

Peter D. Ward – Curriculum Vitae
Born May 12, 1949, Seattle Washington, USA
Married, two children

1. Education

B.S., 1971 Interdisciplinary Studies (Paleoecology), University of Washington, Seattle
 M.S., 1973 Geology, University of Washington, Seattle
 Ph.D., 1976 Geology, McMaster University, Hamilton, Ontario, Canada

Employment

1976-1978 Assistant Professor, Department of Geology, Ohio State University
 1978-1981 Assistant Professor, Department of Geology, University of California, Davis
 1981-1983 Associate Professor with Tenure, Department of Geology and Division of Environmental Sciences, University of California, Davis
 1982 Visiting Scientist, Laboratoire Arago (C.N.R.S.), Banyuls, France
 1984 Professor, Department of Geology, University of California, Davis
 1985 Associate Professor, University of Washington
 1986 Professor, Department of Geological Sciences, and Adjunct Professor, Department of Zoology, University of Washington
 1989- 1996 Curator of Invertebrate Paleontology, Thomas Burke Memorial Museum, University of Washington
 1991. Visiting Scientist, South African Museum
 1992-1996 Chairman and Head, Division of Geology and Paleontology, Thomas Burke Memorial Museum, University of Washington
 2000. Visiting Scientist, South African Museum
 2001 – present, Adjunct Professor, Department of Astronomy, University of Washington
 2003- present, Professor, Dept. of Biology, and Professor, Department of Earth and Space Sciences, The University of Washington
 2007- Adjunct Curator, Burke Museum of Natural History and Culture, University of Washington
 2007. Visiting Scientist, University of Western Australia

Professional Service

Councilor, Paleontological Society 1986-1988; 1992- 1994
 Co-Editor in Chief, *Cretaceous Research* (Academic Press) 1984-1988
 Associate Editor, *Paleobiology*, 1985-1989
 Member, International Subcommittee on Cretaceous Stratigraphy 1985-1992
 Convener, Working Group 6, Cretaceous-Tertiary Boundary, Global Sedimentology Program, 1990-1992
 Associate Editor, *Geology*, 1991-1993
 Co-editor, *Geological Society of America Special Paper 247*, Global Catastrophes in Earth History, 631p. 1990.
 Associate Editor, *Geology*, 1995-1996
 Associate Editor, *Lethaia*
 Councilor, Paleontological Society, 1994-1998

Board of Directors, Seattle Marine Aquarium, 2002-2005
 Executive Council, NASA Astrobiology Institute, 2001-2006
 Executive Council, University of Washington Astrobiology Program, 2001- present
 Principal Investigator, University of Washington node, NASA Astrobiology Institute, 2001-2006

Current Graduate Students (all PhD candidates at this time)

Frederick Dooley, Biology
 Shane Schoepfer, ESS
 Kelly Hillbun, ESS
 Tom Tobin, ESS
 David Smith (graduated 12/2012)
 Loren Ballanti, PhD, graduated 9/2012

Undergraduate advisees (Biology)

– seven Biology undergrads

Selected Academic Honors or Awards

Fellow, California Academy of Sciences, (elected 1985)
 Affiliate Professor, California Institute of Technology, 1995-1997
 Keynote Speaker, Rimini Conference, Italy, 2002
 Stafford White Annual Lecturer, Princeton University, 2006
 Pardee Keynote Speaker, Geological Society of America Annual Meeting, 2005; 2007
 TED main speaker, Monterey Ca 2008
 Fellow, World Academy of Science, elected, 2000
 Annual Faculty Lecturer (33rd), The University of Washington (*highest academic honor bestowed by the University of Washington for one of its faculty: awarded for excellence in teaching, research, and outreach*)
 100 best ideas of 2010: *New York Times*, for Medea Hypothesis
 Keynote, First South American Meeting on Astrobiology, Quito, Nov. 2011
 Fellow (elected 2010) Washington State Academy of Science
 Distinguished Lecturer, American Association of Petroleum Geologists, 2011-2012
 Washington State Governor's Book Award: Best book of 2005 for *Gorgon*
 Keynote Speaker: 2012 Gordon Conference on Geobiology, January 2013, Ventura Ca.
 Washington Academy of Sciences (elected 2011)

Books and book honors

Ward has published the following books to date. Various of Ward's books are now translated into German, French, Polish, Spanish, Italian, Czechoslovakian, Chinese, Portuguese (for Brazil), Japanese, Korean, and more than a half million copies have been sold world wide.

1. *Beneath Puget Sound* (1974, PB Press, Seattle);
2. *The Natural History of Nautilus* (1987, Unwin Hyman, London);
3. *In Search of Nautilus* (1988; Simon and Schuster);
4. *On Methuselah's Trail: living fossils and the great extinctions* (1991, W.H. Freeman), which won the Golden Trilobite Award by the Paleontological Society for best science

book of 1991, and was nominated for a Los Angeles Times Book Award as well as being a Book of the Month Club selection,

5. *The End of Evolution: on mass extinctions and the preservation of biodiversity* (1994, Bantam Books) was one of three finalists for the Los Angeles Times Book Award (science category) ;
6. *The Call of Distant Mammoths: What killed the Ice Age mammals* (1997, Copernicus: Springer Verlag)
7. *Time Machines: scientific explorations in deep time* (1998, Copernicus: Springer Verlag)
8. *Rare Earth: why complex life is uncommon in the Universe*(with Don Brownlee) (2000, Copernicus: Springer Verlag), named by *Discover Magazine* as one of the ten most important science books of 2001.
9. *Rivers in Time* (2000, Columbia University Press)
10. *Future Evolution* (with Alexis Rockman) 2001, W.H. Freeman
11. *The Life and Death of Planet Earth* 2003 Henry Holt
12. *Gorgon: paleontology, obsession, and the greatest catastrophe in Earth History*,2004 Viking Penguin. *Gorgon* was awarded a Washington State Governor's Book Award in 2005, and was nominated for a Keck Science Writing award.
13. *Life as We Do Not Know It: the NASA search for and synthesis of alien life*" was published by Viking in November, 2005, and it was named one of *Library Journals* "Best Books of 2005: (<http://www.libraryjournal.com/article/CA6298434.html>). It was also nominated for a Keck Science Writing Award.
14. *Out of Thin Air: Dinosaurs, Birds, and Earth's Ancient Atmosphere*, (2006) The Joseph Henry Press, of the National Academy of Sciences, was a main selection of the Discover Book Club.
15. *Under a Green Sky: global warming, the mass extinctions, of the past and what they can tell us about our future mass extinctions*, (2007), Smithsonian Books (Collins)
16. *The Medea Hypothesis*, 2009, Princeton University Press, was listed by the *New York Times* as one of the "100 most important ideas of 2009".
17. *Our Flooded Earth*, 2010.
18. *In Press: A New History of Life*, (with Joseph Kirschvink).

Patents: US Patent Office - serial number 61/584,966: The effect of hydrogen sulfide on human crop production. Awarded 2013. All rights reverted to Peter Ward, 12/2013.

Grants

Current Funding

1. Hypotheses of True Polar Wander – USNSF – \$250k total, 3 years (6/12-9/15)
2. Conservation Biology of deep sea fisheries in the Philippine Islands, \$40k, Tiffany & Company Foundation (expires 12/13; all funding expended)
3. USNSF: Mode and Tempo of molluscan evolution across the K/Pg mass extinction boundary in Antarctica. NSF, Polar Programs, \$299k, accepted 10/13, two years
4. National Geographic Society – Population and conservation of deep sea Nautilus. 20k, awarded 1/2014
5. Storm damage assessment, Philippine Islands. Awarded 11/2013, 19k

Prior funding

- 2009-2012 Population numbers of living Nautilus on the Great Barrier Reef – US Fish and Wildlife 100k (6/11-7/13)2
- 2011-2012 Ecological position of Nautilus in Fiji. National Marine Fisheries, 42k.
- 2012-2013 Population structure of Nautilus in Samoa, 39k, NOAA (6/12-7/14)
- 2009 -2011. Upper Cretaceous stratigraphy of Antarctica. 3 year, 432k.
- 2007- 2009. National Science Foundation. Clumped isotope analyses of mass extinction boundaries. 425k
2008. NSF Devonian mass extinction in the Canning Basin, Australia: 17,000
- 2006-2011 Australian Research Council/Chevron. Devonian Chronostratigraphy of the Canning Basin, Australia. Written by P. Cawood and P. Ward (funds transferred to US to conduct stable isotope analyses was \$120k), total A\$ 2.4 million
- 2001-2007. University of Washington node, NASA Astrobiology Institute, P. Ward PI \$6.2 million
2000. National Science Foundation . Timing and mechanisms of mammal-like reptile extinction at the Permian/Triassic boundary. \$145,000, 2 yr.
1998. National Science Foundation, Tectonics panel Testing the Baja B.C hypothesis:. \$136k, 3 yr.
1997. National Science Foundation . Phylogeny of the post- Triassic Nautilacea. \$150,000 (2 yr)
1996. Royalty Research Foundation. Isotopic tests of the Permo /Triassic Extinction. \$35,000 (1 yr)
- 1995 National Science Foundation EAR 9567123 The roles of cameral liquid transport in shell strength in ammonoid suture complexity \$18,000 (1 yr)
- 1994 National Science Foundation, EAR 9432487. Pacific Coast Campanian-Maastrichtian Chronostratigraphy. \$100,000 (2 yr)
- 1992 National Science Foundation, EAR 9205555. The extinction of the Inoceramidae and Campanian-Maastrichtian paleoceanography. \$99,894 (2 yr)
- 1989 National Science Foundation, EAR 8904797. Molluscan Biostratigraphy at four Cretaceous-Tertiary boundary sections, Western Europe, a renewal. \$90,000 (2 yr)
- 1987 National Science Foundation, EAR-8843296. Molluscan Biostratigraphy at four Cretaceous-Tertiary boundary sections, Western Europe. \$89,200
- 1986 National Science Foundation - Renewal, The Species of Nautilus \$131,000. (With W. Saunders and D. Woodruff) (3 yr)
- 1985 National Science Foundation. Biostratigraphy and magnetostratigraphy, Great Valley Sequence, California. \$56,800. (2 yr)
- 1983 National Science Foundation, EAR 83-18932. The Species of Nautilus. \$137,240. (With W. Saunders and D. Woodruff) (2 yr)
- 1982 National Science Foundation, EAR 82-12165. Stable Isotopic Investigations of Early Development in Extant and Fossil Chambered Cephalopods. \$86,276. (With M. Deniro) (2 yr)
- 1982 National Science Foundation, PCM 82-02891. Buoyancy Regulation in the Chambered Nautilus. \$95,084. (With L. Greenwald) (2 yr)
- 1982 National Science Foundation, U.S.-France Exchange of Scientists.\$10,000.

- 1980 National Science Foundation, EAR 80-19696. Biostratigraphy and Magnetostratigraphy of Upper Cretaceous Great Valley Sequence, Northern California. \$49,872. (With K. Verosub) (2 yr)
- 1979 National Science Foundation, PCM 78-80176. Buoyancy Control in the Chambered Nautilus. \$58,076. (With L. Greenwald) (2 yr)
- 1978 American Chemical Society. Investigations into the Upper Cretaceous Biostratigraphy of the Nanaimo Group. \$10,000.

Publications submitted and in review

Barord, G., Ward, P. and Dunstan A. Population numbers of the cephalopod Nautilus in fished and unfished habitats. *Nature*. Submitted 11/18/2013

Ward, Peter, Barord, G. Chamberlain, J. The role of calcium phosphate uroliths in the metabolism of Nautilus. Submitted to Proceedings of the National Academy of Sciences, 11/14/13

In press (proofs received). Smith, D., Timonen, H., Jaffe, D., Griffin, D., Birmele, M., Perry, K., Ward, P., and Roberts, M. Intercontinental Dispersal of Bacteria and Archaea by Transpacific Winds. *Applied and Environmental Microbiology*

Ward, P. Mitchell, R. Haggart, J. Morphological variability in the Late Cretaceous ammonite *Baculites inornatus* Meek from western North America: implications for species concepts in the biostratigraphically important Baculitidae. *Journal of Paleontology*

Published

2013. Vilhena, D., E B. Harris¹, C T. Bergstrom¹, M E. Maliska¹, P D. Ward, C A. Sidor, C A. E. Stromberg & G P. Wilson, 2013. Bivalve network reveals latitudinal selectivity gradient at the end-Cretaceous. mass extinction. *SCIENTIFIC REPORTS (Open)* V. 3, (1790): 1-5.

2013. Dooley, F., Ward, P., Nair, S, 2013. Hydrogen Sulfide causes unusually fast growth in crop plants; *PLoS ONE*, May.

2013. Bookstein, F. and Ward, P. A modified Procrustes analysis for bilaterally symmetrical outlines, with an application to microevolution in *Baculites*. *Paleobiology*, 39(2):214-234

2012 Ward, P.; J. Haggart, R. Mitchell, J. Kirschvink, T. Tobin (Integration of macrofossil biostratigraphy and magnetostratigraphy for the Pacific Coast Upper Cretaceous (Campanian - Maastrichtian) of North America and implications for correlation with the Western Interior and Tethys. *GSA Bulletin*. 124, 957-974

2012. Schoepfer, S., Charles M. Henderson, Geoffrey H. Garrison, Peter D. Ward. Cessation of a productive coastal upwelling system in the Panthalassic Ocean at the Permian–Triassic Boundary. *Palaeogeography, Palaeoclimatology, Palaeoecology*,

Volumes 313–314, Pages 181–188.

2012 Schoepfer, S., Charles M. Henderson, Geoffrey H. Garrison, Julien Foriel, Peter D. Ward, David Selby, James C. Hower, Thomas J. Algeo, Yanan Shen. Termination of a continent-margin upwelling system at the Permian–Triassic boundary (Opal Creek, Alberta, Canada). *Global and Planetary Change*, Available online 15 July 2012.

2012. Tobin, T. , P. Ward, E. J. Steig, E. B. Olivero, I. A. Hilburn, R. N. Mitchell, M. R. Diamond, T. D. Raub, J. L. Kirschvink. Extinction patterns, $\delta^{18}\text{O}$ trends, and magnetostratigraphy from a southern high-latitude Cretaceous - Paleogene section: links with Deccan volcanism. *Palaeogeography, Palaeoclimatology, Palaeoecology*. 350-352, 180-188.

2012. Ward, P., G. J. Retallack, and R M.H. Smith. The terrestrial Permian–Triassic boundary event bed is a nonevent: reply to Gastaldo et al . *Geology*, March online edition

2012. Dooley F., Wyllie-Echeverria S., Ward P.D, & Roth M.B. The tolerances and responses of *Zostera marina* seedlings to Hydrogen Sulfide (H_2S); *Aquatic Botany* <http://dx.doi.org/10.1016/j.aquabot.2012.10.007>

2011. Whiteside, J and P. Ward. 2011 Ammonoid diversity and disparity track episodes of chaotic carbon cycling during the early Mesozoic. *Geology*, v. 39, p. 99-102.

2011. Dunstan AJ, Ward PD, Marshall NJ. Vertical Distribution and Migration Patterns of *Nautilus pompilius*. *PLoS ONE* 6(2): e16311.

2011. Ward, P and Berner, R. 2011. Why are there dinosaurs? Why are there birds? In Dyke GA and Kaiser G (eds) . *Living dinosaurs, the evolutionary history of modern birds*, Wiley Blackwell, pp30-38 etc.

2010. Ward, P. What is the diversity of life in the Cosmos? Eds Bell, I., Conway Morris, S., Barrow, J., Finney, J., and Harper, C. *Water and Life*. CRC Press, 370p.

2009. Haggart, J. and P. Ward. Molluscan biostratigraphy and paleomagnetism of Campanian strata, Queen Charlotte Islands, British Columbia: implications for Pacific coast North America biochronology Raub et al, Queen Charlottes, *Cretaceous Research* Volume 30, Issue 4, August 2009, Pages 939-951

2009. Williford KH, Foriel J, Ward PD, Steig EJ. Major perturbation in sulfur cycling at the Triassic-Jurassic boundary. *Geology* 37: 835-838 (2009).

2007. Ward, P.D., Garrison, G.H., Williford, K.H., Kring, D., Goodwin, D., Beattie, M., McRoberts, C., . The organic carbon isotopic and paleontological record across the Triassic-Jurassic boundary at the candidate GSSP section at Ferguson Hill, Muller Canyon, Nevada, USA. *Palaeogeography, Palaeoclimatology, Palaeoecology* .

2007. Williford, K.H., Ward, P.D., Garrison, G.H., Buick, R., 2006. An extended stable organic carbon isotope record across the Triassic-Jurassic boundary in the Queen Charlotte Islands, British Columbia, Canada. *Palaeogeography, Palaeoclimatology, Palaeoecology*).

2006. Ward, P., Labandeira, C., Lauren, M. Berner, R. Confirmation of Romer's Gap as a low oxygen interval constraining the timing of initial arthropod and vertebrate terrestrialization. *Proc. Nat. Acad. Sci.*, October 25, 2006, 10.1073/pnas.0607824103

2005. Huey, R. B., and Ward, P. D. 2005 Hypoxia, Global Warming, and Terrestrial Late Permian Extinctions. *Science*, Vol 308, Issue 5720, 398-401

2005. Farley, K., Ward, P., Garrison, G., Mukhopadhyay, S. 2005 Absence of extraterrestrial ^3He in Permian Triassic Rocks. *Earth and Planetary Science Letters*, 240:265-275.

2005 Ward, P.D., Botha, J., Buick, R., De Kock, M.O., Erwin, D.H., Garrison, G., Kirschvink, J., and Smith, R.M.H., 2005, Abrupt and Gradual Extinction Among Late Permian Land Vertebrates in the Karoo Basin, South Africa: *Science*, v. 307: 709-714

2004. Ward, P. D., Garrison, G. H., Haggart, J. W., Kring, D. A., Beattie, M. J. Isotopic evidence bearing on Late Triassic extinction events, Queen Charlotte Islands, British Columbia, and implications for the duration and cause of the Triassic/Jurassic mass extinction. *Earth and Planetary Science Letters* 224 (3-4): 589-600.

2003. Retallack, G., Smith, R., and Ward, P. Vertebrate extinction across the Permian-Triassic boundary in Karoo Basin, South Africa. *GSA Bulletin*, v.115, 1133-1152.

2003. Maestres, Y., Kenneth G. MacLeod, Robert Douglas, Jean Self-Trail and Peter D. Ward. Late Cretaceous foraminifera, paleoenvironments, and paleoceanography of the Rosario formation, San Antonio del Mar, Baja California, Mexico. *The Journal of Foraminiferal Research*; July 2003; v. 33; no. 3; p. 179-191

2002. Smith, R.M.H., and Ward, P.D. Pattern of vertebrate extinctions across an event bed at the Permian-Triassic boundary in the Karoo Basin of South Africa: *Geology*, v. 29, 1147-1150

2001. Ward, P., Haggart, J., Carter, E., Wilbur, D., Tipper, H., and Evans, T., 2001, Sudden productivity collapse associated with the Triassic/Jurassic boundary mass extinction: *Science*, v. 292, 115-119.

2001. G. Gonzalez, D. Brownlee, P. Ward, The Galactic Habitable Zone. *Icarus*. V. 152, 185 -200.

2001. Kodama, K.P., and Ward, P.D. Compaction-corrected paleomagnetic paleolatitudes for Late Cretaceous rudists along the Cretaceous California margin: Evidence for less than 1500 km of post-Late Cretaceous offset for Baja British Columbia. *Geological Society of America Bulletin*, 113(9): 1171-1178.

- 2000 . Ward, P., Montgomery, D., and Smith, R., 2000, Altered River Morphology in South Africa Related to the Permian-Triassic Extinction: *Science*, v. 289, 1740-1743.
2000. MacLeod, K., Smith, R., Koch, P., and Ward, P., 2000, Timing of mammal-like reptile extinction across the Permian-Triassic boundary in South Africa: *Geology*, v. 28, 227-230.
2000. Ward, P. Bathymetric ranges and morphological adaptations in the sepiidae. *Muséum d'histoire naturelle de la Ville de Genève Revue de Paléobiologie: Vol. spécial 8* (2000), 157-167.
1999. Smith, A., Gallemi, J., Jeffrey, C., Ernst, g., and Ward, P. Late Cretaceous –early Tertiary echinoids from northern Spain; implications for the Cretaceous-Tertiary extinction event. *Bull. Natural History. Museum, London (Geology)* 5592, 81-137.
1997. Ward, P. and Orr, W., Integration of Campanian-Maastrichtian ammonite and planktonic foraminiferal zonations, based on new data from Tercis, France. *Journal of Paleontology*, V. 71: 407-418.
1997. Ward, P. On the Cretaceous extinction of the ammonites. *Proceedings, Dinofest 2 Special Publication of the Paleontological Society*: 519-525.
1997. Ward, P. Impacts and mass extinctions. *Proceedings of the Lawrence Livermore Laboratory, Special volume, Planetary Defense Workshop*, 51-57.
1997. Ward, P. and W. B. Saunders. A new genus of living nautiloid cephalopod and its bearing on phylogenetic hypotheses of the Nautilida *Journal of Paleontology*, v.71: 1054-1064
1997. Daniel, T. W. Saunders, P. Ward and B. Helmuth. Septal complexity in ammonoid cephalopods: a trade off between strength and buoyancy regulation. *Paleobiology*, v.23 (4): 403-411.
1997. Ward, P., J. Hurtado, J. Kirschvink, K. Verosub. Measurements of the Cretaceous paleolatitude of Vancouver Island: consistent with Baja British Columbia Hypothesis *Science*, , v. 277, 1642-1645.
- 1996 Ward, P. After the fall: lessons from the K/T debate. *Palaios*, v.10: 530-538.
1996. McLeod, K, B. Huber, and P. Ward. The biostratigraphy and paleobiogeography of Maastrichtian inoceramids. *Geological Society of America, Special Paper 307* (Proceeds of the Third meeting on global crises in earth history:361- 373.
1996. Marshall, C. and Ward, P. Macrofossil extinction patterns in K/T boundary sites. *Science*, V. 274, 1360-1363.

- 1995 Ward, P. The K/T trial. *Paleobiology* 21 (3) 245-248.
- 1993 Ward, P. and Kennedy, W., Maastrichtian ammonites from the Biscay region (France and Spain). *Journal of Paleontology, Memoir* 34, v. 67, 58 pp.
1992. Ward, P. Nelson, B. MacLeod, K. Marine Isotope Evolution. *Nature* 358:378
- 1992 Burnett, J., Kennedy, W., and Ward, P., Maastrichtian nannofossil biostratigraphy in the Biscay region (southwestern France, northern Spain). *Newsletters in Stratigraphy*, 26:145-155.
- 1990 Ward, P. A review of Maastrichtian ammonite ranges. *Geological Society of America, Special Paper* 247:519-530.
- 1990 MacLeod, K. and Ward, P. Extinction pattern of *Inoceramus* based on shell fragment biostratigraphy. *Geol. Soc. Am. Special Paper* 247:509-518.
- 1990 Ward, P. The Cretaceous-Tertiary extinctions in the marine realm: a 1990 perspective. *Geol. Soc. Am. Special Paper* 247:425-432.
- 1991 Nelson, B., MacLeod, K., and Ward, P., Rapid change in strontium isotopic composition of sea water prior to the Cretaceous-Tertiary boundary. *Nature*, 351:644-647.
- 1991 Ward, P., Kennedy, W.J., MacLeod, K., and Mount, J., Ammonite and inoceramid bivalve extinction patterns in Cretaceous-Tertiary boundary sections of the Biscay Region (southwest France, northern Spain). *Geology*, 19:1181-1184.
- 1989 Tsudy, D., Feldman, R., and Ward, P. Cephalopods: Biasing agents in the preservation of lobsters. *Journal of Paleontology*, v. 63:621-625.
- 1989 Haggart, J. and Ward, P. New Nanaimo Group ammonites from British Columbia and Washington State. *Journal of Paleontology*, v. 63:218-227.
- 1989 Verosub, K., Haggart, J., and Ward, P. Magnetostratigraphy of Upper Cretaceous strata of the Sacramento Valley, California. *Bulletin of the Geological Society of America*, v. 101:521-533.
- 1988 Ward, P. Form and function of the *Nautilus* shell: Some new perspectives. IN Wilbur, K. (ed.) *The Mollusca*. Academic Press 11:143-165.
- 1988 Ward, P. Maastrichtian ammonite and inoceramid ranges from Bay of Biscay Cretaceous-Tertiary boundary sections. IN Lamolda, M. E. Kauffman, and O. Wallisee, eds. *Paleontology and Evolution: Extinction events*. *Revista Española de Palaontologie*, n. Extraordinario, 119-126.

- 1988 Ward, P. and MacLeod, K. Macrofossil extinction patterns at Bay of Biscay Cretaceous-Tertiary boundary sections. Lunar and Planetary Institute Publications, no. 673, 206-207.
- 1987 Saunders, B. and Ward, P. Sympatric occurrence of living *Nautilus* (*N. pompilius* and *N. Stenomphalus*) on the Great Barrier Reef. *The Nautilus*, v. 101(4):188-193.
- 1987 Margolis, S., Mount, J., Doehne, E., Showers, W., and Ward, P. The Cretaceous-Tertiary boundary carbon and oxygen isotope: The stratigraphy, diagenesis, and paleoceanography at Zumaya, Spain. *Paleoceanography*, 2:361-377.
- 1986 Ward, P. Cretaceous ammonite shell shapes. *Malacologia*, 27(1):3-28.
- 1986 Ward, P. Compensatory buoyancy change in *Nautilus macromphalus*. *Veliger*, 28(4):356-368.
- 1986 Mount, J. and Ward, P. Origin of limestone - marl alternations in the Upper Maastrichtian of Zumaya, Spain. *Journal of Sedimentary Petrology*, 56:228-236.
- 1986 Mount, J., Margolis, S., Showers, W., Ward, P., and Doehne, E. Carbon and oxygen isotope stratigraphy of the Upper Maastrichtian Zumaya, Spain: a record of oceanographic and biologic changes at the end of the Cretaceous Period. *Palaios*, 1:87-92.
- 1986 Ward, P., Wiedmann, J., and Mount, J., Maastrichtian molluscan biostratigraphy and extinction patterns in a Cretaceous-Tertiary boundary section exposed at Zumaya, Spain, *Geology*, 14:899-903.
- 1985 Ward, P. Upper Cretaceous (Santonian-Maastrichtian) Molluscan faunal associations, British Columbia. IN: Bayer, U. and Seilacher, A. (eds.). *Sedimentary and Evolutionary Cycles*, Springer-Verlag (Berlin):397-420.
- 1985 Ward, P. and Westermann, G. Cephalopod Paleoecology. IN Bottjer, D., Hickman, C., and Ward, P., eds. *The Mollusca*. Short course notes, Paleontological Society: 79-95.
- 1985 Ward, P. and Signor, P. Evolutionary patterns of Jurassic and Cretaceous ammonites: an analysis of clade shape. IN Valentine, J. (ed.), *Phanerozoic Diversity Patterns*. Princeton Press, 399-418.
- 1985 Crocker, K., Deniro, M., and Ward, P. Stable isotopic investigations of early development in extant and fossil cephalopods. I. Oxygen isotopic composition of eggwater and carbon isotopic composition of siphuncle organic matter in *Nautilus* *Geochemica., Cosmochemica. Acta.* 49(12):2527-2532.

- 1985 Ward, P. Chamber formation periodicity in Nautilus. *Paleobiology* 11(4):438-450.
- 1984 Haggart, J. and Ward, P. Late Cretaceous stratigraphy of the northern Sacramento Valley, California. *Geological Society of America, Bulletin.* 95:618-627.
- 1984 Signor, P. and Ward, P. Paleontology, past and future. *Geology.* 1:175-176
- 1984 Crick, R., Mann, K., and Ward, P. The Sr, Mg, and Ca chemistry of the skeleton of Nautilus. *Geology.* 4:73-75
- 1984 Ward, P. and von Boletsky, S. Shell implosion depth and implosion morphologies in three species of Sepia (Cephalopoda) from the Mediterranean Sea. *Journal of the Marine Biological Association of the United Kingdom.* 64:955-966.
- 1984 Ward, P., Carlson, B., Weekly, M., and Brumbaugh, B. Remote telemetry of daily vertical and horizontal movement in Nautilus. *Nature.* 309(5965):248-250.
- 1983 Taylor, B. and Ward, P. Stable isotopic studies of Nautilus macromphalus (New Caledonia) and N. Pompilius (Fiji). *Palaeogeography, Palaeoclimatology, Palaeoecology.* 41:1-16.
- 1983 Ward, P., Verosub, K., and Haggart, J. Marine magnetic anomaly 33-34 identified in the Upper Cretaceous of the Great Valley Sequence of California. *Geology.* 11:90-93.
- 1983 Ward, P. and Chamberlain, J. Radiographic observation of chamber formation in Nautilus pompilius. *Nature.* 304:57-59.
- 1983 Ward, P. and Signor, P. Evolutionary tempo in Jurassic and Cretaceous ammonites. *Paleobiology.* 9(2):183-198.
- 1982 Ward, P. and Stanley, K. O. The Haslam Formation: A late Santonian early Campanian Forearc Basin Deposit in the Insular Belt of Southwestern British Columbia and adjacent Washington. *Journal of Sedimentary . Petrology.* 52(3):975-990.
- 1982 Greenwald, L., Cook, C., and Ward, P. The structure of the chambered Nautilus siphuncle: the siphuncular epithelium. *Journal of Morphology,* 175:5-22.
- 1982 Ward, P. The relationship of siphuncle size to emptying rates in chambered cephalopods: implications for cephalopod paleobiology. *Paleobiology.* 8(4):426-433.
- 1982 Greenwald, L. and Ward. P. The source of cameral liquid. *Veliger,* 169-170.
- 1981 Ward, P. Shell sculpture as a defensive adaptation in ammonoids. *Paleobiology.* 7(1):96-100.

- 1981 Ward, P., Greenwald, L., and Magnier, Y. The chamber formation cycle in *Nautilus macromphalus*. *Paleobiology*. 7(4):481-493.
- 1981 Chamberlain, J., Ward, P., and Weaver, S. Post mortem ascent of *Nautilus* shells: implications of cephalopod paleobiogeography. *Paleobiology*. 7(4):494-509.
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D. Refereed Book chapters

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F. Television Series funded: Animal Armageddon. Animal Planet Network, 8 hours, budget 3.2 million.

4. Courses taught (by area)

A. In Biology Department:

Evolution (for 3d and 4th years)

Evolution (for 1st years)

Paleobiology (for grads)

B. In Geology Department

Invertebrate Paleontology and lab (4th years and grads)

Geobiology (required, 3d and 4th year majors)

Earth History (required, 2nd yr majors)

Earth History (science elective, all undergrads)

Sedimentology (3d and 4th year Geology majors)

Advanced Earth History (Geology grads)

Oceanography (all undergrads)

Paleobiology (3d and 4th year majors)