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OF

WILLIAM BERRYMAN SCOTT

1858–1947

BY

G. G. SIMPSON

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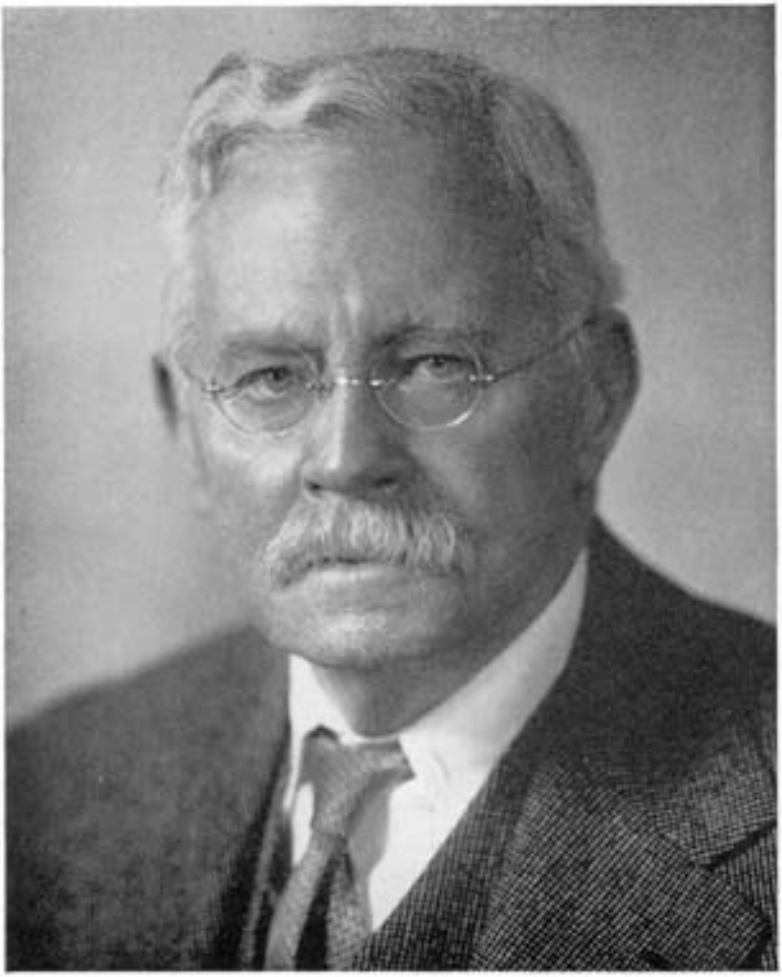

W. B. Scott

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1. *Life*

A great-great-great-grandson of Benjamin Franklin, grandson of Sarah Bache, great-grandson of Catherine Wistar (sister of Caspar), grandson of Charles Hodge (for 56 years professor in Princeton Theological Seminary), and son of William McKendree Scott (a graduate of that Seminary), might be expected to have close associations with Philadelphia and with Princeton. It seems almost anomalous that William Berryman Scott was born in Cincinnati, Ohio (on 12 February 1858), but in 1861 his family moved to Princeton, which was to be his home during most of his life. His father died in December of that year. Young William Berryman was raised by his beloved mother, Mary Elizabeth (Hodge) Scott, and her father, Charles Hodge, whom his grandson "held in a love and reverence that are quite impossible to describe."

Scott was frail and sickly in childhood. He had little companionship in his own age group and his adult associates were kindly but sober and deeply religious. His childhood reading ran to theology, philosophy, and the classics. In college he took some part in athletics and he formed wider and more appropriate friendships, but his sedate, withdrawn childhood left some permanent traces in his character. His early education was also affected. He studied with his mother, with tutors, and in a series of schools most of which he judged worthless in retrospect. His inadequate preparation did not, however, prevent entrance to the College of New Jersey (now Princeton University) at the age of 15, in 1873. Native ability soon compensated for an initial handicap, and he soon went to the head of his class and was tied for first place at graduation.

Precociously mature, quiet, and sensitive, the young student (by his own later statement) was not popular outside of a restricted circle of intimates. Outstanding among these were his classmates "Sally" Speir (Francis Speir, Jr.) and "Polly"

Osborn (Henry Fairfield Osborn), both of whom became lifelong friends. To these contemporaries and to his family, Scott, himself, was "Wick."

The future author of "The theory of evolution, with special reference to the evidence upon which it is founded," had assumed as a boy that he would enter the clergy and had acquired from his revered grandfather a violent antipathy toward all evolutionary ideas. In his junior year he took a course in geology under Guyot, but he was more fascinated by such courses as psychology under McCosh (then president of the College) and literature under Murray. The turning point, often recalled in later years, was marked by an idle remark during the examination period of his junior year, in June, 1876. Scott, Osborn, and Speir were lying on a canal bank after a swim, trying to read Paley but finding the day too balmy for natural theology. His daydreaming inspired Scott to say, "Fellows! I have just been reading in an old Harper's an account of a Yale expedition to the Far West in search of fossils; why can't we get up something of the kind?" The query was not meant seriously, but Osborn and Speir acclaimed it with, "We can. Let's do it!" That idle moment completely changed the careers of Scott and of Osborn and had a profound influence on the history of paleontology. There is a certain irony in the fact that the inspiration came from O. C. Marsh (his was the expedition related in Harper's Magazine), whom Scott later "came nearer to hating . . . than any other human being."

The projected expedition materialized after the three friends were graduated in 1877. It was a grand affair led by Dr. Brackett, professor of physics, with General Kargé to lead the Indian fighting (which happily did not occur), eighteen students, and two cook-teamsters. After a journey through Colorado, which appeared to the would-be bone diggers as mere aimless wandering, the professor and the general quarreled. This had the result, most fortunate as it proved, that the general left the main party and, with Scott, Osborn, and Speir went to Fort Bridger, Wyoming. In that region they made a good collection of early Eocene mammals, including a skull of *Uintatherium*, which Dr. Guyot had especially wanted and which was large

enough and grotesque enough to attract wide attention in Princeton.

Speir eventually became an attorney, although he long retained a collector's and amateur's interest in fossils. The professional fate of Scott and of Osborn was sealed by their early collecting and work on the resulting specimens. It became inevitable that they should be geologists, biologists, or (as finally eventuated) a combination of the two, that is, paleontologists. A graduate year at Princeton, 1877-78, was devoted to studying anatomy, among other things, and especially to the enthusiastic and, at first, somewhat amateurish study of their own collection.

At this time the great figures in paleontology in this country were Joseph Leidy and E. D. Cope of Philadelphia and O. C. Marsh of New Haven. Cope and Marsh were bitterly antagonistic and the Cope-Marsh feud was getting into full swing. Leidy, disgusted with this affair, was withdrawing from paleontology into the more peaceful fields of biological research. After an initial rebuff caused, perhaps, by his suspicion that they might have some connection with Marsh, Cope became cordial and helpful to Scott and Osborn. They maintained warm friendship with him to the end of his life some twenty years later. They were inevitably drawn into Cope's war with Marsh, as the years went by, and they staunchly supported Cope's side. In memory, they kept this factional bitterness alive long after the original feudists had disappeared from the scene. Scott always maintained that some day he would write and publish to the world the full story of Marsh's perfidy and other failings, but fortunately he never carried out this threat, which could, indeed, have been countered by evidence that Cope was human, too. The young students also met and greatly admired Leidy, who gave them considerable assistance in their first venture into paleontological research.

In the summer of 1878 there was another Princeton expedition, this time on a more modest scale and with a more definite purpose. "The triumvirate," Scott, Osborn, and Speir, returned to the Bridger Basin where they obtained another good collection of fossil mammals as well as a fine lot of Eocene fish from the now famous Green River Shales.

That autumn both Scott and Osborn went to Europe to complete their advanced studies, the usual procedure for higher professional education in that day. Scott landed in London with no concrete idea as to what, where, or with whom he was going to study, but he carried a letter from Leidy to Huxley, and Huxley took him in hand and helped to direct his further development. After attending Huxley's lectures at the Royal College of Science and working in his laboratory, Scott moved to Cambridge where (with Osborn) he studied embryology under Balfour. Thence he went to Germany, where he perfected his knowledge of German and worked with Gegenbaur at Heidelberg. There he wrote a dissertation on the embryology of the lamprey, *Petromyzon,* and was made a Doctor of Philosophy in 1880.

Back in Princeton, President McCosh was energetically trying to improve and broaden instruction at the College and in 1880 he called to the faculty nine instructors to whom he referred as "my bright young men." Two of these were Scott and Osborn, both engaged to strengthen the teaching of science. Their interests and training had been almost identical, but academic needs turned Scott to the teaching of geology and Osborn to comparative anatomy. Both became vertebrate paleontologists, but this divergence in their early teaching left a mark. Scott added to his biological training a more evident geological background, and this is still noticeable in Princeton paleontology. Osborn's more purely biological outlook long characterized the Columbia school.

Scott served actively on the Princeton faculty for just fifty years, 1880-1930, and after his retirement he continued to work mainly at Princeton to the end of his long life. In all, he was associated with the College and the University (as it became in 1896) for seventy-four years, more than a third of the whole history of an institution which is accounted venerable in America and which celebrated its bicentennial in the year of Scott's death. He was promoted to full professorship in 1884 at what now seems the startlingly early age of 26. He was the first chairman of the Department of Geology, established in 1904, and served in that capacity until his retirement in 1930.

During this period he guided and, when necessary, fought for the improvement and expansion of the department, which grew from three to thirteen members under his leadership.

Scott considered teaching as his most significant work, and there is evidence that his students found him an inspiring and successful teacher. John Grier Hibben, who was in Scott's first class and who later became president of the University, wrote to Scott in retrospect: "You gave us a new view of scholarship as an adventure into the unknown and great world of knowledge. You had the spirit of an explorer returning from his absorbing quest and you were able by your enthusiasm to impart that spirit in large measure to us." Fifty years in the classroom did not eliminate that enthusiasm, as witness the student reporter who wrote when Scott retired, "We cannot view with equanimity a world bereft of some of his lectures such as the 'Eruption of Vesuvius' or the even more popular 'Johnstown Flood'."

Scott confined his teaching to undergraduates. He did not give professional training in geology, but he built up a department which became signally successful in such training. He founded no school of paleontological practice or theory, but under his younger associate, W. J. Sinclair, and under Sinclair's student, G. L. Jepsen, Princeton continued to develop as a major center for both teaching and research in vertebrate paleontology. Within this science, Scott's important direct influence was rather through his activity in professional societies and through his publications than through teaching.

In 1883, when his salary had reached the substantial figure of $2,500, Scott married his boyhood sweetheart, Alice Post. The marriage was singularly happy and was clouded only by having two children, Anne and Hugh, die in infancy, and another, their first child, Charles Hodge Scott II, die before them (in 1926) at the age of 41. Four daughters, Adaline, Angelina, Mary, and Sarah survive, as does Mrs. Scott.

In his early years on the Princeton faculty, Scott spent eight summers in the field, building up fresh collections without which vertebrate paleontology stagnates or becomes an armchair science. The first of these expeditions, in 1882, worked

mainly in the White River Badlands and began from that extraordinary deposit the accumulation of Oligocene mammals which, with rich additions by Sinclair and others, has become an outstanding feature of the Princeton collections. Perhaps at this time was born an ambition to revise the whole of that great mammalian fauna, a plan carried to completion almost sixty years later. In 1884 Scott and his party visited the Big Horn Basin of Wyoming in search of early Eocene mammals, but this was, in Scott's own words, "a complete failure." This cannot be said of any other Princeton expedition for fossil vertebrates, and the stigma, if any existed, was fully wiped out by later work under Sinclair and Jepsen which has amassed, mainly from the Big Horn Basin, one of the greatest collections of early Eocene mammals in the world.

In 1885 and 1886 Scott returned to the Bridger beds, where he had worked with Osborn and Speir in 1877 and 1878. In 1889 he collected from the John Day formation in Oregon. In 1890 a brief visit was made to South Dakota and in 1891 Scott collected in the vicinity of White Sulphur Springs in Montana. On all of these expeditions Scott took along parties of students or recent graduates and their contributions paid for the expenses of the work.

In 1893, John Bell Hatcher, one of the greatest of fossil collectors, left Marsh's employ and came to Princeton to work under Scott. That summer Scott and Hatcher returned to the White River Badlands and had phenomenal success. The results (quoting Scott) were "incomparably greater in amount" than any from Scott's earlier parties and reflected "the difference between professional and amateur collecting." Scott felt that there was no real need for him, put the party in Hatcher's hands, and returned home early. Scott never again collected a fossil, although he was only 35 when he made this renunciation of field work and although he continued to be a frequent traveler. Hatcher made other large western collections for Princeton, and in 1896-99 conducted the Princeton Patagonian Expeditions, which occupied Scott's research and editorial efforts for many years. In 1900 Hatcher went to the Carnegie Museum in Pittsburgh and he died in 1904 at the early age of 43. After

Hatcher, the continuously successful Princeton fossil vertebrate collecting campaigns were directed or conducted, in the main, first by Sinclair and more recently by Jepsen.

The facts that Scott still considered himself an amateur after ten collecting expeditions and that he gladly turned over this activity to others as soon as opportunity presented, demonstrate his own judgment that field work was not his strong point and perhaps also reflect a certain distaste for this physical activity, even more strenuous then than now. He certainly appreciated the picturesque aspects of life in the field, amusing incidents of which were often repeated in later years and occupy much space in his autobiography. He must, however, have lacked the real love of life in the open and the burning passion for the fossil chase that activate so many of his colleagues. Nevertheless, his field experience gave him a touch for geological reality which is missing in those paleontologists whose experience has been mainly indoors, and it laid the basis for a collection that has become one of the major assets of American vertebrate paleontology.

Even though he may have had mixed feelings about camping, tramping, and digging, Scott surely loved to travel, to see new places and to make and renew friendships. London, the only large city in which he ever lived, always retained a special attraction for him. His friendships with British colleagues were also among the most treasured things in his life. One of the few drawbacks of his long and unusually placid, happy life was the sorrow caused by the death before him of most of these old friends.

Scott learned to speak German fluently, and his student days in Germany left him with a strong admiration for many things in that country. The German universities were then at their height and Scott considered them the best in the world. (He later recognized and deplored their decline from this peak.) He found most Germans friendly and admired, especially, their widespread respect for learning, science, and art. He noted, however, "the hard egoism and envious disposition which characterized so many Germans." He highly esteemed such colleagues as Zittel, Schlosser, and, especially, E. Fraas, but he

seldom spoke of German friends with the same warmth as of the British. He noted and detested the influence of the army in Germany and foresaw where it would lead. The first World War so upset him that he could not work outside of routine. He was eager to have the United States enter what he considered a crusade against Prussian militarism for the benefit of what was good in Germany as well as for the peace of the world. Even this degree of faith in the Germans was shaken by the second war.

One of the highlights of Scott's life was a long journey in 1900 which took him to Germany and England again and then to the Argentine by way of Portugal and Brazil. The main purpose of these travels was to study and photograph type specimens of fossil mammals from Patagonia, for use in research on Hatcher's collections. Paleontology in the Argentine was then very active but bitter in a way too reminiscent of the days of Cope and Marsh in North America. Moreno, Burmeister, and Ameghino were carrying on a three-cornered feud which stopped at nothing in the way of vituperation or even, at times, more direct injury. Scott managed to steer his way with consummate diplomacy and was able to examine not only the official collections, in the Museo de La Plata, then controlled by Moreno, but also the Ameghino collection (considerably superior in the field of interest to Scott), then still private property. Ameghino had acquired a reputation for being secretive regarding his specimens, but Scott's open and friendly approach gave him full access to all of these and even free permission to figure them in future publications. This outcome speaks well for both men and establishes the fact that any fault that may have existed in Ameghino's attitude was provoked by his enemies.

This journey and Scott's extensive publications on Patagonian fossils gave rise to a widespread impression that he had explored Patagonia. Three of Scott's outstanding characteristics, integrity, modesty, and humor, are reflected in his later remarks that some of the awards made to him must have been based on this mistake and that he was the only man who had been honored for exploration in Patagonia without the preliminary formality of visiting that region.

Others among Scott's many travels that stood out particularly in his memory were the trip to the South African meeting of the British Association for the Advancement of Science in 1905, involving a circumnavigation of Africa as well as wide land excursions, and a cruise to the Canal Zone in 1911. At various times he also visited Italy, Spain, Switzerland, Cuba, and many other parts of the world, with Australia and the Far East as the major exceptions. During the long period after he had an established reputation and while he retained full physical vigor, he played an unusually active part in national and international scientific affairs. In the latter field, he was a frequent delegate to the international zoological and geological congresses and to celebrations of foreign universities and societies. In addition to the British Association, he was a member of the Geological, Zoological, and Linnaean Societies of London.

Scott's election to the National Academy of Sciences came in 1906, when he was 48 years of age. This will not seem a very late election to many members of the Academy and forty-one years as a member is exceptional, but Scott indicated, with a touch of naïveté not entirely characteristic of him, that he considered his election long deferred. He ascribed this delay to the enmity of Marsh, who died seven years before Scott's election but who had been a dominating figure in the Academy during the years when Scott was rising to eminence. Scott was more active in the American Philosophical Society, where he had a truly remarkable record. He was elected in 1886 at the age of 28 and was a member for sixty-one years. Until the last few years of his life he missed few meetings except during his trips abroad. He was president of the Society from 1918 to 1925. He was also active in the Paleontological Society, of which he was president in 1911, and the Geological Society of America, president in 1925. He took a friendly interest in the recent organization of the Society of Vertebrate Paleontology, but left the active work of that society to younger colleagues. Among other professional organizations to which he belonged were the American Academy of Arts and Sciences, the Academy of Natural Sciences of Philadelphia, the Academies of Sciences

of New York and of Washington, and the American Association for the Advancement of Science.

Recognition of Scott's work included honorary degrees from the University of Pennsylvania (1906), Harvard (1909), Oxford (1912), and Princeton (1930). The National Academy of Sciences bestowed on him both the Mary Clark Thompson Medal (1930) and the Daniel Giraud Elliot Medal (1940). He also received the Wollaston Medal (1910) of the Geological Society of London, the E. K. Kane Medal (1905) of the Geographical Society of Philadelphia, the F. V. Hayden Medal (1926) of the Academy of Natural Sciences of Philadelphia, the R. A. Penrose Medal (1939) of the Geological Society of America, and the Walker Grand Prize (1934) of the Boston Society of Natural History.

After his retirement in 1930, Scott applied himself with even closer devotion to research, but his other professional activities inevitably tended to become more restricted. His time at home was divided between Princeton and Cataumet (on Cape Cod) and he was a frequent and welcome visitor at the American Museum of Natural History, the Museum of Comparative Zoology at Harvard, and other institutions with collections of interest to him. During this period he undertook and completed his revision of the White River fauna, and followed this with an almost equally ambitious plan to revise the late Eocene Uinta fauna. In spite of his sickly childhood, he retained unusual physical and mental vigor to an advanced age. His powers began visibly to fail only in the last few years of his life and he was at work on the Uinta monograph up to two days before his death, which occurred at Princeton in his ninetieth year on 29 March, 1947.

This brief and formal account of Scott's life has perhaps failed to portray its subject in the round and in full color. If so, the proper corrective is to read Scott's autobiography (1939, listed in the bibliography, below). There he reveals his own admirable character more fully, consciously and unconsciously, than could be achieved by a biographical memoir. He did not have the overpowering presence of Osborn and certainly not the slightly rakish air of some of his other colleagues, but he was

neither weak nor prim. He never wholly lost the reserved manner developed during his boyhood and he insisted on gentlemanly conduct in himself and in others, but he was flatly outspoken on matters of principle and was a charming conversationalist given to delightful sallies of rather dry, always kindly and never improper humor.

It is one result of his long life that most of those who can now write of Scott were separated from him by one or two generations. To us he became during his lifetime an almost fabulous link with the heroic past. The young and even the middle-aged Scott tends to elude us, except as he could be glimpsed through his own phenomenal memory and the introspection of his later years. As we knew him and as he revealed himself, he was characterized by mild but steadfast character, by unflinching integrity, by unassuming worth, and by "a mind at leisure from itself" (as he quoted on his eightieth birthday). His life was a masterpiece, long and full of happiness and of achievement.

(NOTE: This account of Scott's life has drawn heavily on his autobiography, published by the Princeton University Press. Some information has also kindly been supplied by Dr. G. L. Jepsen.)

2. *Works*

Throughout his career, the great bulk of Scott's published works consisted of descriptive studies of fossil mammals. This generalization fails, however, to convey an adequate idea either of the development or of the full scope of his research. This work was marked by common themes and by considerable continuity, but it can be divided into four intergrading periods. The earliest period began with his first technical publication in 1878 and lasted, approximately, through the 1880's. These were more or less the 20th to 30th years of Scott's life, and the important output of these years demonstrates the fact that Scott not only remained active to a great age but was also precocious. In this period Scott published his few embryological studies, products of his graduate work, and the first of many monographs on fossil mammals. A number of these papers were written jointly with Osborn, who was also at Princeton during

this period. Osborn went to New York in 1891 and collaboration then ceased although friendship continued.

Scott's second period covered roughly the decade of the 1890's and the 30's of Scott's life. It was (in this reviewer's opinion) the time of his greatest powers as a research student, characterized by a series of monographs of highest value and also by brief but searching discussions of evolutionary theory. The third and longest period, from around 1900 until the early thirties, was dominated by one great project, the Patagonian memoirs, and by the production of several textbooks. There was increasing maturity and no diminution of vigor in his work, but there was some narrowing of its breadth or depth, except as wider interests were reflected in compilation of his books. The last period, in the declining years of his eighth and ninth decades, were devoted almost exclusively to two projects, the White River monograph and the similar but uncompleted Uinta monograph.

Among Scott's outstanding contributions to the study of evolution were two memoirs, both published in 1891, the first on *Poebrotherium* and the second on *Mesohippus* and *Leptomeryx*. Besides the descriptive parts of these papers, the first included a list of what Scott considered the most important questions regarding evolution and the second attempted to answer these questions from the paleontological point of view. These treatments are of such exceptional interest for the history of paleontology and biology that it is worth while to summarize them here. The main questions and the gist of Scott's answers were as follows:

Regarding the "mode" of evolution, by which Scott meant the so-called "laws" or morphogenetic principles of evolution:

1. Are polytypic genera monophyletic or polyphyletic in origin? The genetical genera of taxonomic theory are monophyletic by definition. The morphological genera of practice are probably often of polyphyletic origin because of the widespread incidence of parallelism and convergence.

2 and 3. How are parallelism and convergence possible and to what extent have they occurred? Parallelism and conver-

gence, which are different degrees of the same phenomenon, are common results of the modification of different groups to achieve similar evolutionary ends. Both are extremely widespread in the historical record and they demand close attention to morphological differences if that record is to be read correctly.

4. Can a structure which has once been lost ever be regained? Paleontology cannot give a conclusive answer; it is probable that such a process can occur but rarely does.

5. Does evolution tend to move steadily in one direction? This seems to be normal, but not quite universal, in mammals. The generalization may not be valid for lower forms of life.

6. In higher animals, does advancing differentiation always involve reduction in numbers of parts? It normally does so. Reduplication can theoretically occur but is exceptional.

7. Does such reduction always occur in the same way in different lines? The mode of reduction is generally very uniform, in mammals, at least.

8. (As an example of many questions of a more special character—) What effects follow by mechanical necessity from great increase or decrease in body size? (Scott specified a number of such effects and showed them to be quite general.)

This really extraordinary list shows how progressive Scott was at that time and how much more morphogenetic theory owes to him than is now commonly realized. Although none of these points was, or was claimed to be, completely original with Scott, he is here seen to have discussed "Dollo's Law" (4) before Dollo, "Williston's Law" (6) before Williston, graviportal adaptation (8) before Osborn, orthogenesis (5) before Haacke or Eimer (indeed, before the term was invented), etc.

On the broader problem of the causes of evolution, which he called "factors" as opposed to "modes," Scott strongly criticized Weissmannian neo-Darwinism and took a definitely, although not extremely, neo-Lamarckian position. In a critical review of Bateson's work, Scott later (1894) maintained that random and discontinuous variations (i.e., very nearly mutations in the later genetical sense) have little to do with evolution, which normally proceeds by continuous and oriented change (mutation

in the original sense of Waagen, not in that of the later geneticists).

It is characteristic of this period of Scott's work that these broad and profound theoretical discussions were the outcome of and were appended to descriptions of particular fossils. Most of his monographs of various groups and genera were considerably more than mere description, important as were the descriptions as accurate, factual additions to knowledge. Among many other examples of major studies that oriented morphology against a broad background of phylogeny and theory may be mentioned such publications as his revision of the oreodonts (1890), several basic studies of the creodonts (e.g. 1888, 1892), revisions of the Uinta (1889) and Deep River (1893) faunas, and monographs on *Dinictis* (1889), *Ancodus* (1894), *Hyaenodon* (1894), *Protoceras* (1895), *Elotherium* (1898), and Eocene selenodont artiodactyls (1899).

After Hatcher's highly successful expeditions to Patagonia, Scott assumed the long and arduous task of editing the whole series of reports and writing some of those on Miocene (Santa Cruz) mammals. This work was begun in 1900 and continued, with an interruption during the first World War, until 1932 when the last of fifteen (nominally eight) luxurious volumes was issued. Aside from research in Princeton, it involved for Scott the voyage to the Argentine mentioned above and also several trips to Germany, where the earlier volumes were printed. Scott's own contributions were more narrowly morphological and taxonomic than much of his earlier work, but they were outstandingly good within their scope. In addition to their great and permanent factual value, they brought order and reason into an important field of study that was in a really chaotic condition when Scott entered it.

As an outgrowth of his teaching, Scott had written a textbook of geology, first published in 1897, and during the period of work on the Patagonian reports he twice thoroughly revised and expanded this (1907, 1932). During this period he also published a textbook of physiography (1922) and a book on evolution (1917), in which he stressed the evidence for the reality of organic evolution more than the theoretical principles

as to how and why evolution has occurred. A more direct outcome of his personal research and perhaps the most valuable of all his books was "A history of land mammals in the Western Hemisphere" (1913), in which he summarized all that was known of the history, characteristics, phylogeny, and distribution of mammals in North and South America. A revised edition of this book, issued in 1937, was so completely rewritten and brought up to date (with help from G. L. Jepsen and others) that it might be considered a new production. This work is truly a paleontological classic and is one of the most valuable text and reference books available to the mammalogist, paleo- or neo-. It has one peculiarity: Scott intended it as a popular book, although it is commonly considered far too technical for the general reader, and he felt that for this audience it was preferable to take up the history in the reverse of the usual order, starting with the recent and more familiar and working backward through time. This peculiarity, which is mentioned for its interest regarding Scott's work and personality and not as a criticism, was retained in the revision, over the protests of some of Scott's colleagues (but with the approval of some others).

In 1934, in his seventy-seventh year, Scott undertook another major research task, the revision of the White River fauna. With the assistance of Scott's successor, Jepsen, and with two of the smaller sections written by A. E. Wood, this was completed and was published in five quarto parts by the American Philosophical Society, 1936-1941. One more smaller study, on the Duchesne River fauna, was completed and published under the same auspices (1945), but another major project, on the Uinta fauna, was left unfinished.

There is no doubt that Scott will occupy a permanent and high place in the history of his science. He and Osborn dominated vertebrate paleontology in America, one might say in the world, as Marsh and Cope had in the preceding generation. The parallel can be pushed a little further, for Scott and Marsh were both at their best in dealing with practical and theoretical morphology, while Osborn and Cope were by preference and temperament theoreticians in a broader sense and tended to consider

morphology as a somewhat wearisome necessity. In personality and in the effect of personality on science, Scott and Osborn happily did not parallel Marsh and Cope. They cooperated with each other, remained firm friends, and passed on a tradition of mutual helpfulness to their successors. They encouraged and aided younger men to enter their profession, and the great expansion of this profession in the last few decades is due in large measure to them.

Without disparagement but as a dispassionate judgment such as he would have welcomed, a review of Scott's career leads to a feeling of regret in just one respect. He tremendously advanced the science of paleontology as he found it, but he made few noteworthy innovations in its methods or principles and contributed little of a fundamental nature for integration with the broader fields of biology or geology. This is the more regrettable and the harder to understand when the achievement and apparent greater promise of his 30's are considered. Already in his 40's, when most biologists or geologists of his stature are reaching greatest fulfillment, his outlook was becoming narrower and his insight into the deeper problems of his subject seems to have ceased to develop, or even to have retrogressed. It is significant that when he heard a discussion of Mendelism and evolution in 1904 his reaction was to repeat "Uncle Jack Robinson's formula, 'Mebbe it is, but I don't believe it.'" It is still more significant that he could write in 1937 that he had found no need "to abandon any of the tentative conclusions concerning the modes and factors of mammalian evolution which were formulated so many years ago." To the end of his life, the only apparent change from his views from the 1890's was an increasing disillusionment. He remained anti-Darwinian and retreated from his cautious neo-Lamarckism without finding anything to replace it, so that evolution became for him simply inexplicable. He had earlier (in 1913) expressed a hope that experimental zoology and paleontology might solve these problems by combining their resources, but he saw no real basis for such a synthesis and did nothing to promote it.

The slight feeling of regret that Scott did not accomplish still more is in itself a tribute to how much he did accomplish. No

one wishes that mediocrity had been more fully expressed, but one does wish that Scott's exceptionally well balanced mind and profound knowledge had been more fully expressed on levels of higher abstraction. Even this appreciative wish would not be a proper note on which to end the evaluation. Scott's disillusionment with attempts to explain evolution and his retreat from theory occurred in a period when the basic study of evolution had fallen into confusion and when many despaired of achieving a reasonable and valid generalization. Some students reacted by proposing solutions that seem, in retrospect, merely bizarre, or by clinging blindly to solutions clearly discredited. Others lost faith in scientific method and sought refuge in views covertly or overtly metaphysical. Scott saw the difficulties and it is wholly to his credit that his intellectual honesty and his faith in objective science prevented his entering the false paths followed by so many of his colleagues.

Scott's unusually long career was also unusually productive. His material contributions to mammalian paleontology fill many volumes. There is hardly any phase of this subject that does not depend today, in some measure, on studies first made by him.

KEY TO ABBREVIATIONS USED IN BIBLIOGRAPHY

Acad. Nat. Sci. Phila. Proc. = Academy of Natural Sciences, Philadelphia, Proceedings
Amer. Assn. Adv. Sci. Proc. = American Association for the Advancement of Science, Proceedings
Amer. Geol. = American Geologist
Amer. Journ. Sci. = American Journal of Science
Amer. Mus. Nat. Hist. Bull. = American Museum of Natural History, Bulletin
Amer. Nat. = American Naturalist
Amer. Phil. Soc. Proc. = American Philosophical Society, Proceedings
Ann. Mag. Nat. Hist. = Annals and Magazine of Natural History
British Assoc. Adv. Sci. = British Association for the Advancement of Science
Carnegie Mus. Ann. = Carnegie Museum Annals
Contr. E. M. Mus. Geol. Arch. = Contributions from the E. M. Museum of Geology and Archeology of Princeton College
Field Mus. Nat. Hist. Geol. Mem. = Field Museum of Natural History Geology Memoirs
Geol. Mag. = Geological Magazine
Geol. Soc. Amer. Bull. = Geological Society of America Bulletin
Harvard Coll. Mus. Comp. Zool. Bull. = Harvard College, Museum of Comparative Zoology, Bulletin
Internat. Mo. = International Monthly
Journ. Morph. = Journal of Morphology
Journ. Roy. Micro. Soc. = Journal of the Royal Microscopical Society
Morph. Jahr. = Morphologisches Jahrbuch
Princeton Coll. Bull. = Princeton College Bulletin
Princeton Morph. Studies = Princeton Morphological Studies
Quart. Journ. Micro. Sci. = Quarterly Journal of Microscopical Science
Sci. Amer. Suppl. = Scientific American Supplement
Sci. Mo. = Scientific Monthly
Scribner's Mag. = Scribner's Magazine
Smith. Inst. Ann. Rept. = Smithsonian Institution Annual Report
Studies, Morph. Lab. = Studies from the Morphological Laboratory of Cambridge University
Wyo. Hist. Geol. Soc. Proc. Coll. = Wyoming Historical and Geological Society, Proceedings and Collections
Zool. Anz. = Zoologischer Anzeiger

3. BIBLIOGRAPHY

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1878

Palaeontological report of the Princeton scientific expedition of 1877. (With Henry Fairfield Osborn and Francis Speir, jr.) Contr. E. M. Mus. Geol. Arch., vol. 1, pp. 1-146.

1879

On some points in the early development of the common newt. (With Henry Fairfield Osborn.) Quart. Journ. Micro. Sci., n.s. 19, pp. 449-475.

1880

On some points in the early development of the common newt. (With Henry Fairfield Osborn.) Studies, Morph. Lab., vol. 1, no. 1, pp. 34-61.

Vorläufige Mittheilung über die Entwickelungsgeschichte der Petromyzonten. Zool. Anz., vol. 3, no. 63, pp. 422-426, 443-446.

1881

Development of *Petromyzon* (the lamprey). Journ. Roy. Micro. Soc., ser. 2, vol. 1, pp. 425-428.

Preliminary account of the development of the lampreys. Quart. Journ. Micro. Sci., n. s. 21, pp. 146-153.

1882

Orthocynodon, an animal related to the *Rhinoceros,* from the Bridger Eocene. (With Henry Fairfield Osborn.) Ann. Mag. Nat. Hist., ser. 5, vol. 10, pp. 332-334.

Orthocynodon, an animal related to the *Rhinoceros,* from the Bridger Eocene. (With Henry Fairfield Osborn.) Amer. Journ. Sci., ser. 3, vol. 24, pp. 223-225.

Preliminary report upon the Princeton scientific expedition of 1882. (With W. F. Magie.) Princeton, N. J., C. S. Robinson & Co., 8 pp.

Beiträge zur Entwicklungsgeschichte der Petromyzonten. Morph. Jahr., vol. 7, pp. 101-172.

Report of the assistant in geology for the year 1881-1882. E. M. Mus. Geol. Arch., 1st Annual report, pp. 7-8.

1883

On *Desmatotherium* and *Dilophodon,* two new Eocene Lophiodonts. Contr. E. M. Mus. Geol. Arch., Bull. 3, pp. 46-53.

On the development of teeth in the lamprey. Science, vol. 2, pp. 731-732.

On the development of the pituitary body in *Petromyzon,* and the significance of that organ in other types. Science, vol. 2, pp. 184-186.

On the skull of the Eocene rhinoceros, *Orthocynodon*, and the relation of this genus to other members of the group. (With Henry Fairfield Osborn.) Contr. E. M. Mus. Geol. Arch., Bull., vol. 3, no. 1, pp. 3-22.

1884

On the origin and development of the *Rhinoceros* group. (With Henry Fairfield Osborn.) British Assoc. Adv. Sci., Report for 53rd meeting, 1883, p. 528.

A new marsupial from the Miocene of Colorado. Amer. Journ. Sci., ser. 3, vol. 27, pp. 442-443.

1885

A fossil elk or moose from the Quaternary of New Jersey. Science, vol. 5, pp. 420-422.

The osteology of *Oreodon*. Amer. Assn. Adv. Sci. Proc., vol. 33, pp. 492-493.

Toxodontia. In volume 5, Mammalia, of J. Sterling Kingsley, editor, "The Standard Natural History by the leading American scientists." Boston, Cassino.

1886

Cervalces americanus, a fossil moose, or elk, from the Quaternary of New Jersey. Acad. Nat. Sci. Phila. Proc., 1885, pp. 181-202.

On some new forms of the Dinocerata. Amer. Journ. Sci., ser. 3, vol. 31, pp. 303-307.

Some points in the evolution of the horses. Science, vol. 7, p. 13.

Tinoceras stenops. Amer. Nat., vol. 20, p. 316.

1887

Preliminary account of the fossil mammals from the White River formation, contained in the Museum of Comparative Zoology. (With Henry Fairfield Osborn.) Harvard Coll. Mus. Comp. Zool. Bull., vol. 13, No. 5, pp. 151-171.

Preliminary report on the vertebrate fossils of the Uinta formation, collected by the Princeton Expedition of 1886. (With Henry Fairfield Osborn.) Amer. Phil. Soc. Proc., vol. 24, pp. 255-264.

American elephant myths. Scribner's Mag., vol. 1, pp. 469-478.

Notes on the development of *Petromyzon*. Journ. Morph., vol. 1, No. 2, pp. 253-310.

1888

On some new and little known creodonts. Acad. Nat. Sci., Phila. Journ. ser. 2, vol. 9, No. 2, pp. 155-185.

Origin of American Carnivora. Amer. Assn. Adv. Sci. Proc. 36th meeting, 1887, p. 258.

Remarks on the Development of *Petromyzon*. Amer. Assn. Adv. Sci. Proc. 36th meeting, 1887, pp. 257-258.

The upper Eocene lacustrine formations of the United States. Amer. Assn. Adv. Sci. Proc. 36th meeting, 1887, p. 217.

1889

A comparison of the American and European Tertiary Mammalia. Princeton Coll. Bull., vol. 1, No. 1, pp. 20-21.

European fossil vertebrates lately added to the museum. Princeton Coll. Bull., vol. 1, No. 1, pp. 21-22.

A German Rome. Scribner's Mag., vol. 5, No. 3, pp. 286-305.

Notes on the osteology and systematic position of *Dinictis*. Princeton Coll. Bull., vol. 1, No. 4, p. 112.

Notes on the osteology and systematic position of *Dinictis felina*, Leidy. Princeton Coll. Bull., vol. 1, p. 112.

The Oreodontidae. Princeton Coll. Bull., vol. 1, No. 3, pp. 75-77.

1890

Beiträge zur Kenntnis der Oreodontidae. Morph. Jahr., vol. 16, No. 2, pp. 319-395.

The dogs of the American Miocene. Princeton Coll. Bull., vol. 2, No. 2, pp. 37-39.

The Mammalia of the Uinta formation. Part I. The geological and faunal relations of the Uinta formation. Part II. The Creodonta, Rodentia and Artiodactyla. Amer. Phil. Soc. Trans., n. s. 16, pp. 461-504.

The Mammalia of the Uinta formation. Princeton Coll. Bull., vol. 2, no. 2, pp. 46-47.

Notes on the osteology and systematic position of *Dinictis felina*, Leidy. Acad. Nat. Sci. Phila. Proc. 1889, pp. 211-244.

1890-1891

Preliminary account of the fossil mammals from the White River and Loup Fork formations, contained in the Museum of Comparative Zoology. Part II. The Carnivora and Artiodactyla (With Henry Fairfield Osborn). Harvard Coll. Mus. Comp. Zool. Bull., vol. 20, pp. 65-87.

1891

On the mode of evolution in the Mammalia. Princeton Coll. Bull., vol. 3, No. 3, pp. 62-68.

On the osteology of *Mesohippus* and *Leptomeryx*, with observations on the modes and factors of evolution in the mammalia. Journ. Morph., vol. 5, no. 3, pp. 301-406.

On the osteology of *Poebrotherium:* a contribution to the phylogeny of the Tylopoda. Journ. Morph., vol. 5, no. 1, pp. 1-78.

The osteology of *Poebrotherium*. Princeton Coll. Bull., vol. 3, no. 4, pp. 95-96.

The osteology of *Poebrotherium* and descent of the camels. Princeton Coll. Bull., vol. 3, no. 2, p. 45.

The Princeton scientific expedition of 1891. Princeton Coll. Bull., vol. 3, no. 4, pp. 88-91.

1892

The evolution of the premolar teeth in the mammals. Princeton Coll. Bull., vol. 4, No. 4, pp. 74-76.

The genera of American Creodonta. Princeton Coll. Bull., vol. 4, No. 4, pp. 76-81.

On some of the factors in the evolution of the Mammalia. Princeton Coll. Bull., vol. 4, no. 1, pp. 11-17.

A revision of the North American Creodonta with notes on some genera which have been referred to that group. Acad. Nat. Sci. Phila. Proc., pp. 291-323.

1893

The evolution of the premolar teeth in the mammals. Acad. Nat. Sci. Phila. Proc. 1892, pp. 405-444.

The mammals of the Deep River Beds. Amer. Nat., vol. 27, pp. 659-662.

On a new musteline from the John Day Miocene. Amer. Nat., vol. 27, pp. 658-659.

The Princeton scientific expedition of 1893. Princeton Coll. Bull., vol. 5, No. 4, pp. 80-84.

Syllabus of a course of ten lectures on historical geology. Wagner Free Inst. Sci., Spring Term 1893.

1894

The later Tertiary lacustrine formations of the West. Geol. Soc. Amer. Bull., vol. 5, pp. 594-595.

The mammalian fauna of the Deep River beds. Princeton Coll. Bull., vol. 6, No. 3, pp. 76-78.

The manus of *Hyopotamus*. Amer. Nat., vol. 28, pp. 164-165.

Notes on the osteology of *Agriochoerus* Leidy (*Artionyx* O. & W.). Amer. Phil. Soc. Proc., vol. 33, pp. 243-251.

Notes on the osteology of *Agriochoerus* Leidy (*Artionyx* O. & W.) Princeton Coll. Bull., vol. 6, No. 4, pp. 98-100.

Notes on the osteology of *Ancodus (Hyopotamus)*. Geol. Mag., decade 4, vol. 1, pp. 492-493.

On variations and mutations. Amer. Journ. Sci., ser. 3, vol. 48, pp. 355-374.

Syllabus of a course of ten lectures on historical geology. Wagner Free Inst. Sci., No. 31, 11pp. (No date but probably 1894.)

1895

A new insectivore from the White River beds. Acad. Nat. Sci. Phila. Proc. 1894, pp. 446-448.

On the Creodonta. British Assoc. Adv. Sci. Report for 65th meeting, pp. 719-720.

On the Tertiary lacustrine formations of North America. British Assoc. Adv. Sci. Report for 65th meeting, pp. 681-682.

The osteology and relations of *Protoceras*. Journ. Morph., vol. 11, No. 2, pp. 303-374.

The osteology of *Hyaenodon*. Acad. Nat. Sci. Phila. Journ., ser. 2, vol. 9, No. 4, pp. 499-536.

A restoration of *Hyaenodon*. Geol. Mag., decade 4, vol. 2, pp. 441-443.

Review of: H. F. Osborn and Ch. Earle "Fossil mammals of the Puerco beds" Amer. Mus. Nat. Hist. Bull., vol. 7, No. 1, pp. 1-70. *In:* Sci., n. s. 1, pp. 660-661.

The structure and relationships of Ancodus. Acad. Nat. Sci. Phila. Journ., ser. 2, vol. 9, No. 4, pp. 461-497.

1896

Antarctic paleontology. Sci. n. s. 3, pp. 307-310.

The mammalia of the Deep River beds. Amer. Phil. Soc. Trans. n. s. 18, pp. 55-185.

Notes on the development of *Petromyzon*. Princeton Morph. Studies, vol. 1, No. 1, 1883-1892. (reprint of article in Journ. Morph., vol. 1, No. 2, pp. 253-310, December 1887).

On the osteology of *Elotherium*, Pomel. 3rd Congres International de Zoologie, Leyden 1895, Compte Rendu, pp. 317-319.

Die Osteologie von *Hyracodon* Leidy. Festschrift zum siebenzigsten geburtstage von Carl Gegenbaur, vol. 2, pp. 351-384, Leipsig, Engelmann.

Palaeontology as a morphological discipline. Science, n. s. 4, pp. 177-188.

Palaeontology as a morphological discipline. Biological Lectures delivered at the Marine Biological Laboratory of Wood's Hole in the summer session of 1895, pp. 43-61.

Protoptychus hatcheri, a new rodent from the Uinta Eocene. Acad. Nat. Sci. Phila. Proc. 1895, pp. 269-286.

A question of priority. Amer. Geol., vol. 17, p. 58.

1897

Glaciers. Sci. Amer. Suppl., vol. 44, pp. 18005-18006.

An introduction to geology. New York, Macmillan, 573 pp.

Lakes. Sci. Amer. Suppl., vol. 43, pp. 17756-17758.

The osteology of *Hyracodon*. Princeton Univ. Bull., vol. 9, No. 1, pp. 11-13.

Preliminary notes on the White River Canidae. Princeton Univ. Bull., vol. 9, No. 1, pp. 1-3.

Syllabus of a course of ten lectures on historical geology. Wagner Free Inst. Sci., No. 60.

Syllabus of a course of ten lectures on physiographical Geology. Wagner Free Inst. Sci., No. 55.

1898

Memoir of Edward D. Cope. Geol. Soc. Amer. Bull., vol. 9, pp. 401-408.

The methods of palaeontological inquiry. Biological Lectures delivered at The Marine Biological Laboratory of Wood's Hole, 1896-1897, pp. 59-78.

Notes on the Canidae of the White River Oligocene. Amer. Phil. Soc. Trans. n. s. 19, pp. 325-415.

The osteology of *Elotherium*. Amer. Phil. Soc. Trans., n. s. 19, pp. 273-324.

Preliminary note on the selenodont Artiodactyls of the Uinta formation. Amer. Phil. Soc. Proc., vol. 37, pp. 73-81.

The Princeton expedition to Patagonia. Princeton Univ. Bull., vol. 10, No. 2, pp. 25-27.

Syllabus of a course of ten lectures on dynamical geology. Wagner Free Inst. Sci., No. 65.

Thirty years of geological progress in North America. Pages 21-30 *in*: Addresses delivered at a celebration in honor of Professor Thomas Conrad Porter, D.D., LL.D., at Lafayette College, October 20, 1897. Easton, Pennsylvania, Chemical Publishing Co.

1899

North American ruminant-like mammals. Biological Lectures from The Marine Biological Laboratory, Wood's Hole, Massachusetts, 1898, pp. 243-264.

The selenodont artiodactyls of the Uinta Eocene. Wagner Free Inst. Sci. Phila. Trans., vol. 6, pp. v-121.

Third Princeton expedition to Patagonia. Science, n. s. 10, pp. 580-581.

1900

Contributions to geology. Amer. Phil. Soc. Proc. (Memorial volume 1), pp. 303-314.

The mammalian fauna of the Santa Cruz beds of Patagonia. Science, n. s. 12, pp. 937-940.

Notes on the geology and paleontology of Patagonia. Geol. Mag., decade 4, vol. 7, p. 470.

Notes on the geology and palaeontology of Patagonia. British Assoc. Adv. Sci., Report for 70th meeting, Bradford, p. 730.

Säugethierfauna der Santa-Cruz-Schichten in Patagonien. Naturwissenschaftliche Rundschau, vol. 16, No. 8, pages 94-96.

1901

Earth-carving. Sci. Amer. Suppl., vol. 52, p. 21456.

The evolution of the Mammalia. Internat. Mo., vol. 4, pp. 21-47, 224-250.

La geologie de la Patagonie. 8e Congres Geologique International, Paris 1900, Compte Rendu, vol. 2, pp. 747-748.
Historical Geology. Sci. Amer. Suppl., vol. 52, pp. 21352-21353.

1903

The Edentata of the Santa Cruz beds. Science, n. s. 17, pp. 900-904.
Editor's preface. Reports of the Princeton University Expeditions to Patagonia, 1896-1899. Vol. 1, pp. vii-x, December 8, 1902. Princeton, N. J., The University.

1903-1904

The Princeton expeditions to Patagonia. Princeton Univ. Bull., vol. 14, No. 3, pp. 109-112.
Mammalia of the Santa Cruz beds. I. Edentata. Reports of the Princeton University Expeditions to Patagonia, 1896-1899. 5, Palaeontology, vol. 2, pp. 1-364, July 15, November 4, 1903; September 5, 1904.

1904

John Bell Hatcher. Science, n. s. 20, pp. 139-142.

1905

The geology and palaeontology of Patagonia. Wyo. Hist. Geol. Soc. Proc. Coll., vol. 9, pp. 33-46.
Mammalia of the Santa Cruz beds. II. Insectivora. III. Glires. Reports of the Princeton University Expeditions to Patagonia, 1896-1899. 5, Palaeontology, vol. 2, pp. 365-499.
The mammalian fauna of the Santa-Cruz beds of Patagonia. 6me Congres International de Zoologie, Berne 1904, Compte Rendu, pp. 241-247.
Memoir of John B. Hatcher. Geol. Soc. Amer. Bull., vol. 16, pp. 548-555.
The Miocene ungulates of Patagonia. (abst.) British Assoc. Adv. Sci., Report for 74th meeting, London 1904, pp. 589-590.

1906

Convergent evolution, as illustrated by the Litopterna, a group of fossil Ungulata in Patagonia. British Assoc. Adv. Sci., Report for 75th meeting, 1905. p. 443.

1907

A collection of fossil mammals from the coast of Zululand. Natal. Surveyor-General's Dept. 3rd and final Report of the Geological Survey of Natal and Zululand, pp. 253-262.
La correlation des formations tertiaires et quaternaires dans l'Amerique du Sud. pages 465-470 in: "Nouvelles Recherches sur la Formation Pampeenne et l'homme fossile de la Republique Argentine," ed. by Robert Lehmann-Nitsche. Revista del Museo de la Plata 14 (series 2, vol. 1), pp. 143-488.
An introduction to geology. New York, Macmillan, 2nd edition, 816 pp.

1909

The palaeontological record. I. Animals. Chapter XI, pp. 185-199 *in*: A. C. Seward "Darwin and Modern Science", New York, Putnam.

1910

The Litopterna of the Santa Cruz beds. Reports of the Princeton University Expeditions to Patagonia, 1896-1899. 7, Palaeontology, vol. 4, part 1, pp. 1-156.

1912

Mammalia of the Santa Cruz beds. II. Toxodonta. III. Entelonychia. Reports of the Princeton University Expeditions to Patagonia, 1896-1899. 6, Palaeontology, vol. 3, pp. 111-300.

1913

A history of land mammals in the western hemisphere. New York, Macmillan, 693 pages.

Restoration of Tertiary mammals. Geol. Soc. Amer. Bull., vol. 24, pp. 105-106.

1914

Syllabus of lectures on the theory of evolution. Six lectures under the auspices of the Westbrook Free Lectureship, delivered February 14, 21, 28 and March 7, 14, 21, 1914. Wagner Free Inst. Sci.

1916

The Isthmus of Panama in its relation to the animal life of North and South America. Science, n. s. 43, pp. 113-24.

1917

The theory of evolution, with special reference to the evidence upon which it is founded. New York, Macmillan, 183 pages.

1921

Influence of geography on history. Princeton Lectures number 6, 8 pp. Princeton Univ., Princeton, N. J.

1922

Physiography, the science of the abode of man. New York, Collier, 384 pp.

1923

Symposium on the inheritance of acquired characters. Historical sketch. Amer. Phil. Soc. Proc., vol. 62, No. 5, pp. 270-273.

1924

Leidy's paleontological and geological work. Sci. Mo., vol. 18, No. 4, pp. 433-439.

Paleontological and geological work of Joseph Leidy. Acad. Nat. Sci. Phila. Proc., vol. 75, (Appendix—The Joseph Leidy Commemorative meeting, December 6, 1923) pp. 36-43.

1926

Geological climates. Geol. Soc. Amer. Bull., vol. 37, No. 1, pp. 261-278.

1927

Development of American palaeontology. Amer. Phil. Soc. Proc., vol. 66, pp. 409-429.

Undergraduate and graduate days, 1873-1878, pp. 12-34 *in*: H. F. Osborn, editor, "Fifty years of Princeton '77." Princeton, N. J.

1928

The geographical distribution of animals. pp. 81-101, *in*: Frances Mason, editor, "Creation by Evolution, a consensus of present day knowledge as set forth by leading authorities," New York, Macmillan.

Geological climates. Smith. Inst. Ann. Rept. 1927, pp. 271-287.

Mammalia of the Santa Cruz beds. IV. Astrapotheria. V. Primates. Reports of the Princeton University Expeditions to Patagonia, 1896-1899. 6, Palaeontology, vol. 3, pp. 301-352.

The origin of the mammalian faunas of North and South America. Palaeo-biologica, Jahrgang 1, Band 1, pp. 253-262.

Reports of the Princeton University Expeditions to Patagonia, 1896-1899. Amer. Phil. Soc. Proc., vol. 67, No. 2, pp. 119-122.

Some applications of paleontology. Science, n. s. 67, pp. 327-333.

1929

Syllabus of four lectures on volcanoes and vulcanism, March 2, 9, 16, 23, 1929. Wagner Free Inst. Sci.

1930

Extinction of Pleistocene mammals. Geol. Soc. Amer. Bull., vol. 41, No. 1, pp. 104-105.

Extinction of Pleistocene mammals. Pan-American Geologist, vol. 53, No. 2, p. 140; No. 4, pp. 303-304.

On certain Silurian fish-like forms from Norway. Amer. Phil. Soc. Proc., vol. 69, No. 6, pp. 391-396.

A partial skeleton of *Homalodontotherium* from the Santa Cruz beds of Patagonia. Field Mus. Nat. Hist. Geol. Mem., vol. 1, No. 1, pp. 7-34.

1932

An introduction to geology. New York, Macmillan, 3rd edition, volume 1, physical geology, 604 pp.; volume 2, historical geology, 485 pp.

Nature and origin of the Santa Cruz fauna. With additional notes on the Entelonychia and Astrapotheria. Reports of the Princeton University

Expeditions to Patagonia, 1896-1899. 7, Palaeontology, vol. 4, part 3, pp. 193-238.

1934

Excerpts from letters *in*: Huxley, Leonard—An American student in Huxley's laboratory. From the letters of Professor W. B. Scott. Cornhill Magazine, vol. 149, pp. 679-693.

1936

The Astrapotheria. Geol. Soc. Amer. Proc. for 1935, p. 392.

The mammalian fauna of the White River Oligocene. Part I. Insectivora and Carnivora. (With Glenn L. Jepsen.) Amer. Phil. Soc. Trans. n. s. 28, No. 1, pp. 1-153.

The laws of mammalian evolution. Sci. Mo., vol. 43, No. 5, pp. 421-429.

1937

The Astrapotheria. Amer. Phil. Soc. Proc., vol. 77, No. 3, pp. 309-393.

A history of land mammals in the western hemisphere. New York, Macmillan. Revised edition, 786 pp.

Paradoxical fossil mammal from the Uinta formation of northeastern Utah. Geol. Soc. Amer. Proc. 1936, p. 376.

A remarkable sabretooth-like creodont from the Eocene of Utah. Science, n. s. 85, pp. 454-455.

1938

The camel-like ruminants of North America. Science, n. s. 87, p. 465.

The Oligocene-Eocene boundary in the Rocky Mountain and Pacific Coast regions. Science, n. s. 88, p. 437.

A problematical cat-like mandible from the Uinta Eocene, *Apataelurus kayi*, Scott. Carnegie Mus. Ann., vol. 27, No. 6, pp. 113-120.

White River Artiodactyla. Science, n. s. 88, pp. 503-504.

1939

Memorial to William John Sinclair. Geol. Soc. Amer. Proc. 1938, pp. 185-189.

Some memories of a palaeontologist. Princeton, New Jersey, Princeton University Press, 336 pp.

Vertebrate paleontology since 1888. Geol. Soc. Amer. Bull., vol. 50, No. 3, pp. 375-386.

1940

The mammalian fauna of the White River Oligocene. Part 4, Artiodactyla. Amer. Phil. Soc. Trans., n. s. 28, No. 4, pp. 363-746.

1941

The mammalian fauna of the White River Oligocene. Part 5, Perissodactyla. Amer. Phil. Soc. Trans., n. s. 28, No. 5, pp. 747-980.

1942

The later Cenozoic mammalian faunas of South America. 8th American Scientific Congress, Washington, D. C. 1940, Proc. vol. 4, pp. 333-357.

1945

The mammalia of the Duchesne River Oligocene. Amer. Phil. Soc. Trans., n. s. 34, No. 3, pp. 209-253.

Memorial to Henry Fairfield Osborn. Geol. Soc. Amer. Proc., vol. Ann. rept. 1944, pp. 287-292.

No date

Syllabus of a course of ten lectures on geology. Fall Term, Wagner Free Inst. Sci., no date. (Probably 1891).

Syllabus of a course of ten lectures on dynamical and structural geology. Wagner Free Inst. Sci., no date, 16 pp. (Probably published between 1891 and 1894 or in 1899 or 1900.)

Syllabus of a special course of ten lectures on historical geology. Wagner Free Inst. Sci., no date. (Probably 1892.)