TEACHING

Dr. Paul J. Watson

Students add so much to my life. In spite of the fact that I am a member of UNM's research faculty, I always will seek to serve on graduate committees, supervise undergraduate independent study or honors thesis projects, and teach 402/502 & 419/519 level seminars. Most of my mentoring activities are in practical research contexts, both at The University of New Mexico and The University of Montana's Flathead Lake Biological Station. I am always interested in talking to students about research in the areas of behavioral ecology and evolutionary psychology, regardless of their departmental affiliation.

I have taught many summer field courses in Behavioral Ecology, and Plant-Animal Interactions at the Biological Station. These courses, sadly, are closed down for now due to lack of funding, but I dream of them resuming some day. I also advise undergraduate students undertaking independent study or honors thesis projects, and serve as co-Chair or member of graduate student committees. I also teach seminars and occasional lecture courses.

My current specialty course at UNM is offered for either Biology (419/519) or Religious Studies (447) credit and is entitled, "The Evolution of Religiosity and Human Coalitionary Psychology." Finally, I occasionally offer workshops on evolutionary theory and problem-solving oriented curricula for high school teachers, and workshops concerning evolution and spirituality and evolutionary perspectives on issues in psychotherapy at the Esalen Institute, Big Sur, CA, and other locations. In all these teaching contexts, the freedom afforded by my "Research Faculty" position allows me devote a lot of time to my students.

The ultimate task of biology is to enable us to understand the nature of life on earth, including human life. To understand life as exactly, unromantically, and immediately as possible - to me this is to make the quintessentially human discovery. Every moment, we can have a fresh impression of the true nature of the stage upon which we play out our existence. But this requires that during each such moment we have a fresh impression of how our mind's conscious and unconscious processes are influencing our perception and the roles we play on that stage.

Movements toward such an understanding require a theoretical framework that both guides and potentiates our curiosity, imagination, and our interpretation of observations. It also requires a critical, self-correcting methodology, the scientific method, to check the heavy influence that our imagination and our biologically and ideologically based biases exert upon our views of ourselves and the world. In my courses, I try to create conditions in which my students and I can confront the wonderful challenges of rigorous nature study and self-study, *in situ!!*

Darwin's theory of evolution by natural selection is the theory of life on earth. Many a great imagination has been at work over the years to bring us where we are today in our understanding of evolution. But, in the end (not yet reached), evolutionary theory is forged from verifiable naturalistic observation and experimentation, not any particular human ideology or belief system. Thus it may be said that the evolutionary theory of life represents and elucidates the power, the amplitude, and the precious theory of the earth that Walt Whitman refers to in this excerpt from "Leaves of Grass" ...

"I swear there is no greatness or power that does not emulate those of the earth,
There can be no theory of any account unless it corroborate the theory of the earth,
No politics, song, religion, behavior, or what not, is of account, unless it compare with the amplitude of the earth,
Unless it face the exactness, vitality, impartiality, rectitude of the earth." - Walt Whitman

We may even find that natural selection works on a cosmological level, and that the entire design of the universe, from the mass of the proton to the structure of galaxies, can only be understood as resulting from a Darwinian process of selection - see Lee Smolin's book, "The Life of the Cosmos."

I hope that every participant in my field courses and workshops comes to an experience of the thrill of discovery in nature. To discover something about the natural world that was previously unknown to science is a fantastic event that one never forgets. Maybe even more important is the personal discovery of how nature actually works; this can be both observed externally, and "tasted" within oneself. Such a discovery cannot help but change and inform a person's life, and is profoundly relevant regardless of what walk of life you adopt...

"For the artist communication with nature remains the most essential condition.
The artist is human; himself nature; part of nature within natural space." - Paul Klee

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CURRENT & FORMER GRADUATE STUDENTS

- **Paul Andrews, J.D.** Evolution of honest signalling, especially signals of altruistic intent; an evolutionary approach to analyses of legal systems; the evolution of depression. *(Co-chair, for some years)*
- **Kimberly Cline.** The adaptive function of depression, especially in the elderly, and the importance of inability to engage in nepotistic investment in the etiology of depression. Evolutionary perspectives on psychotherapy, sexual jealousy and mating strategies. *(Co-chair)*
- **William LaRue.** Behavioral host manipulation by sexually transmitted pathogens; Assortative and disassortative mating patterns in relation to personality traits; evolutionary explanations of homosexuality; evolution of musical ability. *(Co-chair)*
- **Jennifer Hill.** The evolution of avian sexual selection systems. Field and captive studies of sexual selection system of the Golden Pheasent. *(Committee member)*
- **Pamela L. Keil.** Comparative studies of sexual selection. Fighting behavior in sierra dome spiders. Molecular phylogenetic analysis. Comparative mating behavior, genitalic morphology and ecology of linyphiid spiders. *(Co-chair)*
- **Corey L. Fincher.** Sexual selection, ecology, human evolutionary psychology. The effect of disease risk on the evolution of societal traits, such as individualism versus collectivism or conservatism versus liberalism. Socioecology and sexual behavior of snakes, especially rattlesnakes. Sexual selection in flour beetles. *(Co-chair)*
- **Kevin Walker.** Insect ecology and behavior; plant-animal interactions; associations between ant community structure and the presence of extrafloral nectaries in cacti. Energetic costs of processing secondary plant compounds by herbivores. *(Committee member)*
- **Melissa Franklin.** Sexual selection. The importance of facial features, and the viability-related information content of facial features. Sexual signals of female sierra dome spiders. *(Co-chair)*

- **Amy Koerner.** Cognitive neuroscience. Sex differences in cognitive processing. Long term (developmental) and short term (activational) influences of sex hormones on sex differences in spatial information processing abilities. *(Committee member; Dept. of Psychology)*
- **Michael LaFlamme.** The theory and practice of environmental education. Investigating methods for uniting and motivating diverse communities to engage in environmental restoration and stewardship. *(Committee member; Dept. of Education)*
- **Christopher Eppig.** Human evolutionary psychology. The role of the vomeronasal organ, and scent in general, in meditating sexual selection in humans and other primates. *Parasites and pathogens and their effect on neurodevelopment. (Co-chair)*
- **Kenneth Letendre.** Human evolutionary psychology. The psychology of war and group cohesiveness. The effects of external threats on individual assessments of leaders. *(Co-chair)*
- **Diana Andres.** Sexual selection. Management of mate selection tradeoffs by female sierra dome spiders, e.g., the role of conditional sexual preferences, polyandry, and facultative sex ratio adjustments. *(Co-chair)*
- **Rhiannon JD West.** The evolution of human social behavior, especially religiosity. The evolution of human kin recognition mechanisms. *(Co-chair)*

As a member of the Biology Department's Research Faculty, I may serve on graduate student committees or as a committee co-chair. As in the cases above, I typically co-chair with Dr. Randy Thornhill or Astrid Kodric-Brown. I can also serve on committees in departments other than Biology. An unusual opportunity at The University of New Mexico is that our graduate students have access not only to evolutionarily oriented faculty in the Biology Department, but also in the Departments of Psychology, and Anthropology.

Postgraduate teaching experience

(University of Montana and University of New Mexico)

- **Plant-Animal Interactions** (Biology 495) - Summers 1999 & 2001 - Field Course at Flathead Lake Biological Station, Montana.
- **The Evolution of Human Sexuality** (Biology 365) - University of New Mexico, Spring 1999. Provided 10 guest lectures in the Spring of 2000 and 2004 as well.
- **Animal Behavior** (Biology 495) - Integrated field and lecture course for mature, dedicated undergraduates and graduates, taught at Flathead Lake Biological Station, University of Montana, Polson MT, summer 1994, 96, 98. In the summer of 2000, the course was divided into two 4-credit parts that could be taken individually or in sequence, namely, *The Evolution of Animal and Human Behavior* and *Field Studies in Animal Behavior (see below)*. The summer 2002 brought the course back as an 8-week offering. In 2003 and beyond the course, now billed as Behavioral Ecology, should provide, better than ever, an immersion into theory and practice of behavioral ecology and the evolutionary study of mind.

- **Graduate Seminars** – In the fall 2006 semester I taught, "The Evolution of Religious Experience," offered both for Biology 402/502 and Religious Studies 447 credit. Advanced students from biology, psychology, anthropology, and religious studies attended. I taught a similarly cross-listed seminar called "The Evolution of Religiosity and Willpower" in the Fall 2007 semester. The third edition of my religiosity seminars, offered Fall term 2008, again will be cross-listed for either Biology or Religious Studies credits, and will be entitled, "The Evolution of Religiosity and Human Coalitional Psychology."

  I have co-taught many seminars (Biology 402/502) with Dr. Randy Thornhill also bringing together students interested in the evolution of behavior from across campus. Our Fall 2004 and 2005 seminar centered on a major mutual interest, The Evolution of Female Sexuality. In addition to my general interest, I shall be presenting data and ideas about what might be termed optimally vague "honest" signals of the timing of sexual readiness (i.e. fertility) by female sierra dome spiders. Such signals are of special interest because in most cases we do not expect females to be under pressure to advertise their fertility or availability, because males are under intense selection to use inadvertent cues to discover that information. Dr. Thornhill has written the following description of the seminar's broader focus:

  "In the Fall 2004 semester Paul Watson and I will do a 502, 3 hrs credit, Thurs, 11-1 pm or so. It will deal with The Evolution of Female Sexuality. Although the focus will be on woman's sexuality it will be broad in content and range across all taxa including plants. Regarding estrous sexuality, for example, do female plants or the female side of hermaphroditic plants have features that are the analog of female estrous sexuality seen in all vertebrates including woman? How does female "estrous" sexuality in invertebrate animals compare with the estrous seen across all vertebrates? What is currently known about the functional design of woman's estrus? Why have so many researchers claimed that woman doesn't have estrus? How can the study of woman's estrus be improved to determine better the nature of concealment of her estrus from her partner or from men in general? Of the various hypotheses proposed what is the functional significance of woman's concealment of estrus? Why haven't ornithologists recognized that female birds have estrus given that female bird sexual motivation is estrogen dependent as is estrous sexuality in all vertebrates?

  Regarding female extended sexuality (female interest in sex outside the fertile period of the cycle or reproductive season), why is woman's extended sexuality so greatly extended compared to females of other species with extended sexuality? What role if any do reproductive hormones play in woman's sexuality outside the estrous phase of the cycle? Although extended sexuality is widespread in the catarrhine primates, why is it less common in the other primates and across other mammal taxa? Why is extended female sexuality so common across pair-bonding birds? Do elephant shrews really lack estrus?

  Regarding female sexual ornaments, what is the information signaled? Can it ever be the case that female ornaments (e.g. sex swellings) function to signal female ovulation or peak fertility in the season? Why do women and at least the females of 10 other primates have adolescent exaggeration of ornamentation (i.e. peak ornamentation in sub-fertile adolescent females rather than in older females)? Why are woman's ornaments permanent across her entire reproductive life?

  Two evolutionary methods will be employed: adaptationist analysis and phylogenetic analysis. The former allows dissection of the phenotype into its two basic categories: adaptations and byproducts. Adaptationism also allows determination of an adaptation's functional design and thus the kind of past selection that created it. Phylogenetic analysis must be added to information about selective history in order to complete a story about a given trait's evolutionary history. What is the phylogeny of woman's estrus and of her extended sexuality and adolescent exaggeration in ornamentation?

  A book manuscript that is in progress will be used to introduce students to the unsolved problems in research on female sexuality. It also provides hypotheses for all the questions stated above. This book manuscript will be supplemented with readings from the primary literature on female sexuality.

  Students will pick 1 or 2 topics of interest to them and present an analysis of the relevant hypotheses and literature. For example, a topic might be, is it reasonable to argue (as some have) that cows, seals or chimps in estrus have specialized behaviors that function to sexually motivate males? Or, if one is interested in dogs, cats or guppies, just how choosey are the females when in estrus? Or, why does testosterone seem to play a bigger role in the estrus of fish and amphibians than that in mammals or reptiles? Or, why is estrus in rodents dependent upon both estrogen and progesterone? Or, what are the differences in women's copulatory orgasms during estrus and during the extended phase of the cycle? Or just how homologous is the hormonal machinery of a hen's estrus to that or woman's?"

  Our Fall 2003 seminar centered on The Evolution of Religion. I attended the New England Institute's 2nd Annual Conference on Religion, Cognitive Science, and Evolutionary Psychology, August 12-13, and brought back material from that experience for discussion. There also were assigned readings from recently published material on the subject, including a careful reading and discussion of Pascal Boyer's book, "Religion Explained."

  Our Fall 2002 seminar was a 502 course for graduate students from inside and outside our lab, called *"Evolutionary Problems."* The focus of our discussions will be the evolution of values (i.e., morals and beliefs) and empathy. We shall begin the seminar with a detailed discussion of philosopher Donald Cameron's book, The Purpose of Life." We will also spend several sessions discussing a major paper and commentaries on the evolution of empathy recently published in Behavioral and Brain Sciences.

  Recent seminars have emphasized discussion of ongoing student and faculty research as well as selected recently published papers from the evolutionary literature. Our spring 2000 seminar, *Sexual Selection* entailed review and discussion of recent papers of interest in this rapidly developing research field. Other past topics have included: our spring 1998 seminar, entitled *Darwinism Applied*, which was dedicated to discussion of how the evolutionary perspective illuminates practical issues in modern social life. *The Evolution of Development*, which looked in detail at the concepts and mechanisms connected with the fact that all traits are results of gene*environment interactions. *Human Evolutionary Psychology*, and *Darwinian Methodology* explored debates concerning how to properly to apply an adaptationist

approach to the theoretical analysis and empirical study of all life.

- **Human Nature: The Darwinian Conception** - Co-taught with Dr. R. Thornhill (BS190); one month lecturing Fall 1995. Also supervised graduate seminar on similar topic during this same period.
- **Tutoring** undergraduate biology and chemistry students as volunteer to UNM's College Enrichment Program, 1992-1993.
- **NSF Young Scholars Program** - Participated in Montana summer program headed by Dr. Donald Jenni, University of Montana, Missoula, MT, summer 1992.

Graduate teaching experience

(Cornell University)

- **Chemical Ecology** (BS 623),1988, with T. Eisner and J. Meinwald.
- **Sensory Function** (BS 492), 1987, with B.P. Halpern and H.C.Howland.
- **Vertebrate Social Behavior** (BS427), 1984, with S.T. Emlen.
- **Field Studies in Animal Behavior** (BS 425), 1982 & 1983, with P.W. Sherman.
- **Introductory Biology Lab** (BS 103-4), 1981-1982, with J.C. Glase and K.K. Adler.

Upcoming Field Courses
Alas ...
None are currently planned unless 8-week courses are reinstated at Flathead Lake Biological Station.

Summer 2003 and beyond? Maybe not... Here is what I have offerd in the past at Flathead Lake Biological Station, University of Montana, Polson, Montana

- **Behavioral Ecology - BIOL 495 (Sec. 5)** ***Four Weeks: July 11 - August 4, 2005; meets Monday-Wednesday 8:00-5:00; Thursday 8:00-12:00.***
  4 Credits, Graduate or Undergraduate

Behavioral Ecology *is an intensive experiential field course on the evolution of behavior. It prepares mature students from across relevant disciplines to apply a rigorous hypothesis testing approach to the evolutionary analysis of virtually any behavior of any organism, including humans. The course provides a special opportunity to apply and digest the modern, balanced adaptationist program for understanding behavior and the associated psychological, morphological, and physiological traits of individuals. The dual aims of the course are to: (1) collaboratively design, troubleshoot, and execute informed studies with publication potential concerning behaviors that the students themselves find intriguing and, (2) appreciate the radically profound implications of modern Darwinism for the structure and function of animal and human minds. Students are challenged to experience the nature operating around them, and within them, in fresh, new, and more objective ways. Wide-ranging field based discussions and lectures are emphasized, with inspiration and context often provided by observations of free-living organisms and lab and field experimentation. Yearly enrollment is limited to 13 students, willing to work together, to "live" the special opportunity outlined above.*

My intellectual and research interests are broad. I have done extensive research on the reproductive behavior of the Sierra dome spider and will continue these and other field and lab studies of arthropod, bird and mammal sexual and social behavior while in full-time residence at the Station. At the other end of the spectrum, for example, I am developing a model of the evolution of human unipolar depression which I recently presented as invited keynote addresses to several evolutionarily oriented mental health and philosophical societies, and I teach a five-day residential workshop entitled Evolutionary Psychology and Spiritual Practice at the Esalen Institute, Big Sur, CA.

Students will be immersed, full-time, in the active pursuit of new scientific insights concerning the sexual, social, anti-predator or foraging behavior of arthropods, birds and mammals at or near the Station. These studies will be real investigations, not exercises, and they will be supported by daily whole-class roundtable discussions of hypotheses, methods and preliminary data, as well as the constant availability of personal consultation with me. During his 20 years of field research and teaching at the Station, I have developed many studies involving arthropods, birds and mammals. Students also will be encouraged and helped to develop original studies of their own involving observable arthropod or vertebrate species. Authorship of a quality publication is a possible outcome for dedicated students. I have done extensive research on the reproductive behavior of the Sierra dome spider and will continue these and other studies of sexual selection and social behavior while in full-time residence at the Station. See my full web page for more information on my teaching and research background or the behavior course page for more on the content of this course.

This speciality course is intended for mature undergraduate students considering or preparing for graduate work in animal behavior or human evolutionary psychology, science teachers wishing to add behavioral studies to their own curricula, and serious students from any academic field who wish to explore the practical and profund implications of modern Darwinism.

Please refer to Flathead Biological Station's home page for more information about the venue, as well as about the Biostation's summer teaching program, tuition, and fees Note: the station's recently revised fee structure is very favorable to out-of-state students!.

Sue Gillespie, the Biostation's Director of Operations, should be your main administrative contact (sgill@selway.umt.edu). Please feel free to write me if you have questions about course content or design. I can also put you in direct contact with former students of this course - do not hesitate to ask!

Additional remarks:
The course will provide the student with a working understanding of evolutionary theory and the current state of knowledge in behavior with extensive use of examples in the field, The focus is bringing the student to a point of professional competence in the practical application of Darwinian theory for designing field studies in behavioral ecology. The course will be designed to provide rich experience doing theoretically informed, high quality field research in behavior. Behavioral ecology will open up all aspects of animal and human behavior to evolutionary analysis by the students, and provide a real taste of what it is like to do Ph.D. level research. We shall accomplish these aims via immersion in modern Darwinian theory and rigorous hypothesis-testing methodologies in a highly dynamic, applied field and lab context. The course will

introduce students to the art and science of naturalistic observation and the formulation of evolutionary "why" questions about animal behavior. While covering a wide range of conceptual material concerning the nature of selection and the adaptive process, the course will provide extensive practical experience in the modern "adaptationist" approach to evolutionary behavioral analysis.

We shall constantly use the insect, spider, bird and mammal fauna of gorgeous Northwestern Montana to provide behavioral phenomena to study using our Darwinian analytical tools. After observing and pondering behaviors and morphological traits of interest, students will develop evolutionary hypotheses and testing schemes which we shall discuss together on site and in classroom roundtables. These discussions will lead to the design and execution of potentially publishable studies by teams of students as primary or sole authors. These teams will collaborate in organizing and troubleshooting data collection protocols, performing statistical data analyses, and writing a professional quality paper on their study. All students will have an opportunity to supervise 1-2 studies of their choosing and participate as occasional research assistants in most every study that is performed. I will constantly be available to help in all aspects of the work, since I shall be in residence at the station, my summer home for 23 years, throughout the course.

For more information on my behavior courses at Flathead Lake, click here

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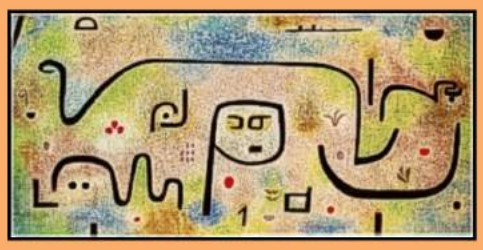
Past Workshops



Evolutionary Psychology and Spiritual Practice, 4th edition
29 September to 4 October 2002, Five Day Residential Workshop
The Esalen Institute, Highway 1, Big Sur, California 93920-9616

Our five day workshops on this topic in October 1999 and September 2000-01 were very successful, and we have been invited to offer this workshop a third time in the Fall of 2002.

Take the understanding of the East, and the knowledge of the West - and then seek. - G.I. Gurdjieff

Spiritual traditions commonly impose the directive, "know thyself," upon their followers. Seeing is viewed as only source of inner freedom. But many devote a lifetime to this pivotal project of self-knowledge and its successor aim of self-mastery and, if they are sincere, admit little progress.

Why are self-knowledge and self-mastery so difficult? Evolutionary biological theory-of-mind has matured to a point where it offers powerful answers and tools for critical minds devoted to self-understanding. Much is understood about the human mind's design to contingently avoid self-knowledge - watch at the right moment and you will feel the veils forming. "What am I?" and "What are my Potentials?" are necessarily intertwined, yet we are designed to subconsciously work to keep these questions and other crucial questions separate and out of clear consciousness.

Our thesis is that evolutionary ideas, properly understood (a genuine rarity), can combine synergistically with traditional contemplative, introspective teachings and skills to foster more incisive, objective self-exploration. We form a working community for this five day session to try to take the ancient self-knowledge mandate seriously and see its meaning and difficulty in a new light. We will show how modern evolutionary theory can potentiate a sincere spiritual quest, that is, one embracing radical self-disillusionment as a necessity instead of fearfully or non-critically defending against it. Evolutionary theory can perform the life-long service of re-revealing and thus gradually dispelling ruthlessly tenacious illusions about ourselves. Throughout our days together we will develop the theme of a spiritual search that uncompromisingly insists upon reconciliation of personal experience and traditional sacred teachings with modern scientific ideas about the nature of life on earth and human intrapsychic design, which has arisen as one of the supreme products of natural and sexual selection.

The sessions will include talks and discussions on fundamental elements of well established evolutionary theory. Biological explanations about the nature of subconscious psychological programming affecting all aspects of human social and sexual behavior will be covered. Evolutionary views will be discussed concerning the purpose and structure of conscious experience, the environmental determinism and contingency of self-perception and situational analysis, and the behavior of our most basic psychological capacity, namely, attention. All of our efforts to digest the biology, however, will be done in the context of a contemplative atmosphere in which we shall work practically, actively and in quite specific ways within ourselves to make contact with uniquely human capacities for self-observation and a more intentional, free, and genuinely devotional inner state. We hope that the cogent state-of-art biological models about intrapsychic dynamics of the wondrously complex and subtle "human animal" will help clarify some of the real work that needs to be done by those who wish to pursue spiritual self-development, and reveal the nature and difficulty of the common pitfalls one is bound to encounter and re-encounter in any spiritual journey.

Workshop participants are encouraged to bring with them readings that they feel offer relevant insights concerning any aspect of the human condition and human developmental potentials. *One aspect of our work together will be to share and carefully consider the possible meaning and significance of these materials in a biologically informed atmosphere of sincerity, receptivity, and respect. Folks who have taken Wes Nisker's Esalen workshop on Buddhism, meditation, and evolution, or read his related book, "Buddha's Nature" (Bantam Books, 1998; recommended) will find our workshop a challenging follow-up and extension.*

I like to think of this workshop as a sobering celebration of the life within us and around us! We are after a whole new appreciation of life on earth and our inner situation. A view of reality bests the products of our imagination every time!

For more information on the workshop, view our application letter to Esalen
to have Continuing Education Units (CEU's) available for participants in this workshop (pdf format).

"Right practice should flow naturally from right thinking about reality."
"If you see a monk climbing to heaven in an effort to flee his human nature, grab him by the foot and pull him back down, for what he's doing will ruin him entirely."
- The Monks of New Skete: In the Spirit of Happiness. 1999. pp. 84 & 180, respectively. Little, Brown and Co., New York.

"Seemingly inescapable conflict within diploid organisms came to me both as a new agonizing challenge and at the same time a release from a personal problem I had had all my life. In life, what was it I really wanted? My own conscious and seemingly indivisible self was turning out far from what I had imagined ... I was an ambassador ordered abroad by some fragile coalition, a bearer of conflicting orders from the uneasy masters of a divided empire Still baffled about the very nature of the policies I was supposed to support, I was being asked to act, and to act at once --- to analyse, report on, influence the world about me. Given my realization of an eternal disquiet within, couldn't I feel better about my own ability to be consistent in what I was doing, about my indecision in matters ranging from daily trivialities up to the very nature of right and wrong? ... As I write these words, even so as to be able to write them, I am pretending to a unity that, deep inside myself, I now know does not exist. I am fundamentally mixed, male with female, parent with offspring, warring segments of chromosomes that interlocked in strife millions of years before the River Severn ever saw the Celts and Saxons of Housman's poem ['A Shropshire Lad']."
- William D. Hamilton, 1996, Narrow Roads of Geneland. Vol. 1: Evolution of Social Behavior. NY: Freeman Spektrum, pp. 134-135.

See Esalen's online catalog of workshops.

SUMMER 2005? FIELD COURSE

Plant-Animal Interactions *(BIOL 449)*
Summer 2003; Four Weeks
9 July to 2 August
Monday, Tuesday, Wednesday 8:00-5:00 and Thursday 8:00-12:00; 4 credits
Flathead Lake Biological Station, University of Montana, Polson, Montana

To understand the evolutionary basis of the ecology and life history of any species it is necessary to critically evaluate the ways in which they interact with other species. Plant-animal interactions are absolutely fundamental in molding the biology of species, communities, and individuals. This intensive course will center on concepts and techniques for understanding the interdependent relationships between plants and animals. Emphasis will be upon ecological and behavioral studies and a heightened general appreciation of the co-evolutionary process, but there will be coverage of all major classes of PA interactions. We will discuss general principles underlying different modes of interaction, and their consequences at different levels of organization.

Field trips in the beautiful and enormous Flathead drainage, including Glacier National Park, will be a central feature of the course to give students hands-on experience with different classes and examples of interactions and, more generally, in the scientific observation and hypothesis testing process. We will spend much time in the field striving to discover PA interactions susceptible to study and brainstorming relevant research strategies. Come prepared and equipped to be physically and intellectually functional in the field under conditions conducive to hypothermia!

No single text is available for this course. Background for several subjects is available in Abrahamson, W. G. (editor) 1989. Plant-Animal Interactions. McGraw-Hill Book Company, New York. pp. 480 (required text) and Thompson's "Interaction and Coevolution" and "The Coevolutionary Process." The first two books are out-of-print, but we will find some way to make them available. Many other recent review and research papers, as well as a few classics, also will be studied to provide an up to date view of this rapidly developing field. Our use of the burgeoning primary literature will be in two contexts: frequent student led paper discussions and as references for the development of specific PA interaction research proposals. Discussions and proposal development will entail collaborative efforts by teams of 2-3 students. Although there will be a final exam on the last day of class, most of the course grade (ca. 80%) will be based on performance in discussions, active and attentive participation in field activities, and the quality of the final written research proposal.

Students taking PA interactions may extend their field studies by enrolling in independent study, which I am also happy to oversee. Research opportunities abound at the station and surrounding areas.

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