

Economics 437 Winter 2015

Prof. Levis A. Kochin

Class Monday and Wednesday 12:20AM to 2:20 PM Savery 156

Office Hours Tuesday 2PM-4PM and by Appointment

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This version of assignment list 12/11/2014

This course is about the intersections of Economics and Biology. We will look in five areas:

- 1) Animals and plants, as well as people, make resource allocation decisions. There has been a convergence of economic and biological approaches to modeling these choices. The foraging behavior of animals is similar to the productive and consumptive behavior of people and can be modeled using price theory.
- 2) Animals and plants interact and thus make strategic decisions. Game Theory can be used to predict these interactions.
- 3) Humans are biological creatures. Our emotions and our reason are the products of biological evolution in natural history. The extent to which this history guides and limits human behavior has been the subject of great controversy.
- 4) Important parts of any human economy are concerned with using living things. Fisheries, Forestry and Farming and Pharmaceuticals are important industries which cannot be understood without considering the biology of fish, trees, crops and germs.
- 5) Human attempts to limit infection are subject to an important biological kickback in the form of resistance.

Required Texts:

- 1) Robert Dawkins. *The Selfish Gene* 2nd Edition 1990 Oxford Univ. Press or 3rd Edition paperback Now available now at Amazon New and Used Will be at UW bookstore
- 2) Matt Ridley. *The Origins of Virtue: Human Instincts and the Evolution of Cooperation* paperback Penguin Books 1998 paperback Now available now at Amazon. Will be at UW bookstore
- 3) Jared Diamond (1997) *Guns Germs and Steel: The Fate of Human Societies* WW Norton Now available now at Amazon. Will be at UW bookstore
- 4) A set of readings to be posted on Catalyst
- 5) Rognvaldur Hannesson *The Privatization of the Oceans* MIT Press 2004

Key Dates

Wednesday January 21 Term Paper Proposal

Wednesday February 18 Preliminary Term Paper

FINAL EXAM Thursday March 19 8:30AM-10:20AM

Tuesday March 17 4PM Hand in Final Term Paper Savery 334

Thursday March 19 8:30 to 10:20 AM Final Examination

Term Paper W Awarded 50% of Grade

- 1) Proposal Due Wednesday January 21
 - a. A term paper proposal of 1 page with 3 references No Grade
 - i. At least 1 reference to an article on this assignment list
 - ii. At least 1 reference to an article NOT on this assignment list
 - iii. Bring 37 hard copies to class
- 2) Preliminary Term Paper Wednesday February 18 10% of Course Grade
Approved Proposal must be resubmitted with Preliminary Paper
Preliminary Term Paper must have at least five pages with at least five references
10% of Term Grade
- 3) Final Term Paper Term Paper of 13-17 pages is due Tuesday March 17 40% Term Grade
Graded Preliminary Term Paper must be resubmitted with Final Paper

Penalty of .1 on term paper grade on final term paper if submitted by Final Exam

Penalty of .2 on term paper grade if submitted by the end of the first day of Spring Quarter

SCHEDULE OF ASSIGNMENTS

Posted on Catalyst * Page numbers are as in original source

Economic Theory and Biological Theory Monday January 5

“Economics and Biology; The Historic Link” Edited From the Wikipedia article on Malthus posted on the next to the last page of the assignments

Wikipedia articles on Thomas Malthus, Alfred Wallace, Ronald Fisher and John Maynard Smith.

Maynard Smith, J. (1978) “Optimization Theory in Evolution” *Annual Review of Ecological Systems* Vol. 9 pp 31-56

a) Animals Making Rational Choices Wednesday January 7

- i) *Tullock, Gordon (1971) “The Coal Tit as a Careful Shopper” *The American Naturalist* Jan/Feb 1971
- ii) *Stephans and Krebs *Foraging Theory* “Risk Sensitive Foraging” Ch. 6

2) Game Theory and Biology

a) Selfish Co-operation Monday January 12 and Wednesday January 14

Recommended Martin A. Nowak “Why We Help” *Scientific American* July 2012
Dawkins. *The Selfish Gene* Ch 1-4 **Read the endnotes** in Dawkins *The Selfish Gene*

Monday January 19 Martin Luther King Day No Class

Term Paper Proposal Due Wednesday January 21

b) The Evolutionary Stable Strategy Wednesday January 21

Dawkins *The Selfish Gene* Ch. 5-6

*Maynard Smith, John. "The Limitations of Evolution Theory" "The Evolution of Animal Intelligence" and "Evolution and the Theory of Games" Chapters 20-22 in *Did Darwin Get it Right: Essays on games, sex and evolution* Chapman and Hall 1989

c) Group Selection and the Battle of the Generations Monday January 26

i) Dawkins *The Selfish Gene* Ch. 7

d) Sex Battle of the Generations Wednesday January 28

i) *Maynard Smith. "Why Sex" Ch. 19 in *Did Darwin Get it Right: Essays on games, sex and evolution* Chapman and Hall 1989

ii) Dawkins *The Selfish Gene* Ch. 9

iii) *Clutton-Brock, T. H. "Birth sex ratios and the reproductive success of sons and daughters" Ch. 16 in *Essays in Honor of John Maynard Smith* edited by Greenwood, Harvey and Slatkin, Cambridge University Press 1985

iv) *Yezerinac, Weatherhead and Boag (1996) "Cuckoldry and lack of parentage dependant paternal care in yellow warblers: a cost-benefit approach" *Animal Behavior* Vol. 52

v) Levis Kochin and Melissa Knox "Behavioral Accommodations to the Excess Supply of Men in the Chinese Marriage Market" University of Washington 2012 2

e) Co-operation vs. Non-co-operation Monday February 2

i) Dawkins *The Selfish Gene* Ch. 10, 12

ii) *Axelrod and Hamilton(1981) "The Evolution of Co-operation" *Science* Vol. 211 pp1390-1396

iii) *Nowak, Martin and Sigmund, Karl (1993) "A strategy of win-stay lose-shift outperforms Tit for Tat in the Prisoner's Dilemma Game" *Nature* Vol. 364 pp. 56-58

iv) *Houston, A.J. And Davies N.B. 'The Evolution of Cooperation and Life History In the Dunnock, "Prunella modularis" in *Behavioral Ecology* edited by R.B. Sibley and R. H. Smith

f) The Reach of Replicators Wednesday February 4

i) Dawkins *The Selfish Gene* Ch. 11, 13

3) **Economics and Sociobiology Monday February 9**

- i) Matt Ridley *The Origins of Virtue: Human Instincts and the Evolution of Cooperation* Penguin Books 1998
- ii) *Franz B. M. de Waal “How Animals Do Business” *Scientific American* April 2005 73-79
- iii) *Samuel Bowles (2001), with R. Boyd, C. Camerer, E. Fehr, H. Gintis, J Henrich, and R. McElreath “[In Search of Homo economicus: Behavioral Experiments in 15 Simple Societies](#)” *American Economic Review*. 91, 2 (May, 2001) 73-78
- vi) *Steven B. Levitt and Stephen J. Dubner “Unbelievable Stories About Apathy and Altruism” pp. 97-131 and pp. 236-242 *Superfreakonomics* William Morrow 2009

4) **Topics in the Economics of Biological Resources**

a) **Fishing**

**Wednesday February 11, Wednesday February 13 and Wednesday February 20
No Class Monday February 18 President’s Day**

- i) Rognvaldur Hannesson *The Privatization of the Oceans* MIT Press 2004
- ii) * Gardner Brown “The Economics of Renewable Resources: Fishing ” University of Washington 1994
- iii) *Costello, Gaines, Lynham “Can Catch Shares Prevent Fisheries Collapse” *Science* Vol. 321 (19 September 2008) pp. 1678- 1681
- iv) *Wikipedia* articles on “Fisheries Management”, “Individual Fishing Quota“ and “Common Fisheries Policy” (European Union)
- v) Kochin, Riley, Plesha and Kujundzic. “*Analysis of an Incentive-Based Chinook Salmon Bycatch Avoidance Proposal for the Bering Sea Pollock Fishery*” Not in Reader Available to those requesting it Required of those doing a term paper on bycatch

b) **The Evolution of Agriculture Monday February 25 and Wednesday February 27**

- i) Jared Diamond (1997) *Guns Germs and Steel: The Fate of Human Societies*. WW Norton, 1997 *Read Chapters 4,5, 6, 7 and 8

c) Agriculture and Policy Monday March 2

Wikipedia Articles on “Agricultural Policy”. “Agricultural Policy of the United States”, “Fuel vs. Food”, “Agricultural Subsidy” “Common Agricultural Policy” (European Union)

d) Pharmacy Wednesday March 4

- i. *Berndt, Erni R. “Pharmaceuticals in U.S. Health Care: Determinants of Quality and Price” *Journal of Economic Perspectives* Vol. 16 N. 4. pp 45-64
- ii. *Kremer, Michael “Pharmaceuticals and the Developing World” *Journal of Economic Perspectives* Vol. 16 N. 4. pp 65-90

e) Resistance: Evolution Bites Back Monday March 9

- i. *Gardner Brown and David F. Layton (1996) “Resistance Economics: social cost and the evolution of antibiotic resistance” *Environment and Development Economics* Vol. Part3

Review Wednesday March 11

Final Term Paper Due Tuesday March 17 4PM

Final Exam Thursday 8:30 AM to 10:20AM

Economics and Biology; The Historic Link Edited From the Wikipedia article on Malthus

“[Charles Darwin](#) and [Alfred Russel Wallace](#) each read and acknowledged the role played by Malthus in the development of their own ideas. Darwin referred to Malthus as "that great philosopher",^[72] and said: "This is the doctrine of Malthus, applied with manifold force to the animal and vegetable kingdoms, for in this case there can be no artificial increase of food, and no prudential restraint from marriage".^[73] Darwin also wrote:

"In October 1838... I happened to read for amusement Malthus on *Population*... it at once struck me that under these circumstances favourable variations would tend to be preserved, and unfavourable ones to be destroyed. The result of this would be the formation of new species."
—Barlow, Nora 1958. *The autobiography of Charles Darwin*. p128

Wallace stated:

"But perhaps the most important book I read was Malthus's *Principles of Population*... It was the first great work I had yet read treating of any of the problems of philosophical biology, and its main principles remained with me as a permanent possession, and twenty years later gave me the long-sought clue to the effective agent in the evolution of organic species.
—Wallace, Alfred Russel 1908. *My life: a record of events and opinions*.^[74]

[Ronald Fisher](#) commented skeptically on Malthusianism as a basis for a theory of [natural selection](#).^[75] Fisher did not deny^[citation needed] Malthus's basic premises, but emphasized the role of [fecundity](#).^[76] [John Maynard Smith](#) doubted that famine functioned as the great leveller, as portrayed by Malthus, but he also accepted the basic premises:

3"[A population] cannot increase logarithmically for ever. Sooner or later, a shortage of resources must bring the increase to a halt. It was this insight which led both Darwin and Wallace acquired by reading... Malthus, and which led to the idea of natural selection."
—Maynard Smith, John 1998. *Evolutionary genetics*. 2nd ed Oxford. p17”

Wikipedia Downloaded August 14, 2012

Some Possible 437 Term Paper Topics

Malthus to Darwin to Maynard Smith : Economics and Evolution
Evolution and Religion in Islam
The Evolution of Property Rights
Why Do Hunter Gatherers Share Meat more than vegies?
Why didn't West Coast Native Americans Farm?
Cultural Survival and Genetic Survival Genes and Memes Applied to:
Sperm Donation , Egg Donation , Adoption Celibacy or Religion
The biology and economics of the differences between men and women in
earnings or politics or sexual behavior or child care or education or life span or
Why are more boys born than girls?
The effects of Sex Selective Abortion on Savings, Marriage Rates, Birth Rates etc.
Reciprocal Altruism in Apes or Bats or Humans, Killer Whales or ...
The Economics of a bio-fuel
Farm Policy in the US or the European Union or Japan or
The History of Regulation in some one regulated stock (Alaskan Halibut, Alaskan
Salmon, deer, Pollock, Pacific Hake, salmon, Cod, tuna or any other species fished
or hunted)
The Regulation of By-Catch in New Zealand or Alaska or the Pacific Coast of the US...
Megafauna Extinction in North America, New Zealand or Africa, India or Madagascar
An Economic Perspective on the Endangered Species Act
Drug Resistance in AIDS in Antibiotics in Malaria
The Economics and biology of impotence and its cures
Selection at the population level
Agricultural Policy in the US or the European Union or Brazil, Japan or China or ...
Economics of Biological Invasions: Wolves or Fire Ants or Milfoil or Whatever
Free trade in Pharmaceuticals?
The Economics of Prohibition of Alcohol or Marijuana or Cocaine or Heroin or Tobacco
Lions and Tigers and Bears; O My! : RE-introducing Megafauna to the US
The Evolution of Human Utility (Just so stories and scientific hypotheses)
Nature and Nurture (for IQ, cancer, diabetes, wages etc)
The Costs and Benefits of Decoding Your Personal Genome
Resistance and the progression of HIV to AIDS
Resistance and the control of Malaria or Ebola or Measles or Chickenpox
Should it be legal to feed healthy animals antibiotics?
Vaccination – Who should pay for it? Should it be illegal not to be vaccinated?