

## Who's who

In behavioral ecology and animal cognition research

By students of ECOL496V/596V

(some slides changed in color and compressed by Anna for printing)

who's who by Anna Dornhaus



## Nigel Franks

University of Bristol

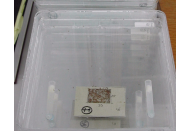
<http://www.bio.bris.ac.uk/people/staff.cfm?key=687>

Studies ants – *Temnothorax albipennis* and army ants, some modelling

**Interesting results:** proposed 'foraging for work' as task allocation mechanism in social insects; studied collective decision making in nest choice of ants, found quorum threshold mechanism

### References:

Anim Behav 48:470-472 (1994);  
Phil Trans R Soc 357: 1567-1583 (2002)



Who's who by Anna Dornhaus



## Lars Chittka

University of London,  
Queen Mary College

<http://www.biology.qmul.ac.uk/research/staff/chittka/chittka.htm>

Studies bees – mostly *Bombus terrestris*, a bumble bee



**Interesting results:** found social learning in bees; found that flower colors evolved to match bee vision, not vice versa; found that there is variation in learning and color preference traits within and across populations

### References:

Advances in the Study of Behavior 36: 305-354  
Current Biology 15: R869-R871

Who's Who by Laura Stein



## Naomi Pierce

Harvard University

<http://www.oeb.harvard.edu/faculty/pierce/people/Naomi/Naomi.html>

Studies symbiotic interactions between *Lycaenid* larvae and ants

**Interesting Results** – Attendant ants have significant effects on distribution and structure of populations of specific *Lycaenids*; some larvae use acoustic signaling in symbiotic ant-larvae relationships; some parasitoids exploit myrmecophilous behavior



### References:

Journal of Research on the Lepidoptera 31: 153-168 (1995)  
Journal of Animal Ecology 55: 451-462 (1986)  
Animal Behaviour 60: 13-26 (2000)

Who's Who by Laura Stein



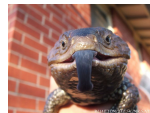
## Michael Bull

Flinders University

[http://www.scieng.flinders.edu.au/biology/people/bull\\_m/index.html](http://www.scieng.flinders.edu.au/biology/people/bull_m/index.html)

Studies lizard social organization and host-parasite interactions

**Interesting Results** – Demonstrated kin recognition in two species of skink, long-term studies found monogamy in some skink species, found presence of ectoparasites may determine social structure of skinks



### References:

Animal Behaviour 52: 193-200 (1996)  
"Lizard Ecology: Historical and Experimental Perspectives" pp 159 – 174 (1994)  
Oecologia 146: 675-680 (2005)

Who's Who by Laura Stein



## Deborah Gordon

Stanford University

<http://www.stanford.edu/~dmgordon/>

Studies harvester ants: colony organization, ecology, population genetics; studies invasive Argentine ants

**Interesting Results** – An ant's task decisions depend on its recent experience of brief encounters with other ants; in the course of an encounter, one ant assesses the task-specific cuticular hydrocarbons of another.

Developed a model of interactions between colonies shows how competition for food shapes foraging behavior



### References:

Nature 423: 32 (2003)  
Nature 380:121-124 (1996)  
American Naturalist 162:529-543 (2003)



## Who's Who by Laura Stein

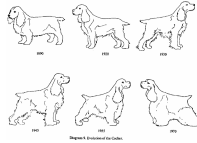


### James Serpell

University of Pennsylvania

<http://w3.vet.upenn.edu/faculty/JamesASerpell/method/display>

Studies evolution, behavior, and human interactions with the domestic dog



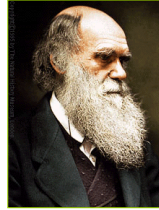
**Interesting Results** – Coat color does not seem to have an effect on aggression; exposing a pregnant dog to stressful situations renders her puppies more reactive to test situations later in life; extensive documentation on the effect of pets on humans



**References:** Appl Anim Behav Sci 47: 75-89 (1996)

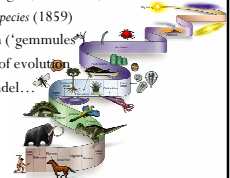
Serpell, James. *The Domestic Dog: Its Evolution, Behaviour, and Interactions with People*. 1995

## sneaky Who's Who by Tuan Cao



Charles Darwin

- Born February 12, 1809
- Dropped out of medical school at 18
- Graduated from the University of Cambridge at 22 (degree in theology)
- Voyage of the Beagle (1831-1836)
- *On the Origin of Species* (1859)
- Natural selection ('gemmules')
- Hierarchy of evolution
- Mendel...



By Tuan Cao

### George Romanes

(May 19, 1848 – May 23, 1894)

- English naturalist and psychologist
- Met Darwin at Cambridge
- Founder of Comparative psychology
- Romanes Lectures (Oxford University)
- Anecdotal approach to studying animal intelligence
- Versus Lloyd Morgan's Canon



*Animal Intelligence* (1881)

*Mental Evolution in Animals* (1883)

*Darwin and After Darwin* (1892)

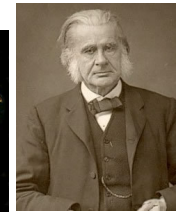
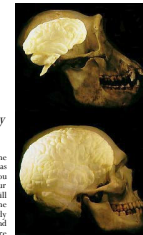


By Tuan Cao

### Thomas Henry Huxley

(1825-1895)

- Early life
- Voyage of the H.M.S *Rattlesnake*
- Studied marine invertebrates
- Outspoken defender of Darwin's theory
- Huxley vs. Wilberforce (1860)
- *Evidence as to Man's Place in Nature* (1863)
- *On the Methods and Results of Ethnology* (1865)



"I finished your book yesterday. Since I read Van Baer's essays nine years ago no work on Natural History Science I have met with has made so great an impression on me and I do most heartily thank you for the great store of new views you have given me. As for your doctrines I am prepared to go to the stake if requisite. I trust you will not allow yourself to be in any way disgusted or annoyed by the considerable abuse and misrepresentation which unless I greatly mistake is in store for you. And as to the curs which will bark and yelp -- you must recollect that some of your friends at any rate are endowed with an amount of combativeness which (though you have often and justly rebuked it) may stand you in good stead. I am sharpening up my claws and beak in readiness."

Letter of T. H. Huxley to Charles Darwin, November 23, 1859, regarding the *Origin of Species*

### Dr. Zachary Huang

by Tuan Cao

- Associate professor at Michigan State
- Behavioral, genetic, and physiological analyses of honey bee social behavior
- Avid photographer
- Funny funny guy!
- Published papers on:
  - Temporal polyethism
  - Juvenile hormone
  - Queen mandibular gland pheromone
  - varroa mites
- <http://www.msu.edu/~bees/>

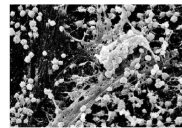
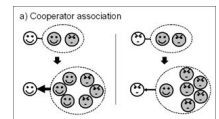
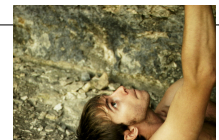


- Huang, Z.Y. & Robinson, G.E. 1996. Regulation of honey bee division of labor by colony age demography. *Behav Ecol and Social* 33: 147-158
- Huang, Z.Y. & Fernald, J.H. 2002. Modelling insect societies: from genes to colony behavior. *Trends in Ecol and Evol* 17: 403-404
- Cho, S., Huang, Z.Y., Gries, D.R., Smith, D.R. & Zhang, J. 2006. Evolution of complementary sex-determination gene of honey bees: balancing selection and transposon polymorphism. *Genome Research* 16: 1366-1375

### Dr. Kevin Foster



by Tuan Cao

- Program for Evolutionary Dynamics, Harvard University
- Social insects (reproductive conflict and the evolution of cooperation)
- Theory of social evolution (tragedy of the commons; mutualism)
- Microbes and the genetic of sociality (social behavior of microorganisms)
- <http://www.people.fas.harvard.edu/~kfoster/>

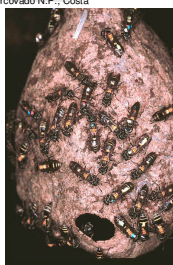


- Ratnieks, F.L.W., Foster, K.R. & Wenseleers, T. 2006. Conflict resolution in insect societies. *Annual Review of Entomology* 51: 591-608
- Foster, K.R. & Kokko, H. 2006. Cheating can stabilize cooperation in mutualisms. *Proc of the Royal Society of London* 273: 2233-2239
- Foster, K.R. & Wenseleers, T. 2006. A general model for the evolution of mutualisms. *Journal of Evolutionary Biology* 19: 1258-1269
- Foster, K.R., Wenseleers, T. & Ratnieks, F.L.W. 2006. Kin selection is the key to altruism. *Trends in Ecology and Evolution* 21: 57-60

## Who's Sean O'Donnell?

<http://faculty.washington.edu/sodonnell/>



*P. occidentalis*  
Guanacaste, Costa Rica

**Social Behavior**  
Wasps & Bees (& Ants)


**Division of Labor**  
Evolution  
Regulation

**Dominance Influences**  
Behavior  
Physiology

**Behavioral Neurobiology**  
Neural Plasticity



**Behavioral Genetics**  
Wasps & Bees

**Ecological Factors**  
Species Richness  
Elevational Patterns




*Bombus bifarius nearcticus*

By Jenny Jandt

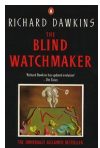
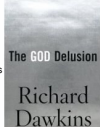
## Who's Richard Dawkins?

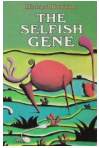


- Darwin's Rotweiler
- Student of Niko Tinbergen - 1962
- Controversial Scientist
  - Selection at the level of the **gene**
  - Meme
  - Human Exponential Population Growth
- Outspoken Commentator
  - Evolution
  - Sociobiology & Evolutionary Psychology
  - Atheism & Religion
- Namesake of the Oxford Dawkins Prize -2004
  - Research in ecology and behavior of animals who may be endangered by human activities
- A Media Favorite
  - The Colbert Report, South Park, Time

By Jenny Jandt

Creationism is a "preposterous, mind-shrinking falsehood"



"Life results from the non-random survival of randomly varying replicators"

Dawkins (1981) response - This statement would be "hard to match, in reputable journals, for its patronizing condescension toward a fellow academic."

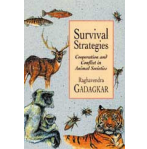
"Midgley (1979) - To debate Dawkins would be as unnecessary as to 'break a butterfly upon a wheel'"

"Revealed faith is not harmless nonsense, it can be lethally dangerous nonsense"


## Who's Raghavendra Gadagkar?

Indian Institute of Science - Bangalore, India  
<http://ces.isc.ernet.in/hpg/ragh/>


400 pages, one wasp!



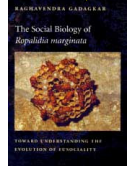
"In an irresistible style, Raghavendra Gadagkar explores the strategies of cooperation and conflict adopted by animals—from the lordly lion to the primitive wasp worker—as they choose mates, raise their young, communicate with others, and establish the division of labor necessary to feed and protect the group and safeguard their territory." - Harvard Univ. Press



**Current Research:**  
*Lazy Males Made to Work*



*Raghadia marginata*  
*Animal Behaviour* 2006. 71: 345-350





"*R. marginata* has provided Gadagkar with a unique opportunity to study the evolution of eusociality; its long-lived dynasties can continue almost indefinitely, as old or weakened queens are replaced by young and healthy ones and new colonies are founded throughout the year." - Harvard Univ. Press

By Jenny Jandt

## Who's Charles D. Michener?

Kansas University Natural History Museum  
Professor Emeritus, Curator Emeritus  
<http://www.nhm.ku.edu/ksem/staff-students/mich/michener.html>

- 1927 - Began drawing & describing flowers & insects
- 1936 - Worked with grad students at Berkeley as a freshman
- 1943 - Volunteered for Army Sanitary Corps
  - Survey & Control of Mosquitoes & Chiggers
- 1944 - Dissertation Thesis (1<sup>st</sup> key to N American Bee Genera)
- 1948 - Kansas University - Professor & Curator
  - Focus on Halictidae & Allogdipini
  - Observations helped Sociobiology theory
  - Mentored over 80 MS & PhD students
- 1989 - Retired
- 2000 - The Bees of the World
  - 913 pages!
  - Natural History > 12,000 general
  - Classification > 16,000 species!
- To date: 427 publications

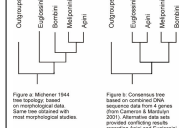


Figure 8. Michener 1984 tree showing relationships among the genera of the subfamily Halictinae. See the original site for more information on the tree.

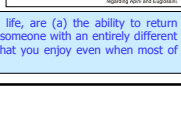



Figure 9. Michener 1984 tree showing relationships among the genera of the subfamily Halictinae. See the original site for more information on the tree.

By Jenny Jandt

"I think important qualities to develop, especially for those in academic life, are (a) the ability to return seamlessly to what you were doing or thinking after being interrupted by someone with an entirely different problem and (b) the resolve to keep doing and publishing the research that you enjoy even when most of your time has to be devoted to something else."






## Stephen T. Emlen

<http://www.nbb.cornell.edu/neurobio/emlen/>

- orientation and navigation in birds
- encodement of information in bird song.
- role of ecological factors in shaping mating systems (monogamy, polygyny, polyandry, and promiscuity) - Emlen and Oring 1977.
- costs and benefits of group living
- adaptive bases of sex differences in behavior
- evolution of cooperative and altruistic behavior in animal societies
- formation and social dynamics of multi-generational families among animals
- how the incorporation of an evolutionary framework can increase our understanding of the human social condition


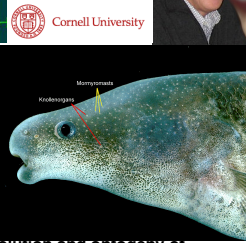


By Erica Sontz


## Carl D. Hopkins

Professor of Neurobiology and Behavior  
<http://www.nbb.cornell.edu/neurobio/Hopkins/hopkins.html>






- Temporal coding of mormyrid EOD and its role in species recognition
- Behavioral mechanisms of passive electrolocation.
- Molecular phylogeny of mormyrids
- Systematics of a group of endemic species of mormyrid fishes in the genus *Brienomyrus* from Gabon.
- Evolution and ontogeny of electrogenesis.
- Fieldwork: A survey of the freshwater fishes of Gabon, 100 years after the explorations of Mary H. Kingsley.

*Brienomyrus hopkinsi* from the Ivindo River in Gabon

**Thomas D. Seeley**  Cornell University  
<http://www.nbb.cornell.edu/Faculty/seeley/seeley2.html>

**Organization: Levels of organization, social organization of individuals, particularly, honeybees**





- Worker-worker policing
- Food sources and foraging efficiency
- Worker efficiency
- Nest site selection
- Multiple matings of queen vs. parasite loads
- Predation as an influence on colony organization

**References:**  
 Seeley, T.D. and P.K. Visscher. 2004. Quorum sensing during nest-site selection by honeybee swarms. *Behavioral Ecology and Sociobiology* 56:594-601.  
 Sherman, P.W., T.D. Seeley, and H.K. Reeve. 1998. Parasites, pathogens and polyandry in honey bees. *The American Naturalist* 151:392-396.  
 Seeley, T.D. 1995. *The Wisdom of the Hive*. Harvard University Press. 302 pp.

**THE WISDOM OF THE HIVE**  
 The Social Physiology of Honey Bee Colonies  
 THOMAS D. SEELEY

**Bert Hölldobler**  
 Arizona State University  
 University of Würzburg  
 Harvard University





**Interests:** Behavioral physiology and ecology, sociobiology, social insects, chemical ecology and evolution *By Michele Lanan*





<http://sols.asu.edu/faculty/bhoelldobler.php>

**Neat Results:**  
 Honey-pot ants fight ritualized tournaments over territory boundaries, assessing the size of their opponent.

**References**  
 Behav. Ecol. & Socio 9: 301-314. (1981)  
 Science 192(4242): 912-914. (1976)  
 Science 210(4471): 732-739. (1980)  
*The Ants*. (1990)  
*Journey to the Ants*. (1994)

**Wayne Maddison**  
 University of British Columbia  
 (U of A until 2003)  
<http://salticidae.org/wpm/home.html>


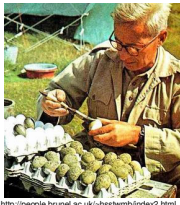





**Studies the evolution of courtship behavior in jumping spiders, using phylogenetics.**

**Interesting results:** *By Michele Lanan*  
 Sexual selection helps drive diversification in jumping spiders. Males often use bright color patterns, alternating asymmetrical motions, synchronized sounds.

**References**  
 Maddison & Hedin. 2003. Phylogeny of *Habronattus* jumping spiders (Araneae: Salticidae), with consideration of genitalic and courtship evolution. *Sys. Ent.* 28.  
 Masta & Maddison. 2002. Sexual selection driving diversification in jumping spiders. *PNAS* 99(7).  
 Maddison & McMahon. 2000. Divergence and reticulation among montane populations of the jumping spider *Habronattus pugillis* Griswold. *Sys. Bio.* 49.  
 Maddison & Stratton. 1988. Sound production and associated morphology in male jumping spiders of the *Habronattus agilis* species group (Araneae: Salticidae). *J. Arach.* 16.

**Nikolaas (Niko) Tinbergen**  
*By Michele Lanan* 1907-1988  
 Leiden University, Oxford University  
 1973 nobel prize, with Karl von Frisch and Konrad Lorenz

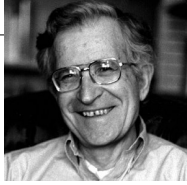



**Four Questions:**  
 Proximate: causation, development  
 Ultimate: function, evolution

**Studied Digger wasps, gulls, sticklebacks, geese**

**1951** *The Study of Instinct*  
**1953** *The Herring Gull's World*  
**1958** *Curious Naturalists*  
**1972** *The Animal in its World Vol. 1.*  
**1973** *The Animal in its World Vol. 2.*  
**1972** *Early Childhood Autism – an Ethological Approach*  
*Les Prix Nobel en 1973*, Editor Wilhelm Odelberg, [Nobel Foundation], Stockholm, 1974

**Sneaky Who's Who: (by Michele)**  
**Noam Chomsky**  
<http://www.chomsky.info/>



**Linguist- studied language in humans. Hypothesized that children are born with an innate "Universal Grammar." All that is necessary for language acquisition is vocabulary and parameter settings.**

**References:**  
*Logical Structure of Linguistic Theory* (1955, 1975)  
*Syntactic Structures* (1957)  
 1965). *Aspects of the Theory of Syntax* (1965)  
*Topics in the Theory of Generative Grammar* (1966)  
*Studies on Semantics in Generative Grammar* (1972)  
*Language and Thought* (1993)


Univ. Pennsylvania & Harvard. Teaches at MIT.

Generative grammar: a rule set for a language.

Politics: authority is illegitimate until proven otherwise.

**Who's who by Ming Huang**



**Walter Tschinkel**  
 Florida State University  
<http://www.bio.fsu.edu/faculty-tschinkel.php>



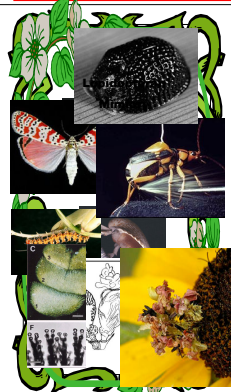
**...Artist...Builder...Innovator...Scientist**

**Interesting results:**  
 Ant nest architecture (various ants)  
 Colony ontogeny (*Solenopsis* & *Pogonomyrmex*)  
 Invasive ecology (*Solenopsis invicta*)

**References:**  
*Discover* 24: 78-81 (2003)  
*Behav Ecol Soc* 22(2): 103-115 (1988)  
*The Fire Ants* (2006)

**Who's who by Ming Huang**




**Tom Eisner**  
Cornell University  
<http://www.nbb.cornell.edu/haurobio/eisner/eisner.html>

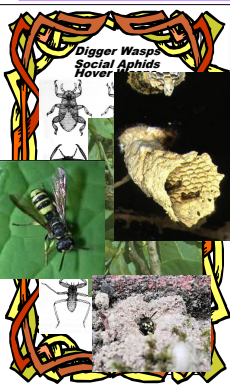
**...Artist...Chemical Ecologist...Naturalist**

**Interesting results:**  
**Chemical defense**  
 - Tiger moths  
 - Bombardier beetles  
**Mechanical defense (Tortoise beetles)**  
**Visual camouflage (Lepidopteran larvae)**

**References:**  
*Chemecology* 13: 199-205 (2004)  
*Chemecology* 11: 209-219 (2001)  
*Zoology* 103: 1-6 (2001)  
*For Love of Insects* (2004)



**Who's who by Ming Huang**



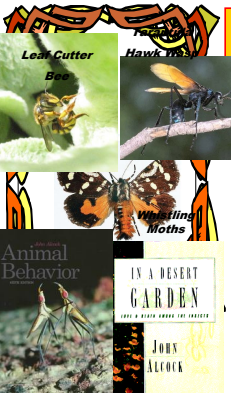
**William Foster**  
University of Cambridge  
<http://www.zoo.cam.ac.uk/zoostaff/foster/williamins.htm>

**.....Evolution of eusociality.....**

**Interesting results:**  
**Social Aphids (Eusociality of clonal species)**  
**Hover Wasps (Facultative eusociality)**  
**Digger Wasps (Cooperative nesting or Usurpation?)**

**References:**  
*Biological Reviews* 71: 27-50 (1996)  
*Proceedings of Royal Society, Series B* 265: 973-977 (1998)  
*Animal Behaviour* 50: 99-112 (1995)

**Who's who by Ming Huang**

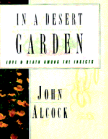


**John Alcock**  
Arizona State University  
<http://sols.asu.edu/faculty/jalcock.php>


**Insect Mating Systems.....**

**Interesting results:**  
**Mate Acoustic Signaling (Whistling Moths)**  
**Aerial Combat (Tarantula Hawk Wasp)**  
**Multiple Copulations (Leaf Cutter Bees)**

**References:**  
*J Zoology* 237: 337-352 (1995)  
*Animal Behaviour* 71(2): 279-287 (2006)  
*Behav. Ecol. & Soc Biol.* 2: 385-396 (1977)



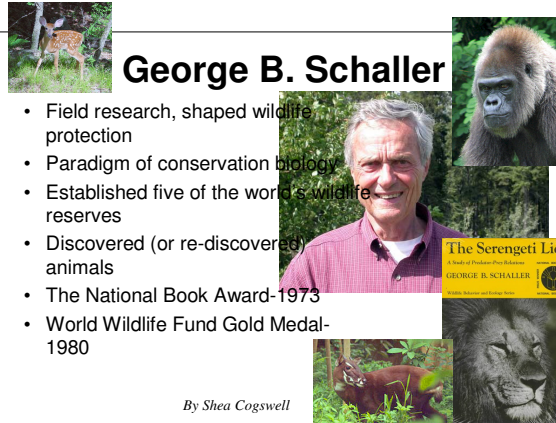
**Richard Wrangham**  
Ruth Moore Professor in Biological Anthropology and Curator of Primate Behavioral Biology  
[wrangham@fas.harvard.edu](mailto:wrangham@fas.harvard.edu)



- British primatologist
- Zoopharmacognosy
- Published 5 books and 164 articles
- Primate Behavioral Ecology Research Group
- Study of human evolution based on ape behavioral tendencies

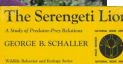
*By Shea Cogswell*

**George B. Schaller**

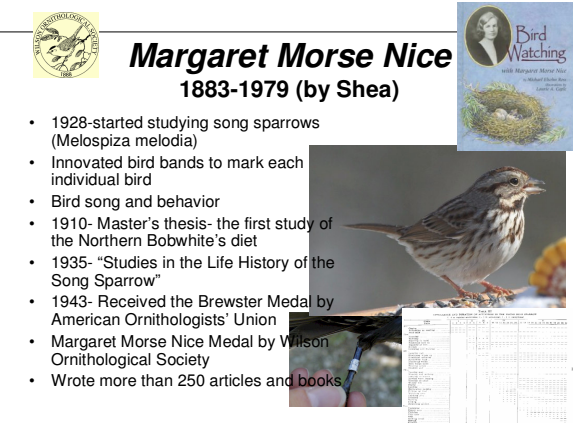


- Field research, shaped wildlife protection
- Paradigm of conservation biology
- Established five of the world's wildlife reserves
- Discovered (or re-discovered) animals
- The National Book Award-1973
- World Wildlife Fund Gold Medal-1980


*By Shea Cogswell*



**Margaret Morse Nice**  
1883-1979 (by Shea)



- 1928-started studying song sparrows (*Melospiza melodia*)
- Innovated bird bands to mark each individual bird
- Bird song and behavior
- 1910- Master's thesis- the first study of the Northern Bobwhite's diet
- 1935- "Studies in the Life History of the Song Sparrow"
- 1943- Received the Brewster Medal by American Ornithologists' Union
- Margaret Morse Nice Medal by Wilson Ornithological Society
- Wrote more than 250 articles and books



By William Fitz



## Dr. Steven J Gould

- Paleontologist
- Studied Bermuda land snails- genus *Poecilozonites*
- Worked at Harvard from 1967 until the end of his career
- Died at age 60 in 2002
- Important Results- Punctuated Equilibrium



**Books:**

**Ever Since Darwin: Reflections on Natural History**

**The Panda's Thumb: More Reflections in Natural History**

**Wonderful Life: The Burgess Shale and the Nature of History**

**The Structure of Evolutionary Theory**