

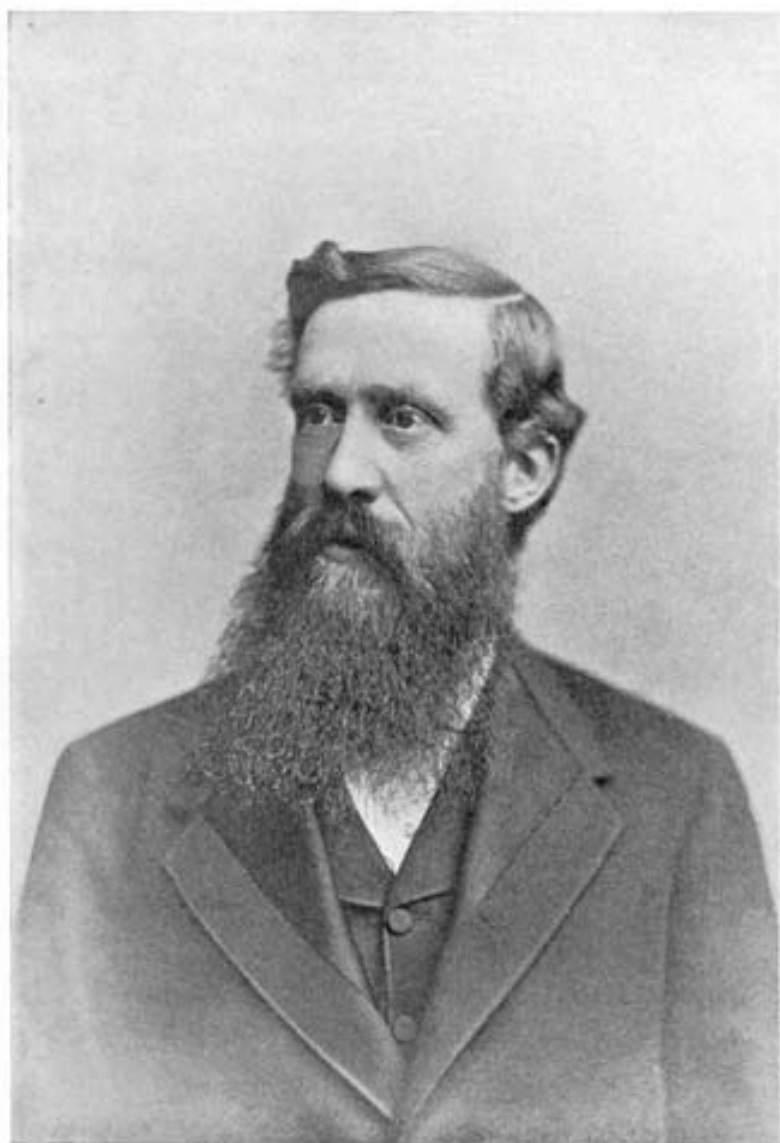
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BIOGRAPHICAL MEMOIR
OF
ELLIOTT COUES
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BY
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BIOGRAPHICAL MEMOIR OF ELLIOTT COUES.

ELLIOTT COUES* was born in the town of Portsmouth, New Hampshire, September 9, 1842, and died in the Johns Hopkins Hospital, in Baltimore, Maryland, December 25, 1899, at the age of 57 years, the immediate cause of death being a grave surgical operation for an affection of the throat. He was a son of Samuel Elliott and Charlotte (Haven) Coues.

Dr. Coues† came of excellent New England ancestry. The first of the Coues line to settle in America was Peter Coues, great-grandfather of Elliott Coues, who was born in the Parish of Saint Peters, Island of Jersey, Channel Islands, and came to Portsmouth, New Hampshire, about 1735, where he was married November 4 of the same year, and where he died at an advanced age, about 1783. His son, grandfather of the subject of this memoir, was Captain Peter Coues, born in Portsmouth, New Hampshire, July 30, 1736, where he died November 29, 1818, at the age of eighty-two years. In early life he was a sea captain, and for a time an officer in the British Navy, but he returned to Portsmouth some time before the beginning of the American Revolution. Here he spent the remainder of his life, becoming a prominent citizen and one of the founders of the Universalist Church of Portsmouth. It is a family tradition that he was at one time sailing master of the famous *Royal George*, which cap-sized and sank in the roadstead at Spithead, England, in August, 1782. A number of Captain Coues's relatives were also officers in the British Navy.

Dr. Coues's father, Samuel Elliott Coues, was born in Portsmouth, New Hampshire, June 13, 1797, and died there July 3, 1867. In early life he was a merchant, but later, for many

* Pronounced *Kouez*. Cf. the Century Cyclopedia of Names, 1894, p. 285.

† I am greatly indebted to Mr. Joseph Foster, of Portsmouth, N. H., for a very full genealogical history of Coues's ancestry, on which the following brief summary is wholly based.

years, held an appointment in the Patent Office at Washington, where he resided from 1853 to 1866. He was a man of literary tastes, active in humanitarian movements, and for several years was president of the American Peace Society. He was the author of "Mechanical Philosophy" (Boston, 1851) and "Studies of the Earth," etc. (Washington, 1860). It is said of him that he had "a keen perception of the beauties and mysteries of nature and an ever-pervading feeling of philanthropy."

Dr. Coues's ancestry on his mother's side is traced back, on different lines, to John Mason (d. 1635), the original grantee of New Hampshire, to the Appletons and Havens of Massachusetts, and to other distinguished New England families (among them to Governor Thomas Dudley). Charlotte Haven (Ladd) Coues, Dr. Coues's mother, was a direct descendant from Daniel Ladd, who came to New England in 1633-1634, and, after short residences at Ipswich and Salisbury, became one of the original settlers of Haverhill, Massachusetts, where he died in 1693. Coues's mother survived him by a few months, dying at Brookline, Massachusetts, July 4, 1900.

Coues's grandmother, wife of Captain Peter Coues, was Rebecca Elliott, a daughter of Samuel Elliott, who came from Topsham, Devonshire, England, and was married at Portsmouth, New Hampshire, May 6, 1761. This connection is the source of the baptismal name Elliott in the later generations of the Coues family.

It thus appears that Dr. Coues's ancestry was partly French and partly English. His forebears on the English side in America were among the earliest settlers of New England, and belonged to families of distinction, there being among them a former president (Haven, 1749-1806) of Harvard College. It also appears that his immediate predecessors for several generations were all residents of Portsmouth, New Hampshire.

As already noted, Dr. Coues's father removed with his family from Portsmouth to Washington in 1853, when Elliott was eleven years old, and this city became the future residence of the younger Coues until his death, except when away on official duties during his nearly twenty years' service in the medical corps of the United States Army. He prepared for college at Gonzaga Seminary, a Jesuit school in Washington, and later

entered Columbian College of that city (afterwards called Columbian University and now known as George Washington University), from which he received the degree of A. B. in 1861 and M. D. from its medical department in 1863. From the same institution he received the honorary degree of A. M. in 1862 and that of Ph. D. in 1869. Here for ten years—1877-1886—he acceptably filled the chair of anatomy.

In 1869 he was chosen to the chair of zoölogy and comparative anatomy at Norwich University, Vermont, which position, however, he was unable to accept.

His military career began in 1862, when he enlisted in the United States Army as a medical cadet; he was promoted to acting assistant surgeon in 1863, and to assistant surgeon in 1864, serving in this capacity till 1881, when he resigned from the army to devote his entire time to scientific and literary pursuits. He was assigned to his first military post at Fort Whipple, Arizona, in March, 1864,* where he remained for sixteen months, making the journey from Fort Leavenworth to Santa Fé, New Mexico, by mail coach, and thence to Fort Whipple on horseback, traveling with the military command to which he was officially attached. During his assignment to Fort Whipple he made a military journey from Fort Whipple to San Pedro, on the coast of southern California, via Fort Mojave and Fort Yuma.† Later his travels in the service of the Government gave him an opportunity to become personally familiar with the physical features of other portions of the West while it was still unchanged by the inroads of civilization. On his return from Fort Whipple he was assigned to Fort Macon, North Carolina,

* For an interesting sketch, with portrait, of Dr. Coues at this enthusiastic stage of his ornithological career, see a paper by Captain C. A. Curtis, U. S. A. (retired), entitled "Coues at his first Army Post," published in "Bird-Lore" in 1902 (Vol. IV, pp. 5-7), together with an extract from Coues's journal, referring to a day's march in New Mexico (reprinted from the "American Naturalist," Vol. V, June, 1871, pp. 199, 200).

† The ornithological results of his journey from Fort Leavenworth to Fort Whipple and from Fort Whipple to the Pacific coast are given in two papers published in "The Ibis," entitled respectively "Ornithology of a Prairie Journey" (Ibis, April, 1865, pp. 157-165) and "From Arizona to the Pacific" (Ibis, July, 1866, pp. 259-265).

and afterwards to Fort McHenry, Baltimore, Maryland. In 1873 he was ordered to Fort Randall, Dakota, and thence assigned (1873-1876) as surgeon and naturalist to the United States Northern Boundary Commission. From 1876 to 1880 he was detailed as secretary and naturalist to the United States Geological and Geographical Survey of the Territories, under the late Dr. F. V. Hayden. In 1880 he was again ordered to Arizona, but the surroundings of a post surgeon on the frontier were so incompatible with the prosecution of the scientific work he had then in hand that, failing to receive a more favorable assignment, he resigned his commission and returned to Washington.

Dr. Coues early showed a strong liking for natural history pursuits, and especially for ornithology, to which he later became passionately devoted. His residence in Washington, with free access to the collections of the Smithsonian Institution and intimate association with the late Professor Baird and other leading naturalists connected with this great institution, afforded him the incentive and opportunities for research which he early and enthusiastically embraced. His first technical paper was "A Monograph of the Tringæ of North America," published in the Proceedings of the Academy of Natural Sciences of Philadelphia in July, 1861 (pp. 170-205), when he was only nineteen years old. This paper was notable for the care and completeness with which the subject was treated, and would have been creditable to an author of much greater experience. It fully foreshadowed the high character of his subsequent work in systematic ornithology.

This paper was followed in the same year by his "Notes on the Ornithology of Labrador,"* based on field observations and collections made by him on a visit to that country in 1860. This was succeeded the same year by "A Monograph of the Genus *Ægiothus*, with Descriptions of new Species,"† and the following year by a faunistic paper (with D. Webster Prentiss) on the birds of the District of Columbia,‡ and the beginning of a series

* Proc. Acad. Nat. Sci. Philadelphia, 1861, pp. 215-257.

† *Ibid.*, pp. 373-390.

‡ Sixteenth Ann. Rept. Smithsonian Institution for 1861 (1862), pp. 399-421.

of monographs (1862-1868) on various groups of water birds, as follows: "Synopsis of the North American Forms of the Colymbidæ and Podicipidæ";* "Revision of the Gulls of North America";† "A Review of the Terns of North America";‡ "Critical Review of the Family Procellariidæ,"§ and "A Monograph of the Alcidaë."|| Here may also be mentioned his "Classification of Water Birds";¶ his "Studies of the Tyrannidæ, Part 1. Revision of the Species of Myiarchus";** and his "Material for a Monograph of the Sphenicidæ."†† During this same decade he also published several papers on the anatomy of birds.‡‡

Dr. Coues's writings cover the whole field of ornithology, and, including reviews and short notes on special subjects, number probably more than five hundred titles, but, with the exception of a few revisionary, monographic, and bibliographical papers, deal almost exclusively with the birds of North America north of Mexico. His greatest service to ornithology is, beyond question, his "Key to North American Birds," the first edition of which appeared in 1872 and the fifth and last in 1903, four years after the author's death. This edition was in reality, as respects the general text, the third revised edition, the third and fourth editions being reprints of the second, with the addition of important appendices.

The "Key" was designed as a popular handbook of North

* Proc. Acad. Nat. Sci. Philadelphia, Vol. XIV, 1862, pp. 226-233.

† *Ibid.*, pp. 291-312—an abstract of a monograph published in full twelve years later in "Birds of the Northwest," 1874, pp. 589-717.

‡ *Ibid.*, pp. 535-559.

§ *Ibid.*, Vol. XVI, 1864, pp. 72-91, 116-144; Vol. XVIII, 1866, pp. 25-33, 134-197.

|| *Ibid.*, Vol. XX, 1868, pp. 2-81, figs. 1-16.

¶ *Ibid.*, Vol. XXI, 1869, pp. 193-218.

** *Ibid.*, Vol. XXIV, 1872, pp. 56-81.

†† *Ibid.*, pp. 170-212, pls. iv, v.

‡‡ "The Osteology of the *Colymbus torquatus*; with Notes on its Myology." Mem. Boston Soc. Nat. Hist., Vol. I, pt. ii, 1866, pp. 131-172, pl. v, and 2 text figures.

Bird's-Eye Views [on the structure of the eye in birds]. American Naturalist, Vol. II, 1868-69, pp. 505-513, 571-583, with illustrations.

Mechanism of Flexion and Extension in Birds' Wings. Proc. American Assoc. Adv. Sci., Vol. XX, 1871 (1872), pp. 278-284, with illustrations.

American birds, and was one of the first works to introduce the "key" method of botanical manuals into zoölogy. It was at the same time a taxonomic revision of North American birds from the standpoint of a competent authority.

The first edition of the "Key" contained an "Introduction" of some sixty pages, giving a general account of the external characters of birds, an explanation of the technical terms used in ornithology, a concise exposition of the principles of classification and nomenclature, an artificial key to the genera, and much other information useful to the amateur. A systematic synopsis of North American birds followed, with brief descriptions of the species, indications of their geographical distribution, and references to leading authorities. By skillful use of language and several hundred illustrations, the amount of text was reduced to small compass without serious sacrifice of clearness. The higher groups were quite fully characterized, and a synopsis of fossil North American birds was added. Many changes in classification were introduced, and many "species" were reduced to "varieties," this being before the days of trinomial nomenclature.

The second edition (1884) was prepared on essentially the same lines, but it was entirely rewritten and greatly augmented, containing twice the number of pages and, through use of smaller type, nearly four times the amount of matter, and a large increase in the number of illustrations.

The "Key" now comprised four "Parts," namely: Part I, "Field Ornithology," a reprint, with slight modifications, of a separate work issued by the author under this title in 1874. Part II, "General Ornithology," consisting of the introductory matter of the first edition, greatly amplified, with the further addition of nearly one hundred pages of new matter on the anatomy of birds. Part III, "Systematic Synopsis of North American Birds," is the "Systematic Synopsis" of the first edition, greatly extended by fuller diagnoses and the addition of concise biographies of the species. Part IV, is the "Systematic Synopsis of the fossil Birds" brought down to date and the subject more fully presented. The nomenclature is materially changed throughout, some twenty or more groups previously rated by him as subgenera being here given full generic rank, entailing corresponding changes in the names of species.

The four parts are preceded by an "Historical Preface" of twenty pages of wholly new matter, which is a concise history of North American ornithology, from its earliest beginnings in 1612 to the year 1860. The history is divided into epochs and periods, and the work and impress of each prominent author is briefly and judiciously weighed, with the author's usual felicity of characterization.

The third edition (1887) is the same as the second, with the addition of an appendix of thirty pages, "exhibiting the nomenclature of the American Ornithologists' Union Check-List in comparison with that of the Key and including descriptions of additional species, etc.," the American Ornithologists' Union Check-List of North American Birds having appeared during the interval between the second and third editions of the "Key." The names employed in the two systems are arranged in parallel columns, with the interpolation of descriptions of some sixty species and subspecies not previously included in the "Key."

The fourth edition (1890) is the same as the third, with the addition of a second appendix, to include a number of further additions of species and subspecies.

The fifth edition (1903), issued in two volumes instead of one, is again largely a new work, the synoptic portion having been wholly rewritten and greatly enlarged, the classification and arrangement considerably altered, and the nomenclature revolutionized. This being the first revised edition of the "Key" since the appearance of the American Ornithologists' Union Check-List in 1885, we have here the nomenclature of this list, which Dr. Coues did so much to shape, for the first time adopted in the "Key," the author often waiving his own opinions and preferences for the sake of conformity with the Check-List. Many of the old illustrations were discarded and hundreds of new ones added, made expressly for the work. The "Historical Preface," the "Field Ornithology," and the "General Ornithology" are the same as in former editions, except that in the latter, besides slight verbal changes in the text, much new matter is added. The changes in Part III, besides those of nomenclature and arrangement, consist in the amplification of many of the diagnoses, a revision of the ranges of the species and subspecies, the addition of bibliographical references, many vernacular synonyms,

and much critical and historical comment on questions of nomenclature (almost wholly excluded in former editions); also the characterizations of the higher groups are more elaborate and extended, their composition and relations being stated with masterly clearness and comprehensiveness. As stated by the present writer in a review of the "New Key," it is a "masterpiece of mature ornithological work, which alone would long keep green the memory of its gifted author." The "Key" is a "well-known and old favorite, whose thirty years of practical usefulness have won for it unstinted and well-merited praise, and in its new form will prove for many years to come a boon alike to the amateur and the professional student of North American birds. The 'Key' of 1872 was an innovation and an experiment in ornithological literature; its practicability was evident from the outset, and it proved to be the forerunner of almost numberless successors of 'key' manuals in various departments of zoölogy. The author's final revision of this greatest of his many contributions to ornithological literature will make a new generation of bird students his debtors and admirers."* It was his last piece of literary work, and could he have lived to carry it through the press its publication would have been not only less delayed, but the work would have had the benefit of his final touches.

The "Key" was recognized, abroad as well as at home, as a work of the highest excellence. In a review of the second edition in "The Ibis" (1885, pp. 100, 101), a journal not noted for its use of superlatives in its notices of current literature, the following high praise is accorded the "Key":

"It is, however, to Part II of the present volume that we must specially direct the reader's attention. In this Part there is condensed into some 180 pages a more complete account of the structure and classification of birds, brought up to the present standard of our knowledge, than any other with which we are acquainted. * * * So much information that cannot be got at elsewhere is brought together in this comprehensive treatise, that it ought to be in the hands of every ornithologist, whether he is a special student of the American avifauna or not. It is, in fact, our deliberate opinion that Coues's new 'Key' is, as one of the veteran ornithologists of the continent has tersely put it, in a private letter, 'one of the best and most useful bird books ever written;' and we commend it to our readers accordingly."

* Auk, Vol. XXI, 1904, p. 296.

Closely conjoined with the "Key to North American Birds" are three other publications by Dr. Coues, namely, a "Check-List of North American Birds," his "Field Ornithology," and a second edition of his Check-List, entitled "The Coues Check-List of North American Birds, Second Edition."

The first edition of the Check-List was published in December, 1873, forming a brochure of 137 pages, and a bare catalogue of scientific and vernacular names, printed in thick type on one side of the paper, with critical comment in footnotes and in a 15-page appendix. It was reissued in January, 1874, with the "Field Ornithology." The Check-List was "prepared in strict accordance with the Key" and "reflects exactly whatever of truth or error that work represents." As said by the author, the need of a new check-list was urgent, the first and only previous check-list of North American birds being that of Baird, published in 1858. In the meantime great changes had been made, through the addition of some fifty species, the removal of many as extralimital or invalid, and the reduction of a large number of others to the rank of "varieties." In the introduction to the combined "Manual of Instruction and Check-List of North American Birds," the author says:

"In the present state of our knowledge, and under a system of nomenclature that is proven inadequate and may before long become obsolete, recognition of numerous 'varieties'—resultant modifications of species by physical conditions of environment—is imperative; and what are these varieties but the rills that flow into and help swell the mighty stream of descent with modification?"

Here was reflected the tendency, already prevailing among the leading American ornithologists of that time, to reduce the status of local forms from species to "varieties" (later called "sub-species"), such a reduction being for the first time consistently made for the whole ornis in the first edition of the "Key."

The "Field Ornithology" and "Check-List" were intended originally to form part of the first edition of the "Key," with which the "Field Ornithology" was combined in all of the later editions of that work. The scope and purpose of the "Field Ornithology" is well indicated by the subtitle, "A Manual of Instruction for procuring, preparing, and preserving Birds." It

was divided into eight chapters, covering such subjects as collecting implements and their use, directions and suggestions for field work, the registration and labeling of specimens, the preparation of birdskins, determination of sex, etc., and the care of collections.

The instructions here offered were based on the author's many years of field experience, and were not only detailed and judicious, but were presented with a familiarity and charm of style that made even such dry details attractive. It is thus, without doubt, one of the most useful and popular manuals of ornithological field work ever put forth.

The second edition of the "Coues Check-List" appeared in 1882, a royal octavo of 165 pages, containing as an appendix a "Catalogue of the Author's Ornithological Publications, 1861-1881," numbering 300 titles. The second edition is a very different work from the first, inasmuch as it is philological as well as ornithological. In nomenclature and classification the second Check-List is a faithful reflection of the second edition of the "Key," and holds to it the same relation that the first Check-List held to the first edition of the "Key." Furthermore, it was the nomenclature followed in all subsequent editions of the "Key" down to and including the fourth, published in 1887, with a few additions and slight changes in the appendices to the third and fourth editions.

Baird's Check-List, published in 1858, included 722 species and subspecies (excluding 22 recognized by Baird himself as extralimital); the first Coues Check-List (1872) included (with the 28 given in the appendix) 778, an increase of 66 over the Baird list; the second Coues Check-List (1882) included 888, an increase of 100 over the Coues list of 1872.

A Check-List of North American birds was also published by Ridgway in 1880.* This comprised 924 species and subspecies, of which 37 were admitted by the author to be extralimital, leaving as "North American" 887, or one less than the number recognized by Coues. The two lists are, however, very unlike, not

* "A Catalogue of the Birds of North America." By Robert Ridgway. Proc. U. S. Nat. Mus., Vol. III, 1880, pp. 163-246. Also separate, as: "Nomenclature of North American Birds," forming "Bulletin of the United States National Museum, No. 21," pp. 1-94, 1881.

only as regards nomenclature, but in the species and subspecies (especially the latter) admitted or excluded by the two authors. This comparison of check-lists connotes in a general way the advance of knowledge of the forms of the North American ornithology for the twenty-four years between 1858 and 1882, which may be taken also as an indication of the general advance made in our knowledge of the geographical distribution and life histories of the birds of North America north of Mexico.

To revert now to the second Coues Check-List: According to the author, the changes in nomenclature from his first list are numerous and in many instances radical, affecting not less than 150 cases, while the changes in ornithological status are "probably not more than 30." Respecting this edition of the Check-List he says:

"In revising the list for the main purpose of determining the ornithological *status* of every North American bird, the most scrupulous attention has been paid to the matter of nomenclature, not only as a part of scientific classification, determining the technical relations of genera, species, and varieties to each other, but also involved in writing and speaking the names of birds correctly. The more this matter was scrutinized, the more evidences of inconsistency, negligence, or ignorance was discovered in our habitual use of names. It was therefore determined to submit the current catalogue of North American birds to a rigid examination, with reference to the spelling, pronunciation, and derivation of every name—in short, to revise the list from a philological as well as an ornithological standpoint."

Accordingly some twelve pages are devoted to the philological phase of the subject, which is discussed under the several heads of etymology, orthography, and orthoepy. After explanations of the English, Continental, and Roman methods of pronunciation, he adopts the latter to the extent of insisting upon "the Roman sounds of the vowels and diphthongs, but yields the point in the disputed cases of certain consonants."

More than half of the space of the Check-List is occupied by the etymology, pronunciation, and definition of the technical names—an instructive and important feature, almost unique in such a connection; but neither his emendations of names, nor his prescribed Roman pronunciations made much impress upon the users of the Check-List. Indeed, in less than four short years

the American Ornithologists' Union, through a committee of which he was chairman, adopted and published, in the interest of stability in nomenclature, a rule that "the original orthography of a name is to be rigidly preserved, unless a typographical error is evident," and a check-list of North American birds in which this rule was strictly enforced. Yet Dr. Coues, in all the subsequent editions of his "Key" and in his other works, continued to employ his own "corrected" names; but he did not use in private conversation nor in scientific discussion the Roman method of pronunciation, nor did he introduce it into any edition of the "Key."

Although he was loyal (except in the spelling of names) to the American Ornithologists' Union "Code of Nomenclature" and to the American Ornithologists' Union Check-List, which on its appearance in 1886 immediately supplanted all previous check-lists of North American birds, he properly reserved the right of individual judgment in all questions of ornithological science. Thus, in the preface to the third edition of the "Key" (1887) he says:

"Uniformity of nomenclature is so obvious and decided a practical convenience that even at the risk of seeming to laud work in which he had a hand, the author cannot too strongly urge compliance with the Union's code, and adherence to the set of names the Union has adopted. These may not be the best possible, but they are the best we have."

In the "Appendix" to this edition of the "Key," as already noted, he gave the nomenclature of the "Key" and the American Ornithologists' Union Check-List in parallel columns, which made the occasion for any display of dissent or criticism of that work he may have felt, yet this "consists chiefly in declining to admit to the 'Key' some forms that the American Ornithologists' Union committee have deemed worthy of recognition by name." The number of forms he saw fit at this time to exclude is not large, and nearly all were admitted by him in his later (fifth) edition of the "Key." Yet his adhesion to purism in the construction of names, despite the American Ornithologists' Union and other codes of nomenclature to the contrary, continued to the end and proved in later years the cause of estrangement be-

tween himself and some of his (otherwise and formerly) most esteemed colleagues.

In his first check-list, Coues protested against the use of "so many needless and burdensome generic names, * * * adopted in Baird's great work," which he discarded in the first edition of the "Key," but gradually adopted in the later editions, with others proposed in the meantime by himself and others, in accordance with the prevailing custom of recent authorities.

Other important ornithological works by Dr. Coues are his "Birds of the Northwest," published in 1874, and his "Birds of the Colorado Valley," published in 1878, both in the "Miscellaneous Publications" series of the Hayden Geological Survey. The first of these, the "Birds of the Northwest: A Hand-book of the Ornithology of the Region drained by the Missouri River and its Tributaries" (8vo, pp. xii+791) treats primarily of the birds of the Missouri region (about 450 species), with reference to their geographical distribution, habits, and synonymy, and the specimens taken on various expeditions under the late Dr. F. V. Hayden; the North American species of the families Laridæ, Colymbidæ (= Gaviidæ), and Podicipidæ (= Colymbidæ), however, being, in addition, treated monographically, abstracts of which monographs were published in 1862-1863. Two new genera and one new species are here described, and there are various rectifications of nomenclature. The work is an important summary of the ornithology of the region treated, as then known, and will ever remain a standard work of reference.

Here may also be mentioned a fourth important contribution to the ornithology of a portion of this general region, namely, his "Field Notes on Birds observed in Dakota and Montana along the Forty-ninth Parallel during the seasons of 1873 and 1874,"* embodying the results of his ornithological field work as naturalist to the United States Northern Boundary Commission. The line surveyed extended from the Red River of the North to the Rock Mountains, a distance of about 850 miles. The faunal characteristics of different portions of the route are compared, followed by a systematic list of the species observed, with the

* Bull. U. S. Geol. and Geogr. Surv. Terr., Vol. IV, No. 3, July 29, 1878, pp. 545-661.

localities, dates, and measurements of the specimens taken, and extended biographical notes on many of the species, some of which were previously little known, resulting altogether in a large amount of wholly new information about the birds of this region.

The publication of the "Birds of the Colorado Valley" (8vo, pp. xvi+807, figs. 70), in 1878, was a marked event in the literature of North American ornithology and added immensely to the reputation of this already well-known and extremely popular author. The subtitle of the work, "A Repository of Scientific Information concerning North American Ornithology," is fully justified by its contents, and it has ever been sincerely regretted, by ornithological amateurs and experts alike, that the "Part First, Passeres to Laniidæ," with the "Bibliographical Appendix," is the only portion of the work ever published. It is not too much to say that this volume will ever remain a classic in ornithological literature. The biographical portions display to the fullest Coues's wonderful command of the English language, and prove, as claimed in the "Prefatory Note" (p. vi) :

"It is possible to make natural history entertaining and attractive as well as instructive, with no loss in scientific precision, but with great gain in stimulating, strengthening, and confirming the wholesome influence which the study of the natural sciences may exert upon the higher grades of mental culture; nor is it a matter of little moment to so shape the knowledge which results from the naturalist's labors that its increase may be susceptible of the widest possible diffusion."

At the same time, the technical portions of the work measure up to the highest standards, and the bibliographical appendix established a grade of efficiency never before attained, and set a model for the emulation of all future natural history bibliographers.

This work is a systematic treatise on the birds of the region drained by the Colorado River (embracing all of Arizona, much of New Mexico, Utah and Nevada, and portions of Colorado and southern California), with the synonymy and bibliography (mostly in footnotes) of the extralimital North American species of the families treated. The higher groups are fully characterized, and their relationships elaborately discussed, as nearly as possible

in non-technical phraseology; full descriptions are given of the external characters of the species, with exhaustive tables of synonymy and bibliographic references, a brief statement of the ranges of the species and "varieties," and usually extended biographies, some of them remarkable for their literary excellence, the common-place facts of bird-dom being often infused with a flavoring of poetic imagery. Chapter XIV, on the Swallows (*Hirundinidæ*), is ideal in its combination of technical details with general information, arranged under sections entitled: "Names of Swallows," "General Distribution of Swallows," "Migration of Swallows," "Architecture of Swallows," "Abnormal coloration of Swallows," and "General Habits and Traits of Swallows," followed by detailed treatment of the genera and species of this family found in North America, including very full biographies, presented with the felicity of touch characteristic of the author at his best. Under "Migration of Swallows" is a long dissertation on the question, Do swallows hibernate? which includes, besides a summary of the alleged evidence, an exhaustive annotated bibliography of special articles on the subject, occupying a dozen pages and numbering nearly two hundred titles. He says, in commenting on the evidence:

"I have never seen anything of the sort, nor have I ever known one who had seen it; consequently, I know nothing of the case but what I have read about it. But I have no means of refuting the evidence, and consequently cannot refuse to recognize its validity. Nor have I aught to urge against it, beyond the degree of incredibility that attaches to highly exceptional and improbable allegations in general, and in particular the difficulty of understanding the alleged abruptness of the transition from activity to torpor. I cannot consider the evidence as inadmissible, and must admit that the alleged facts are as well attested, according to ordinary rules of evidence, as any in ornithology. It is useless as well as unscientific to pooh-pooh the notion. The asserted facts are nearly identical with the known cases of many reptiles and batrachians. They are strikingly like the known cases of many bats. They accord in general with the recognized conditions of hibernation in many mammals."

There are also special bibliographies* on the "Architecture of

* The titles here given in the body of the work are, unfortunately for the convenience of subsequent authors, not repeated in Coues's later published bibliographies.

Swallows” and on “Abnormal Coloration of Swallows”; and there is another special bibliography (117 titles) on the genus “*Ampelis*” (= *Bombycilla*), of the family “Ampelidæ” (= Bombycillidæ).

The last 217 pages of the main text of the “Birds of the Colorado Valley” form a “Bibliographical Appendix,” entitled “A List of Faunal Publications relating to North American Ornithology.” The list is made up mainly of titles of “‘local lists’ and allied kinds of articles,” all general treatises including larger geographical areas than North America, although North America may be included, being excluded, as are also all systematic papers treating of genera or higher groups, even when consisting wholly of North American species, these latter, under the author’s plan of a “Universal Bibliography of Ornithology,” falling under the section “Systematic Ornithology.” The geographical limits are North America from the southern boundary of Mexico northward, including Greenland, and also the Bahamas and Bermudas, but not the West Indies nor any part of America south of Mexico. The author says: “There is little to be said of the way in which the work has been done; for if it cannot speak for itself, the less said the better.” He adds, however, that “the compiler has habitually regarded THE TITLE as a thing no more to be mutilated than a man’s name; and that he has taken the utmost pains to secure transcription of titles *verbatim, literatim et punctuatim*”; and further states that “no title * * * has been taken at second-hand,” unless so specified. The list begins with John Smith’s description of Virginia, published in 1612, and ends with papers and works that appeared during the first half of the year 1878. The list is followed by an index, arranged in two sections, the first of authors, the second of localities, the great utility of which is obvious.

Aside from the complete and exact transcription of titles, whether of independent works or of papers published in journals or in the proceedings of societies and academies, the extent and character of the information given in relation to North American ornithology is indicated by descriptive comment or concise annotations, as may be required, which add immensely to the usefulness of the citations. As said by the author:

“Bibliography is never finished, and always more or less defective, even on ground long gone over. * * * In fact, one object in printing the present batch of titles is to invite criticism, to the end that the final bibliography may be bettered. The writer would be accurate; yet he feels the weight of Stevens’s satire: ‘If you are troubled with a pride of accuracy, and would have it completely taken out of you, print a catalogue.’”

Coues’s several instalments of his ornithological bibliography certainly do “speak for themselves.” That there are omissions goes without saying, but they are surprisingly few; the accuracy and completeness of citation are beyond criticism, while the concise descriptions supply information of the utmost convenience.

The “Bibliographical Appendix” to the “Birds of the Colorado Valley” forms the first instalment of a proposed “Universal Bibliography of Ornithology,” to which Dr. Coues devoted a large part of several of the most active years of his life, the greater part of which still remains in manuscript, greatly to the regret and distinct loss of ornithologists the world over. Fortunately, however, that relating to American ornithology was practically completed up to the time of its publication, 1878-1880. The second instalment* was published in 1879, and includes the faunal works and papers relating to South America, Central America, and the West Indies, and contains about 700 titles. It is constructed on the same lines and with the same care as that relating to North America, already described.

The third instalment†, published in 1880, also relates to America, and consists of titles referring to systematic ornithology, or to “publications treating of particular species, genera or families.” This portion makes nearly five hundred and fifty pages, and completes the Bibliography so far as America is concerned.

Only one instalment relating to birds of other parts of the world was ever published, namely, “Fourth Instalment of

* “Second Instalment of American Ornithological Bibliography.” Bull. U. S. Geol. and Geogr. Surv. Terr., Vol. V, No. 2, September 6, 1879, pp. 239-330.

† “Third Instalment of American Ornithological Bibliography.” Bull. U. S. Geol. and Geogr. Surv. Terr., Vol. V, No. 4, September 30, 1880, pp. 521-1066.

Ornithological Bibliography: being a List of Faunal Publications relating to British Birds.”* This consists of “the titles of all publications treating of British birds as such, exclusively, and indiscriminately or collectively,” as further fully defined in the introductory explanations.

It is only fair to give here the author’s own point of view respecting these several instalments of his proposed “Universal Bibliography of Ornithology.” He says:

“This instalment, like those that have preceded it, is to be considered only in the light of published proof-sheets, to be canceled on the final appearance of the whole work. They are thus published in advance for several reasons—among others, both to render available certain departments of the Bibliography which approach completion, and are therefore useful as far as they go, and to invite suggestions and criticism for the bettering of the work.”

Of this instalment he further says: “I do not think it contains more than one-half as many titles as belong to this department of the Bibliography”; and he goes on to indicate certain sources of its weakness through his inability to lay hands on various desired serial and other publications.

In the introduction to the “Third Instalment” (which was published several months later than the fourth) he says:

“The portions of the Bibliography now before the public suffice for an estimate of its plan and purpose; but I may add that nothing has yet appeared of several other important departments, such as those of ‘General and Miscellaneous’ publications, of publications in ‘Anatomy and Physiology,’ of publications relating to ‘Birds in Domestication and Captivity,’ etc. It is not my intention, however, to print any more of the work at present, the *American* departments being the only ones sufficiently perfected to warrant their leaving my hands. But meanwhile I am making manuscript for the rest as rapidly and as continuously as possible.”

Alas that this vast amount of expert labor should still remain unavailable to the ornithological world!†

* Proc. U. S. Nat. Mus., Vol. II, May 31, 1880, pp. 359-482.

† His latest public reference to this phase of his literary work appeared in “The Osprey” for November, 1897 (II, pp. 39, 40), from

Dr. Coues was joint author or editor and annotator of various ornithological papers and special works, as papers on the ornithology of Texas by Lieut. C. A. H. McCauley (1877) and George B. Sennett (1877 and 1879), and on the ornithology of Kerguelen Island (with Dr. J. H. Kidder). Stearns's "New England Bird Life, a Manual of New England Ornithology," "edited from the manuscripts of Winfrid A. Stearns" (two volumes, 1881) was, as is well known, practically written by Coues. He also collaborated with Mrs. Mabel Osgood Wright in the preparation of "Citizen Bird" (1897). He was also one of the associate editors of the "Bulletin" of the Nuttall Ornithological Club (1876-1883) and of the earlier volumes of "The Auk" (1884-1888).

which I transcribe the following extract, for the information it conveys, and as an excellent illustration of Couesian rhetoric:

"The bibliography of ornithology is a subject which occupied me for several years, in the seventies, and upon which I expended an enormous amount of labor, mainly with my own pen, with comparatively little ostensible result. In 1880 I had published four instalments of my intended 'Universal Bibliography of Ornithology,' these being a few thousand titles relating to the birds of North and South America and Great Britain. In that year my machinery for doing the work broke down, and I found myself amidst the debris of the great plan I had projected or partially accomplished, with many thousand manuscript titles on hand and no prospect of their ever seeing the light. * * * I think I never did anything else in my life which brought me such hearty praise 'in mouths of wisest censure'—immediate and almost universal recognition, at home and abroad, from ornithologists who knew that bibliography was a necessary nuisance and a horrible drudgery that no mere drudge could perform. It takes a sort of an inspired idiot to be a good bibliographer, and his inspiration is as dangerous a gift as the appetite of the gambler or dipsomaniac—it grows with what it feeds upon, and finally possesses its victim like any other invincible vice. Perhaps it is lucky for me that I was forcibly divorced from my bibliographical mania; at any rate, years have cured me of the habit, and I shall never again be spellbound in that way. * * * This raises another question, which may be put in this way: Where is the man who will undertake to bring my North American Bibliography up-to-date? * * * Among the requisite qualifications may be reckoned more zeal than discretion, youth, health, strength, staying power, unlimited time at command, and access to the foci of ornithological literature in some large eastern city. All my material, both published and unpublished, shall be at the service of any such individual, with such opportunities, and any such appetite for bibliographical immortality; I will even throw my blessing into the bargain. What do I hear in answer to this advertisement: Wanted—A competent bibliographer of North American ornithology?"

Coues's contributions to North American mammalogy, while somewhat voluminous, were far less important than his ornithological writings, and relate to a field with which he was far less familiar. His activities in this field were also limited to the decade between 1868 and 1877. His first papers on mammals appeared in 1867, and were based on his field notes and collections made in Arizona.* These were followed during the next ten years by notes and short articles on different North American species, by several anatomical papers,† by a faunal list of the mammals of Fort Macon, North Carolina‡, and by a number of systematic papers and monographs on various genera and families, chiefly during the years 1874 to 1877. The first was entitled "On the Muridæ of the Northern Boundary Survey, with critical revision of the North American Genera and Species,"§ an abstract of his monograph of the family published two years later. A new "subgenus" (*Vesperimus* = genus *Peromyscus* Gloger, 1841), two new genera (*Ochetodon* = *Reithrodontomys* Giglioli, 1873, and *Evotomys*), and two new species were here characterized, and are still recognized, although earlier names have since been found for two of the genera.

During the following year he published additional taxonomic papers, including one entitled "On the Cranial and Dental Characters of Mephitinæ, with description of *Mephitis frontata* n. sp.

* "Notes on a Collection of Mammals from Arizona" (Proc. Acad. Nat. Sci. Philadelphia, 1867, pp. 133-136), and "The Quadrupeds of Arizona" (American Naturalist, I, 1867, pp. 281-292, 351-363, 393-400, 531-541).

† "Antero-posterior Symmetry, with special reference to the Muscles of the Limbs" (Medical Record, June-September, 1870, in eight instalments); "On the Myology of *Ornithorhynchus*" (Comm. Essex Inst., VI, 1871, pp. 128-173); "The Osteology and Myology of *Didelphis virginiana*" (Mem. Boston Soc. Nat. Hist., Vol. II, 1873, pp. 41-154), and "Notice of a Cyclopean Pig" (Proc. Acad. Nat. Sci. Philadelphia, 1869, pp. 93-101).

‡ "Notes on the Natural History of Fort Macon, N. C., and vicinity" (Proc. Acad. Nat. Sci. Philadelphia, 1871, pp. 12-49—mammals, pp. 12-18).

§ Proc. Acad. Nat. Sci. Philadelphia, 1874, pp. 173-196. Reissued as a repaged separate, with additions, 1874, pp. 1-28, retitled "U. S. Northern Boundary Commission * * * Natural History, No. 1. On the Muridæ."

foss.”* The new species was based on a skull from the bone caves of Pennsylvania. This paper gave a review of the characters of the genera *Mephitis*, *Spilogale* and *Conepatus*, of which only a single North American species of each was here recognized. This was shortly followed by “Some Account, critical, descriptive, and historical, of *Zapus hudsonius*,”† in which the jumping mice of North America were first separated from the Jerboas of the Old World under the new generic name, *Zapus*, and as a new family, Zapodidæ. This paper, like others published at about this time, was preliminary to his monographic treatment of various families of North American rodents, published in 1877, in volume XI of the final reports of the Hayden Survey, entitled “Monographs of North American Rodentia.” These include his “Critical Review of the North American Sacomysidæ,”‡ and several papers on the family Geomyidæ,§ the one last cited in the accompanying footnote, however, being the full monograph of the family, reprinted in abstract only in “Monographs of North American Rodentia.”

In 1875 he also published (with Dr. H. C. Yarrow) a report on the mammals collected on the Surveys West of the One Hundredth Meridian, under Lieut. George M. Wheeler, the report on the collections by the joint authors occupying pages 35-129 of volume V of the final “Report” of the Surveys.¶ The text relates mainly to the habits and geographical distribution of the mammals of the southwestern portions of the United States, with extensive tables of synonymy and bibliographic references. While now of course obsolete as regards the nomenclature, it is still the original source of much important information.

* Bull. U. S. Geol. and Geogr. Surv. Terr., 2d ser., No. 1, 1875, pp. 7-15, with 1 text-figure.

† Bull. U. S. Geol. and Geogr. Surv. Terr., 2d ser., No. 5, January 8, 1875, pp. 253-262.

‡ Proc. Acad. Nat. Sci. Philadelphia, 1875, pp. 227-327.

§ “The Cranial and Dental Characters of Geomyidæ.” Bull. U. S. Geogr. and Geol. Surv. Terr., 2d ser., No. 2, May 11, 1875, pp. 83-90.

¶ “Synopsis of the Geomyidæ.” Proc. Acad. Nat. Sci. Philadelphia, 1875, pp. 130-138.

“Abstract of Results of a Study of the Genera *Geomys* and *Thomomys*.” Expl. of the Colorado River of the West, 1875, pp. 215-285, figs. 1-80.

¶ The volume as a whole was not issued till September, 1876.

He appears to have published nothing on mammals during the year 1876 that requires notice in the present connection, but in 1877 his output in this field was notable, consisting largely of matter prepared during the preceding year. This includes his "Precursory Notes on American Insectivorous Mammals, with description of a new Species,"* in which the genera and species were critically considered, and three new subgenera and five new species were characterized. This paper remained for many years the authoritative paper on the group. The other publications of this year, to be here noted, are Coues's well-known monograph, "Fur-bearing Animals of North America," and his several final monographs of various families of North American rodents.

The "Fur-bearing Animals" was issued as a special volume of the "Miscellaneous Publications" of the Hayden Survey, and was put forth "as a specimen fasciculus of a systematic History of North American Mammals," in which, as stated in the "Prefatory Note," it was "proposed to treat the mammals of North America, living and extinct, in the same comprehensive and thorough manner in which the single family of the Mustelidæ has [here] been elaborated." The form and character of the proposed final work is here outlined, namely, a concise treatment of the technical and critical portions of the subject, while those aspects of more general interest, such as the life histories and economic and other practical relations of the species to man, will be given in ample detail. Unfortunately, this scheme was never carried out, and until this day we have had no general work on the mammals of North America, considered from both the technical and popular standpoint, since the completion of Audubon and Bachman's "Quadruped of North America," issued in three volumes, royal octavo, in 1846-1854. Coues had at this time "been long engaged" upon such a work, and continued gathering material for it for several years more, when in 1880, when the work was far advanced toward completion, he was ordered to duty at Fort Whipple, and the several Government geological surveys were reorganized, and their scope so restricted as to exclude the proposed great work on North American mammals and other similar enterprises, which at this time had become a

* Bull. U. S. Geol. and Geogr. Surv. Terr., Vol. III, 1877, pp. 631-653.

marked feature of the Hayden and other surveys. Had the work been completed and published, its taxonomy would have been soon obsolete, but the work as a whole would have formed a repository of general information on the mammals of North America, drawn from all then available sources, that would have been of great convenience and usefulness.

The comprehensive plan of the monograph of the Mustelidæ includes a consideration of their systematic position, their subfamily and generic subdivisions, with full diagnoses of these divisions and of the species, the derivation and signification of the names applied to them, both vernacular (in various languages) and technical, their geographical ranges, habits, economic products, and much interpolated matter relating to the allied foreign species, and much original information respecting special features of their anatomy. In short, it is an elaborate compendium of all that relates to the North American representatives of this especially important and interesting family of mammals, as then known.

The thick quarto volume of the Hayden Survey entitled "Monographs of North American Rodentia," comprised eleven monographs, of which the following five were by Dr. Coues: I, Muridæ (pp. i-iv+264); VII, Zapodidæ (pp. 455-479); VIII, Saccomyidæ (pp. 481-542); IX, Haplodontidæ (pp. 543-599); X, Geomyidæ (pp. 601-629). They were written, as well as the "Fur-bearing Animals," at the height of the wave of conservatism that engulfed American mammalogists and ornithologists alike between the years 1872 and 1882, in respect to the "species question."

But the results were far more disastrous in respect to the work of that period in the mammalogical field than in ornithology. It was unfortunately based on the assumption that the mammals and birds of North America were at that time well known, and that the then available material was sufficient for their critical, and perhaps final, revision; and not only this, that not only had all the species been described, but that far too many, especially in the case of mammals, had been recognized. Hence many of the then currently recognized species were properly reduced to "varieties" or subspecies, but many others, through lack of sufficient or properly prepared material and the wrong interpretation

of slight differences, and not infrequently the oversight of important characters in skulls that had not been taken out of the skins, were reduced to synonymy. More recent work in North American mammalogy, based on later-acquired and better-prepared material, from a multitude of new localities and many times greater in quantity, have shown how erroneous were the conclusions of 1877. New methods of field work, introduced by Merriam some years later, led to the discovery of not only a large number of new and markedly distinct specific types, but a considerable number of new genera and an endless list of new local forms or subspecies.* Whether or not the pendulum has not swung too far in the direction of ultra subdivision only time can disclose. But it still may be said of these monographs that the work was performed with the utmost conscientiousness and in accordance with the prevailing tendencies of the time, and under the handicap of extremely limited and wretchedly prepared material. The rejuvenation of mammalogy, both in this country and abroad, during the last twenty years, is due almost wholly—at least primarily—to the new methods of field work which originated in this country during the eighties and have since extended throughout the world. Yet the "Monographs of North American Rodentia" contain much of permanent value, especially in relation to the historical and bibliographical phases of the subject, and as a summary of previous knowledge of the groups treated.

About 1885 Dr. Coues's hitherto incessant intellectual activities in ornithology and mammalogy became diverted to other fields, and, with the exception of the preparation of the fifth edition of the "Key," which work, as already detailed, was then again rewritten, he ceased to impress, to any considerable extent, his personality upon either of these two branches of investigation.† Even his contributions to "The Auk" were few after 1888 (none in 1893 and 1894), and consisted mainly of reviews,

* For a fuller presentation of this phase of North American mammalogy, see my papers entitled "Recent Work in North American Mammalogy" (Trans. New York Acad. Sci., Vol. X, 1891, pp. 71-85) and "Recent Progress in the Study of North American Mammals" (Abstr. Proc. Linn. Soc. New York, No. 6, 1894, pp. 17-45).

† He wrote little on mammals after 1877.

short notes on questions of nomenclature, or historical references to early descriptions of American birds. The volume for 1897 is an exception, he having contributed to this some thirty or more short papers or notes, all of interest and a number of them, on questions of nomenclature, of considerable importance, some of them leading to nomenclatural changes in the American Ornithologists' Union Check-List.

For seven years (1884-1891) his energies and attention were absorbed by work on the "Century Dictionary" (6 volumes, 1889-1893), of which Dr. Coues was one of the collaborators, having charge of the departments of General Zoölogy, Biology, and Comparative Anatomy, and for which he furnished some 40,000 definitions and hundreds of illustrations, largely original, drawn under his supervision by Mr. E. T. Seton. In a review of this great work from the ornithological standpoint, the present writer stated, in 1891,* "The ornithological matter, both as regards text and cuts, forms a conspicuous feature of the work, which is practically an encyclopedia of ornithology. For those who know Dr. Coues's ability at giving the gist of a bird's history in a few happily worded sentences, it is unnecessary to say that a vast amount of information is compressed into the space of a few lines."

In March, 1897, Dr. Coues became associated with Mr. Walter A. Johnson in the editorship of an illustrated monthly magazine of ornithology, "The Osprey," published at Galesburg, Illinois, and later in New York city, to which journal he furnished a few reviews and short notes, beginning with volume I, No. 7, March, 1897. With the second number of volume III (October, 1898), the magazine changed ownership and the office of publication was transferred to Washington, where the magazine was continued under the editorship of Elliott Coues and Theodore Gill. This joint editorship, however, continued for only six numbers of volume III, when Dr. Coues's connection with the magazine wholly ceased. A glance at Dr. Coues's editorial and other contributions to these numbers seems to afford an explanation of his early retirement from the editorial sanctum.

Immediately following the completion of his work on the "Century Dictionary" Dr. Coues turned his attention to other

* Auk, VIII, pp. 222-224.

work in which for a long time he had had a deep interest—the early explorations west of the Mississippi River. As early as 1876 he published “An Account of the various Publications relating to the Travels of Lewis and Clark, with a Commentary on the Zoölogical Results of their Expedition,”* and in 1893 appeared his “History of the Expedition of Lewis and Clark,” in four octavo volumes, continuously paged, with commentary on the geography, ethnology, and natural history of the route. His principal annotations on the natural history occur in chapter XXV (Vol. III), pp. 821-900. This was followed in 1895 by his “Expeditions of Zebulon Montgomery Pike” (3 vols., 8vo); in 1897, by the “Journals of Alexander Henry and David Thompson,” for many years (1799-1814) officers of the Northwest Company (3 vols., roy. 8vo); in 1898, by the “Journal of Major Jacob Fowler” (1 vol., 8vo), and the “Personal Narrative of Charles Lapenteur,” for forty years a fur trader on the upper Missouri (2 vols., 8vo); and in 1900, by the “Diary of Francisco Garcés,” who traveled through the Indian Territory, Kansas, Colorado, and New Mexico in 1775-76 (2 vols., 8vo), the revision of the proof-sheets of which last was made in part during his last illness.

These works, † forming fifteen volumes, consist entirely, except in the case of the expeditions of Lewis and Clark and Pike, of previously unpublished material and form a mass of new and original information on early explorations in the West of the highest interest and importance. They are all copiously annotated in reference to the geography, ethnography, and general natural history of the regions traversed by these various explorers, with the usual care and accuracy characteristic of Coues’s scientific and bibliographic writings. In order to secure geographical correctness as to localities and the precise routes traversed by several of these explorers, he traveled many thousands of miles over the same routes, these journeys including a personal examination of the route of Lewis and Clark, a canoe trip up the Mississippi to determine Pike’s route to the head-

* Bull. U. S. Geol. and Geogr. Surv. Terr., No. 3, February, 1876, pp. 7-20.

† The titles are given in full in the “List of Works,” etc., appended to this biography.

waters of that river, and an effort to locate the trail of Garcés. His admirable equipment for this kind of editorial work is beyond question, and these volumes will ever remain a monument to his industry and intimate knowledge of early conditions in the West, while the information thus made available provides a mine of wealth for future historians.

For a time Dr. Coues was deeply interested in spiritualistic and theosophical questions—a side of his nature little known to even his intimate scientific associates. He was president for a time (1885-1886) of the American Board of Control of the Theosophical Society of India and of the Psychical Science Congress of the World's Congress Auxiliary at Chicago in 1893. Despite his activities in other fields, he found time to prepare and publish various brochures along these lines, among which are: "Biogen, a Speculation on the Origin and Nature of Life" (1884); "The Dæmon of Darwin" (1884); "Buddhist Catechism" (1885); "Kuthumi" (1886); "Can Matter Think?" (1886); "A Woman in the Case" (1887); "Neuro-Myology" (with Shute, 1887); "Signs of the Times" (1888). His connection with the Theosophical Society was sundered in 1889 by his expulsion from the Society, which would seem to indicate that he had ceased to be in sympathy with its doctrines and claims.

Dr. Coues was intimately associated with the American Ornithologists' Union, he having been one of the three signers of the call for a meeting of American ornithologists in New York city in September, 1883, which resulted in the founding of the Union. He was its first vice-president for ten years, presiding, in the absence of the president, at its first meeting, it thus falling to his lot to appoint the six committees then established to take in hand as many different lines of special investigation.

Later (1893-1895) he held the office of president for three years, and was always a valued and efficient member of its council and for many years was chairman of one of its most important committees—that on the Nomenclature and Classification of North American Birds. He had also an important share in the work of drafting and perfecting its "Code of Nomenclature," published in 1886. Dr. Coues held honorary membership in a large number of scientific societies and academies, foreign as well

as American. His election to the National Academy of Sciences occurred in 1877, when he was thirty-four years old.

Dr. Coues was a man of fine physique and rare mental endowments. With an attractive personality, he had unusual gifts of expression, which rendered him a ready and effective public speaker, genial and vivacious in conversation, and a writer of marked originality and force. As a reviewer he was kind and considerate; his friendships often assumed the ardor of affection, and the kindness of his nature led him on many occasions to tender a helping hand to younger ornithological aspirants. As an antagonist he was sometimes bitter and unforgiving.* He detested shams and exposed them ruthlessly. Discovery of truth was the marked incentive of his labors, and he freely and frankly retracted his opinions when convinced that they were wrong. He was naturally conservative, yet was a leader in his special lines of research. He was impulsive and sometimes indiscreet, having some of the failings that usually accompany genius.

Dr. Coues's capacity for work was enormous—indeed, phenomenal if we consider his sedentary habits and disregard of the ordinary precautions of health—and the wonder is that he for so many years maintained a condition of such vigor. In addition to his regular daily literary output, he maintained a voluminous correspondence, writing with his own hand many letters of great length, in a style peculiarly brilliant and spicy—in short, *Couesian*. With all his apparent energy and ceaseless activities, his health at last gave way, and for some years before his death he was a sufferer from a complication of diseases. During the summer preceding his death he made a journey to New Mexico and Arizona to refresh his memory of the country described in the diary of Francisco Garcés, which he was editing for publication; this proved too arduous for his reduced powers of endurance, “and he was brought to Santa Fé in a rather critical condition, where for a month he was very ill, but in September came

* An unfortunate illustration is his controversy with the late Dr. T. M. Brewer, of which Dr. Coues himself said, twenty years after the death of his opponent: “The controversy [in the ‘Sparrow War’] had become [in 1874] between Dr. Brewer and myself a personal feud, with the usual accompaniments in the way of sweetness and light” (*Osprey*, I, 1897, p. 124).

to Chicago,"* and later to Washington. His condition was already critical, and early in December he was taken to Johns Hopkins Hospital, Baltimore, where he "had to undergo two surgical operations for distinct disorders within a month of each other. He succumbed from exhaustion the second day after the later operation, and died on Christmas day," 1899.† Throughout his last illness he maintained a courageous spirit, bearing excessive pain without complaint, and wrote occasional letters to several of his intimate scientific friends up to almost the day of the final operation, expressing doubt as to the outcome; they proved to be his final letters of farewell.

Thus ended the life of one who had attained high eminence in several literary fields as well as in ornithology; one whose beneficial influence on the progress of North American ornithology, both technical and popular, has never been excelled, and whose work in other lines of research was varied, thorough, and conscientious, and will be of lasting influence.

Dr. Coues's near surviving relatives are his half-brother, Medical Director Samuel F. Coues, U. S. Navy (retired), of Cambridge, Massachusetts; his sister, Grace Darling (Coues) Estes (Mrs. Dana Estes), of Brookline, Massachusetts, and two sons and a daughter.

Dr. Coues married, first, May 3, 1867, in Columbia, South Carolina, Jane Augusta McKenney, daughter of Owen McKenney, of Rushford, New York, and, second, October 25, 1887, in Boston, Massachusetts, Mrs. Mary Emily Bates, who survived him, but died in 1906. Dr. Coues had five children, all by his first wife, two of whom died in infancy. The other three are: (1) Edith Louise (Coues) O'Shaughnessy, born January 31, 1868, in Columbia, South Carolina, wife of Mr. O'Shaughnessy of the American Embassy at Vienna; (2) Elliott Baird Coues, born January 19, 1872, at Baltimore, Maryland, who was graduated with the degree of M. D. at the Bellevue Medical College, New York, and is now residing in Europe (unmarried); (3) Beverly Drinkard Coues, born in November, 1878, in Washington, and now in Europe (unmarried).

* D. G. Elliot, in *The Auk*, Vol. XVIII, 1901, p. 9.

† *Osprey*, IV, January, 1900, p. 80.

LIST OF PRINCIPAL WORKS AND PAPERS.

From this list are omitted hundreds of reviews contributed by Dr. Coues to the "American Naturalist," "Bulletin of the Nuttall Ornithological Club," "The Auk," "Science," "The Osprey," the New York "Nation," Chicago "Field," "Forest and Stream," "The Oölogist," and other scientific and literary journals, and also hundreds of short notes and semi-popular articles on natural history subjects, published in the above-mentioned and in other journals and magazines.

The most important works and papers of this list have been noticed in the foregoing pages. The annotations following some of the titles are briefly explanatory or give simply the names of the new genera, new species and subspecies, etc., described in the works and papers to which they relate.

ORNITHOLOGY.

1861.

1. A Monograph of the Tringæ of North America. Proc. Acad. Nat. Sci. Philadelphia, Vol. XIII, July, 1861, pp. 170-205.
Actodromas bairdi (p. 194), sp. nov.
2. Notes on the Ornithology of Labrador. Proc. Acad. Nat. Sci. Philadelphia, Vol. XIII, August, 1861, pp. 215-257.
Ægiothus fuscescens (p. 222), sp. nov.
3. A Monograph of the Genus *Ægiothus*, with descriptions of new Species. Proc. Acad. Nat. Sci. Philadelphia, Vol. XIII, November, 1861, pp. 373-390.
Ægiothus rostratus (p. 378), *Æ. exilipes* (p. 385), spp. nov.

1862.

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C. homochroa (p. 77), *H. microsoma* (p. 79), spp. nov.
 12. A Critical Review of the Family Procellariidæ: Part II, embracing the Puffinæ. Proc. Acad. Nat. Sci. Philadelphia, Vol. XVI, 1864, pp. 116-144.
Nectris amaurosoma (p. 124), *Puffinus creatopus* (p. 131), *P. opisthomelas* (p. 139), spp. nov.
 13. Notes on certain Central American Laridæ, collected by Mr. Osbert Salvin and Mr. F. Godman. Ibis, July, 1864, pp. 387-393.

1865.

14. Ornithology of a Prairie-Journey, and Notes on the Birds of Arizona. Ibis, April, 1865, pp. 157-165.
 15. [Notes on Birds observed at Fort Whipple, Arizona]. Ibis, October, 1865, pp. 535-538.
 Extracts from a letter to the Editors. *Empidonax pygmaeus* (p. 537), sp. nov.

1866.

16. List of the Birds of Fort Whipple, Arizona: with which are incorporated all other species ascertained to inhabit the Territory; with brief critical and field notes, descriptions of new species, etc. Proc. Acad. Nat. Sci. Philadelphia, Vol. XVIII, March, 1866, pp. 39-100.

Fifty copies reissued, with new pagination and title page, as: "Prodrome of a Work on the Ornithology of Arizona Territory," pp. 1-64.

Micrathene (p. 51), *Asyndesmus* (p. 55), *Podasocys* (p. 96), gen. nov.; *Mitrephorus pallescens* (p. 63 = *Empidonax pygmaeus* Coues, 1865), *Vireo plumbeus* (p. 74), *V. vicinior* (p. 75), *V. pusillus* (p. 76), spp. nov., *Chrysomitris mexicanus* var. *arizonæ* (p. 82), var. nov.

17. A Critical Review of the Family Procellariidæ: Part III, embracing the Fulmaræ. Proc. Acad. Nat. Sci. Philadelphia, Vol. XVIII, March, 1866, pp. 25-33.

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1868.

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Simorhynchus cassini (p. 45), sp. nov.

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23. Synopsis of the Birds of South Carolina. Proc. Boston Soc. Nat. Hist., Vol. XII, October, 1868, pp. 104-127.

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25. Bird's-Eye Views. American Naturalist, Vol. II, December, 1868, pp. 505-513; Vol. II, January, 1869, pp. 571-583, figg.

On the structure of the eye in birds.

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26. Seaside Homes. *American Naturalist*, Vol. III, September, 1869, pp. 337-349.
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27. On Variation in the Genus *Ægiothus*. *Proc. Acad. Nat. Sci. Philadelphia*, Vol. XXI, October, 1869, pp. 180-189.
Supplementary to No. 3, above.
28. On the Classification of Water Birds. *Proc. Acad. Nat. Sci. Philadelphia*, Vol. XXI, December, 1869, pp. 193-218.

1870.

29. The Clapper Rail [*Rallus crepitans*]. *American Naturalist*, Vol. III, January, 1870, pp. 600-607.
30. The Great Auk [*Alca impennis*]. *American Naturalist*, Vol. IV, March, 1870, p. 57.
31. The Natural History of *Quiscalus major*. *Ibis*, July, 1870, pp. 367-378.

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32. Notes on the Natural History of Fort Macon, N. C., and Vicinity. No. I, Vertebrates. *Proc. Acad. Nat. Sci. Philadelphia*, Vol. XXIII, May, 1871, pp. 12-49. (Birds, pp. 18-47.)
33. Progress of American Ornithology. *American Naturalist*, Vol. V, August, 1871, pp. 364-373.
A review of J. A. Allen's "On the Mammals and Winter Birds of East Florida" (*Bull. Mus. Comp. Zoöl.*, Vol. II, No. 3, pp. 161-451, pl. iv-viii, April, 1871), with discussion of positions taken by this author. The main points here contested were soon after conceded and made the basis of his revisions of species in the first edition of the "Key," in 1872. The correspondence between the two authors during this period, would throw much light on the "new departure" that marked this period in American ornithology.
Pipilo alleni (footnote, p. 366), sp. nov.
34. The Yellow-headed Blackbird [*Xanthocephalus icterocephalus*]. *American Naturalist*, Vol. V, June, 1871, pp. 195-200 and fig.
- 34 bis. Bullock's Oriole [*Icterus bullocki*]. *American Naturalist*, November, 1871, pp. 678-682 and fig.
35. The Long-crested Jay [*Cyanura macrolopha*]. *American Naturalist*, Vol. V, December, 1871, pp. 770-775.

1872.

36. Mechanism of Flexion and Extension in Birds' Wings. *Proc. American Assoc. Adv. Sci.*, Vol. XX, for 1871 (1872), pp. 278-284, figg.

37. Observations on *Picicorvus columbianus*. Ibis, January, 1872, pp. 52-59.
38. Contribution to the History of the Blue Crow [*Gymnokitta cyanocephala*] of America. Ibis, April, 1872, pp. 152-158.
39. The Nest, Eggs, and Breeding Habits of *Harporhynchus crissalis*. American Naturalist, Vol. VI, June, 1872, pp. 370, 371.
40. A New Bird [*Glaucidium ferrugineum*] to the United States. American Naturalist, Vol. VI, June, 1872, p. 370.
41. Studies of the Tyrannidæ. Part I: Revision of the Species of *Myiarchus*. Proc. Acad. Nat. Sci. Philadelphia, Vol. XXIV, 1872, pp. 56-81.
42. Material for a Monograph of the Spheniscidæ. Proc. Acad. Nat. Sci. Philadelphia, Vol. XXIV, September, 1872, pp. 170-212, pll. iv, v.
43. Key to North American Birds, containing a concise account of every species of Living and Fossil Bird at present known from the Continent north of the Mexican and United States Boundary. Illustrated by 6 steel plates and upwards of 250 woodcuts. By Elliott Coues, Assistant Surgeon, United States Army. Salem: Naturalists' Agency. New York: Dodd and Mead. Boston: Estes and Lauriat. 1872. 1 vol., imp. 8vo, 4 prel. ll., pp. 1-361, 1 l., pll. i-vi, figg. 1-238. (Pub. October, 1872.)

Spizella socialis var. *arizonæ* (p. 143), *Ortyx virginianus* var. *floridanus* (p. 237), varr. nov.

1873.

44. Some United States Birds, New to Science, and other Things Ornithological. American Naturalist, Vol. VII, June, 1873, pp. 321-331, figg. 65-70.
Peucaea carpalis (p. 322), *Harporhynchus bendirei* (p. 330), spp. nov.
45. New Avian Subclass [Odontornithes]. American Naturalist, Vol. VII, June, 1873, p. 364.
46. Color-variation in Birds Dependent upon Climatic Influences. American Naturalist, Vol. VII, July, 1873, pp. 415-418.
47. Notice of a Rare Bird [*Coturniculus lecontei*]. American Naturalist, Vol. VII, December, 1873, pp. 748, 749.
48. Notes on Two little-known Birds of the United States [*Centronyx bairdi*, *Anthus spragueii*]. American Naturalist, Vol. VII, November, 1873, pp. 695-697.
49. Report on the Prybilov Group, or Seal Islands, of Alaska. By Henry W. Elliott, Assistant, Treasury Department. Washington: Government Printing Office. 1873. 1 vol., oblong 4to. (Appendix: Ornithology of the Prybilov Islands. By Dr. Elliott Coues, U. S. A.)

This is the original edition. Other editions appeared in 1875. Not paged.

Tringa ptilocnemis, sp. nov.

50. A Check List of North American Birds. By Elliott Coues. Salem. Naturalists' Agency. 1873, 8vo, 2 prel. ll., pp. 1-137, 2 ll.

This is the original edition, separately published, December, 1873; also reissued with "Field Ornithology," 1874. (See No. 51.)

1874.

51. Field Ornithology. Comprising a Manual of instruction for procuring, preparing, and preserving Birds, and a Check List of North American Birds. By Dr. Elliott Coues, U. S. A. Salem: Naturalists' Agency. Boston: Estes & Lauriat. New York: Dodd & Mead. January, 1874. 1 vol., 8vo, pp. i-iv., 1-116, 1-137. (See No. 50.)
52. [On the Classification of Birds, with Characters of the Higher Groups, and Analytical Tables of North American Families.] Baird, Brewer, and Ridgway's Hist. North American Birds, Vol. I, 1874, pp. xiv-xxviii.
53. [Glossary of Technical Terms used in Descriptive Ornithology. Including a number of prominent Anatomical and Physiological Terms]. Baird, Brewer, and Ridgway's Hist. North American Birds, Vol. III, 1874, pp. 535-560.
54. Habits and Characteristics of Swainson's Buzzard [*Buteo swainsoni*]. American Naturalist, Vol. VIII, May, 1874, pp. 282-287.
55. [A Recently] New Species of North American Bird [*Tringa ptilocnemis*]. American Naturalist, Vol. VII, August, 1874, pp. 500, 501.
 Republication of the original description. (See above, No. 49.)
56. New Variety of the Blue Grosbeak [*Guiraca carulea eurhyncha*]. American Naturalist, Vol. VII, September, 1874, p. 563.
57. On the Nesting of Certain Hawks, etc. American Naturalist, Vol. VII, October, 1874, pp. 596-603.
Falco communis, *Buteo swainsoni*, *Archibuteo ferrugineus*, and other birds of Montana.
58. Birds of the Northwest: A Hand-book of the Ornithology of the Region drained by the Mississippi River and its Tributaries. By Elliott Coues, Captain and Assistant Surgeon, U. S. Army. U. S. Geol. and Geogr. Surv. Terr., Miscell. Publ. No. 3. 1874. 1 vol., 8vo, pp. i-xii, 1-791.
Eremophila alpestris b. *leucolama* (p. 38), var. nov.

1875.

59. *Fasti Ornithologiae Redivivi*. No. 1. Bartram's "Travels." Proc. Acad. Nat. Sci. Philadelphia, Vol. XXVII, 1875, pp. 338-358. Claims tenability for twenty of Bartram's names of North American Birds. (See also No. 65.)
60. On the Breeding of Certain Birds [in Montana]. *American Naturalist*, Vol. IX, February, 1875, pp. 75-78.

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61. On the Breeding-habits, Nest, and Eggs, of the White-tailed Ptarmigan (*Lagopus leucurus*). *Bull. U. S. Geol. and Geogr. Surv. Terr.*, 2d ser., No. 5, January, 1876, pp. 263-266.
62. An Account of the various Publications relating to the Travels of Lewis and Clarke, with a Commentary on the Zoölogical Results of their Expedition. *Bull. U. S. Geol. and Geogr. Surv. Terr.*, 2d ser., No. 6, February, 1876, pp. 417-444.
63. Contributions to the Natural History of Kergulen Island, etc., Oology, etc. By J. H. Kidder and Elliott Coues. *Bull. U. S. Nat. Mus.*, No. 3, February, 1876, pp. 7-20.
64. A study of *Chionis minor* with reference to its Structure and Systematic Position. By J. H. Kidder, U. S. N., and Elliott Coues, U. S. A. *Bull. U. S. Nat. Mus.*, No. 3, February, 1876, pp. 85-116.
65. Reply to Mr. J. A. Allen's "Availability of certain Bartramian Names in Ornithology." *American Naturalist*, Vol. X, February, 1876, pp. 98-102. (See No. 59.)
66. The Labrador Duck [*Camptolæmus labradorius*]. *American Naturalist*, Vol. X, May, 1876, p. 303.
67. Notable Change of Habit of the Bank Swallow [*Stelgidopteryx serripennis*]. *American Naturalist*, Vol. X, June, 1876, pp. 372, 373.
68. Tarsal Envelope in *Campylorhynchus* and allied Genera. *Bull. Nutt. Orn. Club*, Vol. I, July, 1876, pp. 50, 51.
69. On the Number of Primaries in Oscines. *Bull. Nutt. Orn. Club*, Vol. I, September, 1876, pp. 60-63.

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70. Corrections of Nomenclature in the Genus *Sturus*. *Bull. Nutt. Orn. Club*, Vol. II, April, 1877, pp. 29-33.
71. Notes on the Ornithology of the Region about the Source of the Red River of Texas, from Observations made during the Explorations conducted by Lieut. E. H. Ruffner, Corps of Engineers, U. S. A. By C. A. H. McCauley, Lieut. Third United States Artillery. Annotated by Dr. Elliott Coues, U. S. A. *Bull. U. S. Geol. and Geogr. Surv. Terr.*, Vol. II, May, 1877, pp. 655-695.

72. *Leptoptila albifrons*, a Pigeon new to the United States Fauna. Bull. Nutt. Orn. Club, Vol. II, 1877, pp. 82, 83.

1878.

73. Notes on the Natural History of Fort Macon, N. C., and Vicinity. No. 4. By Drs. Elliott Coues and H. C. Yarrow. Proc. Acad. Nat. Sci. Philadelphia, Vol. XXX, 1878, pp. 21-28. (Birds, pp. 22-24.)
74. Note on *Passerculus bairdi* and *P. princeps*. Bull. Nutt. Orn. Club, Vol. III, January, 1878, pp. 1-3, pl. col'd.
75. Notes on the Ornithology of the Lower Rio Grande of Texas, from Observations made during the season of 1877. By George B. Sennett. Edited, with Annotations, by Dr. Elliott Coues, U. S. A. Bull. U. S. Geol. and Geogr. Surv. Terr., Vol. IV, February, 1878, pp. 1-66.
Parula nigrilora (p. 11), sp. nov.
76. On the Moulting of the Bill and Palpebral Ornaments in *Fratercula arctica*. Bull. Nutt. Orn. Club, Vol. III, April, 1878, pp. 87-91.
77. The Eave, Cliff, or Crescent Swallow (*Petrochelidon lunifrons*). Bull. Nutt. Orn. Club, Vol. III, July, 1878, pp. 105-112.
78. Field-Notes on Birds observed in Dakota and Montana along the Forty-ninth Parallel during the seasons of 1873 and 1874. Bull. U. S. Geol. and Geogr. Surv. Terr., Vol. IV, July, 1878, pp. 545-662.
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Alexander Wilson to A. Lawson; G. Ord to A. Wilson;
C. L. Bonaparte to A. Lawson.
81. History of the Evening Grosbeak [*Hesperiphona vespertina*]. Bull. Nutt. Orn. Club, Vol. IV, April, 1879, pp. 65-75.
82. On the Present Status of *Passer domesticus* in America, with Special Reference to the Western States and Territories. Bull. U. S. Geol. and Geogr. Surv. Terr., Vol. V, No. 2, September, 1879, pp. 175-193.
83. Second Instalment of American Ornithological Bibliography. Bull. U. S. Geol. and Geogr. Surv. Terr., Vol. V, September, 1879, pp. 239-330.

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84. Note on the Black-capped Greenlet, *Vireo atricapillus* of Woodhouse. Bull. Nutt. Orn. Club, Vol. IV, July, 1879, pp. 193, 194, pl. i (colored).
85. Note on *Alle nigricans* Link. Bull. Nutt. Orn. Club, Vol. IV, October, 1879, p. 244.
Alle Link (1806) antedates *Mergulus Vieillot* (1816) for *Alca alle* Linn.
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1880.

87. Sketch of North American Ornithology in 1879. American Naturalist, Vol. XIV, January, 1880, pp. 20-25.
88. On the Nesting in Missouri of *Empidonax acadicus* and *Empidonax traillii*. Bull. Nutt. Orn. Club, Vol. V, January, 1880, pp. 20-25.
89. Notes and Queries concerning the Nomenclature of North American Birds. Bull. Nutt. Orn. Club, Vol. V, April, 1880, pp. 95-102.
90. Further Light on the Moults of the Bill in certain Mormonidae. Bull. Nutt. Orn. Club, Vol. V, April, 1880, pp. 127, 128.
91. Fourth Instalment of Ornithological Bibliography: being a List of Faunal Publications relating to British Birds. Proc. U. S. Nat. Mus., Vol. II, May, 1880, pp. 359-482.
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92. Note on *Grus fraterculus* of Cassin. Bull. Nutt. Orn. Club, Vol. V, July, 1880, p. 188.
93. Third Instalment of American Ornithological Bibliography. Bull. U. S. Geol. and Geogr. Surv. Terr., Vol. V, No. 4, September, 1880, pp. 521-1066.
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1881-1883.

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1882.

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1883.

96. Generic and Specific Appellations of North American Birds. Bull. Nutt. Orn. Club, Vol. VII, 1883, pp. 178, 179.
97. Note on *Passerculus caboti*. Bull. Nutt. Orn. Club, Vol. VIII, 1883, p. 58.
Young of *Melospiza palustris*.
98. Nest and Eggs of *Myiadestes townsendi*. Bull. Nutt. Orn. Club, Vol. VIII, 1883, p. 239.
99. A Hearing of Birds' Ears. Science, Vol. II, 1883, pp. 422-424, 552-554, 586-589, 9 text figg.
The structure of the ear in birds.
100. On the Application of Trinomial Nomenclature to Zoölogy. Zoölogist, 3d ser., Vol. VIII, July, 1883, pp. 241-247.
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1884.

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Reply to a critique by Augustus C. Merriam on the philological portion of the "Coues Check List and Lexicon of North American Birds" (*ibid.*, pp. 36-49).
103. Trinomials are Necessary. Auk, Vol. I, 1884, pp. 197, 198.
104. On some new Terms recommended for use in Zoölogical Nomenclature. Auk, Vol. I, 1884, pp. 320-322.
105. Strickland as an Advocate of "Linnaeus at '58." Auk, Vol. I, 1884, p. 400.
106. Key to North American Birds. Containing a concise account of every species of living and fossil bird at present known from the Continent north of the Mexican and United States Boundary, inclusive of Greenland. Second Edition, revised to date, and entirely rewritten: with which are incorporated General Ornithology: an outline of the structure and classi-

fication of birds, and Field Ornithology: a Manual of collecting, preparing, and preserving birds. Profusely illustrated. Boston: Estes and Lauriat. 1884. Royal 8vo, pp. i-xxx, 1-863, colored frontispiece (anatomy of pigeon), and 563 text figg.

1887.

107. Key to North American Birds. Containing a concise account of every species of living and fossil bird at present known from the Continent north of the Mexican and United States Boundary, inclusive of Greenland and Lower California, with which are incorporated General Ornithology: an outline of the structure and classification of birds; and Field Ornithology, a Manual of collecting, preparing, and preserving birds. The Third Edition, exhibiting the Nomenclature of the American Ornithologists' Union, and including descriptions of additional species, etc. Profusely illustrated. Boston: Estes and Lauriat. 1887. Roy. 8vo, pp. i-x, i-xxx, 1-895, colored frontispiece (anatomy of pigeon), and 561 text figg. Main text same as 1884 ed., with new title-page, and new matter in an appendix (pp. 865-895).

1888.

108. New Forms of North American *Chordilces*. Auk, Vol. V, 1888, p. 37.
C. scnetti and *C. chapmani* spp. nov.
109. Note on Rostratulinae [subfam. nov.]. Auk, Vol. V, 1888, p. 204.
110. Corydomorphae [superfam. nov.]. Auk, Vol. V, 1888, p. 207.
111. Notes on the Nomenclature of the Muscles of Volation in Birds' Wings. Auk, Vol. V, 1888, pp. 435-437.

1889.

112. A new Generic Name for the Elf Owl [*Micropallas*, nom. nov.]. Auk, Vol. VI, 1889, p. 71.
 To replace *Micrathene* Coues, 1866, preoccupied.

1890.

113. Key to North American Birds. Fourth Edition, 1890. Same as third edition, with the addition of a "Second Appendix," pp. 897-907, giving additional species and subspecies, and "notes every further change reported by the [American Ornithologists'] Union's Committee from 1887 to January [1890] inclusive."

1891.

114. *Scenopætes densirostris* [nom. gen. nov.]. Auk, Vol. VIII, 1891, p. 115.

1895.

115. Gätke's "Heligoland." Auk, Vol. XII, 1895, pp. 322-346.
Review of the work, with an extended list of birds observed by Gätke at Heligoland.

1896.

116. Merrem's Work. Auk, Vol. XIII, 1896, pp. 265, 266.
Collation, and list of the birds described and figured in it.

1897.

117. *Zamelodia* against *Habia*. Auk, Vol. XIV, 1897, pp. 39-42.
118. *Asarcia spinosa*. Auk, Vol. XIV, 1897, p. 88.
Fulica spinosa Linn. 1758 = *Parra variabilis* Linn. 1766.
119. Cuculidae of the A. O. U. List. Auk, Vol. XIV, 1897, pp. 90, 91.
Three subfamilies are recognized.
120. Authority for the Name *Myiarchus mexicanus*. Auk, Vol. XIV, 1897, p. 92.
M. mexicanus Baird a synonym of *M. cinerascens* Lawr.
121. *Ammodramus (Passerculus) sanctorum* Coues. Auk, Vol. XIV, 1897, p. 92.
The validity of the species affirmed, and *Ammodramus (Passerculus) sandwichensis wilsonianus* proposed as a new name for *A. s. savanna* (Wils.).
122. Rectifications of Synonymy in the Genus *Junco*. Auk, Vol. XIV, 1897, pp. 94, 95.
J. danbyi Coues, young of *J. aikeni*; *J. h. shufeldti* Coale = *J. h. connectens* Coues.
123. Characters of *Dendroica carulescens cairnsi* Coues. Auk, Vol. XIV, 1897, pp. 96, 97.
D. c. cairnsi redescribed.
124. Note on the Genus *Lucar* Bartram. Auk, Vol. XIV, 1897, p. 97.
Lucar, it is claimed, should replace *Galeoscoptes* as the tenable generic name for the Catbird.
125. *Uria lomvia* in South Carolina. Auk, Vol. XIV, 1897, pp. 202, 203.
Believed to be the first record of the species for South Carolina.
126. Type locality of *Fuligula collaris*. Auk, Vol. XIV, 1897, pp. 206, 207.
Based on a British killed specimen.
127. *Daflula*, a new Subgenus [for *Querquedula eatoni* Sharpe]. Auk, Vol. XIV, 1897, p. 207.
128. *Branta bernicla glaucogastra*. Auk, Vol. XIV, 1897, pp. 207, 208.
Replaces typical *B. bernicla* in North America.
129. A North American Snipe [*Gallinago major*] New to the A. O. U. List. Auk, Vol. XIV, 1897, p. 209.

130. Status of *Helodromas ochropus* in the A. O. U. List. Auk, Vol. XIV, 1897, pp. 210, 211.
 Recalls an early overlooked record.
131. Status of the Redshank [*Totanus totanus* (Linn.)] as a North American Bird. Auk, Vol. XIV, 1897, pp. 211, 212.
 Attention called to an early record in "Fauna Boreali-Americana," Vol. II, 1831, p. 391.
132. Validity of the Genus *Lophortyx*. Auk, Vol. XIV, 1897, p. 215.
 Considered to be a well characterized genus.
133. Notes on the Mexican Ground Dove. Auk, Vol. XIV, 1897, p. 215.
Columbigallina passerina pallescens (Baird) maintained as a good subspecies; also important comment on the generic name *Columbigallina*.
134. Note on *Elanus glaucus* [Barton]. Auk, Vol. XIV, 1897, p. 216.
135. Untenability of the Genus *Sylvania* Nutt. Auk, Vol. XIV, 1897, pp. 223, 224.
 To be replaced by *Wilsonia* Bonap.
136. The most General Fault of the A. O. U. Check-List. Auk, Vol. XIV, 1897, pp. 229-231.
 Respecting the sequence of genera and subfamilies within their respective families.
137. The Turkey Question. Auk, Vol. XIV, 1897, pp. 272-275.
Mcleagris gallopavo Linn. restricted to the Mexican form.
138. Note on *Pagophila alba*. Auk, Vol. XIV, 1897, p. 313.
Pagophila Kaup urged as the proper generic name of the species, in place of *Gavia* Boie, untenable in this connection.
139. *Onychoprion*, not *Haliplana*. Auk, Vol. XIV, 1897, p. 314.
 Both names based on the same species, the former having priority.
140. Remarks on certain Procellariidæ. Auk, Vol. XIV, 1897, pp. 314, 315.
 On the number and sequence of the subfamilies, and on the status of some of the genera and species.
141. Bibliographical Note. Auk, Vol. XIV, 1897, pp. 327-329.
 On the dates of Major Bendire's early indirect contributions to ornithological literature.
- 1898.
142. William Swainson to John James Audubon. Auk, Vol. XV, 1898, pp. 11-13.
 A hitherto unpublished letter of Swainson's to Audubon, in reference to his proposed collaboration with Audubon in the preparation of the "Ornithological Biography."
143. Notes on the Generic Names of certain Swallows. Auk, Vol. XV, 1898, pp. 271, 272.

1899.

144. Note on *Meleagris gallopavo fera*. Auk, Vol. XVI, 1899, p. 77.
Addendum to No. 137, above, *q. v.*
145. The Finishing Stroke to Bartram. Auk, Vol. XVI, 1899, pp. 83, 84.
Comment on, and rejection of, current Bartramian names. *Catharista atrata* (Bartram) renamed *C. urubu* (Vieill.); *Aphelocoma floridana* (Bartram) renamed *A. cyanea* (Vieill.); *Corvus americanus floridanus* Baird renamed *C. a. pascuus* (nom. nov.).
146. On Certain Generic and Subgeneric Names in the A. O. U. Check-List. Osprey, Vol. III, 1899, p. 144.
Believes that a large number of the subgenera should be given full generic rank, and that several additional subgenera should be recognized.
Pallasicarbo and *Psiloscoops*, subgen. nov.

1900.

147. *Pipile vs. Pipilo*. Auk, Vol. XVII, 1900, p. 65.
Pipile replaced by *Cumana*, nom. gen. nov.
148. *Strix vs. Aluco*. Auk, Vol. XVII, 1900, pp. 65, 66.
The two names should be transposed, as also the names of the two families to which they respectively belong; a transposition officially adopted by the A. O. U. Committee in 1908 (*cf.* Auk, Vol. XXV, 1908, pp. 288-291, 370).

1901.

149. Auduboniana, and Other Matters of Present Interest. Bird-Lore, Vol. III, 1901, pp. 9-13.
An address delivered before the American Ornithologists' Union, at the annual meeting held in New York City, November 10, 1897; only the part relating to Audubon here reproduced from a stenographic report, with portrait of Coues.

1903.

150. Key to North American Birds. Containing a concise account of every species of Living and Fossil Bird at present known from the Continent north of the Mexican and United States Boundary, inclusive of Greenland and Lower California. With which are incorporated General Ornithology: an outline of the Structure and Classification of Birds; and Field Ornithology, a Manual of collecting, preparing, and preserving Birds. The Fifth Edition (entirely revised), exhibiting the Nomenclature of the American Ornithologists' Union, and

including descriptions of additional species. In Two Volumes. By Elliott Coues, A. M., M. D., Ph. D., Late Captain and Assistant Surgeon U. S. Army and Secretary U. S. Geological Survey; Vice-President of the American Ornithologists' Union, and Chairman of the Committee on the Classification and Nomenclature of North American Birds; Foreign Member of the British Ornithologists' Union; Corresponding Member of the Zoölogical Society of London; Member of the National Academy of Sciences, of the Faculty of the National Medical College, of the Philosophical and Biological Societies of Washington. Profusely illustrated. Boston: Dana Estes and Company. 1903. 2 vols. roy. 8vo, Vol. I, pp. i-xli, 1-535, col. frontispiece (portrait of Author), and text figg. 1-353; Vol. II, pp. i-vi, 537-1152, col. frontispiece, and text figg. 354-747.

Stellerocitta, *Sieberocitta*, *Dilopholicus*, *Viguacarbo*, subgen. nov.

MAMMALOGY.

1867.

151. The Quadrupeds of Arizona. American Naturalist, Vol. I, 1867, pp. 281-292, 351-363, 393-400, 531-541.

Extended notes on habits and distribution. *Sciurus arizonensis* (p. 537), sp. nov.

152. Notes on a Collection of Mammals from Arizona. Proc. Acad. Nat. Sci. Philadelphia, Vol. XIX, 1867, pp. 133-136.

Brief field notes on 28 species.

1869.

153. Observations on the Marsh Hare. Proc. Boston Soc. Nat. Hist., Vol. XIII, 1869, pp. 86-95.

Habits, external and cranial characters of *Lepus palustris* Bachm.

154. Notice of a Cyclopean Pig. Proc. Boston Soc. Nat. Hist., Vol. XIII, 1869, pp. 93-100, with fig. of skull.

1870.

155. Antero-posterior Symmetry, with especial reference to the Muscles of the Limbs. N. Y. Med. Record, June-September, 1870, pp. 149-152, 193-195, 222-224, 273, 274, 297-299, 370-372, 390, 391, 438-440.

1871.

156. Notes on the Natural History of Fort Macon, N. C., and Vicinity. Proc. Acad. Nat. Sci. Philadelphia, Vol. XXIII, 1871, pp. 12-49. (Mammals, pp. 12-18.)

157. Former Eastward Range of the Buffalo [*Bison bison* (Linn.)]. American Naturalist, Vol. V, 1871, pp. 719, 720.
Former occurrence in West Virginia, as late as 1793-1798.
158. On the Myology of the Ornithorynchus. Comm. Essex Inst., Vol. VI, 1871, pp. 128-173.

1872.

159. The Osteology and Myology of *Didelphys virginiana*. With an Appendix on the Brain, by Jeffries Wyman. Mem. Boston Soc. Nat. Hist., Vol. II, 1872, pp. 41-154.
160. Geographical Distribution of *Bassaris astuta*. American Naturalist, Vol. VI, 1872, p. 364.

1873.

161. The Prairie Wolf, or Coyoté (*Canis latrans*). American Naturalist, Vol. VII, 1873, pp. 385-389.
Relationships with domestic dog.
162. Variation in Dentition. American Naturalist, Vol. VII, 1873, pp. 496, 497.
Supernumerary tooth in lower jaw of "*Canis lupus* L., race *occidentalis* Rich., strain *griseoalbus* Bd."

1874.

163. Synopsis of the Muridæ of North America. Proc. Acad. Nat. Sci. Philadelphia, Vol. XXV, 1874, pp. 173-196.
Reissued (repaged) under the title "U. S. Northern Boundary Commission. * * * Natural History. No. I. On the Muridæ." pp. 1-28.
Ochetodon (p. 184), *Evotomys* (p. 186), *genn. nov.*;
Vesperimus (p. 178), *Euncomys* (p. 185), *subgenn. nov.*;
Hesperomys (*Vesperimus*) *melanophrys* (p. 181), *H. (Onychomys) torridus* (p. 183), *spp. nov.*

1875.

164. The Cranial and Dental Characters of Geomyidæ. Bull. U. S. Geol. and Geogr. Survey. Terr., 2d ser., No. 2, May, 1875, pp. 83-90.
Reprinted, with some modification, in "Monographs of North American Rodentia," in 1877.
165. A Critical Review of the North American Saccomyidæ. Proc. Acad. Nat. Sci. Philadelphia, Vol. XXVI, 1875, pp. 272-327,
3 figures of ears of three species of *Perognathus*.
166. Synopsis of the Geomyidæ. Proc. Acad. Nat. Sci. Philadelphia, Vol. XXVI, 1875, pp. 130-138.

Thomomys clusius (pp. 135, 138), sp. nov.

Abstract of the memoir published in full in "North American Rodentia" in 1877.

167. Abstract of Results of a Study of the Genera *Geomys* and *Thomomys*. Expl. of Colorado River of the West, 1869-1872 (Powell), 1875, pp. 217-285, fig. 80.

Addendum A: "The cranial and dental characters of Geomyidae," pp. 267-279, reprinted from Bull. U. S. Geol. and Geogr. Surv. Terr., 2d ser., No. 2, pp. 88-90, May 11, 1875. (See No. 164.)

Addendum B: Notes on the "Salamander of Florida (*Geomys tuza*)," by G. Brown Goode, pp. 281-285.

168. Report upon the collections of Mammals made in portions of Nevada, Utah, California, Colorado, New Mexico, and Arizona during the years 1871, 1872, 1873, and 1874, by Dr. Elliott Coues and Dr. H. C. Yarrow. Rep. Expl. and Surv. West of the One Hundredth Meridian, Vol. V, 1875, pp. 35-129.

Notes on habits and geographical distribution, with extensive tables of synonymy and bibliographical citations for many of the species.

"*Cervus virginianus* var. *couesi*, Rothrock, MSS.," p. 72, a provisional name, but the authors (p. 75) say they are "at present * * * indisposed to formally recognize this designation."

"Genus *Zapus* Coues MSS.," p. 99.

169. Some Account, Critical, descriptive, and historical, of *Zapus hudsonius*. Bull. U. S. Geol. and Geogr. Surv. Terr., 2d ser., No. 5, 1875, pp. 253-262.

Zapus, gen. nov.; Zapodidae, fam. nov.

170. The Cranial and Dental Characters of Mephitinae, with description of *Mephitis frontata*, n. sp. foss. Bull. U. S. Geol. and Geogr. Surv. Terr., 2d ser., No. 1, 1875, pp. 7-15.

171. The Prairie Gopher [*Spermophilus richardsoni*]. American Naturalist, Vol. IX, 1875, pp. 430-436.

172. Synonymy, Description, History, Distribution and Habits of the Prairie Hare [*Lepus campestris*]. Bull. Essex Inst., Vol. VII, 1875, pp. 73-85.

173. Chips from the Buffalo's Workshop. Forest and Stream, April 1, 1875.

A humorous skit, with much interesting information.

1877.

174. Precursory Notes on American Insectivorous Mammals. Bull. U. S. Geol. and Geogr. Surv. Terr., Vol. III, 1877, pp. 631-653.

Microsorex (ex Baird, MSS.), *Notiosorex* (ex Baird, MSS.), *Soriciscus*, subgen. nov.; *Sorex pacificus* (ex Baird, MSS.), *S. sphagnicola*, *S. (Notiosorex) crawfordi* (ex Baird MSS.), *S. (N.) evotis*, *Blarina mericana* (Baird MSS.), spp. nov.

175. Fur-bearing Animals: A Monograph of North American Mustelidae. U. S. Geol. and Geogr. Surv. Terr. (Hayden), Miscel. Publ., No. 8, 1877, Svo, pp. i-xiv, 1-348, pll. i-xx.
176. Monographs of North American Rodentia. By Elliott Coues and Joel Asaph Allen. Rep. U. S. Geol. and Geogr. Surv. Terr. (Hayden), Vol. XI, 1877, pp. i-xvi, i-x, 1-1091, pll. i-vii.

Dr. Coues's portion includes: I, Muridae, pp. 1-x, 1-264, pll. i-v; VII, Zapodidae, pp. 455-480; VIII, Saccomyidae, pp. 481-542; IX, Haplodontidae, pp. 543-600, pl. vi; X, Geomyidae, pp. 601-630, pl. vii; also, Appendix B. Material for a Bibliography of North American Mammals, by Theodore Gill and Elliott Coues, pp. 951-1091.

Arvicola (Pitymys) quasiater (p. 226), sp. nov.

In the case of the Haplodontidae, in addition to the usual systematic treatment, the skeletal and visceral anatomy of the single species then known are described at length.

1878.

177. Notes on the Mammals of Fort Sisseton, Dakota. By C. E. McChesney, M. D., Acting Assistant Surgeon, U. S. A. Annotated by Dr. Elliott Coues, U. S. A. Bull. U. S. Geol. and Geogr. Surv. Terr., Vol. IV, No. 1, February, 1878, pp. 201-218.
178. On Consolidation of the Hoofs in the Virginian Deer. Bull. U. S. Geol. and Geogr. Surv. Terr., Vol. IV, 1878, pp. 293, 294.
179. On a Breed of Solid-hoofed Pigs apparently established in Texas. Bull. Geol. and Geogr. Surv. Terr., Vol. IV, 1878, pp. 295-297, 1 text fig.

1879.

180. The Outer Ear of *Blarina brevicauda*. Amer. Journ. Otology, Vol. I, July, 1879, pp. —? (also as a repaged separate of 2 pp.).
- 180a. Notice of Mrs. [M. A.] Maxwell's Exhibit of Colorado Mammals. In: "On the Plains, and Among the Peaks; or, How Mrs. Maxwell made her Natural History Collection." By Mary Dartt. Philadelphia, 1879. Mammals, pp. 217-225.

An annotated list of the mammals (about 50 species) shown in the Colorado Exposition Collection at the Centennial Exposition held in Philadelphia in 1876, and exhibited later in Washington, D. C., during the winter of 1876-7.

HERPETOLOGY.

1871.

181. Notes on the Natural History of Fort Macon, N. C., and Vicinity. No. 1. Proc. Acad. Nat. Sci. Philadelphia, pp. 12-49.
Reptiles, pp. 47-49—an annotated list of 11 species.

1876.

182. Synopsis of the Reptiles and Batrachians of Arizona; with critical and field notes, and an extensive synonymy, by Dr. Elliott Coues, U. S. A. Rep. Expl. and Surv. West of the One Hundredth Meridian, Vol. V, 1875, pp. 585-633, pl. xvi-xxv.
Volume not issued till 1876. A note by the author on p. 588 bears date "November 15, 1875."

1878.

183. Notes on the Herpetology of Dakota and Montana. By Drs. Elliott Coues and H. C. Yarrow. Bull. U. S. Geol. and Geogr. Surv. Terr., Vol. IV, No. 1, February, 1878, pp. 259-291.
Eutania radix twiningi (p. 279), subsp. nov.

GENERAL BIOLOGY.

1889-1893.

184. The Century Dictionary, an Encyclopedic Lexicon of the English Language. Prepared under the superintendence of William Dwight Whitney, Ph. D., LL.D., Professor of Comparative Philology and Sanskrit in Yale University. 8 vols,* fol. New York: The Century Company. 1889-1893.

"The definitions of that part of general biological science which in any way relates to animal life or structure, including systematic zoölogy, have been written by Dr. Elliott Coues, who has been assisted in ichthyology and conchology by Prof. Theodore N. Gill, in entomology by Mr. Leland O. Howard and Mr. Herbert L. Smith, and in human anatomy by Prof. James K. Thacher. Special aid has also been received from other naturalists, particularly from Prof. Charles V. Riley. * * *—Preface, p. xiii.

Dr. Coues had special charge of "General Zoölogy, Biology, and Comparative Anatomy," to which subjects he contributed, it has been stated, some 40,000 definitions. This labor occupied nearly his entire time for seven years—1884-1891.

*Excluding Vol. IX, Cyclopedia of Names, and Vol. X, Atlas.

EDITOR AND ANNOTATOR OF JOURNALS OF EARLY EXPLO-
RATIONS WEST OF THE MISSISSIPPI RIVER.

1893.

185. Descriptions of the Original Manuscript Journals and Field Notebooks of Lewis and Clark, on which was based Biddle's History of the Expedition of 1804-6, and which are now in the possession of the American Philosophical Society in Philadelphia. Proc. Amer. Philos. Soc., Vol. XXXI, 1893, pp. 17-33.
186. History of the Expedition under the command of Lewis and Clark, to the sources of the Mississippi River, thence across the Rocky Mountains and down the Columbia River to the Pacific Ocean, performed during the years 1804-5-6, by order of the Government of the United States. A new edition faithfully reprinted from the only authorized edition of 1814, with copious critical commentary, prepared upon examination of unpublished official archives and many other sources of information, including a diligent study of the original manuscript Journals and Field Notebooks of the Explorers, together with a new Biographical and Bibliographical Introduction, new Maps, and other illustrations, and a complete Index. By Elliott Coues, * * * Member of the National Academy of Sciences, etc. Four volumes, Svo. New York: Francis P. Harper, 1893. Vol. I, pp. i-cxxxii, 1-352, frontispiece (portrait of Meriwether Lewis); Vol. II, pp. i-vi, 353-820, frontispiece (portrait of William Clark); Vol. III, pp. i-vi, 821-1298; Vol. IV, pp. i-v, 1299-1364, 6 small maps, reproduced in facsimile from the Philadelphia edition of 1814, 2 large folding maps (in pocket of cover), and 2 genealogical tables (folded inserts) of the descendants and living issue of William Clark.

1895.

187. The Expeditions of Zebulon Montgomery Pike, to the Headwaters of the Mississippi River, through Louisiana Territory, and New Spain, during the years 1805-6-7. A new edition, now first reprinted in full from the original of 1810, with copious critical commentary, new memoir of Pike, new map and other illustrations, and complete index, by Elliott Coues. * * * Three volumes, Svo. New York: Francis P. Harper, 1895. Vol. I, Memoir of the Author—Mississippi Voyage: pp. i-xviii,* xix-cxiv, 1-356, frontispiece (portrait of Pike); Vol. II, Arkansaw Journey—Mexican Tour: pp. i-vi, 357-855; Vol. III, Index—Maps: 4 ll., pp. 857-955, 7 maps in pocket.

1897.

188. *New Light on the Early History of the Greater Northwest. The Manuscript Journals of Alexander Henry, Fur Trader of the Northwest Company, and of David Thompson, Official Geographer and Explorer of the same Company, 1799-1814. Exploration and Adventure among the Indians on the Red, Saskatchewan, Missouri, and Columbia Rivers.* Edited with copious critical commentary by Elliott Coues, Editor of "Lewis and Clark," of "Pike," etc., etc. Three volumes, Svo. New York: Francis P. Harper. 1897. Vol. I, the Red River of the North, pp. i-xxviii, 1-446, portrait of the Editor; Vol. II, The Saskatchewan and Columbia Rivers, pp. i-vi, 447-916; Vol. III, Index and Maps, 3 ll., pp. 917-1027, map (in 3 sections) in pocket.

1898.

189. *The Journal of Major Jacob Fowler, narrating an Adventure from Arkansas through the Indian Territory, Oklahoma, Kansas, Colorado, and New Mexico to the sources of Rio Grande del Norte, 1821-22.* Edited, with notes, by Elliott Coues. New York: Francis P. Harper. 1898. Svo, pp. i-xxlv, 1-183.
190. *Forty Years a Fur Trader on the Upper Missouri. The Personal Narrative of Charles Larpenteur, 1833-1872.* Edited, with many critical notes, by Elliott Coues. Maps, views, and portraits. Two volumes, Svo. New York: Francis P. Harper. 1898. Vol. I, pp. i-xxvii, 1-236, portraits of Charles Larpenteur and Pierre Garreau, and 5 views; Vol. II, pp. i-ix, 237-472, 5 portraits, 5 maps, and view of old Fort Pembina.

1900.

191. *On the Trail of a Spanish Pioneer. The Diary and Itinerary of Francisco Garcés (Missionary Priest) in his Journey through Sonora, Arizona, and California, 1775-76.* Translated from an official contemporaneous copy of the original Spanish Manuscript, and edited, with copious critical notes, by Elliott Coues, Editor, * * * etc. Eighteen maps, views, and facsimiles. Two volumes, Svo. New York: Francis P. Harper. 1900. Vol. I, pp. i-xxx, 1-312, 2 maps, 2 facsimiles, and 4 views; Vol. II, pp. i-vii, 313-608, frontispiece, 8 views, and 1 map.