the laws of biology. They do not have full faith in them because the consequences of these laws follow less promptly and less definitely.

There are some who believe that the great material advancement made possible by science has resulted in less attention being paid to the higher things of life.

Some new evils have come, but these always accompany radical changes in the habits of people. We must learn how best to counteract them. So much has been added to the world in a short time that it is difficult for us as yet to put each thing into its proper place. We shall have to learn to accommodate ourselves more quickly to new conditions. If necessary, we must, by education and organization, see to it that old activities of lasting value are not crowded out of our leisure hours by mere useless pleasures. The ways of the world have changed, but in the great essentials of life we have gone forward and not back. The millennium has by no means arrived. I believe, however, that there is now less selfishness and more love of man for man than ever before. Charity, though organized, is no less real, and more effective. Men have never given so freely for purposes designed for the common good. When tested by the measure of service placed before self, the world dominated by science is not found wanting.

Dissatisfaction often arises because methods of getting things done have changed rather than from lack of accomplishment. The churches have learned to extend their influence by broadcasting their services by radio. They realize that if a human soul is moved to repentance by words entering the home from space, the result is fully as valuable as it would have been were the message received amid the beautiful surroundings of a consecrated temple. Let those who decry the present, instead of railing at it, adopt its methods and use them for whatever noble ends they have in view.

The tide of scientific progress sweeps relentlessly on. It will engulf any who oppose its flow. The old world is gone, never to return. So long as men exist there will be those among them who will sacrifice all to search for truth, and there will be others who will apply new truths to their own ends and to the benefit of mankind.

JOHN ZELENY

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BASHFORD DEAN

1867–1928

BASHFORD DEAN, former curator of the department of arms and armor at the Metropolitan Museum of Art, New York City, honorary curator of the department of ichthyology, American Museum of Natural History, and late professor of zoology, Columbia University, died on December 6, 1928, at Battle Creek, Michigan, aged sixty-one years.

Bashford Dean was born in New York City, October 28, 1867. His families on both sides were "Old Americans." The Deans were of English and "Holland Dutch" derivation and had lived in the region of Tarrytown since before the Revolution, his paternal great-grandfather, John Dean, having been a captain in the American Revolutionary army. His mother's family was of English and "French Huguenot" stock, of Yonkers and New Rochelle.

His sister, Miss Harriet Martine Dean, states that his interest in armor appears to have originated when he was about five or six years old, when he saw a beautiful helmet in the residence of Carlton Gates, of Yonkers. This object fascinated him and he asked and received permission to examine it closely. It seemed to make a deep impression on him. Later, when he was about ten or eleven years old, the owner of the helmet died, and he attended the executor's sale of the household effects and attempted to purchase the helmet, which to his deep disappointment was sold to some one else. He purchased, however, two very beautifully engraved daggers with scabbards, which he always treasured. In later years he made numerous unsuccessful attempts to trace and locate the helmet, which he felt was a very valuable one and to which he attributed his first interest in the subject.

His interest in fishes began when he was about seven years old, through the influence of an old friend of his father's, Professor Edward S. Morse, of Salem, Mass. At this time he made a drawing of a fish, showing the heart and blood vessels.

He attended the College of the City of New York, where he came under the influence of Dr. John Draper and of Professor William Stratford, a noted teacher of zoology, being graduated in 1886 at the age of nineteen. He then entered Columbia College, where he studied geology and fossil fishes with Professor John Strong Newberry, whose labors on the Devonian fishes of New York and Ohio he was destined to carry on in later years. In 1890, at the age of twenty-three, he received the degree of Ph.D. from Columbia University, his dissertation being entitled "Pineal Fontanelle of Placoderm and Catfish," the title indicating the thorough fusion of zoological and paleontological concepts which characterized all his work.

He began his teaching career in zoology immediately after his graduation in 1886, when he was appointed tutor in natural history at the College of the City of New York. At the same time he became an assistant in the New York State Fish Commission, for which

he prepared his first scientific paper, a report on the supposed fish-eating plant, *Utricularia*. Beginning in 1889 he made special investigations for the United States Fish Commission of oyster culture in England, France, Belgium, Spain, Portugal, Italy and later in Japan. Thus was laid the foundation for his remarkably detailed knowledge of the languages, customs and countries of western Europe and of Japan, which was so useful to him both as a zoologist and as a persistent student of ancient arms and armor. At the same time he was a keen observer of the many biological stations at which he studied, and he wrote several papers on this subject. As early as 1890, when only twenty-three years old, he was appointed director of the Biological Laboratory at Cold Spring Harbor.

In 1893 he married Miss Alice Dyckman, of the old Dyckman family of the northern end of Manhattan Island. She has ever been his steadfast and helpful consort in sickness and in health. His health was always more or less precarious on account of a delicate digestive system. In spite of this handicap, or possibly in part because of it, his will power, energy and output always amazed those who knew him best and bore him up in his immense labors and almost ceaseless travels.

His success in all things was brilliant. As an artist his drawings of developing eggs and of ganoid and hagfish embryos had all the minute perfection and finish of the best Japanese work. His blackboard diagrams, drawn with amazing speed and often with both hands, never failed to arouse the enthusiasm of his devoted students at Columbia University, during the many years of his active teaching there. His own lithographic engravings adorned certain of his memoirs, while his line drawings contributed much to the value of his admirable and now classic text-book on "Fishes, Living and Fossil" (1895).

As a student of the old Devonian fishes he edited Newberry's memoirs and published a long and brilliant series of his own. His studies on the Devonian sharks and on a development of the more archaic recent sharks produced important evidence in favor of the view that the pectoral and pelvic fins had arisen as fin-folds, like the median fins, as maintained by Thacher and others; this was in opposition to the famous theory of Gegenbaur, that the most primitive paired fins were the feather-like fins of the Dipnoan fishes, and that these in turn had arisen from cartilaginous rays attached to the outer sides of the gill arches. Professor Dean always opposed the view of Eastman and others that the Arthrodires were related to the Dipnoans, and much critical evidence recently brought to light by Stensiö abundantly supports Dean's position.

Before he became almost completely immersed in the study of armor, Professor Dean had published an important series of papers and memoirs on the embryology of the sturgeon, the garpike, the bowfin, the California hagfish, and the chimæroids, or silver sharks; but perhaps the greater part of his material, including a large series of beautiful plates dealing with the early development of the Port Jackson shark remains to be worked up and published, it may be hoped, in his memory.

The breadth and many-sidedness of Dean's zoological work is well shown in his Carnegie Institution memoir on "Chimæroid Fishes and their Development" (1906), in which he was able to settle for all time the status of these curious forms as highly specialized sharks rather than as intermediates between sharks and higher fishes.

As curator of the Department of Fishes (1903–1910) in the American Museum of Natural History, Professor Dean, with his assistant, Dr. Louis Hussakof, planned and directed the installation of a series of mounted habitat groups, illustrating the life and habits of the ganoid fishes, namely, the spoonbill, the sturgeon, the garpike and the bowfin; also the group showing the spawning of the brook lamprey and many others. During this period also he and his staff installed the synoptic exhibit of fishes and the "fossil aquarium," containing life-like restorations of many of the fossil fishes of the Old Red Sandstone of Scotland.

In 1910, owing to the pressure of other duties, Professor Dean resigned as curator of the department of ichthyology and was appointed by the grateful president and trustees of the museum as honorary curator of the department. It was in this period of his honorary curatorship that with the cooperation of his colleagues and assistants he was enabled to bring to a successful issue one of the greatest enterprises of his life, namely, the "Bibliography of Fishes." This work began very early in his professional career (1890) in the form of an index to references to zoological papers on fishes, and by 1900 it included about twenty thousand cards. Through all the years of his extensive travels in Europe, of his duties in so many directions, he and his coworkers kept adding to this index until it grew to colossal proportions. In 1910, he tells us " . . . my index reached a critical stage in its development. It had become an unwieldy enterprise—too large to be carried on single-handed, yet too valuable to be abandoned. Then it was, at the instance of President Henry Fairfield Osborn, that the American Museum of Natural History happily came to my aid; it allowed me the help of a secretary for transcribing references and since then it has with

great generosity provided the means for editing and enlarging the work."[1]

Nor did he forget to record "certain private subscriptions," notably those of Mrs. Isaac Michael Dyckman and Mrs. Bashford Dean; these and other members of his family were always most willing to help forward any of his scientific or educational enterprises. The first volume of the bibliography, as enlarged and edited by Charles Rochester Eastman, was published by the museum in 1916; the second volume in 1917; the third and most difficult volume, including the great subject index, as extended and edited by Eugene Willis Gudger with the cooperation of Arthur Wilbur Henn, appeared in 1923. It is impossible to overestimate the usefulness of this system of keys to the vast treasury of knowledge of fishes. Fortunately, although Dean himself has passed on, the work on his bibliography is being continued and it is the intention of the museum to publish within a few years still another volume, covering the period since 1914, the closing date of the previous volumes.

Professor Dean's life-long pursuit of the subject of arms and armor will no doubt be treated in a special article by one of his colleagues in the Metropolitan Museum of Art, but the subject formed such an integral part of the man that it can hardly be neglected in this brief survey of his life. The parallel interests of zoology and armor often intertwined themselves in his career. At times the pursuit of the one aided the cultivation of the other, as when his search for the early stages of development of certain fishes of Japan gave him an opportunity to collect a remarkable series of Japanese arms and armor, or when his early studies on oyster culture in France, Belgium, Spain and Italy gave him the opportunity to visit some of the old castles where armor was still to be seen in its native setting. As a keen student of the evolution of the armored fishes of Devonian times, he was quick to perceive the striking analogies in the evolution of human armor. In short, the study of armor was to him almost a branch of zoology. His first interest was always the determination of the chronological horizon and the country of origin of the individual piece. And to afford adequate comparative data for this subject he amassed thousands of sketches and notes, all classified and arranged after the fashion of the fish bibliography. Indeed a great bibliography of arms and armor, the crowning work of himself and his colleagues, is even now ready for publication. And just as he planned the habitat groups for the display of the old armored fishes in the Museum of Natural History, so did he plan and install the brilliant exhibition of armor in the Museum of Art.

[1] "A Bibliography of Fishes," 1916, Vol. I, p. viii.

After this country entered the World War, he was appointed major in the Ordnance Department. He studied field conditions of trench warfare in Europe and was engaged in designing improved helmets and other special armor, when the sudden ending of the war set him free to resume his toilsome journeys in pursuit of collections of armor. Thus by his unceasing efforts the Metropolitan Museum collection finally rose to high rank (perhaps fourth) among the great collections of the world.

Nor should we forget to record Dr. Dean's service in reconstructing the Dyckman House and Park near the northern end of Manhattan Island. This was presented to the City of New York in 1916 by Mrs. Bashford Dean and her sister, Mrs. Alexander McMillan Welch, in memory of their parents, Mr. and Mrs. Isaac M. Dyckman, who were descendants of a family that had lived on or near this property for about two and a half centuries. Dr. Dean and Mr. Welch rescued the house from dilapidation and restored each room with appropriate furniture and memorabilia of its former owners.

At the time of his death he was actively interested in the plans for the development of the new Museum of the City of New York, which is designed to show the life of the inhabitants of Manhattan Island and vicinity from the earliest time to the present day.

In recognition of his multifarious services to science, education and art, honors came to him from many sources. Thus the former Emperor of Japan on two different occasions bestowed upon him an inscribed silver saké bowl, in token of his gratitude for Dr. Dean's services to Japanese ichthyology and armorial history. In 1910 he was made a Chevalier de la Légion d'Honneur. He was an active member of many American scientific and historical societies and corresponding or honorary member of the London and Mexican zoological societies, of the Moscow Society of Naturalists and of the Paris Museum of Natural History. In 1923 he received the D. G. Elliot medal from the National Academy of Sciences in recognition of the great value of the "Bibliography of Fishes" to students not only of ichthyology but also of many branches of the biological and cultural sciences.

On the next to the last night of Dr. Dean's life many of his friends and colleagues, none knowing of his serious illness, attended a reception given in honor of himself and Mrs. Dean in the new Hall of Fishes in the Museum of Natural History. This hall he had years ago planned in outline, and for the last three years his devoted colleagues and successors have rejoiced to develop it in the spirit which he inspired in them.

In 1927, heeding at last the signs of waning endurance, Dr. Dean resigned from the curatorship of armor and was made a trustee of the Metropolitan Museum. But his ever creative spirit continued to renew itself. He designed, built and with his own hands decorated a high and noble Gothic hall connected with his residence at Riverdale, N. Y. In this he had begun to install his private collection of armor when the cord of life was snapped. The visitor who stands within this silent hall will be enabled to feel with him the somber but potent magic of old armor, that for so many years had sent him wandering over the earth.

In conclusion we may safely affirm that Bashford Dean was always visualizing ideals in science and in art, but that he was never content merely to enjoy them himself, but labored with consecrated zeal to build them with imperishable art for the benefit of his friends. And his friends were all those with whom he came in contact.

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SCIENTIFIC EVENTS

YELLOW FEVER IN AFRICA

DR. AUGUSTE PETTIT, professor at the Institut Pasteur de Paris, who with Dr. Stephanopoulos was sent to Senegal, French West Africa, last winter to study the epidemic of yellow fever, has recently communicated his observations to the Academy of Medicine. The first part of his report, as summarized in the *Journal* of the American Medical Association, is devoted to the memory of the eminent scientists who succumbed there to the disease: Stokes, Young and Noguchi. The death of Noguchi is all the more regrettable because of the fact that the researches that he undertook have been abandoned, while all the monkeys inoculated by him have been allowed to die. They were valued at half a million francs. Furthermore, the government of French West Africa has issued an order prohibiting the inoculation of the monkeys of the colony for fear that they may become adapted to the virus, and that, on escaping, which is a frequent event, they may serve to spread the infection. Dr. Pettit made use of a species of monkey of the genus *Macacus,* brought from India, and carried on his researches at the Institut Pasteur, using a virus from Senegal that was furnished him by Professor Sellards, of Harvard University. His first conclusion is that the agent of yellow fever is not a spirochete, as Noguchi believed, but an invisible filtrable virus. That was the opinion advanced also by the Marchoux mission in 1903. This virus can be inoculated into monkeys, and the sick monkeys are cured by injecting into them the serum of a human being who has recovered from yellow fever. Dr. Pettit succeeded in preparing an attenuated virus that serves as an effective vaccine for the protection of monkeys. He has prepared 600 vials of this serum, which is a genuine protective and curative agent. It remains to be discovered whether the serum of these vaccinated monkeys will serve, in turn, as a vaccine for man. That is the problem with which Dr. Pettit is engaged at present, and in view of the results already secured, he feels that it is probable. His researches have been hindered through lack of monkeys, owing to an advance in price since they have been used in Europe for testicular grafts, and the funds at the disposal of the mission are now inadequate.

THE BRITISH INSTITUTE OF RADIOLOGY

THE British Institute of Radiology opened its 1928–1929 session with an exhibition of apparatus and a presidential address at the Central Hall, Westminster, on November 17.

The London *Times* reports that the exhibition, which is expected to become an annual event, illustrates the rapid strides being made every year in the manufacture of equipment, improvements following each other with such rapidity as to render many forms of X-ray appliances obsolete within a very short period. The bulk of the exhibits are British, and the most notable feature of their latest improvements is the protection now afforded to the X-ray operator, whose risk of injury, it is claimed, has been much reduced. Another device, by using more power with the tube at a greater distance from the film, enables a more accurate shadow picture to be taken. Of new ideas for enabling the doctor to handle a patient with greater facility there are many, including a combined operating and X-ray table, which has recently been introduced into one or two special hospitals.

Dr. G. W. C. Kaye, in his presidential address, said the amalgamation of the institute and the Röntgen Society two years ago had left some minor difficulties to be surmounted, but with patience, good-will and tolerance the institute would presently find itself able to speak with an undivided voice on all things affecting its work and objects. To commemorate the work of its two great founders, Archibald Reid and Robert Knox, the council had named the lecture hall of the institute the Reid-Knox Hall. The membership, now 800, was steadily growing, and he hoped it would reach 1,000 before his term of office closed. The institute's examination attracted an ever-increasing number of candidates, and the "M. S. R." was steadily becoming recognized as the hall-mark of the competent radiographer.