance:

"And we hereby certify . . . That the purposes for which it is formed are: To further the cause of ornithological science by the erection and maintainance* of a repository for natural objects, to wit, birds and their nests and eggs, and all other objects, whether natural or artificial, pertaining to or illustrating the life of birds or necessary to such illustration, and by the maintainance of a museum staff whose business it shall be to take care of the collections and to disseminate among men the knowledge of birds, their nests, and eggs; and in pursuance of this object, to . . . acquire objects of natural history, as bird skins, eggs, and nests; . . . to conduct expeditions of exploration or scientific quest; to subsidize scientific research; to publish reports, proceedings, bulletins, or journals of ornithological science; to equip and maintain a library, a lecture hall or halls, work rooms, educational classes, lecture bureaus, exhibition rooms, photographic and moving picture exhibits, and in general to do any and all things and conduct any business in any way conducive to the dissemination of the knowledge of birds, their nests and eggs, or necessary to the realization of the purpose aforementioned—the whole to be conducted for the advantage, benefit, and usufruct of the public, as from time to time determined by the Board of Trustees of said corporation, hereinafter provided for."

The key note of the new institution is coöperation. Since it is for the "public", it must of necessity be supported by the public. But the word "public" here has a varying significance. The contributing public and the benefitted public are not necessarily the same. Only the Santa Barbara public, and of those the well-to-do, are being asked to give the institution financial support. On the other hand, the outside public, the scientific public, will be invited to contribute as liberally as may be to the stocking of the Museum. For, speaking as a resident of Santa Barbara, it has been our very first thought to provide for the scientific world an institution unique of its kind, which might reasonably hope one day to stand pre-eminent in its chosen field. The pleasure and convenience of oölogical specialists will, therefore, be our first aim. Those who are conducting investigations in a serious spirit will be afforded every facility at our command for comparison and research.

A second thought has been to provide for Santa Barbara's annually increasing guests an instructive form of entertainment. How imperative this claim upon our hospitality really is, perhaps the writer knows better than most; for his doors, although at some remove from the city, and not convenient of access, have been thronged with bird-lovers from every clime and in ever increasing numbers. Indeed, it is largely because of the tax upon his modest quarters and the far too appreciative reception of his modest offerings, that this larger vision came. Those who have expressed regret that such a movement should not have been launched in a larger city, little know Santa Barbara or the weight of her responsibilities.

And of course our City expects to reap direct benefits from its new Museum through its educational features. The modern method of education is the laboratory method, and a museum is a concentrated laboratory of nature. While it cannot supplant nature, it will be no longer necessary for boys to rob birds' nests in order to satisfy their natural craving for knowledge in this realm. A centralized, socialized, and highly efficient repository of bird- and egg-material will satisfy this demand, and stimulate a dozen other wholesome interests that group themselves around it. Instead of having three hundred boys at one time collect-

*A legal term of earlier origin and supposedly "stronger" significance than **maintenance**.

ing birds' eggs, as, according to official reports, we once did have in Santa Barbara, we will have an institution which keeps for the inspection of all a representation of each species. One set of eggs, under the centralized museum plan, will do the work of three hundred sets under the old wasteful, haphazard method.

These important ends can only be secured by concerted, coöperative effort. And if Santa Barbara stands chiefly to benefit by this movement, we may urge that we are doing our full duty in providing the plant and in dedicating it to the larger use. It is for Science to realize its opportunity and privilege and to accept our hospitality, not a whit less genuine because our friends are asked to provide a part of the entertainment.

The wider coöperation of which we have spoken is to be sought in a variety of ways. In the first place, we already have an important body of well-wishers, between fifty and sixty in number, organized as a Board of Visitors. This Board will act in an advisory capacity to the new institution, and its members are pledged to further the interests of the Museum of Comparative Oölogy in any way not conflicting with their own. The names given below, then, rather represent than embody the larger scientific interest, for they are but a few of hundreds, although these are men and women eminent in ornithological science, educators, and persons of affairs, as well as special authorities upon oology, and prominent collectors, who might reasonably be expected to interest themselves in such a coöperative institution.

BOARD OF VISITORS OF THE MUSEUM OF COMPARATIVE OÖLOGY

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For those who because of our pleasant embarrassment of riches in the way of friends could not be elected to membership on the Board of Visitors, we have devised a careful schedule of affiliated orders which should mark the various practicable degrees of desired coöperation.

Of these an order of Fellows takes highest rank, comprising as it does those who donate or bequeath their life collections to the Museum of Comparative Oölogy, and who render her exclusive service. Then come Patron Collectors, Field Members, and Exchange Members, each with specified obligations and privileges. In a plan so far-reaching and inclusive, it is obviously impossible to touch upon all the details in this connection.

The financial support of this institution is provided by an order of Patrons of the Museum of Comparative Oölogy, and the members of this order naturally

enjoy special and perpetual privilege. Our affairs are administered by a Board of fifteen Trustees, and we count our cause fortunate in having official sponsors who by reason of social, financial, and administrative prominence, or other special fitness for the task in hand, make up an efficient working body. These are:

BOARD OF TRUSTEES

Joel Remington Fithian, Pres.	George S. Edwards, Treas.	Fred H. Schauer
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Of these, the President, Mr. Joel Remington Fithian, deserves particular credit for having early and warmly espoused a cause in which he saw the future glory of Santa Barbara worthily reflected. The early policies of the institution were shaped by Mr. Fithian and his friends, and they are, in fact, co-founders. And if we should single out for special mention the names of E. P. Ripley, President of the Santa Fé Railway system, or George S. Edwards, President of the Commercial Bank of Santa Barbara, or Miss Ednah Rich, President of the State Normal School of Manual Arts and Home Economics, it is only to give added assurance that the Trustees of the Museum of Comparative Oölogy understand what they are about, and will see the enterprise through.

Building plans are already under discussion, although the building era is definitely deferred for three years. A commanding site with an acre of ground overlooking Santa Barbara is being selected, and upon this it is proposed to erect a closely grouped series of buildings, some twenty-two in number, of two unit types, one 22x40, the other 32x54 feet in dimensions. All construction will be of reinforced concrete, fire-and-quake-proof, with top lighting and dry heating. Besides an administration hall, a library building, a lecture hall, and work rooms, space has been estimated for the housing of a representation of 15,000 species of birds, reckoning to each bird a unit allowance of 2075 cubic inches.

For the architectural grouping and landscaping, the services of the distinguished artist, Francis T. Underhill, have been retained. The entire group of buildings with their furnishings will cost upwards of \$150,000, and the completed whole, including maintenance, endowment, and research expenditures, will require something over half a million dollars. Needless to say this is the ultimate plan, a plan whose realization may require a period of twenty-five or thirty years. The adoption of a consistent plan of unit construction imparts to the whole a greatly desired flexibility. A modest beginning will be made with one or two buildings, and the number of buildings will be increased from year to year as the requirements of accumulating specimens demand.

The immediate program of the Museum of Comparative Oölogy is a very modest one. Owing to the writer's previous engagement with The Birds of California Publishing Company, the new enterprise must accommodate itself to the old one until the task of preparing "The Birds of California" is completed. The Museum will cooperate with the publishing enterprise in prosecuting field work this coming season, although its financing and other responsibilities will be perfectly distinct. The collections now housed in the author's fire-proof studio at Los Colibris are crowding their allotment of space. A temporary building, 20x30, of corrugated iron, is being erected close to the old one, and the added space will be filled as rapidly as possible with new cases. The management pledges itself to provide adequate housing for all material sent in, and will devote itself, for the ensuing three years, not only to the accumulation of desirable material,

but to the establishment of its various lines of coöperative effort, and to the perfecting of its building plans.

If the Museum of Comparative Oölogy appears thus to be in large measure founded on faith, it is not ashamed of such appearance. Works adequate to its present needs have not been lacking locally, and we have received many pleasant assurances of outside help. We believe that we are in a position to fully reciprocate the confidence already reposed in us, and to put such contributions of nests and eggs as may be entrusted to us by the generosity of outside givers to the highest human service.

Santa Barbara, California, February 15, 1916.

NOTES ON SOME LAND BIRDS OF TILLAMOOK COUNTY, OREGON

By STANLEY G. JEWETT

TILLAMOOK COUNTY, on the northwest coast of Oregon, is a land of high, heavily timbered mountains, deep canyons, and level, grassy meadows.

There are three important bays in the county, Nehalem, Tillamook, and Netarts, and seven fair sized rivers, five of which flow into Tillamook Bay, one into Nehalem Bay, and one, the Nestucca, into a small bay of the same name. Besides these streams there are innumerable small creeks flowing directly into the ocean. Most of the county is clothed in its primeval forests of Douglas spruce. Along the immediate coast line just above the tide lands, considerable Sitka spruce is found. Most of the banks of the streams through the agricultural areas are lined with willows, alders and heavy underbrush. The fruit of such species of common native trees and shrubs as the blue elderberry, chittam (*Rhamnus*) and three species of huckleberry, form an important item in the birds' food supply during the late summer and early winter months. The heavy growth of lodgepole pine (*Pinus contorta*) growing on the sand dunes along the beach is a great attraction to the crossbills. Most of the open country is devoted to dairying, and the broad pastures furnish good foraging for Meadowlarks, Brewer Blackbirds and Robins.

During the past three years, the Oregon Fish and Game Commission under the direction of William L. Finley, State Game Warden, has carried on systematic investigation of the bird and animal life throughout various parts of the state. The work has been carried on in Tillamook County by the writer, assisted at times by O. J. Murie, now of the Carnegie Museum staff, and by Morton E. Peck, of Salem. Alfred Shelton, of the University of Oregon, has done some work at Netarts Bay. For two reasons considerable field work has been done in Tillamook County during parts of every month in the year. First, because this part of the state presents ideal conditions for a study of the wild life in our humid coast belt, and second, because the bays and the diversified coast line make ideal collecting grounds for waterfowl. For notes on the water birds found at Netarts, Tillamook County, Oregon, see CONDOR, xvi, 1914, pp. 107-115.

Oreortyx picta picta. Mountain Quail. One of these quail was heard calling from a thicket of dwarf pine near the beach at Netarts, on April 14, 1914. They are reported as common on the hills along the east side of Tillamook Valley. They are not uncommon along the Nehalem River near Batterson Station.