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## THE PROGRESS OF ZOOLOGY IN IOWA DURING THE LAST TWENTY-FIVE YEARS.

BY C. C. NUTTING.

In endeavoring to estimate the advance in a given science during a definite period of time and in a definite region, it seems evident that the best results can be obtained by ascertaining the work done by the representatives of that science in the region and during the time under consideration, and also the advance made in equipment in the institutions in which that science is taught.

In order to definitely limit the scope of this inquiry, I have gathered together what information I could concerning the work of the zoologists connected with the Iowa Academy of Science as Fellows, particularly as to the publications along zoological lines, and also as to the number of students which have received instruction from them. As to the institutions, it has seemed necessary to confine myself mainly to the colleges and universities within the State. It would have been well worth while to have included the high schools; but they are so numerous and the data so hard to ascertain within the time at my disposal, that it seemed best to confine the discussion to institutions of collegiate grade. The Davenport Academy of Sciences has also done much good zoological work in the way of publications; but most of these appear in connection with work done by the members of the Iowa Academy of Science.

In response to written requests, I have been able to secure more or less satisfactory data concerning 25 professional zoologists who have been members of the Iowa Academy and have contributed directly to the advance of zoological science. The progress of zoology in the State is due almost entirely to the zeal and industry of these men; and when we remember that almost every one of them has been tied down to the performance of official duties, usually without adequate help and equipment, it seems to me that we may well be proud of the record herein briefly summarized.

Adopting an alphabetical arrangement, the first name to be considered is that of Professor M. F. Arey, the veteran teacher of natural science at the State Normal College. No name on the list is more revered and beloved than this. A teacher of teachers, he has imparted zoological knowledge and, better still, something of his own personality to 2,500 beginners in zoology and 110 of collegiate grade. His publications have been mainly along geological lines, and will doubtless appear in connection with other papers. He has also served as President of the Iowa Academy of Science.

Doctor B. H. Bailey, of Coe College (where he succeeded Professor S. Stookey, another member of this Academy); has published papers, mainly on ornithological subjects, aggregating about 100 pages, has instructed some 800 students in zoology and has seen the realization of his hopes in the completion of the new Science Hall at Coe, an entire story of which is devoted to zoology.

Prof E. D. Ball, now of the Utah Agricultural College, formerly of the Iowa State College of Agriculture, has published an aggregate of about 840 pages of entomological subjects and is at present instructing some 400 students.

Professor Samuel Calvin must always be counted among those who have been potent in advancing the cause of zoology in Iowa. Up to the year 1888 he taught zoology in the State University, instructing about 250 students, and it was from him that the three professors in the present department of zoology received instruction and inspiration. His death, just about one year ago, removed the most prominent member of the Iowa Academy of Science.

Professor R. E. Call, now of the DeWitt Clinton High School, New York City, was one of the most active members of the Academy during the first years of its existence. I have been unable to obtain a list of his papers, but he published rather extensively on the fishes and mollusks, and also on bibliographic subjects. He was at one time teacher of zoology at the West Des Moines High School.

Professor Gilman A. Drew, of the University of Maine, another of the early members of the Academy, has taken a prominent place among the zoologists of the country and has published some classic papers on the morphology and biology of the Mollusca.

Professor J. E. Guthrie, State College of Agriculture, has published 113 pages of scientific literature and has assisted Professor Summers in the instruction of pupils.

Dr. G. L. Houser, of the State University, has devoted himself to building up the magnificent series of laboratories of Animal Biology, probably the best equipped and best devised in the Mississippi Valley, accommodating 250 students at once. About 2,000 students have taken advantage of these facilities under his instruction in the twenty years since he began service at the university.

Professor E. A. Jenner, of Simpson College, and his predecessors have instructed some 625 students in zoology, and have seen the laboratory equipment in microscopes increased from one to thirty-nine.

Professor H. M. Kelly, of Cornell College, has published 23 pages of zoological matter, and has instructed 566 students in zoology, having at his disposal an equipment of \$1,500.

Dr. Albert Kuntz, of the State University, has, under the direction of Dr. Houser, published 221 pages, the result of his original investigations on the embryology and morphology of the sympathetic system and the embryology of the adrenals. He has also assisted Dr. Houser in the laboratories of animal biology.

Professor A. L. Leathers, of Leander Clark University, reports that there were seven students of zoology of collegiate grade during the year 1909-10.

Professor T. H. Macbride deserves honorable mention among those who have advanced the teaching of zoology in Iowa, as he, with Professor Calvin, taught that science in the State University in the early days of the Academy, and established what was then a series of laboratories and courses of which the State was justified in being proud.

Professor W. H. Norris, of Iowa College, is recognized as one of the leading zoologists of the State. He has contributed 118 pages of excellent morphologi-

cal work, has taught some 1,300 students in zoology and has seen his equipment (including museum) increase in value from \$2,150 to \$7,000.

Professor C. C. Nutting, of the State University, has inflicted upon the public some 1,800 pages, mostly quarto, of work on the Coelenterates, has personally instructed some 1,200 students in zoology and has seen his department increase in value of equipment from about \$15,000 to \$300,000, including building and museum, and in numbers from 12 to 400.

Professor H. Osborn, now of the Ohio State University, formerly of the Iowa Agricultural College, (and the first President of the Iowa Academy) has an enviable national and international reputation as an entomologist. He published, before leaving Iowa, some 100 entomological papers with a total of about 1,000 pages, besides the numerous and important contributions which he has issued since going to Ohio. While at Ames he instructed some 1,500 students in zoology, and has had some 700 in his classes in Ohio.

Mr. Frank C. Pellett, of Atlantic, Iowa, is a lecturer on zoological subjects, and has published nine papers. The number of pages has not been ascertained.

Professor Maurice Ricker, of Des Moines High School, has been a prominent high school teacher at Burlington and Des Moines for many years. He has had an important influence on zoology by his contact with some 400 high school students, besides publishing papers on Hydra.

Professor L. S. Ross, of Drake University, has published about 30 pages of zoological literature and has instructed about 1,200 students in zoology. He has seen his equipment for teaching, exclusive of furniture and building, increased to a value of \$3,500.

Dr. Frank Stromsten, of the State University, has published 73 pages as a result of his investigations in the embryology of the lymphatics, and has instructed several hundred students in zoology as assistant to Dr. Houser.

Dr. H. E. Summers, of the State College of Agriculture, succeeded Professor Herbert Osborn, both as professor and as State Entomologist. He has published 40 pages on entomological subjects, besides attending to his duties as State Entomologist. He has seen his equipment, not including furniture and museum, increase in value from \$1,480 to \$10,200. In the meanwhile he has instructed some 1,540 students.

Mr. T. Van Hyning, Director of the Historical Department of Iowa, has in preparation a catalogue of the Mollusca of Iowa. He has published six pages.

Professor H. F. Wickam, of the State University, has published numerous papers on entomological subjects, amounting in all to about 1,000 pages, has built up his laboratories to their present size, has acted as Assistant Curator of the Museum of Natural History, and has personally instructed 594 students of zoology.

Professor F. M. Witter, deceased, third President of the Iowa Academy, formerly of Muscatine (where he was superintendent of schools for many years), should rank among the foremost zoologists in the State in his influence upon younger zoologists. He published important papers on the Mollusca, and has prepared valuable manuscripts on the birds and butterflies of Iowa. These papers were burned, together with the specimens upon which they were based. Although definite records are not available, it is probable that in the forty years of his service as a teacher he instructed thousands of Iowa boys and girls; and, better still,

held up to them an example of devotion to science amid adverse conditions which could not fail of a profound influence.

A summary of the items noted above shows that the zoological fellows of the Iowa Academy have contributed 5,453 pages of technical matter to our scientific publications embodying a material contribution to our knowledge of animals, while they have conferred the benefit of their professional instruction upon some 12,489 students of collegiate grade.

Substantial honors have been conferred upon the men who have been doing this work. The zoologists have contributed no less than seven of the Presidents of this Academy. They are: Herbert Osborn, F. M. Witter, C. C. Nutting, H. W. Norris, H. E. Summers, M. F. Arey and G. L. Houser. I have omitted from this list those who, although doing work in zoology, have been more particularly identified with other sciences, e. g., Professors Calvin and Macbride.

That the zoologists of this Academy are well known beyond the confines of this State is evidenced by the fact that eighteen of them receive mention in American Men of Science, while four of them are starred to indicate the opinion of the compilers of that work that these men belong to the first 1,000 scientists of America.

Three of our zoologists have a place in "Who's Who in America," one of them has served as President of the Zoological Section of the American Association for the Advancement of Science, one has been President of the National Association of Economic Entomologists, one has been President of the Entomological Society of America, one has been President of the Central Branch of the American Society of Zoologists, while lesser honors have been accorded them in plenty.

While the record of our zoologists is one of which we may justly be proud, there is one fact which intrudes itself on the notice of one who has handled the data concerning the equipment and personnel of the collegiate institutions of the State.

While the State and denominational colleges have been fairly well equipped so far as building and material equipment is concerned, the science of zoology has not received adequate recognition in the way of professorships and other grades in the instructional staff devoted entirely to instruction in zoology.

I find, for instance, that there are but six chairs of zoology in the State, and four of these are in State institutions. Iowa College and Coe College are the only denominational institutions with chairs devoted exclusively to zoology. In one case, Drake, there is a chair of Zoology and Bacteriology, and in most of the others there are chairs of Biology, or Natural Science. It seems to me that in any college properly regarded as of a high grade there should be a chair of Zoology.

The instructional staff in the four institutions having departments of zoology is as follows:

State University, three professors, three assistant professors, two instructors, besides assistants of lower grade.

State College of Agriculture and Mechanic Arts, one professor, two assistant professors and four instructors.

Iowa College, one professor and one instructor.

Coe College, one professor and one assistant.

It seems to your speaker that, considering the financial ability of the colleges of the State, and the value and dignity of the science of zoology, there should be from four to six more chairs of zoology in Iowa, and that there should be a suitable number of assistant professors and other instructors to make these chairs effective.

One more suggestion: An examination of the catalogues of the colleges of the state shows that the men who are teaching zoology are overburdened with work. A man with six or seven hours of daily work in the recitation room simply can not keep up with the advance of his science, and is, of course, utterly unable to take the time to carry on research work and thus become known to the world. It is also practically impossible for a man who is expected to teach botany, geology and zoology to contribute to the advance of science.

There are some rather remarkable combinations of subjects in our colleges. For instance, one college has a man who teaches Chemistry, Greek and Zoology!

These remarks are not in the spirit of captious criticism. Our smaller colleges have to do the best they can with pitifully small means, and the men working in them are as a rule zealous and faithful, men of ability and noble self-abnegation. But these colleges should recognize their obligation to their instructors and realize that it is better to do a few things well than many things poorly. The college that will take the stand that it will teach at least one science well, even if no other science is mentioned in its catalogue, and allow one man to devote his time to that and to research, will create a land-mark in the history of the educational institutions of the State.