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American Society of Parasitologists

NEWSLETTER

Newsletter:

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From the *Editor* of the Newsletter

The ASP newsletter accepts information and news of a parasitological nature from all disciplines. Please assist me in making the content of the ASP newsletter highly relevant. We will be posting material on the web as they are generated by you, the **reader** and **contributor. Send new material to slg@unl.edu.**

Scott L. Gardner, Curator
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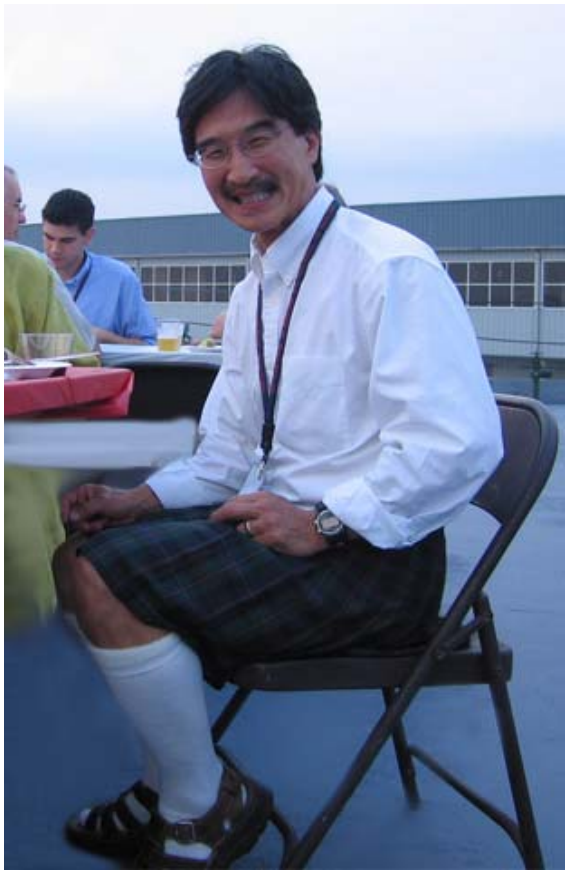
LETTER FROM THE AMERICAN SOCIETY OF PARASITOLOGISTS PRESIDENT – TIMOTHY YOSHINO



I would first like to thank the membership of ASP for entrusting me with the privilege and responsibility of serving as your President over the last year. Starting with the hurricane-truncated meeting in Mobile last summer, and with the planning of the British Society of Parasitology-ASP "cohosted" ICOPA XI meeting in Glasgow in August, this has not been what one would consider an ordinary year. But it has been an enjoyable and gratifying experience to participate in the Society from the "inside." By way of this letter, I want to update you on activities of the Society, ongoing and planned, and to encourage your active participation in the business of the ASP.

Plans for the International Congress in Glasgow are near completion, and the program promises a diverse sampling of parasitology with numerous symposia covering the major parasitic diseases of medical and veterinary significance, as well as those focusing on more general topics such as parasites of wildlife, parasites as bio-tags, vector biology, parasite ecology, systematics, infection modeling, virulence and coevolution, and the like. Steve Nadler, ASP Vice President, has organized what I anticipate will be an exciting Presidential Symposium entitled "Innate Immune Responses in Vectors to Parasitic Infection," featuring the latest on immune interactions involving mosquito-malaria, tsetse fly-trypanosome and snail-schistosome systems. Other highlights include the Stoll-Stunkard lecture by Dan Brooks on "Accommodating Hosts: Parasite-Centered Ecology and Evolutionary Biology," the Presidential Address, and a rousing student reception at a local pub. I know that many of you, unfortunately, will not be able to attend the ICOPA meeting this year, but it is my understanding that many of the symposia and short presentations will be published either as full papers or extended abstracts, so at least the information will be available for all to read. For those that will be in Glasgow, I look forward to seeing you again, sharing our latest findings (and, of course, a beer or two).

If you miss the ICOPA meeting, fear not, as plans are in the works for the first-ever joint meeting of the ASP and the Sociedad Mexicana de Parasitología (SMP) to be held in Merida, Yucatan, Mexico, June 21-24, 2007. This meeting promises to be significantly less expensive than ICOPA, and provides an excellent opportunity to learn about the exciting parasitology research being conducted by our Mexican colleagues, to explore collaborative opportunities, and to enjoy a

rich cultural experience. Also, just a reminder that we still need your help in nominating deserving colleagues for a number of awards (e.g., the Bueding-von Brand Lecture for 2007). More news regarding the scientific and social programs will be upcoming in the Fall, so stay tuned.

Even as we focus on global parasitism with the upcoming ICOPA meeting in August there are important issues that continue to face our society here at home. One of our immediate ongoing concerns is the continuing decline in ASP membership. Unfortunately this has been a reoccurring theme that has haunted my predecessors over a number of years, and most likely, I will not be the last to broach this subject. For the past 3 years there as been a 16% decrease in total membership (from 1101 in 2002 to 922 in 2005) which includes a 20% drop in the "regular member" category, the mainstay of the society (2005, J. Parasitol., 91: 1268). Ironically, this demographic trend is occurring in the face of tremendous popularity of parasitology research, increased public awareness, and substantial funding from the public and private sectors. But as pointed out by members now serving on an ad hoc strategic planning committee (see below), the popularity of parasites may actually be driving the decline in ASP membership through the increased use or application of parasites as models/subjects in a diversity of disciplines whose members are aligned with "nonparasitological" fields such as ecology, evolution, or immunology, or societies related to host species (e.g., mammalogy, shellfish, etc.). Increased popularity of more specialized "boutique" parasitology meetings such as the Woods Hole Immunology of Parasites and Molecular Parasitology meetings, Keystone Molecular Helminthology symposia, and various Gordon Conferences, also adds to increased competition for members and limited travel dollars. Finally, societies like the ASTMH and the AAVP, with their emphasis (and considerable industry and government support) on human and animal parasitic diseases, take their share of potential ASP members. Clearly it is a highly competitive environment for parasitology organizations, and ASP has a major challenge ahead to reverse this trend.

However, faced with the above realities, I am optimistic that we can meet this challenge, but it will take dedicated effort on the part of all members, creative thinking and perhaps a reshaping of who we are as an organization or how we conduct business. As immediate past-President Minchella stated a few years ago, and reiterated recently "…we must continue to develop our efforts to engage one another, other scientists, our students and the general public in the diverse facets of parasitology", and this certainly rings true today. Opportunities for professional parasitologists abound, and it is our challenge to position the (young) members of ASP to compete effectively in the job/grants market. You are now well aware, the ASP leadership has been gathering member information (thanks to all who took the time to fill out your surveys) as part of a society-wide strategic planning effort. Over the past year, a new ad hoc strategic planning committee (SPC), comprised of Dennis Minchella, President-elect Steve Kayes, Vice-President Steve Nadler, Council member Cynthia Chappell, past-Council member Mark Siddall, past-Student Rep Michelle Steinauer and myself, has been formed to "analyze" the survey data with the hope of gaining insights into the ASP as an organization, and to aid in planning for the continued health and well-being of the society. The SPC, with input from many other ASP members, is currently dialoguing in cyber space, and we anticipate having a set of recommendations for general discussion, and upon which we anticipate will lay the ground work as we build for the future. I plan to provide a more comprehensive view of our strategic planning efforts at the Glasgow meeting.

Finally, as mentioned above, because of the shortened ASP council meeting in Mobile last year, several items of business left "unresolved" or were carried over are worth mentioning. For further details, minutes of the 2005 ASP Council meeting in Mobile have been published (J. Parasitol., 91: 1266-1279).

Consideration of partnering with a commercial publisher to handle the business aspects of producing and marketing The Journal of Parasitology.

While our current editorial office continues to do an outstanding job in producing a scientifically-sound, highly-respected journal, it was recognized that the many options available for electronic/online subscription and complexities of journal marketing are beyond what might be expected of a purely "self-publishing" operation, which ASP currently is. A proposal was presented to Council by Alliance Communications Group (ACG), the publishing division of Allen Press, Inc., describing the benefits of such a partnership, not only financially, but by increasing publishing efficiency and visibility for the Journal. ACG's services would also streamline the review process, manuscript handling, subscription renewals, and member tracking. The Council will be discussing and considering this option at its next meeting.

Restructuring of ASP membership dues and meeting registration rate schedules for postdocs and new faculty.

Although Council last year took no formal action on this issue, I would like to see a change in dues and registration structure discussed and voted on. Students currently have a membership/subscription price break on a yearly or tri-yearly basis. However, survey data suggests a significant loss of young members is in the transitional period from student to postdoctoral or first faculty positions. I believe that encouraging this cohort of members to remain members and to attend our annual meetings is crucial, not only in maintaining/building our member base, but to injecting the youth, vitality, and new ideas that will ensure future prosperity of the ASP.

Explore establishing an interactive web-based system to enhance member communications.

Becoming more efficient in communicating with members, between members, and with other societies with parasitological interests can provide enhanced visibility for the ASP, and this is clearly evident in our newly "remodeled" website. In this regard, adding to our website a secure, web-based interactive system(s) would significantly enhance the functionality of our website operations. Such a system could be used for obtaining member opinions on a variety of issues, for on-line voting, and perhaps can be designed to accept credit card membership renewals.

Other issues will undoubtedly be presented by the Priorities and Planning Committee, discussed in Council and reported to you at our annual business meeting and in the Journal.

However, if you have any concerns, questions or suggestions on how the ASP can be more effective in serving you, its members, please do not hesitate to contact me or any of the other Council members. It has been a very busy and enjoyable year serving as your president, but I couldn't have done it without the help of those who actually "run" the society. Special thanks to John Janovy for his judicious handling of our money, Beth Wilkins for always having answers to my many questions, and Don Duszynski for planning our meetings and managing to keep us out of trouble. I look forward to seeing all of you either in Glasgow this August or Merida in June 2007.

Invitation to the ASP Annual Meeting - 2007!

By Victor Vidal Martinez

The 2007 meeting of the American Society of Parasitologists (ASP) will be held in Mérida, Yucatán, México, June 21-24 in conjunction with the Mexican Society of Parasitology (MSP)

Mérida Yucatán

Yucatán is located in southeast Mexico bordered by the Gulf of Mexico. Here the Mayan culture flourished, evidence of this is seen via the numerous archaeological sites which remain as a legacy to humanity. Pre-Hispanic cities are distributed throughout the state, including Chichen Itza, Uxmal, Dzibichaltun, Labna, Xcambo, and the splendid city of Ek´Balam.

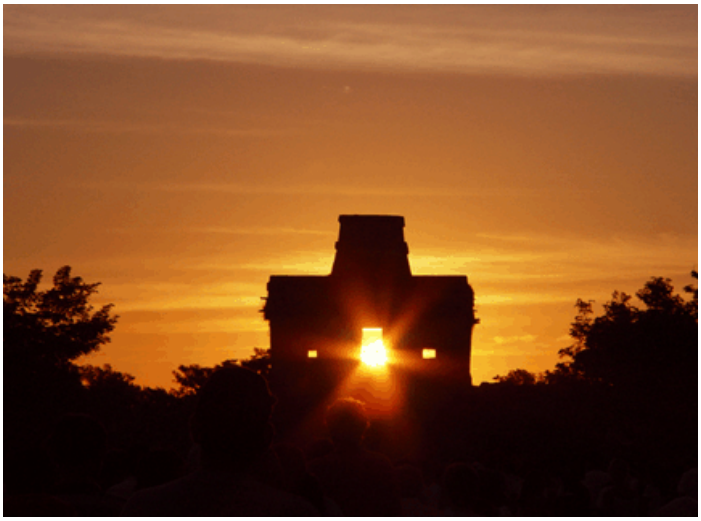
The cultural heritage dating from the Colonial Era becomes obvious in cities such as Valladolid and Izamal. Mérida is the capital city of Yucatán, called "the White City," it one the most important tourist and commercial destinations on the Peninsula, truly, a "must see" for all visitors. It is the ideal place for business and pleasure; with excellent weather year round and a reputation for one of the safest cites in Mexico. In this city you can find a wide range of hotel accommodations consisting of more than 5,000 rooms, the Convention Center "Yucatán Siglo XXI" as well as all types of services and comforts.

As you walk down the streets, you will find museums, parks, folkloric shows, cultural events , open-air cafes, delicious regional cuisine, shopping centers, handcrafts, and of course the hospitality of our people.

The Henequen industry at the beginning of XX century, led to the construction of many

Haciendas whose beauty and elegance have remained. Today, some of them have been transformed into exclusive restaurants and hotels.

With over 350 kilometers of coastline, Yucatan has beautiful beachesincluding Sisal, Progreso, Chicxulub, Chelem, and Telchac. Those who prefer ecotourism can enjoy the flora, fauna and adventures in caves, cenotes (sinkholes), and national parks such as Celestun and Rio Lagartos.



Yucatán has an extensive airport, and highway system making connections fast and safe. You can reach Mérida from Cancun, Houston, Atlanta, and Miami to name just a few. Also cargo and cruise ships arrive at Progreso´s Port and a fleet of buses provides daily service to all local and national destinations.

We hope to see you in Mexico in 2007!
Please come!

Dan McLaughlin with two former students, both of whom are Ward Medal recipients (Marilyn Scott and Dave Marcogliese).

May 12, 2006
Op-Ed Contributor
Evolution's Bottom Line
By HOLDEN THORP
Chapel Hill, N.C.

THE usefulness of scientific theories, like those on gravity, relativity and evolution, is to make predictions. When theories make practicable foresight possible, they are widely accepted and used to make all of the new things that we enjoy — like global positioning systems, which rely on the theories of relativity, and the satellites that make them possible, which are placed in their orbits thanks to the good old theory of gravity.

Creationists who oppose the teaching of evolution as the predominant theory of biology contend that alternatives should be part of the curriculum because evolution is "just a theory," but they never attack mere theories of gravity and relativity in the same way. The creationists took it on their intelligently designed chins recently from a judge in Pennsylvania who found that teaching alternatives to evolution amounted to the teaching of religion. They prevailed, however, in Kansas, where the school board changed the definition of science to accommodate the teaching of intelligent design.

Both sides say they are fighting for lofty goals and defending the truth. But lost in all this

truth-defending are more pragmatic issues that have to do with the young people whose educations are at stake here and this pesky fact: creationism has no commercial application. Evolution does.

Since evolution has been the dominant theory of biology for more than a century, it's a safe statement that all of the wonderful innovations in medicine and agriculture that we derive from biological research stem from the theory of evolution. Recent, exciting examples are humanized antibodies like Remicade for inflammation and Herceptin for breast cancer, both initially made in mice. Without our knowledge of the evolution of mice and humans and their immune systems, we wouldn't have such life-saving and life-improving technologies.

Another specific example is resistant bacterial infections, one of the scariest threats to public health. The ones that are resistant to antibiotics are more reproductively successful than their non-resistant relatives and pass the new resistance genes on to more offspring. Just as Darwin said 150 years ago.

The creationists have devised a tortuous work-around for this phenomenon, which endorses natural selection and survival of the fittest, but says that evolution doesn't explain the original development of species. The problem is, there are hundreds of genes that occur in both bacteria and humans. It's hard to see why a designer would do it that way, since having the same genes in bacteria and humans makes infections harder to treat: drugs that act on bacterial gene products act on the human versions as well, so those drugs could kill both the bacterium and the human host. Talk about throwing the baby out with the bathwater.

So evolution has some pretty exciting applications (like food), and I'm guessing most people would prefer antibiotics developed by someone who knows the evolutionary relationship of humans and bacteria. What does this mean for the young people who go to school in Kansas? Are we going to close them out from working in the life sciences? And what about companies in Kansas that want to attract scientists to work there? Will Mom or Dad Scientist want to live somewhere where their children are less likely to learn evolution?

One Kansas biology teacher, a past president of the National Association of Biology Teachers, told Popular Science magazine that students from Kansas now face tougher scrutiny when seeking admission to medical schools. And companies seeking to innovate in the life sciences could perhaps be excused for giving the Sunflower State a miss: one Web site that lists companies looking for workers in biotechnology has more than 600 hiring scientists in California and more than 240 in Massachusetts. Kansas has 11.

In his most recent State of the Union address, President Bush mentioned our problems in science education and promised to focus on "keeping America competitive" by increasing the budget for research and spending money to get more science teachers. I hope he delivers, but we can't keep America competitive if some states teach science that has no commercial utility. Those smart youngsters in India and China whom you keep hearing about are learning secular science, not biblical literalism.

The battle is about more than which truth is truthier, it's about who will be allowed to innovate and where they will do it. Sequestering our scientists in California and Massachusetts makes no sense. We need to allow everyone to participate and increase the chance of finding the innovations to improve society and compete globally.

Where science gets done is where wealth gets created, so places that decide to put stickers on their textbooks or change the definition of science have decided, perhaps unknowingly, not to go to the innovation party of the future. Maybe that's fine for the grownups who'd rather stay home, but it seems like a raw deal for the 14-year-old girl in Topeka who might have gone on to find a cure for resistant infections if only she had been taught evolution in high school.

Holden Thorp is chairman of the chemistry department at the University of North Carolina.

And then there is the late Dr. Eugene Odum - the following is a book review by Edward Goldsmith. It is an interesting review - and it makes me want to go out and get the book.

Book review: **Ecology: A Bridge Between Science and Society**,Eugene Odum. Third edition, published by Sinauer Associates, Sunderland, Mass., USA, 1997. This is a very interesting review by one of the visionary writers and philosophers of our time (*Editor).*

Ecology - a bridge. By Edward Goldsmith.
From - http://http://www.edwardgoldsmith.com/page7.html
Unpublished, 17 October 2002.

Eugene Odum, who is Professor Emeritus of Ecology at the University of Georgia, is probably the most distinguished ecologist in the world today. His principal textbooks "Basic Ecology" (1983) and its successor "Fundamentals of Ecology" (1971) have been standard textbooks in American universities for decades.

This is a review of the third edition of Eugene Odum's shorter and less formal textbook "Ecology: a Bridge Between Science and Society", which not only updates the previous ones but which includes quite a lot of new and very valuable material as well. Like Odum's more formal textbooks, it differs from just about all the others in use today in the universities of the English-speaking world on two very important counts.

First of all it is holistic, it even takes very seriously the Gaia hypothesis of Jim Lovelock and Lynn Margolis. Crazy as it may appear - modern ecology has become highly reductionistic, most of its practitioners insisting that one can understand the functioning of an ecosystem by examining its parts in isolation from each other. This means of course that they deny, in effect, the

very principle of organisation which is one of the most fundamental features of the living world at all levels of organisation. A natural system, whether a molecule, a cell, an organism, or an ecosystem is not just a random assortment of different components. As Edmund Sinnott puts it,

> "To say that man is made up of certain chemical elements is a satisfactory description only for those who intend to use him as fertilizer."

These elements are organised in a highly sophisticated manner so as to give rise, on the contrary, to a natural system capable of maintaining its stability in the face of change. The reductionist approach to ecology is derived from the writings of Herbert A Gleason, and in particular from his much quoted paper "The Individualistic Concept of the Plant Association" that was published in the Bulletin of the Torrey Botanical Club in 1926.

At the time it was laughed at, but times have changed, our industrial society is ever less organized into families and communities and more and more atomised. Individualism, competition, and egoism, reign - it is fundamental to modern economics - and we live more and more in an economic society in which social and ecological considerations are regarded as largely irrelevant. Much of the public has been converted to this paradigm - hence the popularity of such writers as Richard Dawkins - whose preposterous book "The Selfish Gene" is taught as gospel in most English speaking universities.

Not surprisingly Eugene Odum defines ecology very differently from the reductionist ecologists of today. Whereas they define this discipline as the study of the relationship of an organism to its natural environment and hence in purely biological, one might even say ethological, terms, Eugene Odum defines it in this book as "the science of the total environment" , while in Basic Ecology he defines it as "the study of the structure and function of Nature" and is perfectly happy to regard it as "the study of the structure and function of 'Gaia' " or the ecosphere itself.

It follows that since the natural world or the ecosphere is not only composed of biological organisms but of ecosystems, populations, societies, and in the case of some species, families and communities, this means that ecology is not simply a branch of biology but is a sort of super-science, just as Barrington Moore suggested it should be in his Presidential address to the St Lois branch of the US Ecological Society in 1917 .

Odum's ideas differ too from those of other ecologists in that he does not describe the functioning of the natural world as a purely academic exercise but in order to make clear to young people just what are the hideous implications of the destruction wrought to it by our utterly irresponsible economic activities. Thus, in the preface to the first edition of this book, he tells us that it was intended to be not only a textbook for beginner students but also "a citizen's guide to the principles of modern ecology as they relate to today's threats to our earth home", with the

emphasis on "the causes and long-term solutions to our environmental problems" rather than as a "quick fix treatment of symptoms that has too often been our approach" .

I can think of no other textbook in the English-speaking world that looks at ecology in this way, though, in France, Pierre Ramade's well-known textbooks do so to much the same extent. Another feature of this book is that it is written in very simple language and all technical terms are carefully defined. This means that it is eminently readable by anyone with any real interest in this critical subject.

The book itself is 330 pages long and divided into 8 chapters and an epilogue. The first chapter, "The Life Support Environment" explains in detail to what extent life on earth depends on maintaining the basic structure of the living world or the "ecosphere", which term includes its geological substrate as well as its atmospheric environment. As Odum writes,

> "We are able to breathe drink and eat in comfort because millions of organisms and hundreds of processes are operating to maintain a liveable environment, but we tend to take nature's services for granted because we don't pay money for most of them".

What is more, and contrary to what some economists say, "there are no substitutes for most of nature's resources - water for instance - should they become reduced or deteriorated". I don't need to point out how irresponsibly we have used our scarce water resources and how as a result water scarcity will be one of the most critical problems we shall face in the next decades, something like two thirds of the world's population being expected to experience shortages and one third to have little or no access to it.

Odum also looks at the important issue of land-use. For him it is important to distinguish between "fabricated", "domesticated", and "natural" environments, in other words between developed sites, cultivated sites, and natural sites. A city of course is a fabricated site and has a high-energy density (by which expression he means "the amount of energy consumed per unit of area per year"), which is a thousand or more times greater than that of a forest. In addition, "not only does it pour its waste products into the countryside, but it depends on this same countryside to provide almost all of its life supporting resources".

He makes it clear that we cannot just cover our land with cities, or as they are better referred to as "urban / industrial areas", as we are doing in the UK. Such areas are little more than **parasites** on the natural and domesticated environments, since they make no food, clean no air, and clean very little water (as domesticated and, in particular, natural environments do for us). He illustrates the parasitical nature of cities or urban-industrial areas, as modern cities are best

referred to, with respect to New York and Chicago. He sees it as a tragedy of course that "we don't realize how vital is our life support environment" - so vital is it, he tells us, that we can profitably think of ecology "as the study of the earth's life support systems".

Levels of Organisation

The very terms used in the title of this chapter imply that the living world is organized hierarchically, which of course it must be. For Odum it is organized into biogeographical regions, themselves organised into biomes, landscapes, ecosystems, biotic communities, populations, and organisms, which in turn are organized into organisms, organs, tissues, cells, organelles and molecules. In "Basic Ecology" he points but how ecology is largely concerned with the upper end of this vast hierarchy.

That the living world is organized in this way is critical, for the obvious reason that the relationship between the whole and the parts is not the same as that between the parts and the whole. I make this clear in my book "The Way: an Ecological World View". Living things, contrary to what we are told by sociobiologists such as Edward O Wilson and Richard Dawkins, are not selfish or individualistic - that is, in a stable society within a stable ecosystem. They seek above all to maintain the integrity and stability of the hierarchy of the ecosphere, (not of the State which like the corporations is parasitic to it).

This is essential - for the simple reason that the welfare of living things is ultimately dependent on the maintenance of the families, communities, societies, populations, and ecosystems of which they are part, not to mention the ecosphere itself. By irresponsibly transforming the latter's chemical composition, for instance, we are condemned to global climate change, which, if nothing is done about it, will slowly make this planet uninhabitable.

As I pointed out in great length in the final chapters of my book "The Way: an Ecological World View" , tribal peoples were imbued with a world-view that led them to see the maintenance of the 'cosmos' - which for them included society, the natural world and the world of the Gods - as the fundamental priority of their behaviour pattern and in particular of all their ritual and religious life. It was taken for granted that their welfare, indeed their survival depended on doing so, something that modern man with all his science and technology has failed dismally to understand.

Since living things by their very nature behave in this manner, the control of the parts by the whole takes a very benign form. In primal societies, for instance, the very notion of government, as we see it today, scarcely exists. What control there is is exercised by the people themselves and in particular by the elders acting as fully integrated members of their respective communities.

At an ecological level, the same principle applies. As Odum and Patten have noted, the control extended by an ecosystem over its constituent parts is not a "bossing" relationship

whatsoever. Nevertheless most of today's ecologists and other scientists refuse to accept that the ecosphere is a hierarchy and prefer to see it as a "web". This is the position of Fritzhof Capra, who, in his book "The Web of Life", goes out of his way to tell us that the idea of a hierarchical biosphere has been largely abandoned.

This is undoubtedly true for those who wish to be fashionable but not by those who still insist on explaining the true functioning of stable societies, ecosystems, and the living world. Among other things, the idea of the ecosphere as a web obscures the true relationship between parts and wholes. To suppose that such a relationship is absolutely symmetrical is simply not serious and needless to say Odum is not willing to accept it.

Surprisingly enough, those who see nature as more than a web continue to use such holistic terms as "emergent properties". However these only appear in a natural system once a new level of organization in the Gaian hierarchy has been achieved. Molecules, for instance, cannot grow indefinitely. A point is reached when they must join together to form a cell. That is when a new level of organization appears and when new emergent properties come into being. Hence the term "emergent qualities" only has meaning within the context of a hierarchical system in which behaviour occurs at different levels of organization.

Nor does it make any sense to talk about emergent properties if one also insists that the functioning of an ecosystem can be understood by looking at its parts in isolation from each other. Odum notes, for instance, that such a property cannot be predicted from the study of components that are isolated or de-coupled from the whole of which they are part. He refers on this subject to a paper by G W Salt. Nor can any of the key functions of a natural system be predicted by the reductionist approach, for that matter.

Of course, in different ecosystems, the key functions are often fulfilled by different species, which can be referred to "ecological equivalence". Thus "the grazing kangaroos of the Australian grasslands are ecological equivalents of the bison and antelope (or the cattle that has replaced them on North American grasslands), since they have a similar functional position in the ecosystem". Once again this obvious notion is not apparent to reductionist ecologists who seek to study these animals in isolation.

Odum discusses here the elements and inorganic compounds that are essential for life, and points out that many are becoming ever less available. He also notes carefully how a modern industrial society is introducing new man-made substances into the natural world, which are inimical to living things. In this respect he is outspoken in his criticism of modern agriculture, because of all the energy and expensive chemicals required to eliminate weeds, for instance, and maintain a true monoculture.

He notes too just how vulnerable monocultures are to pests. He questions quite openly, "whether increasing the intensity of farming in an effort to get a little more yield does more harm than good?" Some studies, he reminds us, are showing "that the presence of weeds in moderation

may be beneficial to a crop by providing a habitat for useful insects or by improving soil conditions".

He also refers to other studies that show that "mixtures of crops (polycultures) may produce more food or other products per unit of area than monocultures do". He notes too that agro-ecologists are becoming increasingly interested in traditional agriculture, such as the ancient Indian corn / bean / squash crop mixtures that are still in use in Mexico and Central America. As he warns,

> "The term weed should be used with caution, for a plant that is choking the flowers or vegetables in your garden may turn out to be a very useful member of a fallow field plant community."

In the same chapter, Odum goes into the relationship between diversity and stability. He notes that the issue of whether diversity increases "resistant stability" (the ability of an ecosystem to remain the same after a disturbance) is much debated by ecologists. In fact the reductionist ecologists of today reject the thesis outright, insisting that increased complexity (they do not distinguish between diversity and complexity) has the opposite effect and reduces stability - a notion based on a superficial reading of Robert May's book "Complexity and Stability in Model Ecosystems".

In reality May merely states that this is true on his mathematical model, and admits that "in the real world things may be different". Odum notes that recent field experiments by Tilman and associates have indicated that the diversity of species in grassland communities does indeed increase stability during droughts. Significantly Lovelock has built a sophisticated model that, contrary to May's, demonstrates that diversity does indeed increase stability.

Energetics

This chapter contains a further attack on modern agriculture, noting that in order to double crop yields in the past it has been necessary to increase the fertilizer, pesticides, and work energy by no less than ten times. The Green Revolution he sees as a mixed blessing. He points out that whereas "a wild rice plant, puts no more than 20% of its production into seeds, enough to ensure its long-term propagation; in contrast highly bred strains of 'miracle' rice may produce 80% grain".

The catch, he notes, is that "the miracle rice plant has no energy left for self protection and requires a large amount of expensive auxiliary energy to nourish it and keep the bugs off - something small farmers and small nations often cannot afford". And this, he reminds us, gives rise to pollution.

He also makes the important point that is more often than not completely forgotten by major institutions like the Food and Agricultural Organization of the United Nations (FAO) - that only a small fraction of the world's land area - at most 24 percent of it - is suitable for agriculture and that most of it is already in use for crops and pastures. Trying to extend cultivation to marginal areas he warns would be a big mistake, "not only because of the high cost but because of the damage to life support ecosystems".

He also notes that there is a limit to the use of biomass as a source of energy and that we are never going to supply the growing fleet of motorcars with fuel made from alcohol and methane obtained from crops. At least one fourth of the world's arable land would be required to satisfy the current global demand for motor fuel. He points out that surplus biomass cannot be regarded as waste, as it is essential for maintaining the fertility and water-holding capacities of soils. In the long run, as is pointed out by Hans Jenny, "humus capital" is more valuable than fossil fuels, especially "since there are other sources of fuel but not of humus".

Material Cycles and Physical Conditions of Existence

In this chapter Odum warns that about a fourth of the withdrawal from aquifers is now considered to be overdrafts. An example is the giant Ogallala aquifer which stretches from the high plains of Texas to Kansas, Oklahoma, Nebraska, and Eastern Colorado. "Fossil water and fossil fuel (to pump the water)" he notes, "have combined to create a billion dollar economy in the region". Unfortunately the aquifer will be gone before the fossil fuel, but the fuel becomes useless without the water. The result will be a severe economic depression, and the depopulation of the area, as the land returns to much less lucrative dry land farming. The dust storms of the 1930s, he also warns, could return when the water, now used to keep the landscape green, is gone.

In this chapter he also warns us against modern irrigation methods. More irrigated cropland is currently being lost as a result of salinization than because of water shortages. He also notes that the use of salt on roads for ice and snow removal has increased to such an extent that roadside trees and other vegetations are being destroyed, and underground water mains, telephone lines, and electric cable, are being corroded. The seepage of salts into groundwater aquifers is coming to be recognized as a health hazards for humans. More than 10 percent of all salt produced in the world annually is now deposited each year on American highways in snowy states.

Also in this chapter he notes how industrial activities are disrupting the main elemental cycles - the nitrogen cycle, the phosphorus cycle, etc. He points out in particular the incredibly important role played by nitrogen-fixing by bacteria in the nitrogen cycle. Only a few primitive bacteria including the blue / green algae or cyan bacteria can fix nitrogen, but without them legumes would not be able to fulfil their function. The availability of nitrogen is of paramount importance to us and our fellow creatures, because nitrogen is a necessary part of the basic units of all life: in DNA, amino-acids and proteins.

Maintaining the integrity of the nitrogen cycle is thus absolutely critical. For this reason alone the regeneration of our soil must be one of our highest priorities. The Soil Conservation Service considers that the maximum tolerable level of annual soil loss from good deep soils to be five tons per acre, and from poorer, thinner soils, two tons per acre. However, it appears that half

of the best farmland in Iowa and Illinois is losing ten to twenty tons per acre each year, and a quarter of all farmland in the United States is losing soil at a rate greater than the tolerable level. For every inch of topsoil lost there is a crop yield reduction of at least 10 percent. He warns,

> "The fate of the soil system depends on society's willingness to intervene in the market place, and to forego some of the short-term benefits that accrue from 'mining' the soil so that soil quality and fertility can be maintained over the longer term."

Of course, this has not yet occurred. Industrial society - though Odum does not say so - has totally refused to forego any economic benefits, even the most minor ones. The illusion that there is a technological solution to every problem we create provides our industrialists and politicians and the scientists they employ with a veritable licence to ignore the inevitable consequences of their policies.

Population and Community Evolution

This chapter contains interesting passages on the population irruptions of lemmings, for instance, in the artic tundra, which occur every four or so years. Such irruptions have usually occurred in a biologically impoverished area, and it could be that the ecosystems affected have adapted to these irruptions, as a year or two later only a few lemmings can be found.

This seems to be the view of J.H. Meyers, who has noted that outbreaks of needle-eating caterpillars, that occurred every five to ten years between 1880 and 1940 in German pine forests, "seemed to be adapted by years of evolution to ensure that they do not devastate the host trees, which recover quickly from the periodic defoliation". If this is true, then, as Odum points out, "spraying with insecticides to control the insects is futile once the outbreak is in progress".

Odum also notes that modern man has a great tendency to try to kill off predators that compete with him in consuming commercially important fish species or even livestock. They forget, that many other factors may be more limiting to prey populations but are not as well understood by untrained individuals.

For instance hawks are not a necessary limiting factor to quail populations as long as the vegetative cover lies near feeding areas so that healthy quail can usually escape from attacking hawks. "When efforts are directed towards improving quail habitat, removing hawks to protect the quail is unnecessary - and even undesirable - because hawks also prey on rodents that eat quail eggs". Unfortunately, as Eugene Odum notes, "'ecosystem management' is more difficult and less dramatic than shooting hawks, and game managers are often pressured by hunters into the latter, even when they know better".

Odum also shows how a forest ecosystem is quite capable of recovering from the loss of a key species, which shows once again why the ecosystem rather than the species is the correct unit of ecological study. Thus the American chestnut, which once constituted 40 percent of the biomass in the forests of the southern Appalachians, was killed off in the first part of the 20th

century by a parasitic fungus imported from China. By 1952 all the large trees had been killed.

At present and for the time being, at least, the species is being replaced by other hardwoods, and the total biomass of the present day forest is now similar to that under pre-blight conditions. This shows "once again how redundancy or diversity - the presence of more than one species in a basic functional niche - enhances resilience and recovery at the ecosystem level".

Development and Evolution

In this third edition of "Ecology" Odum has partly at least replaced the term 'ecological succession' by 'eco-sustainable development'. He still sees it, however, as an orderly strategy moving from a pioneer community by several stages towards a climax. He now also prefers to use the term 'maturity' for the term 'climax'. This seems to be, partly at least, an attempt to placate reductionist ecologists who have attacked Odum's view of ecosystem development, which many of them see as but a series of ad hoc moves.

In addition rather than see the process as coming to an end when a position of maximum stability, in the given conditions, has been achieved, they see it instead as continuing indefinitely, which is consistent with their view that everything is in a state or permanent flux, the notion of stability being largely foreign to them. Odum however continues to see ecosystem development as involving the modification of the physical environment by the biotic community acting as a whole, which of course creates conditions that permit each new step in the succession to take place. This, he refers to, as the "holistic component".

However, he also refers to the interaction between the component populations, and presumably the individual members of these populations, which he sees as the "individualistic component". Nevertheless, for Odum the process involved is in essence very much as he has always described it. He still accentuates the randomness of the early pioneer stages, which slowly give rise to organized or deterministic change as the process gets underway, while at the same time there is a shift in energy flow from production to respiration as more of the available energy is required to support the growing organic structure.

The Tabular Model for Autogenic Ecosystem Development

This is a new section in which Odum supplies further details of the controversy over succession between holistic and reductionist ecologists. My criticism is that no one seems to accept that succession is goal directed. For me, the idea that all life processes in a stable society and ecosystem are goal-directed is an essential feature of a truly holistic world-view.

Ecologists like other scientists talk quite happily of negative feedbacks. These serve above all to keep a natural system on its course by enabling it to correct diversions from it. But if it has no course, i.e. no spatio-temporal goal, then negative feedback can serve no conceivable purpose. Why then not admit that life processes are goal-directed? Odum does talk of the overall strategy of succession, which he sees as involving

"decreasing entropy (disorder) increasing information (order) increasing the ecosystem's ability to survive perturbations (resistant stability) and increasing efficiency of energy and nutrient utilisation."

He admits that many ecologists do not accept this hypothesis, which he sees as linked to people's view of the mechanism of evolutionary change. For him though succession moves in a specific direction and as it does, so it acquires all sorts of new features which were not present at the pioneer stage. Each of these new features also seems to contribute in different ways to increasing stability.

Odum refers to an essay by the late George M Woodwell of Woods Hole Marine Biological Station, in Massachusetts - who was one of the really wise men of Modern Science. In it Woodwell stresses "the great urgency of dealing with the environmental follies of humankind", in particular the global threat of atmospheric toxicification and global warming.

Normally when a landscape is devastated by storms, fires or other periodic catastrophes, ecological succession provides a healing process that restores the ecosystem. But, when landscapes have been severely abused over long periods of time (eroded, salinated, stripped of all vegetation, contaminated with toxic wastes and so on), succession cannot occur even after the abuse stops. For Woodwell such sites represent a new class of environment that remains barren indefinitely unless specific efforts are made to restore it.

Woodwell suggests that one third of India is already in this degraded condition, and massive efforts are required to create the conditions in which life can once more develop. Though Odum does not mention it, such positive action has not been taken on any scale so far, because it is politically more advantageous for governments to spend money on projects that a still grossly uninformed public regards as more important and in any case because government is incessantly lobbied by powerful corporations that insist on government money being spent on such things as the infrastructural projects required to maximise their sales and profits.

Epilogue

I am sure that Odum would agree that the terrible ecological problems that we face today can only worsen in the highly competitive global economy that we have created, and which by its very nature can only be dominated by huge and unaccountable multinational corporations. This may provide a means of expanding the world economy, but should this really be our overriding priority? Odum quotes Lester Brown on this subject:

"Economic deficits may dominate our headlines, but ecological deficits will dominate our future".

The only answer - though Odum does not say so explicitly - is to create a very different world economy - one that is much more localized and far less competitive and in which it becomes possible to do all the things that are so desperately required if we are still to have a planet to live on. It is a pity that our political leaders and those who run the multinational corporations that now largely control them, have not been brought up on the writings of Eugene Odum.

This third edition of his "**Ecology: A bridge between science and society**" provides a key textbook, not only for ecology students, but for all students in our schools and universities. Few people have at once the prestige, authority, knowledge, and motivation to write such a book and to provide it with the credibility required to make people realize how crass and simplistic is the view of the world with which we have all been imbued and how destructive are the policies that it serves to rationalize.

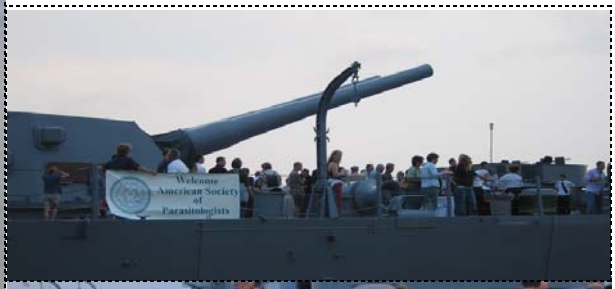
Editors Note (From Wikipedia): "Eugene P. Odum (1913-2002) was an American scientist known for his pioneering work on ecosystem ecology". Even professional biologists seemed to Odum to be generally under-educated about how the Earth's ecological systems interact with one another. Odum brought forward the importance of ecology as a discipline that should be a fundamental dimension of the training of a biologist."

As parasitologists, we know this idea of "undereducated biologists" all too well. Most of us are trained in more than one aspect of parasitology and we can, if asked, teach topics such as tropical biology, marine biology, mammalogy, ornithology, invertebrate zoology, or a myriad of other of the organismal biological or ecological and evolution courses. How can we go about reversing the trend of losing parasitologists and indeed, other organismal biologists to the vast array of other fields like genomics, proteomics, business, and industry? If you have ideas, we want to hear about them. Send e-mail to slg@unl.edu and I will post these comments in the next newsletter.

Post:

Dear Sir
I´m Joao Soares, 39 y old teacher of Biology, pos-graduate in Applied Ecology and interested in Ecoparsitolgy and I also love Ecology (I edit an environmental blog BioTerra (http://bioterra.blogspot.com).

Best regards,
Joao Soares



Photos from Mobile, Alabama, 2005. As you can see - the weather was not all that bad while we were waiting for Hurricane Dennis to show up and spoil our party. John Oaks was kind enough to send along some images for the newsletter. Thanks John!

This newsletter was finished in the Hotel Albuquerque, the same hotel where we had the ASP meeting from 29 June - July1, 2001. Seems like a long time ago already! I hope that everyone has a good summer - we will try to get one more newsletter out before the ASP meeting this summer. Scott

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Note to Members

The ASP Newsletter welcomes news stories and articles. Please send your text electronically to Scott Gardner as an e-mail and attach as an MS Word document. Drawings, photographs, charts, or tables can be sent as B/W TIF files at 300 dpi. Please send TIF files one at a time. A general rule is to limit photograph size to 3x5". You may attach both text and graphic files to your email message.

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