

Biography and Bibliography of Clayton Edward Ray

*Ralph E. Eshelman, Robert J. Emry,
Daryl P. Domning, and David J. Bohaska*

With this volume we pay tribute to our mentor and colleague, Clayton E. Ray. Scientist, historian, ardent supporter of amateur and professional paleontologists alike, Clayton is most especially a sound advisor and a valued friend. One of the things we miss most as a result of his retirement is the benefit of his full-time good counsel: we counted on his instinct for the clear-headed, no-nonsense approach to problems, minor or major, and we relied upon him as a source for thoughtful, good advice, always strengthened with encouragement. In all of his personal interactions, Clayton is invariably perceptive, stimulating, helpful, patient, and kind. All of these qualities, combined with his quick wit and keen sense of humor, have enriched our long associations with him. We all hope that some of his attributes have been communicable—that something might have rubbed off on all of us to make us more like him.

When we began to organize this tribute, our intention was to publish it as a surprise to Clayton, but the process has now taken so long that the bigger surprise will be if Clayton does not find out what is afoot. One disadvantage of intending this as a surprise is that it inhibited our grilling him for biographical information, and thus limited our biography essentially to what is known or could be researched by all of us—the professional, public aspect. Consequently, this cannot be expected to be an in-depth biography, but a rather superficial review of the general trends in Clayton's professional career.

Clayton's wife, Donna, supplied us with a few of the basic facts of his pre-university days. Clayton was born a Hoosier, in Henry County, Indiana, to Lloyd and Ruth Ray, on 6 February 1933 and grew up in central Indiana. Clayton remembers

fondly the rural life he experienced around his boyhood home in Indiana, especially the summers spent on his grandparents' farm. He attended high school in Indianapolis, ranked third in his class at graduation, and was awarded a full scholarship to Harvard College. He married his high-school sweetheart, Donna, and together they raised four daughters.

Clayton enrolled at Harvard College, Cambridge, Massachusetts, in 1951 and received his A.B. degree in geology in 1955. He was elected to Phi Beta Kappa. His advisor as an undergraduate was Alfred S. Romer, one of the most prominent and highly respected vertebrate paleontologists of his time. Toward the end of his senior year, as Clayton met with Romer to discuss graduate school possibilities, Romer revealed to him, in confidence, that Brian Patterson would be coming to Harvard and that Clayton might want to discuss graduate school possibilities with Patterson when he came to visit. Clayton believes that he was the first "civilian" (as he puts it) to know that Brian Patterson would be moving from Chicago to Harvard. Clayton followed Romer's advice, met with Patterson, and decided to remain at Harvard for advanced degrees with Patterson as his advisor. Clayton does stress, however, that, in the real, practical sense, it was Professor Ernest Williams who served as his graduate advisor and had the greatest impact on his career. It was Williams, for example, who steered Clayton's interests into Quaternary mammals of the Neotropics, and the Caribbean region in particular. Clayton was awarded his A.M. degree in 1958 and his Ph.D. in 1962 from Harvard, both in geology.

In September 1959 Clayton moved to the University of Florida, Gainesville, where he accepted the positions of Interim Assistant Professor in the Department of Biology and Interim Assistant Curator at the Florida State Museum (now the Florida Museum of Natural History). Upon receiving his doctorate from Harvard, he was promoted to Assistant Professor and Assistant Curator, positions he held until he moved to the Smithsonian Institution in 1963.

Ralph E. Eshelman and Darryl P. Domning, Research Associates, Department of Paleobiology, National Museum of Natural History, Smithsonian Institution, Washington, D.C. 20560-0121; Robert J. Emry and David J. Bohaska, Department of Paleobiology, National Museum of Natural History, Smithsonian Institution, Washington, D.C. 20560-0121.

Among his duties in Florida was, of course, fielding questions about fossils from visitors. One day he was manning the museum's front office in the old Seagle Building on Gainesville's main street when a high school student from Biloxi, Mississippi, named Daryl Domning walked in, his long-suffering parents in tow, seeking publications and tips on where to collect fossils in the area. Clayton patiently gave them directions to Paynes Prairie, an area on the edge of town where spoil piles from interstate highway construction offered bones of Pleistocene critters to the casual collector; afterward, he helped them identify their finds. This brief encounter was followed by countless more in subsequent years, as Clayton came to play a major role in fostering Domning's career as a vertebrate paleontologist. The two have since coauthored nearly a dozen publications on marine mammals.

Early in the 1960s, the National Museum of Natural History, Smithsonian Institution, began planning a major new exhibition hall devoted to Pleistocene mammals. When the museum decided in 1963 to hire a new curator to be in charge of developing these new exhibits, Clayton was the choice. Clayton's letter accepting the new position was typical of him in its thoughtfulness and clarity; he outlined prior obligations that he had to meet and asked to make his move to Washington, D.C., between school semesters to lessen the disruption to his children's education. On 18 December 1963, Clayton became Associate Curator of Later Cenozoic Mammals at the museum, where he remained until his retirement more than 30 years later.

It is probably not generally known that when research scientists (i.e., curators) are hired at the National Museum, they do not immediately become federal civil service employees, but must first complete a conditional, term appointment of at least one year. If all is well at the end of that term, the appointment is then converted to Career Civil Service status. C.L. (Lew) Gazin, senior vertebrate paleontologist at the Smithsonian at the time Clayton arrived, wrote the following evaluation of Clayton's first year:

I have found him to be a highly intelligent and industrious worker. During the rather short time since receiving his doctorate at Harvard he has had published or has completed for publication a surprising number of well-written and carefully thought out papers. Much of the time of his first year here had been devoted, as anticipated, to planning with the exhibits staff renovation of Hall 6 for a new series of exhibits which are to depict the Pleistocene epoch in vertebrate paleontology. Nevertheless, this has not prevented him from carrying on field work in Mexico during the early part of the summer and in initiating at other times several short trips of profit to the museum. Moreover, in addition to keeping abreast of a rather considerable amount of examination and report work he has managed to squeeze in an appreciable amount of research and give a few lectures. Dr. Ray is a personable young man who gets along well with his colleagues and makes a good impression on outsiders. It gives me pleasure to report that we are entirely satisfied with his work.

So began Clayton's career of more than three decades as a Smithsonian Curator. Clayton officially retired at the end of September 1994 and is now a Curator Emeritus in the Department of Paleobiology.

Fieldwork and Research

Clayton's earliest publications were on modern mammals, including remains of mammals recovered from archeological sites, on Pleistocene mammals, and even on an osteological peculiarity of the extant gopher tortoise (see bibliography, following). In 1960 he cofounded, with two archeologists at the University of Florida, the first formally constituted museum program in archaeozoology. Elizabeth Wing, an early associate in the program, has gone on to become a leading figure in the field, and similar formal programs in archaeozoology are now common in other museums and universities. Clayton's interests in archaeozoology have continued throughout his career, even as his research evolved to focus more on Quaternary mammals and eventually on fossil marine mammals. The latter, however, had been prominent among his interests almost from the start. When Remington Kellogg, the preeminent curator of fossil marine mammals at the Smithsonian, passed away, Clayton's attention shifted progressively to marine mammals, and by the late 1970s this assumed priority over his work on Quaternary paleontology. The collections and research data on Quaternary mammals that Clayton had brought together were largely bequeathed to others. For example, bats were turned over to Gary Morgan, ungulates to Jerry McDonald, Caribbean oryzomyine rodents to Mike Carleton, and faunal studies to Ralph Eshelman. In concentrating on marine mammal fossils at the Smithsonian, Clayton continued a tradition that goes back almost as far as the Institution itself. In fact, the first vertebrate fossil cataloged in the Smithsonian's collections was a marine mammal bone, and work on fossil marine mammals has been conducted by scientists such as F.A. Lucas, Frederick True, Gerrit S. Miller, Jr., Remington Kellogg, and Frank C. Whitmore, Jr. Because of this long-standing emphasis, the fossil marine mammal collection at the Smithsonian is the largest in the United States and probably in the world; certainly it is one of the two most important fossil marine mammal collections in the world. Clayton's contributions have added substantially to this already strong collection; most important, he was the agent directly responsible for the Smithsonian's acquiring the Douglas Emlong collection of Tertiary marine mammals from the West Coast, and for nearly three decades he oversaw the collecting of the huge volume of material from the late Tertiary Lee Creek Mine in North Carolina. In his own research, Clayton has taken a lively interest in nearly every group of aquatic mammals, but pinnipeds most of all; among these, thanks largely to the gargantuan Lee Creek project, he has focused mainly on the phocid seals and on walruses (the subject of his first marine mammal paper, way back in 1960).

In the 1970s, Clayton and Charles Handley, Curator of Mammals in the Division of Mammalogy of the Department of Vertebrate Zoology, attempted to form a marine mammal study center for both fossil and modern marine mammals at the Smithsonian. An important objective was to bring the separate collections together both administratively and, especially, physically. As anyone who has studied whale skeletons knows,

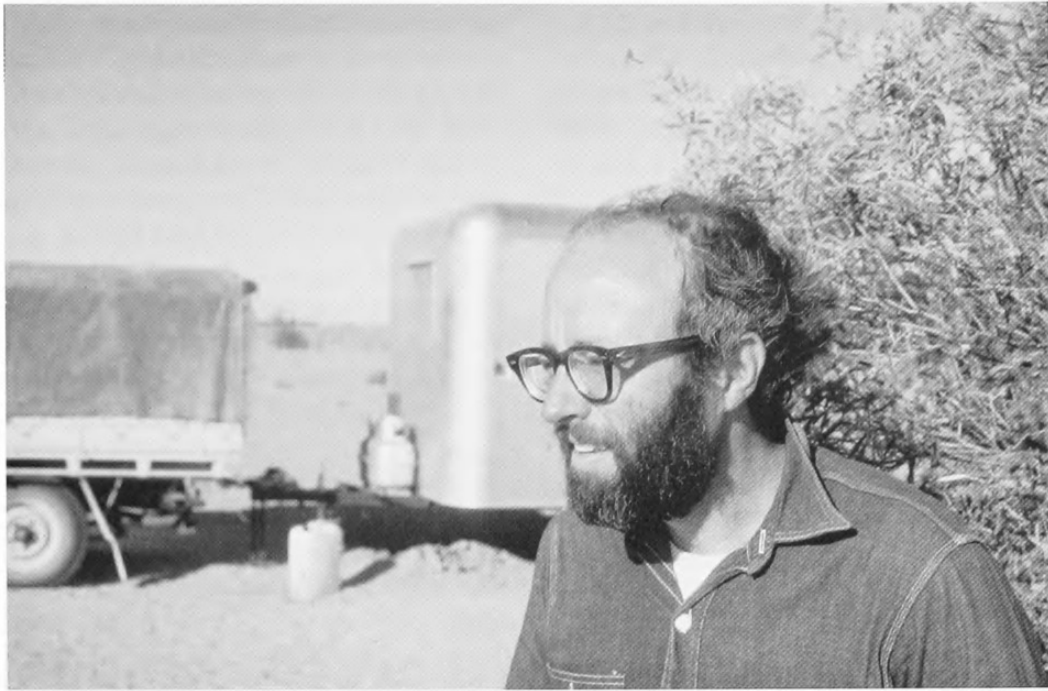


FIGURE 1.—Clayton E. Ray, ready for the long drive to Adelaide, after breaking camp at the end of field work, Lake Callabonna, South Australia, 19 September 1970. (Photograph by R.J. Emry.)

the specimens are immovable in any practical sense, and comparative studies could be greatly facilitated by having all material, fossil and modern, stored together. Space was temporarily obtained at a surplused U.S. Navy building (a World War II torpedo factory) in Alexandria, Virginia. The modern whale collections were moved there from the museum, but this space was lost before the fossil collections could be moved, and no other adequate space could be found. These efforts did result, however, in a unified library, the Remington Kellogg Library of Marine Mammalogy. A new curatorial position for modern whales was established, and a monthly seminar on marine mammals was begun in 1979. Now, in 2001, the goal of bringing the modern and fossil skeletal materials together has finally been partially realized; the fossil baleen whale material has followed the modern material to the Smithsonian's Garber Facility, a new storage facility in Silver Hill, Maryland.

Clayton's early fieldwork included numerous sites in Florida, which he worked from 1956 through 1964. In 1958 Clayton conducted fieldwork in the Dominican Republic and Puerto Rico, and in 1963 he went back to the Dominican Republic and also to the Lesser Antilles.

In 1964 Clayton conducted fieldwork at Ladds Quarry, Georgia, collecting an extensive fauna from a paleoecologically critical area that had not previously been studied; this collection represents one of the larger Pleistocene faunas of North America, with the bulk of the material now housed in the Smithsonian.

In 1964 and 1966 Clayton participated in a multidisciplinary study, sponsored by Harvard University and the National Science Foundation, at Valsequillo, Puebla, Mexico, where late Pleistocene deposits contained associated early humans and

fossil vertebrates. Much of the material collected was retained by the Mexican government, but some of the fossil vertebrates were accessioned into the collections of the Smithsonian.

From 1964 through 1967, Clayton conducted fieldwork in the late Pleistocene deposits at Saltville, Virginia, supported by a grant from the National Science Foundation. Specimens resulting from this work, and associated specimens donated by Virginia Polytechnic Institute, now reside at the Smithsonian. Subsequently, Research Associate Jerry McDonald continued fieldwork at the site for a number of years.

In 1966 Clayton participated in fieldwork at Gate City, Virginia, where parts of a skeleton of *Megalonyx* were discovered in a cave. The specimen is now part of the Smithsonian collections. In 1967 Clayton oversaw fieldwork in borrow pits around the Norfolk, Virginia, area; this work produced about 200 late Pleistocene vertebrate specimens, which, for specimens from the Atlantic Coastal Plain, are unusual in having good stratigraphic control.

In 1968 Clayton worked in Sardinia, Sicily, Malta, and Majorca. One objective of this work was to acquire material for the new Pleistocene exhibits then being developed at the Smithsonian, but this work also produced microfaunal material for future research purposes.

In 1970 Clayton, accompanied by Chief Preparator Franklin Pierce, joined Dick Tedford and Bob Emry from the American Museum of Natural History for fieldwork in the dry northern interior of South Australia (Figure 1). A primary objective of that expedition was also to acquire material for the Pleistocene exhibits. Ten weeks of collecting in Pleistocene deposits exposed in the dry, deflating bed of Lake Callabonna produced numerous skeletons of extinct Australian megafauna, including

giant marsupials and giant birds. Among the specimens personally collected by Clayton were two skeletons of the giant wombat *Phascolonus*; these specimens are the material basis of Dick Tedford's paper in the present volume. A cast of one of the skeletons is now exhibited at the American Museum of Natural History.

Since 1970, most of Clayton's fieldwork has been in connection with his long-term project at the Lee Creek Phosphate Mine in eastern North Carolina. This project has resulted in the majority of vertebrate fossil specimens accessioned into the Smithsonian's collections during this time. Clayton worked with and advised many amateur collectors who helped gather specimens, and he encouraged them to donate important material to the Smithsonian. He has also worked with nearly 50 authors to study and publish the findings. Thus far, three volumes have been published, covering the geology of the site, the plant and invertebrate fossils, and all non-mammalian vertebrates. Clayton is presently close to completing the editing of the fourth and final volume (this one covering mammals, marine and terrestrial) resulting from this research. The Lee Creek Phosphate Mine will certainly be the most comprehensively studied fossil site on the Atlantic Coastal Plain, and, when completed, the four volumes will record what is very likely the taxonomically most diverse fossil assemblage known from a single site.

In addition to his own work on Smithsonian collections, Clayton has actively promoted work on the collections by others. Much of this was accomplished by his taking full advantage of Smithsonian in-house funding sources, such as the Short-Term Visitor Awards Program, Pre- and Postdoctoral Fellowships, the Remington Kellogg Fund, and the Walcott Fund, as well as outside sources (e.g., the Marine Mammal Commission), to enable non-Smithsonian researchers to study and publish on the collections and thereby add to the knowledge about them.

Clayton was advisor to several Smithsonian Predoctoral and Postdoctoral Fellows whose research included using the Smithsonian collections. Among them are David Gillette, who reviewed the glyptodonts of North America; Russell Graham, who worked up the Valsequillo fauna of Mexico that Clayton had collected; Ewan Fordyce, from New Zealand, who studied primitive cetaceans in the Emlong collection; Kishor Kumar, from Pakistan, who also researched primitive cetaceans; Al Myrick, who studied Miocene porpoises; Jerry McDonald, then of Radford University, who worked on fossil ovibovines (musk oxen); and Irina Koretsky, a specialist on fossil phocid pinnipeds, who had emigrated to the United States from Kiev, Ukraine.

Under Clayton's sponsorship, many others received short-term support for a variety of projects: Joaquín Arroyo-Cabrales, Mexico, worked on vampire bats; Oscar Carranza, Mexico, Mexican faunas; Pamela Rasmussen and Jonathan Becker, fossil birds from Lee Creek Mine; Castor Cartelle, Brazil,

megatheres; Laszlo Kordos, Budapest, Miocene land and marine faunas; Guram Mchedlidze, Tbilisi, mid-Tertiary Cetacea; Irina Dubrovo, Moscow, fossil cetaceans; Christian de Muizon, Lima (now Paris), Pliocene pinnipeds; Oldrich Fejfar, Prague, Miocene rodents; Mario Cozzuol, Buenos Aires, fossil Cetacea; Annalisa Berta, Tom Deméré, and Sharon Messenger, all marine mammal workers from San Diego.

Clayton was an Adjunct Professor in the Department of Geological Sciences, Virginia Polytechnic Institute, in 1969. He also served on the doctoral committee of Gregory McDonald, University of Toronto, whose dissertation dealt with edentates.

Clayton has been the long-term sponsor of several Research Associates who have conducted collection-based research at the museum, have added materials to the collections, and have contributed substantially to curation of certain collections: Taseer Hussain, Neogene mammals; Annalisa Berta, fossil pinnipeds; Daryl Domning, fossil Sirenia and Desmostylia; Ralph Eshelman, Neogene faunas; Jerry McDonald, Pleistocene ungulates; Charles Repenning, fossil pinnipeds and microtines; and Frank Whitmore, Jr., fossil whales.

This collaborative work has resulted in important studies of such topics as faunas and stratigraphy of Paratethys, emphasizing fossil pinnipeds; archaic whales from New Zealand, Antarctica, and the west and southeast coasts of the United States; the most diverse nonmarine Miocene mammal fauna east of the Mississippi River outside of Florida; and a bizarre cetacean with convergent walrus-like morphology from the Pliocene of Peru. Clayton's recommendations made at the 1967 Darwin Conference led to the Quaternary cave studies conducted by Dave Steadman on the Galápagos Islands.

Since 1976, Clayton has been an author of nine publications of the *Smithsonian Contributions to Paleobiology* (nos. 28, 40, 51, 52, 53, 59, 61, 66, and 90). Number 59 (1986, coauthored with Daryl Domning and Malcolm McKenna), "Two New Oligocene Desmostylians and a Discussion of Tethytherian Systematics," reported a link among major groups of mammals, with important information bearing on relationships at the supraordinal level. The paper has since been widely cited by other authors discussing the higher-level classification of mammals.

Among Clayton's other more important contributions are his papers on the oldest known pinniped skeleton, which has stimulated and contributed to ongoing intensive debate on the definition, origin (or origins?), and relationships within and outside the Pinnipedia: is the Pinnipedia a natural monophyletic group or the result of convergence of two groups of carnivores with separate origins?

In addition to his scientific publications, Clayton has written book reviews and popular articles. Examples include reviews of the Sierra Club *Handbook on Marine Mammals* and Sutcliffe's *On the Track of Ice Age Mammals*. Clayton served as a consultant on the Smithsonian-American Heritage book *The Evidence of Evolution*, and the Macmillan Company book

Hunting for Fossils. Popular articles include “The time has come the walrus said...” in *Virginia Explorer*; “Outerbank Ovi-bovine Adds Link to Musk Ox Research,” and “Catawba’s wandering walrus: Case of peripatetic pinniped solved,” both in *Whalebones*, Newsletter of the North Carolina State Museum of Natural History.

Clayton has been, of course, a frequent reviewer of proposals and manuscripts for the National Science Foundation, National Geographic Society, Sigma Xi, American Philosophical Society, *Journal of Paleontology*, *Journal of Vertebrate Paleontology*, and other similar journals and grant-awarding agencies. He has a well-deserved reputation as a thorough reviewer who not only finds mistakes but also offers solutions. He never met a split infinitive that he could not repair, and it is almost a sure bet that he will notice some in this volume.

Service to His Profession

During his freshman year at Harvard College, Clayton received a \$50 grant from a fund that had been established in the seventeenth century to enable students to return to their homes to be with their families during the Christmas holidays. To this event Clayton attributes the beginning of his continuing interest in establishing and supporting endowment funds. He was instrumental in establishing the Cooper Fund and the Kellogg Fund at the Smithsonian, and the Society of Vertebrate Paleontology Endowment Fund.

The Society of Vertebrate Paleontology Endowment Fund did not yet exist when Clayton became Chair of the Development Committee in 1986. Clayton had been concerned that the society might not be able to continue its long support of the *Bibliography of Fossil Vertebrates*, an important reference series within the field, but one that was becoming increasingly expensive to produce. Clayton urged the society to establish an endowment fund that would ensure the continuation of the bibliography, and this led to his being invited to chair an endowment committee. His committee organized a fund-raising campaign with a goal of \$500,000 within five years. That goal was surpassed within three years; by 1992 the balance was over \$750,000 and now is more than twice that amount. At the 1989 annual meeting, the Society of Vertebrate Paleontology presented Clayton with a special citation and plaque for his service on the committee. Clayton’s response to the membership is so typical of him that it is worth quoting here for the insight it gives into his character:

On a personal note, as this is my last communication to you from the Development Committee, I was surprised at the business meeting and very pleased to receive a plaque from the Society in recognition of my service on the committee. Rather I owe thanks to the Society for enabling me to pursue on its behalf a cause that I believe to be profoundly important to its future, for making that pursuit successful, and for affording me the opportunity to work closely with the best of the best in VP. Most of all I am proud of my good judgment as to the character of our members.

Clayton was also the leader in persuading the Society of Vertebrate Paleontology to assume responsibility for publishing the *Journal of Vertebrate Paleontology*. His effort began with an open letter to the society, which resulted in the formation of the Journal of Vertebrate Paleontology Committee. He was asked to chair this committee, and he did so from 1982 to 1985. Work toward this end involved distribution of a mail ballot to the membership for approval to take on such an effort, necessary revision of the society’s constitution, and negotiations with the University of Oklahoma and with Jiri Zidek, the journal’s first editor, who had founded the journal with support from the University of Oklahoma. The *Journal of Vertebrate Paleontology* has continued to grow as a professional, highly respected publication and has prompted renewed efforts to increase the society’s endowment in order to ensure timely publication of accepted manuscripts.

From October 1975 through December 1977, Clayton served as Chairman of the Committee of Scientific Advisors on Marine Mammals for the Marine Mammal Commission. John Twiss, Executive Director of the Commission, wrote, in a letter to Bob Emry, 18 August 1999, that Clayton “was an able chairman who had considerable influence upon the Committee’s activities. Particularly noteworthy were his efforts to focus attention on the plight of the West Indian manatee (*Trichechus manatus*). In no small measure as a result of his work, the Commission put into place aggressive research and management programs which succeeded in bringing greatly increased Federal and state resources to bear on this species’ protection and conservation.”

In the 1960s, Clayton served on the American Geological Institute–Geological Society of America Geoscience Information Committee. Clayton served on the Advisory Panel on the Future of Mammalogy at the Museum of Comparative Zoology, Harvard University, in 1985; he was a member of the Search Committee for Curator of Vertebrate Paleontology, American Museum of Natural History, New York, in 1986.

Clayton was the keynote speaker at the first annual meeting of the Marine Mammal Society and authored a paper that was published in the first issue of its journal, *Marine Mammal Science*.

Many of Clayton’s research papers exhibit a strong historical component, and he has a keen interest in the history of our profession and the lives and careers of its early practitioners, those giants whose shoulders we all stand on. Among the accomplishments that Clayton is most proud of is his proposal to name the auditorium at the National Museum of Natural History after Spencer Fullerton Baird, followed by a successful campaign to persuade the museum’s administration to do so. Clayton was banquet speaker at the 1989 Florida Paleontological Society meeting on the occasion of the centennial of the first publication on Florida vertebrate paleontology by Joseph Leidy. He was also the invited speaker at the 1991 ceremony dedicating the Wagner Free Institute of Science, Philadelphia, as a National Historic Landmark on the centennial of Joseph Leidy’s death.

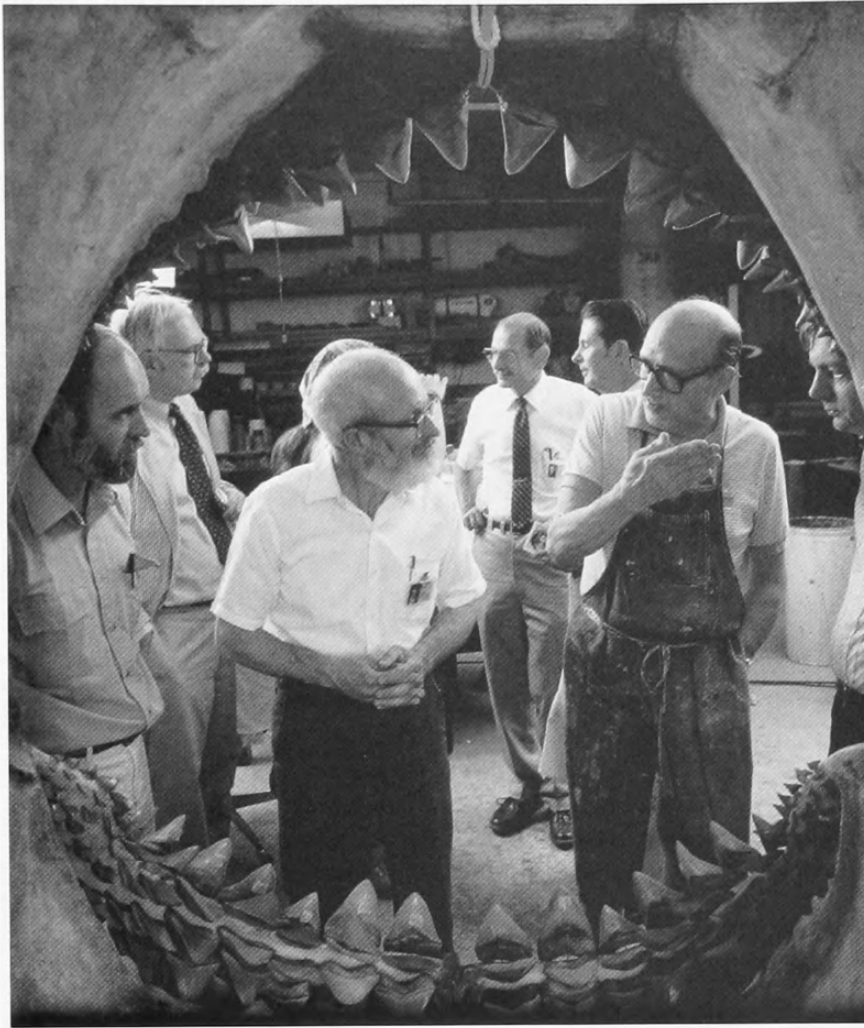


FIGURE 2 (left).—Clayton E. Ray reviewing the modeled jaws of *Carcharodon megalodon* containing actual fossil teeth from Lee Creek Mine, prior to installation in the paleontology exhibits at the National Museum of Natural History, 1985. From left: Robert J. Emry, Curator, Department of Paleobiology; Thomas R. Harney, Public Information Officer, Office of the Director; Clayton E. Ray, Curator, Department of Paleobiology; an unidentified person obscured by Clayton Ray; Victor G. Springer, Curator, Department of Vertebrate Zoology; Ian G. MacIntyre, Curator and then Chairman, Department of Paleobiology; Walter E. Hock, Sr., Modelmaker, Smithsonian Exhibits Central; Robert W. Purdy, Museum Specialist, Department of Paleobiology. All NMNH staff except Hock. (Photograph by Chip Clark, NMNH.)

Professional Affiliations

Clayton has been a Life Member of the American Society of Mammalogists since 1956. He is an Honorary Member of the Marine Mammal Society; a member of the Biological Society of Washington; Florida Paleontological Society; Georgia Academy of Science; Gruppo Grotte Nuorese, Associazione Speleologica; Paleontological Society of Washington; William Penhelly Cave Studies Association; and United States Association for Quaternary Research. He is the only Honorary Charter Member of the North Carolina Fossil Club. He is also a member of the Society of Vertebrate Paleontology, where he served as Chair of the Journal of Vertebrate Paleontology Committee, 1982–1985, Chair of the Development Committee, 1986–1989, and Vice President and President-Elect, 1990–1992.

Exhibits

Early in the planning phase of the Pleistocene Hall at the National Museum, Clayton suggested a multidisciplinary approach of using “living fossils” and introducing the relationship of early humans with the flora and fauna. During development of the Pleistocene Hall from 1964 through 1971,

Clayton advised on the preparation of all skeletal mounts and murals, and he also arranged for acquisition of specimens needed for the exhibit by exchange, gift, or field collection. For example, the Alaskan material (consisting of specimens from the Fairbanks area frozen gravels, including a composite skeleton of a woolly mammoth and a *Bison* mummy) and the Arizona glyptodont specimens, reputed to be the best examples from North America, were acquired by exchange from the American Museum of Natural History. Of the Australian material collected in 1970 by a joint Smithsonian Institution–American Museum of Natural History team, only a skull of the giant marsupial *Diprotodon* was eventually used. Clayton completed the gift of a composite skeleton of the rare goat-antelope, *Myotragus balearicus*, from the Deya Archeological Museum in Majorca. His fieldwork in the Mediterranean produced the material needed to make composite skeletons of the dwarf giant deer from Crete, *Myotragus* from Majorca, *Prolagus* from Sardinia, and giant dormouse from Sicily; these materials remain in the museum’s collections but were not assembled for the exhibit. Clayton also coordinated the collection of dwarf hippo, lemur, tortoise, and elephant bird remains from the Pleistocene of Madagascar.

Clayton proposed the “Jaws” exhibit on fossil sharks and was the primary advisor on its development (Figure 2). The original set of fossil teeth that were mounted in the reconstructed jaws of *Carcharodon megalodon* were acquired through Clayton’s Lee Creek Mine project, mainly through the generosity of amateur collector Peter Harmatuk. The exhibit was completed in October 1985, and the poster that accompanied the exhibit, featuring members of the exhibit team framed by the reconstructed jaws, quickly became a collectors’ item. Clayton also assisted in the acquisition of new fossils for the “Life in the Ancient Seas” exhibit, which opened in May 1990, and he supervised the mounting or remodeling of several marine mammal skeletons, plus creation of the mural, for this exhibit.

Clayton worked actively with the natural history museum community outside the Smithsonian. For example, he testified before the Virginia legislature in favor of the state establishing a museum of natural history, served first as an advisor in 1988, and was then appointed by the Governor of Virginia as a trustee of the Virginia Museum of Natural History in 1989. Among his other services, he helped write the collections policy manual for that museum. Because Thomas Jefferson was an early practitioner of our profession of vertebrate paleontology, and one of Clayton’s heroes, Clayton was especially proud to be awarded the Jefferson Medal in 1993 by Governor Wilder and the Virginia state legislature for his outstanding contributions to science, and especially for his work with the Virginia Museum of Natural History.

Clayton is an Advisory Member of the Saltville Foundation and its Museum of the Middle Appalachians. He has served as an advisor to the Calvert Marine Museum in Solomons, Maryland, and its Calvert Cliffs fossil exhibit; to the Cincinnati Museum of Natural History on its Pleistocene exhibit; and to the Aurora Fossil Museum in Aurora, North Carolina.

Library

Anyone who has known Clayton for any time at all will know that he is an avid bibliophile and a strong advocate of building and maintaining good research libraries. He has served on a succession of Smithsonian Institution library committees through the years, and he served as the Department of Paleobiology Representative on the Library Liaison Committee before his retirement. Clayton was instrumental in arranging for the donation of Remington Kellogg’s personal marine mammal library to the Smithsonian and establishing it as part of the Institution’s library system, set up in a separate room near the fossil marine mammal collections. Clayton almost single-handedly has seen to it that the Kellogg Library has been properly cared for, that new literature and unpublished works are continually added, and that an active reprint exchange program is maintained. Clayton also facilitated the donation of the C.L. Gazin and R.H. Reinhart personal libraries to the vertebrate paleontology library holdings of the Smithsonian. He has

made numerous donations to the Smithsonian Institution Archives and has arranged for all Society of Vertebrate Paleontology documents to be deposited in the Smithsonian Institution Archives as well.

Clayton’s bibliophilia bore early fruit in one of his first publications, a bibliography of the fossil vertebrates of Florida (1957). He later remarked to Daryl Domning that having once produced such a work doomed one forever to be sought out as an advisor on other bibliographic projects. This destiny, however, he willingly embraced; nor did his warning dissuade Domning from using Clayton’s Florida work as a model for his own first publication (a bibliography on fossil vertebrates of Louisiana and Mississippi, 1969). The Florida bibliography also served as an early inspiration for Domning’s much later (1996) and much larger bibliography of the Sirenia and Desmostylia—another major (and Smithsonian-published) project to which Clayton for years lent his enthusiastic encouragement and tangible support.

Extracurricular Pursuits

Clayton in his extracurricular pursuits, and especially in his retirement, practices sustainable agriculture, animal husbandry, and silviculture on his farm near Fredericksburg, Virginia (Figure 3). He regards this as a natural extension of his career in natural history. Some might call him a purist in these pursuits, as he maintains “a holistic commitment to an environmental lifestyle.” He eschews air conditioning, uses no motorized farm equipment, and practices organic farming methods. In line with this commitment, he collects and restores horse-drawn vehicles such as wagons, buggies, and bobsleds, as well as agricultural implements. To “power” this equipment he keeps and breeds Suffolk draft horses, maintaining at least one working team. He and Donna make frequent trips, mainly to southeastern Pennsylvania, to attend farm auctions and shows. He usually comes home with what he considers a prize. He loaned one of his farm wagons for a temporary Hidatsa Indian exhibit and helped the Smithsonian’s Folklife Festival with information on an oat-threshing demonstration.

One of Clayton’s major projects since he retired from the museum has been barn razing and barn raising. In 1995, a large (35 by 80 feet) dairy barn, built early in the last century, was about to be bulldozed to make way for construction of a shopping mall. Clayton was given the barn in exchange for removing it from the property. With the help of his extended family, Clayton dismantled the barn piece by piece and has since reassembled it on his own property.

Clayton still spends occasional days (typically one day each week) at the museum, continuing his research and finishing long-term research projects. The lunchtime gathering on those days is sometimes highlighted by new photographs, perhaps of his proud team of Suffolks pulling some new implement, or maybe of a pony recently acquired for the grandchildren, or, recently, baby pictures—a new foal born to one of his Suffolk

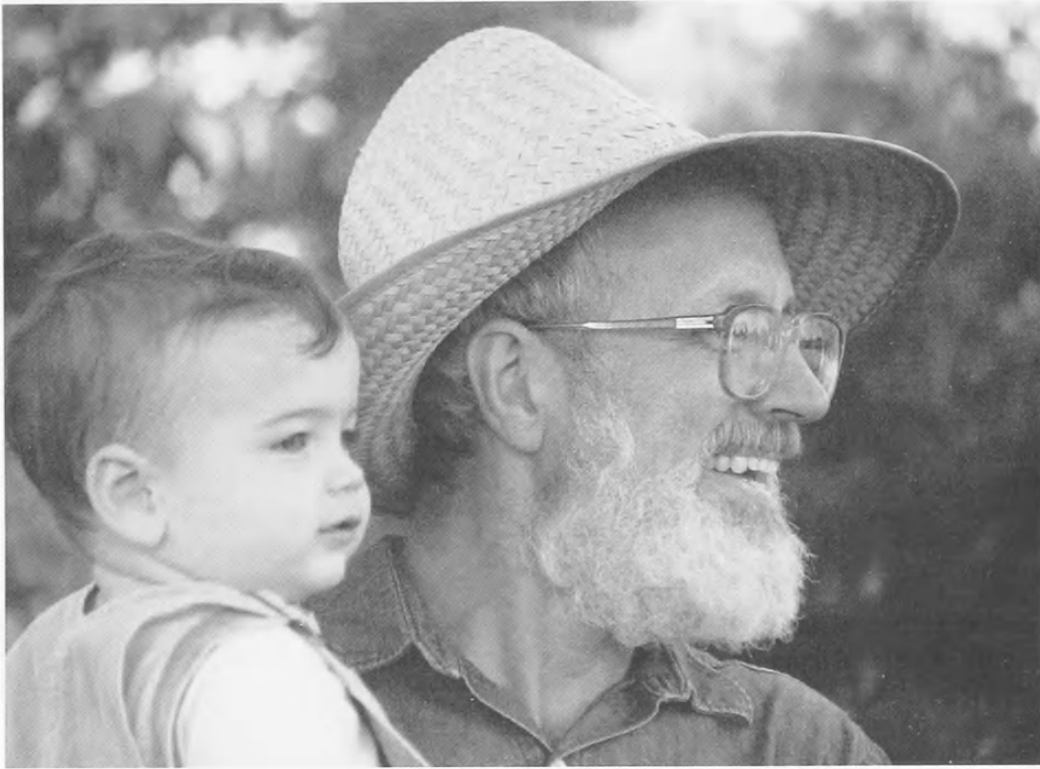


FIGURE 3.—Clayton E. Ray and grandson Danny afield in 1991, Stafford County, Virginia.

mares. We've learned that we cannot expect to see Clayton in the museum if there is new snow in Stafford County, because that far south in Virginia, any opportunity to hitch up the bob-sled is too rare to be missed.

Finally, we take this opportunity to publish, this time complete and unexpurgated, a letter as written by Clayton to the editor of *Smithsonian* magazine (1995).

February first had begun in the dark as a humdrum day like many others with that somnambulant 50-mile drive up I-95. Then right there in the middle of M Street, N.W., opposite my wife's office, suddenly materialized a beautiful tar-covered ball peen hammer with the handle only slightly split. I made it mine as her cautions about traffic echoed behind me. Then, in her office I find the new *Smithsonian* with John Neary's article about junk—this was a day to remember!

I always skim through *Smithsonian* eagerly to keep track of what you are doing (I am a curator in NMNH), to find your mistakes, and to sniff at the superficial potboilers written by hacks just for the money. Suddenly I realized why I have been so critical of you all these years and where you have gone wrong—so little of your stuff is written by real experts who know and love their subject. Neary's article is a sparkling exception.

I assure you that my assessment has nothing to do with why I gave up jogging to and from my office back when we lived in South Arlington. The daily pickings in fender washers, bolts, and screw drivers alone were too heavy and their gleaning too time consuming, to say nothing of the occasional chain or tool box that required phoning my wife from the Jefferson Memorial to come and haul me home with what I had dragged from the 14th Street bridge. Nor is my judgment weighted by my assemblage of blacksmith's vises (8, 9, 10, but who's counting); the next one auctioned at a bargain bid will certainly have some beautilitarian nuance to complement my holdings.

Congratulations on finally publishing something authoritative and of inherent interest to every reader.

As you might imagine, and to Clayton's chagrin, his letter was heavily edited and shortened when published in the magazine.

Bibliography of Clayton E. Ray

1957

Pollock, H.E.D., and C.E. Ray. Notes on Vertebrate Animal Remains from Mayapan. *Carnegie Institution of Washington, Department of Archaeology, Current Reports*, 41: 633–656.

Ray, C.E. A List, Bibliography, and Index of the Fossil Vertebrates of Florida. *Florida Geological Survey, Special Publication*, 3: 175 pages.

Ray, C.E. Palaeontology. Vertebrate. In Walter Yust, editor, *Britannica Book of the Year, 1957*, pages 595–596. Chicago, London: Encyclopedia Britannica.

Ray, C.E. Pre-Columbian Horses from Yucatan. *Journal of Mammalogy*, 38(2):278.

1958

Ray, C.E. Fusion of Cervical Vertebrae in the Erethizontidae and Dinomyidae. *Breviora*, 97:1–13, figures 1, 2.

Ray, C.E. Additions to the Pleistocene Mammalian Fauna

from Melbourne, Florida. *Bulletin of the Museum of Comparative Zoology*, 119(7):419–450, figures 1–5.

1959

Ray, C.E. A Sesamoid Bone in the Jaw Musculature of *Gopherus polyphemus* (Reptilia: Testudininae). *Anatomischer Anzeiger*, 107(1/5):85–91, figures 1–4.

1960

Ray, C.E. *Trichecodon huxleyi* (Mammalia: Odobenidae) in the Pleistocene of Southeastern United States. *Bulletin of the Museum of Comparative Zoology*, 122(3):127–142, text figure 1, plates 1, 2.

Ray, C.E. The Manatee in the Lesser Antilles. *Journal of Mammalogy*, 41(3):412–413.

1961

Ray, C.E. The Monk Seal in Florida. *Journal of Mammalogy*, 42(1):113.

Waters, J.H., and C.E. Ray. Former Range of the Sea Mink. *Journal of Mammalogy*, 42(3):380–383, figure 1.

1962

Ray, C.E. New Finds of Old Bones. *Florida Alumnus, University of Florida*, 14(4):20–22, 3 figures.

1963

Ray, C.E., S.J. Olsen, and H.J. Gut. Three Mammals New to the Pleistocene Fauna of Florida, and a Reconsideration of Five Earlier Records. *Journal of Mammalogy*, 44(3):373–395, text figures 1–7, plates 1–4.

1964

Gut, H.J., and C.E. Ray. The Pleistocene Vertebrate Fauna of Reddick, Florida. *Quarterly Journal of the Florida Academy of Sciences*, 26(4):315–328.

Hooijer, D.A., and C.E. Ray. A Metapodial of *Acratocnus* (Edentata: Megalonychidae) from a Cave in Hispaniola. *Proceedings of the Biological Society of Washington*, 77: 253–258, figure 1.

Ray, C.E. A New Capromyid Rodent from the Quaternary of Hispaniola. *Breviora*, 203:1–4, figure 1.

Ray, C.E. A Small Assemblage of Vertebrate Fossils from Spring Bay, Barbados. *Journal of the Barbados Museum and Historical Society*, 31(1):11–22, figures 1–3.

Ray, C.E. *Tapirus copei* in the Pleistocene of Florida. *Quarterly Journal of the Florida Academy of Sciences*, 27(1): 59–66, plate 1.

Ray, C.E. The Jaguarundi in the Quaternary of Florida. *Journal of Mammalogy*, 45(2):330–332, figure 1.

Ray, C.E. The Taxonomic Status of *Heptaxodon* and Dental Ontogeny in *Elasmodontomys* and *Amblyrhiza* (Rodentia:

Caviomorpha). *Bulletin of the Museum of Comparative Zoology*, 131(5):107–127, figures 1, 2.

1965

Hibbard, C.W., C.E. Ray, D.E. Savage, D.W. Taylor, and J.E. Guilday. Quaternary Mammals of North America. In H.E. Wright, Jr., and D.G. Frey, editors, *The Quaternary of the United States*, pages 509–525. Princeton: Princeton University Press.

Ray, C.E. A Glyptodont from South Carolina. *Charleston Museum Leaflet*, 27:1–12, plates 1–4.

Ray, C.E. A New Chipmunk, *Tamias aristus*, from the Pleistocene of Georgia. *Journal of Paleontology*, 39(5): 1016–1022, text figure 1.

Ray, C.E. The Relationships of *Quemisia gravis* (Rodentia: ?Heptaxodontidae). *Smithsonian Miscellaneous Collections*, 149(3):1–12, text figures 1, 2, plate 1.

Ray, C.E. Variation in the Number of Marginal Tooth Positions in Three Species of Iguanid Lizards. *Breviora*, 236:1–15, figures 1–5.

Ray, C.E., and L. Lipps. An Assemblage of Pleistocene Vertebrates and Mollusks from Bartow County, Georgia. [Abstract.] *Bulletin of the Georgia Academy of Science*, 23(2):67.

1966

Ray, C.E. The Identity of *Bison appalachicolus*. *Notulae Naturae of the Academy of Natural Sciences of Philadelphia*, 384:1–7, figures 1, 2.

Ray, C.E. The Status of *Bootherium brazosis*. *Pearce-Sellards Series*, 5:1–7, figures 1, 2.

1967

Lipps, L., and C.E. Ray. The Pleistocene Fossiliferous Deposit at Ladds, Bartow County, Georgia. *Bulletin of the Georgia Academy of Science*, 25(3):113–119, figures 1, 2.

Ray, C.E. Pleistocene Mammals from Ladds, Bartow County, Georgia. *Bulletin of the Georgia Academy of Science*, 25(3):120–150, figures 1–5.

Ray, C.E., B.N. Cooper, and W.S. Benninghoff. Fossil Mammals and Pollen in a Late Pleistocene Deposit at Saltville, Virginia. *Journal of Paleontology*, 41(3):608–622, text figures 1–4, plates 65, 66.

1968

Ray, C.E., and L. Lipps. Additional Notes on the Pleistocene Mammals from Ladds, Georgia. *Bulletin of the Georgia Academy of Science*, 26(2):63.

Ray, C.E., A. Wetmore, D.H. Dunkle, and P. Drez. Fossil Vertebrates from the Marine Pleistocene of Southeastern Virginia. *Smithsonian Miscellaneous Collections*, 153(3): 1–25, text figures 1, 2, plates 1, 2.

Ray, C.E., D. Wills, and J.C. Palmquist. Fossil Musk Oxen of

Illinois. *Transactions of the Illinois Academy of Science*, 61(3):282–292, figures 1–5.

Wing, E.S., C.A. Hoffman, Jr., and C.E. Ray. Vertebrate Remains from Indian Sites on Antigua, West Indies. *Caribbean Journal of Science*, 8(3–4):123–139, figures 1–4.

1970

Ray, C.E., C.S. Denny, and M. Rubin. A Peccary, *Platygonus compressus* LeConte, from Drift of Wisconsinan Age in Northern Pennsylvania. *American Journal of Science*, 268(1):78–94, 1 text figure, 2 plates.

Ray, C.E., and L. Lipps. Southerly Distribution of Porcupine in Eastern United States during Late Quaternary Time. [Abstract.] *Bulletin of the Georgia Academy of Science*, 28(2):24.

1971

Ray, C.E. Polar Bear and Mammoth on the Pribilof Islands. *Arctic*, 24(1):9–18, text figure 1.

1973

Ray, C.E. Review of *The Distributional History of the Biota of the Southern Appalachians*, Perry C. Holt, editor. *Systematic Zoology*, 22(2):199–201.

Ray, C.E., and F.C. Whitmore, Jr. Paleontology. In T. Simkin, W.G. Reeder, and C. MacFarland, editors, Galapagos Science, 1972 Status and Needs, pages 67–68. *Report of Galapagos Science Conference, October 6–8, 1972, Washington, D.C.* [sponsored by the National Science Foundation, Smithsonian Institution, and the University of Wisconsin]. Washington, D.C.: Smithsonian Institution.

1975

Ray, C.E. The Relationships of *Hemicaulodon effodiens* Cope 1869 (Mammalia: Odobenidae). *Proceedings of the Biological Society of Washington*, 88(26):281–304, plates 1–6.

Ray, C.E. The Geography of Phocid Evolution. [Abstract.] *American Zoologist*, 15(3):812.

Ray, C.E. Field Conference in Marine Mammal Beds of Coastal Oregon, August 18–20, 1975. [Unpublished field guide], 33 pages, 2 tables, 7 maps.

1976

Ray, C.E. *Phoca wymani* and Other Tertiary Seals (Mammalia: Phocidae) Described from the Eastern Seaboard of North America. *Smithsonian Contributions to Paleobiology*, 28: 36 pages, 3 text figures, 11 plates.

Ray, C.E. [Anonymous, with assistance and recommendations of others.] *Marine Mammal Names*. 8 pages. Washington, D.C.: Marine Mammal Commission. [A list of the marine mammals of the world, scientific and common

names, published by the commission and distributed worldwide, to serve as a standard nomenclature.]

Ray, C.E. Procrastination Week [letter to the editor]. *Washington Post*, March 17, page A18.

Ray, C.E. The Gray Seal in U.S. Waters. 11 pages. [Unpublished “white paper” for Marine Mammal Commission.]

Repenning, C.A., and C.E. Ray. The Origin of the Hawaiian Monk Seal. *Proceedings of the Biological Society of Washington*, 89(58):667–688, plates 1–3.

1977

Ray, C.E. The Geography of Phocid Evolution. *Systematic Zoology*, 25(4):391–406, figures 1–6.

Ray, C.E. Fossil Marine Mammals of Oregon. *Systematic Zoology*, 25(4):420–436, figures 1, 2.

Ray, C.E. Seals and Walruses of Florida. *Plaster Jacket*, 27: 1–13, figures 1–3, cover illustration.

1979

Ray, C.E. *Chelonia couperi* Harlan 1842, a Supposed Turtle Based on the Clavicle of a Megatherium (Mammalia: Edentata). *Notulae Naturae of the Academy of Natural Sciences of Philadelphia*, 455: 16 pages, 4 figures.

Ray, C.E., and D.E. Wilson. Evidence for *Macrotus californicus* from Terlingua, Texas. *Occasional Papers, The Museum, Texas Tech University*, 57:1–10, 2 figures.

Repenning, C.A., C.E. Ray, and D. Grigorescu. Pinniped Biogeography. In J. Gray and A.J. Boucot, editors, *Historical Biogeography, Plate Tectonics, and the Changing Environment: Proceedings of the 37th Annual Biology Colloquium and Selected Papers*, pages 357–369. Corvallis: Oregon State University Press.

1980

Morgan, G.S., C.E. Ray, and O. Arredondo. A Giant Extinct Insectivore from Cuba (Mammalia: Insectivora: Solenodontidae). *Proceedings of the Biological Society of Washington*, 93(3):597–608, 1 figure.

Ray, C.E. Douglas Ralph Emlong, 1942–1980. [Obituary.] *Society of Vertebrate Paleontology News Bulletin*, 120:45–46, 1 photograph.

1981

Gillette, D.D., and C.E. Ray. Glyptodonts of North America. *Smithsonian Contributions to Paleobiology*, 40: 255 pages, 97 figures.

Ray, C.E. Catawba's Wandering Walrus: Case of Peripatetic Pinniped Solved. *Whalebones* [quarterly newsletter of the North Carolina State Museum of Natural History], 13(Fall):3, 1 figure [unnumbered pages].

Ray, C.E. *Marine Mammal Information* [guest editorial], December 1981, pages 1–3.

Ray, C.E., E. Anderson, and S.D. Webb. The Blancan Carni-

vore *Trigonictis* (Mammalia: Mustelidae) in the Eastern United States. *Brimleyana*, 5:1–36, 7 figures.

Ray, C.E., and J.K. Ling. A Well Documented Early Record of the Australian Sea Lion. *Archives of Natural History*, 10(1):155–171, 7 figures.

Ray, C.E., and A.E. Spiess. The Bearded Seal, *Erignathus barbatus*, in the Pleistocene of Maine. *Journal of Mammalogy*, 62(2):423–427, 2 figures.

1982

Domning, D.P., G.S. Morgan, and C.E. Ray. North American Eocene Sea Cows (Mammalia: Sirenia). *Smithsonian Contributions to Paleobiology*, 52: 69 pages, 34 figures.

Ray, C.E. The Journal of Vertebrate Paleontology and the SVP. *Society of Vertebrate Paleontology News Bulletin*, 125:5–7.

Ray, C.E. Review of “Handbook of Marine Mammals, Volume 1: The Walrus, Sea Lions, Fur Seals, and Sea Otter, and Volume 2: Seals,” S.H. Ridgway and R.J. Harrison, editors. *Journal of Mammalogy*, 63(4):721–724.

Ray, C.E., F. Reiner, D.E. Sergeant, and C.N. Quesada. Notes on Past and Present Distribution of the Bearded Seal, *Erignathus barbatus*, around the North Atlantic Ocean. *Memórias do Museu do Mar, Série Zoológica* (Cascais, Portugal), 2(23):1–32, 10 figures.

Steadman, D.W., and C.E. Ray. The Relationships of *Megaooryzomys curioi*, an Extinct Cricetine Rodent (Muroidea: Muridae) from the Galapagos Islands, Ecuador. *Smithsonian Contributions to Paleobiology*, 51: 23 pages, 11 figures.

1983

Barnes, L.G., D.P. Domning, and C.E. Ray. Status of Studies on Fossil Marine Mammals. [Abstract.] *Fifth Biennial Conference on the Biology of Marine Mammals, November 27–December 1, 1983, Boston, Massachusetts*, page 1.

Ray, C.E. Journal of Vertebrate Paleontology Committee Report. *Society of Vertebrate Paleontology News Bulletin*, 127:8–9, 17–19.

Ray, C.E. Outerbank Ovibovine Adds Link to Musk Ox Research. *Whalebones* [quarterly newsletter of the North Carolina State Museum of Natural History], 15(Spring):3, 1 figure [unnumbered pages].

Ray, C.E. [Anonymous.] President Robert L. Carroll’s Report on Amendments and the JVP. *Society of Vertebrate Paleontology News Bulletin*, 128:1–2 [also pages 2–9, amendments to SVP constitution also written by C.E. Ray].

Ray, C.E. Hooded Seal, *Cystophora cristata*: Supposed Fossil Records in North America. *Journal of Mammalogy*, 64(3):509–512, 4 figures.

Ray, C.E., editor. Geology and Paleontology of the Lee Creek Mine, North Carolina, I. *Smithsonian Contributions to Paleobiology*, 53: 529 pages, frontispiece, 95 figures, 101

plates.

Ray, C.E. Prologue. In C.E. Ray, editor, Geology and Paleontology of the Lee Creek Mine, North Carolina, I. *Smithsonian Contributions to Paleobiology*, 53:1–14.

1984

Ray, C.E. Fossil Seals from the Calvert Formation of the Pamunkey River, Hanover County, Virginia. In L.W. Ward and Kathleen Krafft, editors, *Stratigraphy and Paleontology of the Outcropping Tertiary Beds in the Pamunkey River Region, Central Virginia Coastal Plain: Guidebook for Atlantic Coastal Plain Geological Association 1984 Field Trips*, pages 232–235. Atlantic Coastal Plain Geological Association.

Ray, C.E., and A.E. Sanders. Pleistocene Tapirs in the Eastern United States. In H.H. Genoways and M.R. Dawson, editors, Contributions in Quaternary Vertebrate Paleontology: A Volume in Memorial to John H. Guilday. *Special Publication, Carnegie Museum of Natural History*, 8:283–315.

1985

Barnes, L.G., D.P. Domning, and C.E. Ray. Status of Studies on Fossil Marine Mammals. *Marine Mammal Science*, 1(1):15–53, 9 figures.

1986

Cifelli, R.L., and C.E. Ray. Review of *Vertebrate Zoogeography and Evolution in Australasia*, M. Archer and G. Clayton, editors. *Journal of Vertebrate Paleontology*, 6(2):203–205.

Domning, D.P., and C.E. Ray. The Earliest Sirenian (Mammalia: Dugongidae) from the Eastern Pacific Ocean. *Marine Mammal Science*, 2(4):263–276, figures 1–6.

Domning, D.P., C.E. Ray, and M.C. McKenna. Two New Oligocene Desmostylians and a Discussion of Tethytherian Systematics. *Smithsonian Contributions to Paleobiology*, 59: iv + 56 pages, 23 figures.

Ray, C.E. [Anonymous.] Development Committee Message. *News Bulletin of the Society of Vertebrate Paleontology*, 138:4 [also annual auction announcement, page 57].

Ray, C.E. [Anonymous.] Development Committee Report. *Society of Vertebrate Paleontology News Bulletin*, 137:5–6 [also raffle announcement, page 49].

Ray, C.E. [Letter to the Editor.] *The Four Star SIWC* [Smithsonian Institution Women’s Council] *Newsletter*, 7(1):8.

Ray, C.E., and D.P. Domning. Manatees and Genocide. *Marine Mammal Science*, 2(1):77–78. [Letter to the editor regarding “Conservation and Protection of Marine Mammals....”]

1987

Germon, R.N., Lauck W. Ward, and C.E. Ray. *Ecphora*:

Important Fossil from the Miocene Strata on the Chesapeake Bay. *Maryland Naturalist*, 31(1):25–33, figures 1–11.

McDonald, J.N., and C.E. Ray. *Bootherium bombifrons*, the Autochthonous Low-Horned Musk Ox of Pleistocene North America. [Abstract.] *Second International Muskox Symposium, October 1–4, 1987, University of Saskatchewan*, page 22.

Ray, C.E., editor. Geology and Paleontology of the Lee Creek Mine, North Carolina, II. *Smithsonian Contributions to Paleobiology*, 61: 283 pages, 49 figures, 80 plates.

Ray, C.E. Foreword. In C.E. Ray, editor, Geology and Paleontology of the Lee Creek Mine, North Carolina, II. *Smithsonian Contributions to Paleobiology*, 61:1–8.

Ray, C.E. Development Committee Message. *Society of Vertebrate Paleontology News Bulletin*, 139:24–25 [also SVP Archives, page 63].

Ray, C.E. Development Committee Activities. *Society of Vertebrate Paleontology News Bulletin*, 140:2.

1988

McDonald, J.N., and C.E. Ray. Zoogeography of the Musk Ox Genus *Praeovibos* Staudinger, 1908. [Abstract.] *Journal of Vertebrate Paleontology*, supplement, 8(3):21A–22A.

Morgan, G.S., O.J. Linares, and C.E. Ray. New Species of Fossil Vampire Bats (Mammalia: Chiroptera: Desmodontidae) from Florida and Venezuela. *Proceedings of the Biological Society of Washington*, 101(4):912–928, 8 figures.

Ray, C.E. Development Committee Report and Second Development Workshop. *Society of Vertebrate Paleontology News Bulletin*, 142:3–7.

Ray, C.E. [Anonymous.] Development Committee Note. *Society of Vertebrate Paleontology News Bulletin*, 143:1–2.

Ray, C.E. Review of “A Short History of Vertebrate Palaeontology,” by Eric Buffetaut. *Earth Sciences History*, 7(2): 162.

Ray, C.E., O.J. Linares, and G.S. Morgan. Paleontology. In A.M. Greenhall and U. Schmidt, editors, *Natural History of Vampire Bats*, pages 19–30 [Chapter 3]. Boca Raton, Florida: CRC Press.

1989

Berta, A., C.E. Ray, and A. Wyss. Skeleton of the Oldest Known Pinniped, *Enaliarctos mealsi*. *Science*, 244(4900): 60–62, figures 1–3.

McDonald, J.N., L.E. Freeman, and C.E. Ray. The Osteology of *Bootherium bombifrons*: A Comparative Osteological Atlas. [Abstract.] *Journal of Vertebrate Paleontology*, supplement, 9(3):32A.

McDonald, J.N., and C.E. Ray. *Bootherium bombifrons*, the Autochthonous Low-Horned Muskox of Pleistocene North America. [Abstract.] *Canadian Journal of Zoology*, 67(5): A64.

McDonald, J.N., and C.E. Ray. The Autochthonous North American Musk Oxen *Bootherium*, *Symbos*, and *Gidleya* (Mammalia: Artiodactyla: Bovidae). *Smithsonian Contributions to Paleobiology*, 66: 77 pages, 64 figures.

Ray, C.E. Development Committee Report. *Society of Vertebrate Paleontology News Bulletin*, 145:9.

1990

Berta, A., and C.E. Ray. Skeletal Morphology and Locomotor Capabilities of the Archaic Pinniped *Enaliarctos mealsi*. *Journal of Vertebrate Paleontology*, 10(2):141–157, 7 figures, cover illustration.

Buffrénil, V. de, A. de Ricqlès, C.E. Ray, and D.P. Domning. Bone Histology of the Ribs of the Archaeocetes (Mammalia: Cetacea). *Journal of Vertebrate Paleontology*, 10(4): 455–466, 4 figures.

McDonald, H.G., and C.E. Ray. The Extinct Sloth, *Megalonyx* (Mammalia: Xenarthra), from the United States Mid-Atlantic Continental Shelf. *Proceedings of the Biological Society of Washington*, 103(1):1–5, 2 figures.

1991

Borns, H.W., Jr., and C.E. Ray. Historic Bovid Teeth from Gardiner, Maine. *Current Research in the Pleistocene*, 8: 85–86.

Domning, D.P., C.E. Ray, and M.C. McKenna. A New Specimen of *Behemotops proteus* (Mammalia: Desmostylia) from the Oligocene of Washington. [Abstract.] *Journal of Vertebrate Paleontology*, supplement, 11(3):26A.

McDonald, J.N., C.E. Ray, and C.R. Harington. Taxonomy and Zoogeography of the Musk Ox Genus *Praeovibos* Staudinger, 1908. In J.R. Purdue, W.E. Klippel, and B.W. Styles, editors, *Beamers, Bobwhites, and Blue Points: Tributes to the Career of Paul W. Parmalee. Scientific Papers, Illinois State Museum*, 23:285–314. [Also published as *The University of Tennessee, Department of Anthropology, Report of Investigations*, 52.]

Tedford, R.H., L.G. Barnes, and C.E. Ray. Earliest Miocene Littoral Arctoid, *Kolponomos*. [Abstract.] *Journal of Vertebrate Paleontology*, supplement, 11(3):57A.

Ubelaker, D.H., H.E. Berryman, T.P. Sutton, and C.E. Ray. Differentiation of Hydrocephalic Calf and Human Calvariae. *Journal of Forensic Sciences*, 36(3):801–812, 9 figures.

1992

Inuzuka, N., D.P. Domning, C.E. Ray, and Y. Hasegawa. Summary of Taxa and Distribution of Desmostylia. *Abstracts, 29th International Geological Congress, Kyoto, Japan, 24 August–3 September 1992*, 2:349.

Koretsky, I.A., and C.E. Ray. Fossil True Seals (Family Phocidae) from the Lee Creek Mine of Southeastern USA. [Abstract.] *Journal of Vertebrate Paleontology*, supplement, 12(3):37A–38A.

Miyazaki, S., H. Horikawa, N. Kohno, K. Hirota, M. Kimura,

Y. Hasegawa, Y. Tomida, L.G. Barnes, and C.E. Ray. Summary of the Fossil Record of Pinnipeds of Japan, and Comparisons with Those from the Eastern North Pacific. *Abstracts, 29th International Geological Congress, Kyoto, Japan, 24 August-3 September 1992*, 2:352.

Muizon, C. de, and C.E. Ray. A Walrus-Like Cetacean from the Early Pliocene of Peru. [Abstract.] *Journal of Vertebrate Paleontology*, supplement, 12(3):45A.

Ray, C.E. Foreword. In R.R. Reeves, B.S. Stewart, and S. Leatherwood, *The Sierra Club Handbook of Seals and Sirenians*, pages xi–xii. San Francisco: Sierra Club Books.

Ray, C.E. "The time has come the walrus said..." *The Virginia Explorer*, 8(1):2–7.

1993

McDonald, J.N., and C.E. Ray. Records of Musk Oxen from the Atlantic Coastal Plain of North America. *The Mosasaur*, 5:1–18, figures 1–13.

Ray, C.E. [Letter to Editor.] Fossil Collecting and Government Regulation. *Science*, 259(5095):581.

1994

Inuzuka, N., D.P. Domning, and C.E. Ray. Summary of Taxa and Morphological Adaptations of the Desmostylia. *The Island Arc*, 3(4):522–537.

Koretsky, I.A., and C.E. Ray. *Cryptophoca*, New Genus for *Phoca maeotica* (Mammalia: Pinnipedia: Phocinae), from Upper Miocene Deposits in the Northern Black Sea Region. *Proceedings of the Biological Society of Washington*, 107(1):17–26, figures 1–4.

Miyazaki, S., H. Horikawa, N. Kohno, K. Hirota, M. Kimura, Y. Hasegawa, Y. Tomida, L.G. Barnes, and C.E. Ray. Summary of the Fossil Record of Pinnipeds of Japan, and Comparisons with That from the Eastern North Pacific. *The Island Arc*, 3(4):361–372.

Ray, C.E. [Letter to the Editor]. The Junkoholic. *Smithsonian*, 25(1):12.

Ray, C.E. Presentation of the Harrell L. Strimple Award of The Paleontological Society to Peter J. Harmatuk. *Journal*

of Paleontology, 68(4):920–923, 1 figure [with statements by F.C. Whitmore, Jr., and F.M. Huber; response by Peter J. Harmatuk].

Ray, C.E., D.P. Domning, and M.C. McKenna. A New Specimen of *Behemotops proteus* (Order Desmostylia) from the Marine Oligocene of Washington. *Proceedings of the San Diego Society of Natural History*, 29:205–222, figures 1–15.

Tedford, R.H., L.G. Barnes, and C.E. Ray. The Early Miocene Littoral Ursoid Carnivoran *Kolponomos*: Systematics and Mode of Life. *Proceedings of the San Diego Society of Natural History*, 29:11–32, figures 1–15.

1996

McDonald, J.N., C.E. Ray, and F. Grady. Pleistocene Caribou (*Rangifer tarandus*) in the Eastern United States: New Records and Range Extensions. In K. Stewart and K. Seymour, editors, *Paleoecology and Paleoenvironments of Late Cenozoic Mammals; Tributes to the Career of C. S. (Rufus) Churcher*, pages 406–430. Toronto: University of Toronto Press.

1997

Arroyo-Cabrales, J., and C.E. Ray. Revisión de los Vampiros Fósiles (Chiroptera: Phyllostomidae, Desmodontinae) de México. In Joaquín Arroyo-Cabrales and Óscar J. Polaco, editors, *Homenaje al Profesor Ticul Álvarez*, pages 69–86. México, D.F. [Mexico City]: Colección Científica, Instituto Nacional de Antropología e Historia.

2001

Ray, C.E., editor. Geology and Paleontology of the Lee Creek Mine, North Carolina, III. *Smithsonian Contributions to Paleobiology*, 90: 365 pages, 127 figures, 45 plates, 32 tables.

Ray, C.E. Prodrum. In C.E. Ray, editor, Geology and Paleontology of the Lee Creek Mine, North Carolina, III. *Smithsonian Contributions to Paleobiology*, 90:1–20.



Clayton E. Ray, 1979.



Eshelman, Ralph E. et al. 2002. "Biography and Bibliography of Clayton Edward Ray." *Cenozoic mammals of land and sea : tributes to the career of Clayton E. Ray* 93, 1–13.

View This Item Online: <https://www.biodiversitylibrary.org/item/266341>

Permalink: <https://www.biodiversitylibrary.org/partpdf/352082>

Holding Institution

Smithsonian Libraries

Sponsored by

Smithsonian Institution

Copyright & Reuse

Copyright Status: In copyright. Digitized with the permission of the rights holder.

Rights Holder: Smithsonian Institution

License: <http://creativecommons.org/licenses/by-nc-sa/4.0/>

Rights: <http://biodiversitylibrary.org/permissions>

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.