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President's Address

C. C. Nutting

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when winter comes they are in excellent bodily condition. The winter being passed in a state of hibernation the slight wastes are supplied immediately from the tissues, no food being taken. In tropical countries this is said to be reversed, the hot dry summer being passed in a dormant condition. When kept in captivity they readily eat flies and other insects, but as they will live for a considerable period of time without food, they are commonly so kept. It has thus been found that frogs will live three or four months without food and suffer but slight loss of tissue. They have been kept nine months in cages where there was no chance for them to obtain food, and in one instance some were kept fourteen months. In this case a number died, evidently by disease, which could not be resisted in this starved condition. At the end of this time the remaining frogs were greatly emaciated and apparently could not have lived many more months, but as they were then needed for laboratory purposes the experiment on their powers of endurance came to an end.

The productiveness of frogs has to do only with the preservation of the species, and with the great number of the tadpoles and adult frogs destroyed every year, it is necessary, if the species are to be preserved, that a correspondingly large number of eggs be produced.

PRESIDENT'S ADDRESS.

BY C. C. NUTTING.

What we have been doing:—

In choosing a subject upon which to address you on this occasion, it occurred to me that it might be profitable to present briefly as possible, the work done by the individual members of the Academy, aside from the papers presented before this body.

In calling upon the State to publish the proceedings of this Academy we have assumed to be a representative body of the working scientists of Iowa. Such an assumption could be made by any body of men who chose to call themselves scientists. It is my purpose in giving a resume of the year's work done by our Fellows, to demonstrate that the real workers are in our ranks, and that our body can support its claims by a creditable showing of achievement. And this we are able to do in spite of the havoc made in our ranks by the removal from our midst of an unprecedented number of our best and most active workers.

Glancing down the list of Fellows we find that the following workers are no longer among us: *R. E. Call*, charter member, secretary for several years, and prominently active in all our meetings. *H. L. Bruner*, formerly of Drake University. *Erasmus Haworth*, called from Penn College to the State University of Kansas, one of the very first and best scientists on our list. *J. E. Todd*, charter member and at one time president of this Academy; a man beloved and honored by us all. *Seth E. Meek*, called from Coe College to the Arkansas Industrial University, the only Ichthyologist of eminence that we had.

All these known to have left the State since our last meeting. We can ill afford to do without them, and it will take not only good, but the *best* men to replace them.

About two months ago I sent a circular letter to the members of the Academy, requesting information concerning their work during the past year. The response was quite general and gratifying, although several have not been heard from. This fact will explain the greater part of the discrepancies in the following resume.

But one of our mathematicians has been heard from. Prof. L. G. Weld, of the State University, has completed a work in "The Theory of Determinants," which is about to be issued. Competent reviewers have given it the highest praise. The subject is one involving discussion of mathematical principles of the most advanced order. Prof. Weld has also nearly completed a definitive determination of our latitude by means of a combined zenith and transit instrument furnished by the United States Coast and Geodetic Survey; probable error of result not > 1 h of arc.

Our chemists have carried on their hazardous occupation without loss of life.

Prof. A. A. Bennett, has published Part I of a text-book on *Inorganic Chemistry*, and is now working on Part II; the whole work will embrace some seven hundred printed pages.

Prof. Floyd Davis has published a work entitled *An Elementary Hand Book on Potable Water*, published by Silon, Bardette & Co., Boston, and has, in the course of preparation, a work on *Water Analysis, Chemical, Microscopical and Biological*. He has also been working on a basis for *Sanitary Analysis of Water*.

Prof. W. S. Hendrixon has been carrying on investigations in *chloe-nitrotoxincline*. He has prepared six of these bodies, including their acid derivations, and determined their constitution.

Prof. G. E. Patrick has published conjointly with F. A. Leighton and D. B. Bisbee a series of experiments on "Sweet versus Sour Cream Butter." He doubtless has published other papers during the year, of which I have obtained no list. The ranks of our geologists have been thinned by the removal of Profs. Haworth and Todd, but the remainder have been working all the harder.

Dr. S. Calvin, State Geologist, has published the following papers: "Report on Some Fossils Collected in the Northwest Territories, Canada, by naturalists from the University of Iowa; illustrated, giving a description of *Pentamerus dicussatus* Whitearos. "Two Unique Spirifers from the Devonian Strata of Iowa;" illustrated; a description of *Spirifera urbana* Calvin, and *Spirifera macbridii* Calvin. "A Geological Reconnoissance in Buchanan county, Iowa," in which a rectified section of Devonian strata is presented, in which seven strata are represented. "Notes on a Collection of Fossils from the Lower Magnesian Limestone from Northeastern Iowa," in which the following new species are described: *Straparollus claytonensis*, *Straparollus pristiniiformis*, *Raphistorna multivolvatum*, *Raphistorna pancivolvatum* and *Cysteceras luthii*.

Dr. Calvin has also published numerous reviews and editorials in the *American Geologist*, besides organizing and getting under way the Geological Survey of Iowa.

Dr. Charles R. Keyes has completed and sent to press during the past year his report for the Missouri Geological Survey on the Paleontology of Missouri, embracing about 600 royal octavo printed pages and over sixty plates—600-700 figures, and large colored geological map of the State; also a report for the U. S. Geological Survey on the Granites of Maryland including about 100 pages of text and fifteen full paged plates—some of them colored. For the forthcoming annual report of the

¹Bulletin No. 18, Iowa Agricultural Experiment Station.

²Bulletin from the Laboratories of Natural History of the State University of Iowa Vol. II, No. 2.

Iowa Geological Survey he has prepared a preliminary report on coal, a sketch of the geological formations of Iowa, an annotated catalogue of minerals and a bibliography of Iowa geology. Has published besides the following papers:

The Principal Mississippian Section.¹

The Classification of the Iowa Carboniferous Rocks of the Mississippi Valley.²

The Platyceras Group of Paleozoic Gasteropods.³

A Remarkable Fauna at the Base of the Burlington Limestone in Northeastern Missouri.⁴

The Present Basal Line of Delimitation of the Carboniferous in Northeastern Missouri.⁵

"Nickel Ore" from Iowa.⁶

Besides a number of shorter notes, reviews and newspaper articles.

Prof. S. W. Beyer has prepared for publication a preliminary report on certain deep wells in the State in connection with his investigations on the artesian waters for the Iowa Geological Survey.

Our botanists are also few in number at present, but are not inclined to take a back seat on that account.

Prof. T. H. McBride, of the State University, has published a beautifully illustrated account of the "Myxomycetes of Eastern Iowa." Sixty-six species are described.

A feature which surely will prove of great value to botanists is the keys to families and genera scattered through the work.

Prof. McBride is now extending his labors to the *Fungi of North America*.

Review of "Monograph of the Myxomycetes." *Ger. Marssee*, London. (In press.)

Prof. L. H. Pammel, of the Agricultural College, has published the following papers: "On the Seed Coats of the Genus *Euphorbia*;"⁷ Illustrated; with a partial Bibliography. He concludes that the seed coats offer few characters of systematic value.

"Fungus Disease of the Sugar Beet," especially in Iowa.

"Temperature of Plants," read at the Rochester Meeting of A. A. A. S., showing that temperature in shaded ground is lower than in open ground.

Report on "Some Observations on Parasitic Fungi in 1892." The fluctuations of temperature were very sudden. Peach trees suffered greatly from *Taphrina deformans*, *T. amea*, *T. pruni*, *Puccinia rubigo-vera* and *P. graminis* were reported as common.

Prof. Pammel is now working on a paper on the "*Chromogenic bacteria*," at Ames, in which a full bibliography and descriptions of new species will appear.

He is also carrying on a series of experiments in crossing cucurbit, which show that the species experimented with will not cross.

Among the zoologists active work has been carried on as follows:

Gilman Drew has been observing the habit of dragon flies.

Prof. H. W. Norris, of Iowa College, has made an important contribution to animal morphology in the shape of a paper on "The Development of the Auditory

¹Bulletin Geological Society of America, Vol. III, pp. 283-300, 1 plate.

²Dissertation Johns Hopkins University, 1892, 24 pp., 1 plate.

³American Geologist, Vol. X, pp. 273-277.

⁴Am. Jour. Sci. (3), Vol. XLIV, pp. 447-452.

⁵American Geologist, Vol. X, pp. 380-384.

⁶Engineering and Mining Journal, Vol. LIV, p. 634.

⁷Bulletin from the Laboratories of Natural History of the State University of Iowa Vol. II, No. 2.

⁸Trans. St. Louis Acad. of Sci. Vol. V., No. 3.

Vesicle," the first of a series of "Studies on the Development of the Ear of Amblystoma," commenced in the Journal of Morphology, Vol. VII, No. 7. So far as I am aware this is the most important morphological work done by any Iowa zoologist during the year. Reconstructions in wax from serial sections were made, and the whole subject clearly presented in a series of excellent figures. Prof. Norris has also published an account of the "Development of the Ovule in *Gruidilla squamata*."¹ He is at present continuing his studies of the Vertebrate Ear, especially in Batrachia.

C. C. Nutting has published a review of the late work on "Coloration of Animals, by Beddard"²

"What is an Inherited Character?"³ in which an attempt is made to show the impossibility of finding such a character that will be accepted by the Neo Darwinians.

"Report on Zoological Explorations on the Lower Saskatchewan River."⁴

This report is devoted largely to the collection of birds made by a party from the State University in the summer of 1891. Over one hundred species were collected, and many interesting phases of plumage are described. A specimen of grouse containing the characters of *Dendragapus canadensis* and *D. Franklinii*, and a warbler containing specific characters of *Geothlypis macgillivrayii* and *G. philadelphia*, are described.

A paper has been prepared for publication on the "Vascular Supply of the Teeth of the Domestic Cat," and investigations on the poison apparatus and fangs of *Heloderma horridum* have been made resulting in the discovery of a beautiful demonstration of the homology of *teeth and scales*, the scales containing *true dentine*.

Prof. Herbert Osborn, of the State Agricultural College, has been active as ever. An important work is a paper on *Lice Affecting Domestic Animals*.⁵ Illustrated. Fifteen species of these pestiferous insects are described. An introductory account written in plain English for the people is a commendable feature. The methods for exterminating several of the parasites are also given.

Professor Osborn and H. A. Gossard are the joint authors of *Reports on Injurious Insects*. Prof. Osborn's most important work this year, from a systematic standpoint, is his "Partial Catalogue of the Animals of Iowa."⁶ The list of mammals is from a previous list by the author and one by F. W. Goding.

The list of birds is, as the author says, condensed from one published by Chas. Keyes and Dr. H. S. Williams in 1888. Two species are added by Prof. Osborn, *Lanius atricilla*, Ia.(?) and *Callipepla squamata*, reported by Prof. J. E. Todd in 1889.

The lists of Reptilia and Batrachia are based on the collections in the Agricultural College museum. A list of fishes is added by Prof. S. E. Meek.

The lists of Hymenoptera and Lepidoptera are based on the collections of the Agricultural College.

In his list of *Coileoptera*, Prof. Osborn has added 384 species to the list of 871 species published by H. F. Wickham in the Bulletin from the Biological Laboratories of Natural History of the State University of Iowa, Vol. 1, No. 1, 1888.

The following is a partial list of other scientific papers published by Prof. Osborn during the year 1892:

Am. Nat., Aug., 1892.
Science, 1892.

Am. Nat., Dec., 1892.

Bulletin from the Biological Laboratories of S. U. I., Vol. III, No. 1.

⁵ From Bulletin No. 16 Iowa Agric. Experiment Station.

⁶ Published by authority of the Board of Trustees of Iowa Agricultural College.

Report of a Trip to Kansas to Investigate Reported Damages by Grasshoppers. *Insect Life*, Vol. IV, pp. 49-56.

The Clover Seed Caterpillar (in connection with H. Gossard). *Insect Life*, Vol. IV pp. 56-58.

An Experiment with Kerosene Emulsions. *Insect Life*, Vol. IV, pp. 63-64.

Origin and Development of the Parasitic Habit in Mallophaga and Pediculidae. *Insect Life*, Vol. IV, pp. 187-191.

Notes on Grass Insects in Washington, D. C. *Insect Life*, Vol. IV, pp. 197-198.

The True Bugs, or Heteroptera of Tennessee. *Insect Life*, Vol. IV, p. 224. (Review.)

Notes on the Life History of *Agallia sanguinolenta*, Prov. (Osborn and Gossard.) *Canadian Entomologist*, Vol. XXIV, p. 35. (Abstract of same paper in *Proc. Acad.*)

On the Orthopterous Fauna of Iowa. *Can. Ent.*, Vol. XXIV, p. 36. (Abstract from *Proc. Acad.*)

Note on the Species of *Acanthia*. *Can. Ent.*, Vol. XXIV, pp. 262-265.

Honey Bee, or House Fly. *Can. Ent.*, Vol. XXIV, pp. 270-271.

Also newspaper articles on economic subjects.

Prof. F. M. Witter has been at work on the fauna of the region around Muscatine.

Prof. B. Shimek, of the State University, has published a paper on "*Pyrgulopsis scalariformis*,"¹ in which the author concludes that *P. scalariformis* and *P. mississippiensis* are identical and calls them by the former name.

A list of 38 species of shells found associated with *Pyrgulopsis* is added.

When it is remembered that every one of the men whose work has been referred to in the preceding account is forced to respond to the innumerable calls made upon the college professor or teacher for time and energy, and that all of the work was done in addition to regular work, and papers read before this Academy, the showing which I have been able to make has certainly been most creditable. It amounts to a demonstration that a majority of the real scientific workers of Iowa are included in our number, that this Academy is a thoroughly representative body of men.

In looking over the list of persons in attendance on the last meeting of the *American Association for the Advancement of Science*, at Rochester, N. Y., I find the names of ten Iowans; seven of the ten are members of the *Iowa Academy of Sciences*, and one of the remaining three is the wife of one of our most honored members, leaving only two of the ten *not* connected with this body. Such facts are surely significant and show that our legislators were right in officially acknowledging our Academy as *the* representative body of Iowa scientific workers.

REPORT OF COMMITTEE ON STATE FAUNA.

BY C. C. NUTTING, CHAIRMAN.

About two months ago the chairman of this committee sent a circular letter to all the members of the Academy asking for notes that could be used in this report. Up to the time of writing, December 19th, only one member has responded to this request, giving an interesting note concerning one species of animal new to the State, and a note concerning the disappearance of the beaver from Big creek, Tama county.

Under these circumstances it is impossible to give as full a report as could

¹Bulletin from Laboratories of Nat. Hist. State University of Iowa.

be desired, as an individual cannot be expected to cover the whole field of Zoology. We will attempt, therefore, a report on the Vertebrates alone.

During the past year Prof. Osborn has published a "Partial Catalogue of the Animals of Iowa¹," which furnishes a convenient basis upon which to build in completing the list. In this report all species not mentioned in Osborn's catalogue will be regarded as new to the State.

MAMMALS.

Putorius longicauda, Bonaparte.—New to the State. Two specimens collected in Johnson county and now in the University museum.

Mephitis putorius (L.).—New to the State. Reported from North Tama county, and specimen deposited in Agricultural College museum. It has also been reported from Johnson county, but specimens have not been submitted.

Canis lupus, L.—Reported as appreciably increasing in numbers in the northern part of the State, especially in Fayette county.

Caracus virginianus, (Bodd.)—A specimen of this deer was killed last winter in Johnson county. There is a strong probability, but not a certainty, that the animal had escaped from confinement in another part of the State.

Castor fiber, L. Beaver.—A family of beavers is reported by Sistine as having worked on Big Creek, North Tama county, for eight years past, but not a trace of them could be found last fall.

Lepus campestris, Bachman. Prairie Hare.—This species is slowly working its way south. Last year it was reported by Prof. Witter from Muscatine county, and during the past fall a specimen was killed in Johnson county, and is now in the State University museum.

BIRDS.

The following species are for the first time reported from Iowa:

Sterna hirundo, Linn. Common Tern. Johnson county, Iowa. Specimen in University museum.

Sterna stehgrava, Lepech. Caspian Tern. Johnson county, Iowa. Reported by John Williams. Specimen in University museum.

Phalacrocorax dilophus floridanus, Aud. Florida Cormorant. Johnson county. Specimen in University museum.

Glaucionetta islandica, (Gmelin). Barrow's Golden-eye. Secured by Robt. E. Leach, Independence, Iowa, October 11, 1892. Specimens in University museum.

Chen caerulescens, (Linn.).² Blue Goose. Whiting, Iowa. D. H. Talbot. Specimens in University museum.

Philacte canagica, (Sevast.). Emperor Goose. Johnson county, Iowa. Fall of 1887. J. T. Paintin.

Plegadis guaraua (Linn.) White-faced Glossy Ibis. Rippey, Iowa, 1891. B. F. Osborn. Specimen in University museum. Mr. Osborn reports there was a flock of thirteen near Rippey, but only one was secured.

¹ Published by the authority of the Board of Trustees of the State Agricultural College.

² regarded as a distinct species by Ridgway. See "Manual," p. 115.

Porzana jamaicensis (Gmelin), Black Rail. Burlington, Iowa, 1889.—Specimens in the flesh examined by me.

Tringa bairdii, Coues. Baird's Sandpiper. Two specimens killed near Iowa City last spring. Now in University museum.

Numenius borealis (Forst). Eskimo Curlew. Johnson county, Iowa. Frank Bond. Specimens in University museum.

Ægialalitis semipalmata, Bonap. Semipalmated Plover. Secured near Iowa City last spring. Specimen in University museum.

[*Ictinia mississippiensis* (Wilson). Mississippi Kite. (Ridgway.')]]

Falco mexicanus, Schlegel. Prairie Falcon. Storm Lake, Iowa. Frank Bond. Specimens in University museum.

Falco richardsonii, Ridgw.—Richardson's Merlin. Storm Lake, Iowa. Frank Bond. Specimens in University museum.

Bubo virginianus (Gmel.). Great Horned Owl. Common at Iowa City. Several specimens in University museum.

Chordeiles virginianus henryi (Cass.).—Western Nighthawk. Johnson county, Iowa. Specimens in University museum.

Calcarius ornatus, (Townsend).—Chestnut-collared Longspur. Cedar Rapids, Iowa. (Bailey.)

Dendroica vigorsii, (Aud.). Pine Warbler. Johnson county, Iowa. Spring, 1892. Specimen in University museum.

Notes on changes in geographical distribution, or unusual occurrences of Iowa birds.

Anser albifrons, Gmelin.—White-fronted Goose. Johnson county, October 7th, 1888. J. T. Paintin.

Porzana noveboracensis, (Gmelin).—Yellow Rail. One specimen secured near Iowa City, 1892.

Strix pratensis, Bonap.—American Barn Owl. Several seen near Iowa City, December, 1876, by John Williams.

Nyctala acadica (Gmel.) Reported as occurring near Davenport by E. G. Decker.

Otocoris alpestris praticola (Hensh.). Prairie Horned Lark. Formerly unknown near Iowa City, but now abundant (John Williams).

Dolichonyx oryzivorus (Linn.). Bobolink. Increasing near Iowa City.

Xanthocephalus xanthocephalus (Bonap.). Yellow-headed Blackbird. The first specimen was secured in Johnson county in 1892, by J. T. Paintin.

Sturnella magna neglecta (Aud.). Western Meadowlark. This species is spreading eastward over the State. Dr. Calvin and Mr. Houser report it as becoming abundant in Cerro Gordo county.

Dendroica cerulea (Wilson). Cerulean Warbler. Rather common near Iowa City last spring.

Coccothraustes vespertinus (Coop.). Evening Grosbeak. Of very irregular occurrence near Iowa City. None seen last year. Two secured in December, 1892, by J. T. Paintin.

Loxia leucoptera (Gmel.). White-winged Crossbill. A flock summered near Iowa City in 1885 (J. T. Paintin).

Plectrophenax nivalis (Linn.). Snowflake. Two specimens in the flesh brought to the University museum by J. T. Paintin last winter.

In concluding the notes on birds, it may be said that there is a well marked

*Originally entered in this report by mistake. Of doubtful occurrence in Iowa.

movement of the northern and western species toward the south and east. Almost without exception the novelties included in the above list come from the north and west.

Among mammals the same is true, although the evidence is not so extensive. The Prairie Hare is the most marked case in point.

REPTILES.

The following species are not found in Prof. Osborn's catalogue. Specimens of each are in the University museum.

OPHIDIA.

- Eulainia saurita* (L.). Johnson county, Iowa.
Coluber guttatus, L. Rippey, Iowa. B. F. Osborn.
Diadophis punctatus (L.). Rippey, Iowa. B. F. Osborn.
Crotalus horridus, L. Iowa City, Iowa.

LACERTILIA.

- Eumeces septentrionalis* (Baird).

BATRACHIA.

Amblystoma jeffersonianum (Green), Baird. Specimens from Iowa in University museum.

FISHES.

The following species should be added to the list on the basis of specimens from Iowa in the University museum.

- Ammocetes niger* (Raf.), Jordan. Iowa City.
 [*Moxostoma microlepidota*¹ (LeS.), Jordan. Iowa City.]
Cliola forbesii, Jordan.² Iowa City.
Acantharchus pomotis (Baird), Gill. Iowa City.

SIGNIFICANCE OF THE CONCEALED CRESTS OF FLY-CATCHERS.

BY C. C. NUTTING.

In all the works on animal coloration that have come under my observation, there is a marked absence of any attempt to account for the concealed crests of bright colors on the crown of many birds, notably the *Tyrannidæ* or "Fly-Catchers."

The writer, although the first, so far as he knows, to offer an explanation for this class of facts, was for a long time compelled by press of other duties, to defer for a number of years any considerable investigation in this direction. Last summer, however, he took the time to examine the collection of *Tyrannidæ* at the Smithsonian Institution, probably the largest series of this exclusively new world group in the world.³

¹This is doubtless the same species that is entered by Meek in Osborn's list as *M. duquesnii*, and is therefore not a species new to the State.

²Synopsis of Fishes of North America. Jordan and Gilbert, 1882, p. 174.

³The writer wishes to take this opportunity to acknowledge the never failing courtesy and patience of Mr. Robert Ridgway in facilitating the examination of the splendid collection under his charge.