

CHAPTER ELEVEN

New Directions in Human Ecology Education

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This chapter is an outcome of the "New Directions in Human Ecology Education" workshop at the XVth International Conference of the Society for Human Ecology in Rio de Janeiro, 2007. Like similar gatherings at past human ecology meetings, our plan was to review selected institutional backgrounds and to explore current models and practices. Three of the presentations focused on ways established organizations are bringing new ideas into fresh combinations and incorporating these changes. In an open dialog, workshop participants discussed additional opportunities for collegial innovation and enhancement of human ecology education.

Examples of curricular innovations were presented from two of the oldest academic programs in human ecology, the Australian National University and the College of the Atlantic in Maine, USA. A third case presentation—by the equally old German Society for Human Ecology—described how local pressures have led to a proposal for a new free-standing college of human ecology in Europe. These three cases are presented below.

First though, the chapter reviews the common roots of human ecology, noting how key metaphors have been appropriated over time from different source domains in order to give meaning to the novel concepts that human ecology develops and applies. Then, using Tengström's 1985 typography, different phases of human ecology are discussed in terms of the extent of their disciplinary integration and presumptions about the nature of the human condition and the methods by which it can be understood. The chapter then discusses the challenge of modern interdisciplinary human ecology in the context of education and cross-institutional learning partnerships more generally, and discusses new directions and avenues for learning and collaboration. Following this, the chapter turns to the three case studies in order to illustrate how the individual historical backgrounds and local contexts in which human ecology has arisen results in diverse approaches to, and practice in, the subject. The chapter concludes with a discussion of how common frameworks and communication pathways are

developing that might further enhance collaborative approaches in human ecology that are enriched by the diverse backgrounds of the participants.

Historical Roots of Human Ecology

As Kormandy notes, a degree of arbitrariness surrounds the selection of a starting point when tracing the historical roots of any intellectual development (Kormandy 1978: 1292). The origins of Human Ecology can be traced back into ecology itself, a concept which in turn has its roots in the metaphor of "the economy of nature" (Wooster 1977). At its foundation lies a concept from the social sciences, "economy", projected into the environmental domain. At the time that Linnaeus invoked it in his 1749 treatise, the "economy" metaphor carried with it the comforting implication of being "managed for someone's (typically human's) greater utility" (Bowler 1992) and so fitted well with prevailing beliefs that nature was God's creation, balanced, designed and ordered for mankind's use. In 1866, when Haeckel coined the term "ecology", he also invoked the "economy" metaphor. However, over the intervening century "economy", as both practice and a phenomenon of study in the social sciences, had become dominated by capitalist means of production, distribution and consumption. So, in defining his ecology as "the body of knowledge concerning the economy of nature", the "economy" metaphor Haeckel uses is infused with a rather different suite of inferences than it had in Linnaeus's time (Grusin 1993). As a disciple of Darwin, whose evolutionary ideas were also influenced by metaphors from capitalist economic processes, Haeckel's definition includes "the study of all those complex interrelations referred to by Darwin as the conditions of the struggle for existence" (quoted in Wooster 1977). Consequently, the concept of ecology in its origins was strongly influenced by the then current social science ideas of competition for finite resources, accumulation of wealth and notions of progress and efficiency.

Once naturalized in the biological sciences, "ecology as economy" concepts were mapped back into the social sciences—geography and anthropology most notably—to account for cultural differences amongst the peoples of the world. However, to view human behaviour as merely responses to ecological conditions—"environmental determinism" in its various forms—grossly failed to give an adequate account of the creativity, diversity and inventiveness of human culture. The inevitable reaction within the social sciences, in the forms of "possibilism" and other kinds of strong cultural relativism, tended to exclude or downplay any role at all for

ecosystems in constraining human behaviour (Schutkowski 2006). These extremes of emphasis on either "environment and biology" or "culture and society" have provided an unhelpful and divisive backdrop to the development of human ecology. To this day terminology, methods or emphasis that seems to preference one over the other is sure to provoke argument amongst human ecologists.

Mono-disciplinary Human Ecology

This ebb and flow of concepts moving between the environmental and the social sciences characterizes much of the history of human ecology (Gaziano 1996). The term "human ecology" is first encountered in introductory sociology text (Park and Burgess 1921) where ecological concepts appropriated from the environmental sciences are found useful in developing understanding within the discipline of sociology. Other social sciences soon followed, with the term claimed by first one then another; including geography (e.g.: Barrows 1923), sociology (eg, McKenzie 1926), ethnology (e.g. Forde 1934) and anthropology (e.g.: Bews 1935), amongst others. Each of these disciplines employed terms such as "competition", "succession", "web of life" and "mutual interdependence" in reference to patterns or processes in human contexts, but beyond this there was little or no common meaning, methodologies, or collaboration between these versions of human ecology. This is what Tengström terms the subject's "monodisciplinary" phase (Tengström 1985).

Multi-disciplinary Human Ecology

Towards the middle of the twentieth century, new developments in the environmental domain of ecology began to cross over and manifest in approaches to human ecology. Notably the term "ecosystem", coined by Tansley in 1935, introduced a holistic, systems based understanding of inter-relationships and process. The focus became "not only the organism-complex, but also the whole complex of physical factors forming the environment" (quoted in Evans 1956). From this perspective, an organism is seen as embedded in a network of relationships that both constrain its numbers, distribution and behaviour and which the organism itself affects as it lives its life.

It is this systems-influenced understanding of human ecology that came to dominate the subject, employing concepts derived from Tansley and

subsequent writers such as Bertalanffy (1950a, b), and Odum, who emphasised fundamental constraints of ecological energetics (1953 and refined in subsequent editions). Never without its critics, who saw the spectre of environmental determinism, these approaches stressed the fact that, like any other species, humans are embedded in ecosystems and are ultimately dependent on these ecological processes for their health and well-being. This caution against human hubris resonated well in many quarters, as concern about human impacts on the environment, and the future well being of the planet, grew across the late 1960s and 1970s. From this period onwards human ecology typically concerned itself with the "Sustainability" of a given practice or process, again adopting a term that economics had used in relation to scarcity and growth (Pezzey and Toman 2005).

The influence of these ecological approaches was also particularly widespread in many of the applied professions. In regional planning, for example, Ian McHarg pioneered an ecological model in his widely regarded book "Design with Nature" (McHarg 1969). His approach was further expanded as the basis for the human ecology planning program at the University of Pennsylvania (McHarg 1981), which became the training ground for a generation of professional planners. Similar metamorphoses took place in architecture, agriculture, impact assessment, public health and epidemiology (Cf. Sargent 1965, 1974). A common feature of these approaches was their applied dimension, as well as a growing awareness of "the costs of not knowing" and the broader ecological impacts that can result from "solutions" that are defined against very narrow criteria. Consequently, they tended to view problems and their possible solutions from a number of perspectives, and by expanding the range of disciplinary content, each of these professions substantially enlarged the scope of their inquiry and recommendations for application. For the most part, however, these were summary collations of expert knowledge, imported directly from the represented disciplines with little or no blending of that knowledge and little understanding of the inter-relations between the parts of the whole. The cumulative results of these various endeavors have been characterized by Tengstrom (1985) as "multi-disciplinary human ecology"—its second stage of development.

Interdisciplinary Human Ecology

The final decade or so of the 20th century was characterized by a growing recognition of the need for an interdisciplinary approach to human ecology—its third phase. The special feature of this interdisciplinary

reorientation came from a realization of the necessity to move beyond extant (disciplinary) contributions. It was increasingly clear that a bona fide human ecological understanding of human-environmental relations required more integrative methods. The "problems" with which human ecology was concerned were typically "ill-defined, unstructured, involve high decision stakes and societal interest, high uncertainty, and [often are] dynamic and embedded in a dynamic setting" (Mobbs and Crabb 2002). In such cases, the use of discipline-based contributions, by themselves, was insufficient. Interdisciplinarity called for a qualitatively different and originatively undertaking—based on disciplinary input—yet also capable of combining, transforming and unifying it.

Throughout this "third phase" of interdisciplinary human ecology there have been some who have been calling for an intellectual framework that will enable a coherent "blending" of knowledge, and the associated emergence of new understanding that distinguishes the particular approach to complex human-ecological interactions conducted in the name of "Human Ecology" (Hawley 1986, Young 1989. For a discussion on "blending knowledges" see Newell et al. 2005). To date, no such unified approach has yet been adopted, and there remains a wide range of perspectives that call themselves "human ecology", each informed by their own local and institutional contexts and history. This paper will now illustrate this diversity through a comparison of the development path of Human Ecology in Australia, North America and Europe, and a description of current and future directions of three programs on these continents.

Human Ecology Education

Interdisciplinary approaches to understanding presented a particular challenge to education—especially higher education. Whereas the practical professions were clearly enriched by multidisciplinary participation, their project-based time frames seldom kept participants engaged in extended dialogs. Education was different. As university professors and administrators began to embrace the ideals of human ecology education, they rapidly discovered that design of interdisciplinary curricula demanded more integrative models. Students needed not only a broad exposure to multiple fields of knowledge. They also required entirely new pedagogical models. Their courses, curriculum and teachers had to prepare them with the additional skills of integrated learning. This recognition was further highlighted by two stubborn problems. On the one hand, worldwide concern was unfolding about the causes and possible solutions to environmental

problems. From the outset, environmental problems were acknowledged to be complex—usually involving an intricate interplay of ecological and human dimensions. On the other hand, educators were confronted by the long-standing separation of knowledge into academic departments. The segregation of disciplines was further reinforced by the very design of higher education. This was a problem both at the level of institutional architecture which physically separated units, as well as in the historic identification of academics with their professional fields—nationally and internationally. In short, the fundamental nature of higher education and university-based research were at odds with the aims of human ecology curriculum development. Higher education and the academic world offered a universe of disciplinary perspectives. But there were few places prepared to support its interdisciplinary integration.

Nonetheless, human ecology's intuitive appeal found an initial foothold in many forms, despite the impediments. The early leaders of human ecology education discovered institutional colleagues in highly diverse educational settings. Working together, they fashioned new courses and preliminary curricula that attracted a new generation of students. In the 1960s and 1970s—long before the World Wide Web and email—most of these initiatives took place without any knowledge of one another. One of the curious features of this period was the widespread—and generally independent—choice of "human ecology" as the founding term for these emerging programs.

Most academic fields can trace their origins to key individuals or institutions. Growth and development of the discipline then follows from these sources to new institutions, academic journals and professional organizations. The history of human ecology is different. It seems somehow to have hatched, more or less spontaneously, in separate and distinctive ways at about the same time worldwide, although many of these early programs were stimulated by common concerns and reference similar gestational ideas and thinkers. However, the inter-institutional and international connections among these diverse beginnings would be late in coming.

Networking Human Ecology Worldwide

One of the first professional organizations for human ecologists was the Commonwealth Human Ecology Council (CHEC). Registered in Britain in 1969 as a charitable trust, CHEC was established as a central coordinating body for human ecology initiatives and activities worldwide. Its first

conference—focused on human ecology education—was held in Malta in 1970. A few years later, in 1973, a survey conducted by P. F. Rogers (1974) summarized over 100 courses of study in 92 institutions in 16 countries. Since then, CHEC's activities have been amplified through additional international meetings, numerous books and other publications, and in development, education and applied projects in Great Britain, Australia, Canada and India, as well as Africa and the Caribbean.

Another attempt to organize human ecologists on an international basis took place through the International Organization for Human Ecology (IOHE) which held its first meeting in Vienna in 1975. A number of national and regional societies resulted as spin-offs of IOHE activities, including: The German Society for Human Ecology, the Nordic Society for Human Ecology (NSHE) and the Austrian Society for Human Ecology. The IOHE and NSHE are no longer active, whereas others have emerged, including the Italian Society for Human Ecology and the multi-national European Association of Human Ecology (EAHE). The EAHE pioneered an "International Certificate in Human Ecology" with partner institutions in France, Portugal, Switzerland, Italy and Belgium. The flagship program on this consortium is based at the Vrije Universiteit Brussel (VUB) in Belgium, where it has offered graduate level education in human ecology since 1972. Other programs established at this time (e.g. at Gothenburg and Lund Universities in Sweden) also continue to offer advanced studies. A number of others have been developed elsewhere. In sum, academic degree programs in human ecology now appear to be in place in most European countries.

Irrespective of a long and varied history during human ecology's mono-disciplinary phase (Cf. Shepard 1967; Young 1974, 1983; Borden 1989, 1991), the United States was a late comer in the trend toward inter-institutional organization. The United States-based Society for Human Ecology (SHE) did not become active until the mid 1980s. Since then, however, it has been increasingly influential at both national and international levels. The primary aim of SHE has been to provide a collaborative forum for human ecology scholars, educators and practitioners. The backbone of these activities is a consistent schedule of international conferences, beginning in 1985 at the University of Maryland and running through to SHE XVI hosted by the Huxley College of the Environment in Bellingham, Washington in 2008. SHE's meetings have been held across the United States, in Canada and Mexico, as well as in Europe and South America. The organization's initial goal was to support collaboration among United States institutions of higher education. By the mid-1970s dozens of academic programs of human ecology had sprung up

across the country. Some were newly re-organized colleges within large land-grant universities¹ (such as Cornell, Rutgers and Michigan State Universities, among many others). Others grew out of scientific ecology programs (e.g.: University of California—Davis) and within a range of other smaller universities and colleges. College of the Atlantic (COA) in Bar Harbor, Maine—founded in 1969 as the first institution of higher education fully dedicated to the interdisciplinary study of human ecology—would also play a major role. In addition to support for human ecologists through conferences and professional networking, SHE has also been a stimulus for scholarly publication—with edited volumes from many of its conferences, as well as through a high quality peer-reviewed journal "Human Ecology Review".

Even from the beginning SHE has played a dual role: one which follows its founding mission within the United States; and a second function, as a semi-formal nexus for broad-based international coordination. This began as early as SHE's first conferences, which attracted leaders in human ecology education from around the globe. One of the first international partnerships growing out of these events was the UNESCO sponsored seminar on the integration of environmental education into general university teaching held in Brussels in 1989 (Susanne et al. 1989). Subsequent exchanges have continued a rich cross-fertilization among educators and inter-institutional collaborations. Some of these collaborations—for instance between EAHE, the Italian Society for Human Ecology, the Japanese Society for Human Ecology and the International Association of Ecology—created additional forums for exploring educational issues within INTECOL's International Congresses of Ecology. These events, and the resulting books (Suzuki et al. 1991; Hens et al. 1998), provide in-depth summaries of educational models for human ecology education around the world. (For a more detailed historical account of the Society for Human Ecology and its collaborative activities, see Borden 2008.)

Beyond Humans and Nature—Entering the Virtual World

Looking back across the brief history of interdisciplinary human ecology, we are reminded of how much the world of communication has changed. In the 1970s and 1980s the interchange of ideas was slow—limited by the rhythms of periodic face-to-face conferences, printed communications, and what is now called "snail mail". By the 1990s things were rapidly changing. The introduction of e-mail was a tremendous

facilitator of interpersonal communication. Not long thereafter, the World Wide Web brought all of us even closer together. The search for academic literature and institutional information was at our finger tips. We are in the midst of discovering the possibilities and promise of these innovations. Their potential throughout society is only beginning to register; and within higher education what we teach and how we teach is in a state of vibrant flux.

For human ecologists, these are especially dramatic changes. Long standing difficulties of finding and communicating with colleagues globally are evaporating. Powerful search engines greatly simplify discoveries of complex, multi-layered topics. What only a few years ago could take countless hours to find is now available almost instantly. A recent internet search of the term "human ecology education" returned, in a matter of seconds, nearly 2,000,000 hits! More compound searches—across any sub-themes of interest—are as easily rewarded. For an interdisciplinary, international field like human ecology, these are indeed powerful tools.

Conversely, there is also a two-way flow. Not only can we find things more readily. It is far easier to be found—to extend our interests, share views and coordinate communication. The impact of these opportunities has already altered the community of human ecologists. Recent SHE conferences have been entirely planned and coordinated via email and web-based programming. All surface and air mail has been eliminated. The program on which this chapter is based—even though its final presentation was done in person before an audience in beautiful Rio de Janeiro—was formulated, re-fashioned and rehearsed within an interactive "virtual" learning environment.

These are spectacular changes in how we do our work. The possibilities for collaboration and mutual exchanges are enormous. They are transforming how we—as educators and as human ecologists—can build the future of our profession. They also raise compelling questions about how we can (and must) modify our teaching methods. Our students are no longer living in the world in which their teachers were educated. As educators, therefore, we not only must catch up and keep up with our students; we must also invent the means to guide them in preparing for a wholly new kind of world.

The standard definition of human ecology proffers itself as the study of the inter-relations among humans and their environment—the complex world of which humans are a part. We are only beginning to discover the powerful tools this "virtual" world has given for that understanding. But there is more, perhaps: this new and rapidly expanding domain of informational connectivity may be itself a new world. However we choose

to view it, there is little doubt that it is world-changing. We should not be blind to its limitations, or too ready to celebrate new technology. However, there is exciting potential that the internet and related methods of communication has for building learning partnerships between the traditional bastions of human ecology in North America and Europe with new centres in Asia, Africa, Latin America and Oceania. The forms of these learning collaborations are currently evolving and developments will no doubt be reported to future SHE conferences and to other fora and through other publications.

The discussion now moves to the background, current activities and new and future directions of three old institutions for human ecology, in order to provide models of the kinds of approaches to human ecology education that could be adopted or adapted in a future of enhanced international collaboration. The discussion starts with the Human Ecology program at the Australian National University.

Models for Institutional Change—Bringing New Ideas into Practice

The Australian National University

The ANU is Australia's only National University, funded by the federal government. It is located in the nation's capital city, Canberra, on 145 hectares of buildings amongst gardens, sporting fields and bushland. It is relatively small, with around 13,500 students and some 3,600 staff. It is a research intensive university and prides itself on melding its teaching activities with that research.

Origins of Human Ecology at the ANU

Founded in 1946 in the spirit of post-World War Two nation-building, the ANU was set up as a small community of well funded elite researchers, with a broad and largely independent mandate to work in the "national interest". In the 1960s the ANU was merged, rather unhappily at the time for both parties, with a pre-existing teaching college—the University College of Canberra. Although the combined entity was called "The Australian National University" for many years it continued to function as two separate institutions, with research activities concentrated in the elite

Institutes of Advanced Studies (IAS) and undergraduate teaching conducted by academics in the School of General Studies.

This research-teaching division within the ANU was influential in the formation of a program of study in Human Ecology by Stephen Boyden in the 1970s. Boyden was recruited into the IAS at the John Curtin School of Medical Research, in 1960 to work on cell biology and immunology (Fenner and Curtis 2001: 73). However, his interests were on much broader understandings of human health and well-being. These interests developed, in part, through conversations with Rene Dubos whilst they were both researchers at the Rockefeller Institute for Medical Research in New York. Dubos and Boyden were concerned with a holistic approach to understanding the "human condition". Their common background as biologists led them to start from fundamental evolutionary principles, but they realized that their thinking had to embrace the cultural domain of human knowledge, values and beliefs (Boyden 2003). Dubos went on to make a number of foundational contributions to "the sustainability debate", including involvement with the United Nations Stockholm conference on humans and the environment, at which the slogan "think globally, act locally" was launched.

The intellectual freedom that was encouraged within the IAS, allowed Boyden to continue to pursue these lines of thought, helped in no small way by a sympathetic Head of Department, Frank Fenner (who had himself worked with Dubos) and the encouragement of the then Vice Chancellor, Leonard Huxley. This latitude extended to allowing Boyden to spend a year researching the cultural dimensions of health at the Research School of Social Science, whilst still employed as a Professorial Fellow in Experimental Pathology. It is questionable whether such arrangements would be tolerated, let alone encouraged, in today's climate of institutional "efficiency".

Following this, Boyden formed an Urban Biology Group, later known as the Human Ecology Group, based within a new Department of Human Biology (Fenner and Curtis 2001). In 1970 he organized an international conference on "Education and the Environmental Crisis" as a response to emerging concern about the state of the global environment (Brown 1978). The conference resolved that tertiary education had a duty to research and learning into environmental problems, and it urged participating universities to seek funds "to establish courses designed to give a comprehensive understanding of the human situation" (quoted in Brown 1978: 171). As a consequence, Boyden proposed that the ANU should confer a new degree, the Bachelor of Human Ecology, as a program of study dedicated to interdisciplinary studies of human-environmental relationships.

However, within the institutional structure of the ANU, undergraduate teaching was the responsibility of the School of General Studies, and new programs and degrees required the approval of the disciplinary-based faculties. Whilst the interdisciplinary ideas behind the proposed human ecology program might have been tolerated within the IAS, they were far less welcome to the faculties. The Faculty of Arts objected that there was "little chance of the proposed integrating units being accepted, because not enough attention would be paid to the cultural aspects of the study of man". The Faculty of Science response was that there would be "insufficient attention to scientific method" and would not approve such a program unless there was "more scientific rigour". Both found agreement that "if a course was Science it could not be Arts and vice versa" (quotes are all from Brown 1978).

It took the enthusiasm of a few key academics on the ground floor, who were prepared to put in their time and effort, and the support of a few key senior officers, to overcome faculty resistance to this new approach. The presence of a small number of powerful figures to "pull" change, in combination with separate "push group" of junior players willing and able to deliver outcomes, seems not uncommon in overcoming structural inertia to institutional change (Barnett and Brown 1983).

Eventually, in 1973, a program in Human Ecology was first offered within both Arts and Science as:

A sequence of interdisciplinary units on the interplay between human societies and the environment designed to encourage students to work towards an integration of their previous and existing training in various other disciplines. (ANU 1973)

The courses in the program were from the very beginning based on an integrative conceptual framework which encouraged thinking and communication about the dynamic interrelationships in human ecosystems. This framework, which was an essential feature of the program, recognised the crucial role of human culture as a powerful force in the human ecosystems. Consequently, because of the nature of the phenomena that they sort to understand, the courses were necessarily transdisciplinary. The courses were very much concerned with the underlying principles governing the cause-and-effect interrelationships in the system, and this approach was later covered in a number of books, notably *Western Civilisation in Biological Perspective* (Boyden, 1987). Furthermore, the group that developed the program was at the same time engaged in designing and running the first study of the ecology of an urban ecosystem, as recorded in *The Ecology of a City and its People: the Case of Hong Kong*

(Boyden et al. 1981). This research had an enormous impact on the content and intellectual nature of the undergraduate program, and established the tight relationship between research and teaching as a feature of the program from the beginning.²

Today

The Human Ecology program has gone on to offer all levels of study from undergraduate majors to PhD. In this time the cultural context in which the program has operated has, of course, changed often. Teaching and learning about “stable societies” (Goldsmith 1970) and the “structure of permanence” (Clarke 1977) has changed over time to the concern with “sustainability”, which now in turn is changing further to notions “eco-literacy”, or “biosensitive society” (Boyden 2004) and guiding the transitions to such societies. This dynamic has also changed some of the primary objectives of the program and the means by which its learning outcomes have been delivered. However, broadly speaking the program and its various courses has been characterized by an emphasis on the following key notions:

- Human Ecology is a legitimate and valid knowledge domain in its own right.
- Important though they are, the world is not divided into “disciplines”—human thinking is. Integrating these disciplinary (and other) knowledges is a distinct methodological challenge.
- Systems-thinking provides a powerful way to “get at” an understanding of the complex, multi-scaled, interactions that characterize human-ecological situations.
- Students learning should be made personally meaningful through field trips and other experiential activities, including the students’ everyday lives.
- “Normal” values and everyday behaviour account for much of a society’s ecological signature, so encouraging critical engagement with the “taken for granted” is crucial to imagining alternatives
- Overall, the courses are not so much concerned with cataloguing the problems of today as envisioning ethical, sustainable and worthwhile futures

Boyden once remarked that “for some reason, human ecology has often elicited quite extraordinary opposition from elsewhere in academia”, a phenomena he notes is “not restricted to the Australian National University” (Boyden 1995). True as this claim was at the time of the program’s

founding, and for much of its history, there are now some encouraging signs that this hostility is abating. There seems to be a growing recognition of the need for dedicated interdisciplinary centres for “sustainability science”, or similarly named programs, to work alongside the more traditional disciplines in tackling the complex environment-society problems of humankind today. New directions at the ANU have seen the recent establishment of the Fenner School of Environment and Society, named after Frank Fenner, and now home to the Human Ecology program. The mission of the Fenner School is “to build and sustain a world-class, nationally-distinctive School at the ANU for transdisciplinary³ research and education on complex environment-society systems” (Steffen 2008). The Fenner School houses a wide range of both social and environmental scientists, as well as Human Ecologists, who collaboratively research and teach into various aspects of “sustainability science”, very broadly understood. The school also functions as a “hub” or nexus point for collaborative research across the campus, and with partner institutions globally.

These teaching and research activities are matched by a commitment from the ANU to “practise what it preaches”, or “walk the talk”. Amongst other commitments to sustainability practice the ANU is a signatory to the Talloires Declaration and plays a lead role in Australasian Campuses Towards Sustainability (ACTS), a regional umbrella body for promoting principles of ecologically sustainable development in the tertiary education sector. Major building and works initiatives have been initiated to deliver campus sustainability measures. These developments are joined by environmental management programs aimed at reducing the environmental impact of the ANU campus operations, including targets areas in greenhouse gas emission reduction, water conservation, urban biodiversity management, sustainable transport, environmental risk and so forth. Wherever possible, and in keeping with the education principles discussed above, student research into these campus sustainability projects is encouraged. Consequently, the operational arm of the university—which is all too often only seen as a “support service” for academics—is harnessed as a teaching and learning resource. Students from a broad range of disciplines have been involved in projects over the years, including students of human ecology as well as economics, accounting, visual arts and music, creative writing, ecology, resource management, marketing, law and engineering. In many cases student projects can be made suitable for academic assessment at various levels, from 1st year essays, later year coursework projects, independent research projects, through to Honours and Masters theses. Above all, though, students derive immense satisfaction

from seeing their project findings put into "real practice" and this strongly reinforces their learning outcomes (Dyball and Carpenter 2006; Carpenter and Dyball 2006; McMillin and Dyball 2008).

The Future

It would seem that the time is now very conducive to the approaches to learning and research that characterize Human Ecology. Ideas and proposals that would have been dismissed as "irrational" or "unfeasible" at the time the program was founded, and through much of its life, are now seemingly much more acceptable, both within academia and in community, businesses, farming and government circles. For many issues it is a time to deliver on the arguments and advocacy that have been made over the previous decades; to "bring home the bacon", as would be said in Australia. This is all welcome indeed, but it is important that in delivering on the ground prepared for us by yesterday's thinkers we continue to prepare future grounds for today's students to move into when their time comes.

The particular circumstances that surround human ecology at the ANU are distinct from those that framed human ecology at the College of the Atlantic, yet a number of parallel influences and kindred motivations can be detected, as this next account discusses.

College of the Atlantic—Mission and Background

College of the Atlantic was founded in 1969 as the first institution of higher education in the United States fully dedicated to the study of human ecology. The college is located on Mount Desert Island, Maine—250 miles north-east of Boston. Its ocean-side campus is in close proximity to the scenic Acadia National Park and the popular resort town of Bar Harbor. From the outset, COA has sought to develop human ecology as both an academic and applied field. It also has been an active participant in many of the international human ecology networking activities described above.

Founded on the premise that a new educational philosophy was needed to prepare students to address the world's social and environmental challenges, the college is patterned around several distinctive principles. One of them is its unique, interdisciplinary faculty structure. The college has no departments or academic ranks in the traditional sense. Instead, faculty work together on design and implementation of the curriculum as a whole. Another distinctive feature is the college's commitment to self-

directed studies. While all students obtain either a Bachelor of Arts (B.A.) or Masters of Philosophy (M. Phil.) in Human Ecology, no two students take the same course of study.

The bridge between the resources of a non-departmentalized, interdisciplinary faculty and students' individually designed degree plans is provided by the college's problem-focused mission. This takes place at several levels. First, each student works closely with academic advisors to define their own focal themes and educational path. They individually explore and engage in effective ways of interrelating disciplines and of relating thought and practice. This process begins with a first-year interdisciplinary, foundational curriculum which expands in the second and third years through self-directed studies. As it gains focus, it culminates in a term-long internship experience, a self-reflective philosophical "human ecology essay" and a senior thesis. Second, students are given opportunities to work with other students and faculty in a wide variety of issue-centred teams of research, outreach and applied projects. Finally, as an institution, the college holds a long-standing commitment to innovation and leadership in education and applied human ecology—regionally, nationally and internationally. Beyond these interdisciplinary and integrative academic features, COA is also distinctive in terms of student diversity. Through a partnership with the Davis International Scholars Program, which supports highly qualified students from around the globe, the COA community contains the greatest percent of international students of any four-year liberal arts college in the United States.

These elements have combined into a remarkable record over the past four decades. In the first year of the college, for instance, COA students were instrumental in getting a groundbreaking beverage container recycling bill through the Maine state legislature—the first in the country. Many other achievements have followed: construction of the first solar home in the region to qualify for a conventional mortgage; leadership in collaborative planning and ecological policy development from local to international levels; and notable accomplishments in conservation and applied ecology—ranging from endangered plant protection and reintroduction of multiple avian species, to creation of the "Allied Whale" research centre for international marine mammal research and policy studies (Rabineau and Borden 1991; Hall 1994; Clark 1997; Koffman and Borden 1998).

Sustainability—Leadership and Practice

As has been discussed above, “sustainability” is a relatively recent term in the environmental lexicon. Nonetheless, its underlying ideals have been a hallmark of the college from the beginning. They have been a continuous thread throughout the curriculum, as well as a significant dimension of outreach initiatives. Over the years, the college community has maintained an unbroken dialog on “ecologically responsible” institutional standards and practices. The range is broad: chlorine and dioxin free office supplies, energy-efficient lighting and heating, organic and regional food sources (increasingly from the college’s farm and local growers’ cooperatives), recycling, composting, sustainably-managed forest products for building materials, and so on.

In the 1990s these themes became increasingly popular throughout higher education elsewhere—not only as an object of study in environmental studies programs, but also as an arena for institutional leadership at the highest levels. A diverse constellation of inter-institutional initiatives began to form, e.g., the Talliores Declaration of university presidents committed to sustainability practices, the National Wildlife Federation’s “Campus Ecology Program”, Second Nature’s models of best practices, the Earth Charter’s 16 principles of sustainability (begun in Rio in 1992 and ratified in 2000 in the Hague) and, of course, the 1997 UNESCO Thessaloniki Declaration’s decade of education for sustainability.

For College of the Atlantic this was an exciting opening and a significant challenge. The college began to find a new audience for its educational mission. It was a time to speak up, to stand out, and to walk the talk. What follows is a brief outline of the college’s institutional response.

- 1996 - membership in the Campus Environmental Initiative for the design and sharing of college policies about purchasing practices, waste management, energy efficiency, etc.
- 2002—signatory member of the Talliores Declaration
- 2003—first college to join Maine’s STEP-UP program to reduce institutional environmental footprints, contract for renewable electricity services, monitor greenhouse gas emissions, etc.
- 2005—first campus to hold a “zero waste graduation”
—hiring of a permanent, full-time director of sustainability to ensure a continuing commitments to a sustainable future
—ratification of the Earth Charter by the college’s All College Meeting
- 2006—Board of trustees pledge to establish a Net Zero carbon emissions policy—the first college or university to do so.

—Hosting of the XIV International Conference of the Society for Human Ecology with funds for carbon emission offsets for all participants’ travel invested in a green energy savings account for renewable energy sources

- 2007—Net Zero pledge achieved—all greenhouse gas emissions reduced, avoided or offset and third party verifiable—first college or university to achieve carbon neutrality
—Founding member—American College and University Presidents Climate Commitment (ACUPCC)
—deemed the “greenest college in the world” by Grist Magazine
- 2008—opening of state-of-the-art residence complex of six low environmental impact, super insulated, energy efficient buildings.

Taken together, these and other activities have brought COA’s educational mission full circle. As the college’s curricular goals and institutional operations merge toward a seamless integration, they have entered the forefront and broader aims of business and society. What once were considered alternative educational ideas are now in the main stream of higher education.

Leadership in sustainability practices has brought considerable recognition, including the Sustainable Endowments Institute’s first “Sustainability Innovator Award”. Attention from the electronic and print media has followed as well (Butler 2007; Lewin 2007; Monastersky 2007). The media spotlight is a mixed blessing. Attending to the press can be time consuming and distracting in educational settings. Some visitors seem unable to grasp the bigger picture of human ecology or focus on somewhat unimportant or minor features. But there is another side to the coin. There is satisfaction in seeing the work of building a college validated through the eyes of others. It is gratifying when the Chronicle of Higher Education proclaims “when it comes to sustainability, the College of the Atlantic seems to be walking while the others are merely talking” (Monastersky 2007). It is even better when the New York Times goes further: “While sustainability and the physical environment are certainly major components, the concept of human ecology goes much further, encompassing almost anything....” (Lewin 2007).

The German Society for Human Ecology

The German Society for Human Ecology was founded in the mid 1970s mainly by public health and environment oriented movement of scientists. The society developed into an interdisciplinary group spanning a broad field

of disciplines, with participation from Austria, Germany and Switzerland with some branches in Scandinavia and Belgium. The membership was networked across central Europe by annual meetings, the journal *GAIA* and regular yearbooks. By the end of the 1980s there were chairs in Human Ecology established at some universities, including Zurich and Berlin, but no independent program of study had been established. However, the opportunity for further raising the profile of Human Ecology and the possibility of establishing an independent program was dashed by the restructuring of German universities that followed the so called Bologna process⁴. A project or problem oriented program of study, as promoted by human ecology, now seems to be impossible inside the system of public universities in Germany. Yet there is evidence of a continuing and strong interest by students for a program in Human Ecology. Evidence of this interest is the success of the Austrian program Master in Social and Human Ecology in Vienna and Klagenfurt in 2007. Consequently, there has been a proposal to form and to fund a dedicated College of Human Ecology, not only for Germany but for all of Europe.

The possibility for such a college has become favourable due to recent developments in how institutions for education can establish themselves. In Germany since the 90s private colleges and schools have created a new, exciting and expanding market in response to perceptions that State universities have become overcrowded and ineffective. There are now 74 state-approved—and about a dozen unapproved—private universities and colleges in Germany. Degree programmes in economics, law and social sciences dominate the programs that these private universities offer, but other subject areas, such as art and theology, also exist. Less common are programs in subject areas such as engineering and the natural sciences. Demand for these programs of study is strong and on the increase, with interest from international students, including Austria and Switzerland, augmenting that of native German students (see Brauns 2003). However, as yet there is no private college offering an interdisciplinary program of study in which students can flexibly put together their own individual curriculum tailored to their own interests and needs. As discussed, such an interdisciplinary, flexible and student oriented approach is beyond the mainstream State institutions.

A College of Human Ecology for Europe

These are the circumstances which, in about 2007, there was a proposal for the foundation of a College of Human Ecology in German-speaking

countries—following the model of the College of the Atlantic. The reactions were manifold, but overall the response has developed into a growing campaign of support, both in Germany and beyond. After an initially cautious, reticent or sometimes critical response the proposal has enjoyed an increasing number of much more positive attitudes, and there is now a number of activities underway to promote the venture (Serbser and Mrzljak 2006). Key issues currently being negotiated include the formulation of a curriculum; the location and thus the catchment from which students will be drawn, including the size of the local and international pool and its demographic; the funding conditions and possibilities within Germany and Switzerland, particularly regarding tuition fees, against the costs associated with running a private college, and especially the conditions of providing grants, scholarships and other possibilities of financial sourcing for candidates. In the German context the approach requires a major paradigm change, with the focus switching from an institution being first and foremost concerned for itself, to an institutional approach that is primarily concerned with its students.

To further promote the scheme a study-group within the German Society for Human Ecology was formed. The first meeting of the group outlined the basic principles for the mission and vision of the proposed College, modelled on those of the College of the Atlantic, as refined over 30 years of operating and contributing successfully to the world of education and beyond. A first 5 year start-up funding model for a college, initially based on tuition fees, was generated, with indicative figures that seem very plausible. In essence, a German College of Human Ecology can be expected to operate efficiently and economically with as few as 25 new students enrolments per year. Moreover, the college can also be expected to establish itself as a centre for scientific research in the field of human ecology. However, there is a need to generate founding sources beyond tuition fees in order to make the College accessible to students on low incomes. Again, the model to look at to make this happen is the College of Atlantic, where some level of scholarships are provided to 70 percent of the students enrolled.

The outcome of the meeting was an official statement, the “Higher Education Initiative in Human Ecology”, which was designed to promote consideration of the following aspects of the proposed studies in the field of human ecology:

- Teaching methods in social and natural sciences including artistic techniques and creative media;
- important contents of scientific and artistic ways of investigating nature, environment and society;

- the enhancement of expertise in system-thinking and systemic action;
- the development of individual competences within the course of lifelong learning, public campaigning, understanding oriented communication, creative practice of collective problem solving and responsible critical thinking connected to an awareness about the limits of knowledge.

The College Initiative at Work

In September 2007 a working symposium with David Hales, president of the COA, was organized in Berlin. An important question that was discussed at the symposium was, whether a college of human ecology could offer any additional services within the already diversified landscape of study choices in Germany and Switzerland. Providing a project oriented curriculum, the college would offer an almost revolutionary concept regarding the German education system: From day one, students themselves are responsible for the course of study they choose. They are responsible for the study strategies they develop to guide and monitor their very personal route of success, and the college providing just the structural patterns of learning. The tenor of the discussion was that students who reach the Bachelor level in human ecology will understand creativity as an integral part of science and therefore will approach a professional career in a more undeterred way (see Serbser and Mrzljak 2007).

The initiative was eventually presented at SHE in Rio de Janeiro, where important further academic support for the concept was forthcoming. The proposal will continue to be developed and refined, including undertaking a feasibility study and financial budgeting, as further steps towards founding a College of Human Ecology for Europe.

Conclusion

The purpose of education is to prepare young people to anticipate and respond to the needs of society. But the growing complexity of human society and the interlacing relations of humans within the living world are challenging educators, researchers and practitioners everywhere to reorganize their thinking. At all levels, from local to global, people are recognizing a need for entirely new conceptual frameworks and forums for their development. It is a curious fact that the term "human ecology" has

been used throughout the world as a name for this confluence of scientific ecology, interdisciplinary education and environmental concerns. No single statement can sum up the many meanings of human ecology. Yet for nearly a century it has been applied to a diverse family of speculative and scientific lines of thought. In a general sense, it points to certain problem areas manifesting the influence of ecological thinking and to various intellectual movements cutting across traditional academic disciplines.

In this chapter we have offered an overview of this history. We have further highlighted its origins, its development and a recent initiative of two established human ecology programs—along with some first steps of an entirely new undertaking. Taken together, a number of conclusions are suggested. First, looking back across the early history of human ecology (e.g., at its mono-disciplinary and multi-disciplinary phases), it is surprising how many separate starting points there have been. As this history was reconstructed by scholars of the field, a robust foundation has been discovered. What were once isolated bodies of theory and research are now gathered together and readily shared among contemporary human ecologists.

Secondly, as human ecology has moved towards a bona fide interdisciplinary field, the integration of its origins has substantially enriched its credibility and status. Along with these changes, the nature of inquiry and teaching has likewise transformed. In the 1980s, when individuals from separate institutions and distant continents began to meet, the central questions revolved around broad philosophical and pedagogical issues, such as "what do you mean by human ecology?" In recent years patterns of thinking about human ecology have become more nuanced. For most people, the living world of ecology—and humans' place in it—is now generally assumed. The search for a unifying theory has been replaced by a shared perspective. This then forms the basis of a multiplicity of foci and richly contextual ways of thinking. As fresh ideas and approaches emerge within this framework, the questions now are increasingly ones of "how to do human ecology?" These features are apparent in recent conferences and publications, which are structured around a growing family of human ecological problems and themes. From "urban ecology" and "adaptive management" to "sustainability" and "food systems", the discourse of human ecology is ever more focused and practical. In short, human ecology has found its feet. By moving from a diverse intellectual inquiry toward a constellation of applications, human ecology has more clearly defined itself professionally—as colleagues gather and share their respective approaches "within" the unifying perspective of human ecology.

Finally, looking ahead, there is little doubt the advent of electronic connectivity is a timely development. From the outset, the complexity of human ecology's interdisciplinary and international mandate was hampered by the limits of communication. The tools—so necessary for collegiality at a distance—perhaps at last are at hand. The challenge now is to keep up with these opportunities, to infuse them into education, and to prepare the next generation of young men and women to discover what it might be to live and do well in a humane, sustainable and worthwhile world.

Endnotes:

¹In the United States a "land grant" university is a state-supported institution of higher education and research.

²Stephen Boyden's contributions to this section on the origins of the program at the ANU are gratefully acknowledged.

³The term 'transdisciplinary' that Steffen uses here is for the purpose of this paper taken to be sufficiently close in meaning with Tengström's term 'interdisciplinary', as used in the earlier classification of Human Ecology into distinct phases. For a discussion of the important differences between these terms see Mobbs and Crabb (2002).

⁴The "Bologna Process" is designed to standardize education across Europe, ostensibly to make all degrees offered comparable in standard and compatible between one another. Some see it as having a "normalizing" effect that is inimical to the approaches to learning approaches that characterizes Human Ecology, as discussed here.