

THE PERMACULTURE ACTIVIST

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Design for Community

Consumer-Producer Co-Partnerships: A Direct Marketing Approach

Arthur Getz

Over the last several years, Japanese mass media have occasionally dealt with the issue of what constitutes an "organically raised" product. Their conclusions are confirmed by personal experience: a sampling of the products variously described as "organic" (*yukisaibai*, *munoyaku*), "natural" (*shusen-nosambuisu*), or "low-pesticide" (*tenoyaku* or *genoyaku*), reveals that beyond costing more, there is nothing consistent about them. Discrepancies and contradictions abound when one asks Japanese green-grocers, wholesalers, packers, farmers, or consumers what they mean; no common definition or standard yet exists.

Until now, this state of uncertainty left the Japanese consumer with few choices: one could blithely assume that a particular product was *bona fide*; a more skeptical shopper could buy in the conventional market, betting on sub-lethal pesticide accumulations until such time as the standards were clarified (while saving some money); the third option has been to vote with one's feet and seek private channels that offered greater proof of their claims.

Greater consumer awareness of this problem has created pressure for reform of the existing market system. The issue has reached the attention of government officials and other concerned parties, and efforts are under way to develop standards for certifying organic products in the near future. In a search for models, these groups have looked at how other countries have addressed the problem.

Certification programs for organic farming have spread from a handful of state and municipal schemes, to a federal legal definition in the United States (with the Organic Food Act of 1990), and are soon to emerge at the European Common Market level, as member states consolidate their internal approaches.

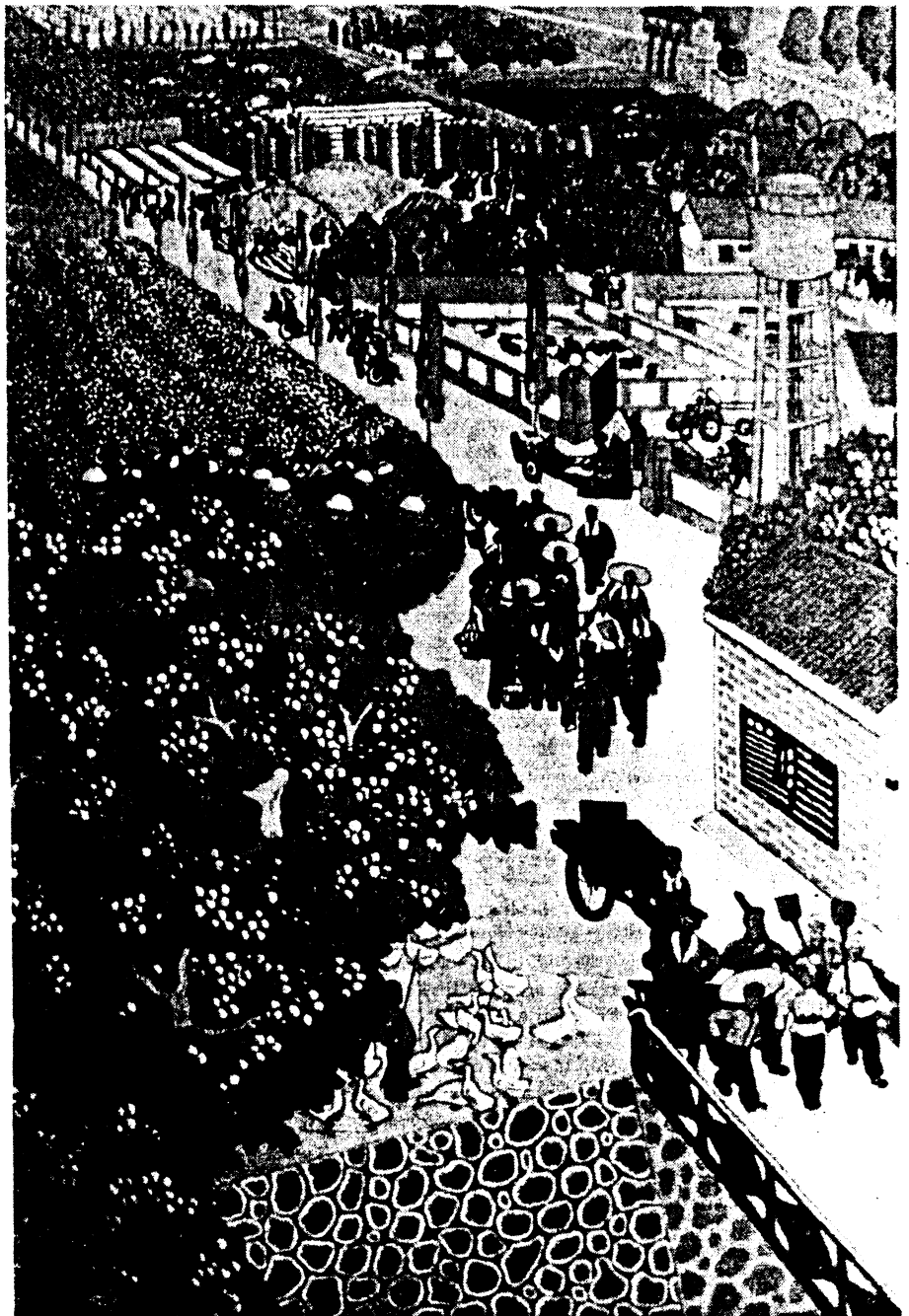
This transformation has been driven by a remarkable surge in interest in food safety. In the span of a decade, the

organic agriculture movement has gone from a fringe specialty market for "health nuts" to a mainstream, multi-million

dollar industry involving interstate and international trade.

In the U.S., certification began with

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FROM THE EDITOR

In this second of two issues in which we look at Design in Permaculture, we complete a model process. What began with individual creativity and vision moves here through the forms of collective discovery, influence, and exchange. Toward the goal of a community based in mutually beneficial relations, a gifted roster of permaculture teachers, designers, and researchers here present the fundamentals of good design.

Reminding us of the scale on which our actions have influence, and of the imperative that we make linkages transcending locality, culture, and nation-state even as we tend the daily face-to-face encounters which build and nurture culture, Arthur Getz and Anwar Fazal outline the tools of political action and the pathways of economic renewal.

Sharing his own experience, a important lesson in itself, Simon Henderson takes us through the process of starting small, observing the world around us intimately, talking to our neighbors, finding out our own needs, and building by increments. Jeff Creque outlines some of the ways in which we can accelerate and shape the healing of landscape, working with Nature to create edges for our own use. His story is enhanced by the fine drawings of Hunter Beyer. My special thanks.

Offering the fruit of many years work with plants, Adam Turtle points to the bounty of perennials, native and adapted, which can broaden our food base in times of climatic and economic change. We get a further glimpse into the wonder of plant diversity in the report of David Theodoropoulos and Shari Calkins. Many rare and unusual plants and many common but little-known ones too, are already in commerce. These and others like them can help us enrich our lives, our local economies, and the diversity of the natural world.

Peter Light has developed an analog for the freedom of association which permaculture designers need to bring to every situation. His design wheel is a tool for learning our own "pattern language." Bill Fleming develops the idea of free associative thinking into a form which serves the logical and linear needs of our work as well. His Manual Indexed Filing System is an example of intermediate technology appropriate to the small-scale office. We need more such tools.

Elaine Myers' elegant essay on root maggots leaves us humbled at the rich interactions of the natural world around us. She reminds us that the most pedestrian of our domesticated plants still hear the call of the wild. They retain their guild associates, seasonal preferences, and growth habits despite our ignorant perversions, our heroic or foolish efforts. When we choose to alter the habitat of plants we need to take responsibility for their management, or our failures to do so will lead us to the threshold of violence against nature. We are reminded also that our attitudes toward natural community must be tempered by an understanding of the limits to our own knowledge.

In the tale of the Swiss Family Gotsch's voyage to a new world, both physical and spiritual, Marsha Hanzi provides us ample evidence of the link between permanent crops and the political autonomy of stable communities. She also nourishes the hope that we can reap the bounty of the tropical forests even as we repair the damage which greed has visited upon them.

J.L. Hudson's essay on the role of exotic species is a bracing corrective for the mushy, guilt-ridden thinking about the damage to nature which botany is alleged to have wrought. The devastation of continents and the massive loss of genetic diversity now occurring is a direct result of materialism and the industrial way of life, "those monocultures of the mind," as Vandana Shiva so blisteringly branded them. The movement of genetic material in and of itself is not a problem. The mindless destruction of ecological communities and of primordial cultures by chemically-addicted and extractive societies is.

A plant species widely-distributed for its useful fodder and nitrogen value, leucaena, has encountered natural limits in many areas as insects and plant diseases have dampened agronomists' early enthusiasm for it. Frank Martin, whose lifetime of work in the tropics has sensitized him to the importance of raising food for many hungry mouths from small plots of degraded or marginal land, makes the case for leucaena's inclusion in permaculture systems. Balance, not cook-

book credulity, is needed.

And concluding our features this issue is Anne Devlin-Firth's excellent profile on clay soap, a balm for the skin, the ingredients of which are commonplace and multi-functional. Time to nurture ourselves and our loved ones is a necessary measure in the balance of life on earth.

Please look over our our Departments beginning on page 30. Notices of permaculture courses and workshops are expanding to include reports of other kinds of education, apprenticeships, internships, study tours, and work exchange programs. Reports are arriving from Regions around the globe as well as across the continent. We try to include them all. I note with pleasure that a lively exchange of opinions is coming to populate our Letters page, not all of them consonant with our own. We welcome your comments and contributions nonetheless.

The pages of *The Permaculture Activist* are open to all. Details of submitting material are to be found in the fine print on page 3.

Why Haven't I Gotten My Copy of *The Activist* ?

A number of our subscribers have called or written us to inquire, "Where is it?" We assure you that we are well, at work, and preparing for future issues of the magazine. Our inexperience as publishers and editors the first few issues led us through some difficult moments:

1) We had to learn the mechanics of computer typesetting, subscription maintenance, and mail distribution and set up our systems to manage them. Most of this is behind us.

2) Communications between ourselves and Guy Baldwin were disrupted for a month in August, 1990. He took a well-earned vacation, and we waited for the subscription list to arrive by boat. There were delays and a few people dropped off the roster. We hope we've found out about all of you and made appropriate corrections.

3) We had a baby. And we moved house. At the same time. She's now a 14-month old toddler and still the delight of our days, but we're more experienced multi-processing parents-in-tandem these days. Things are flowing smoother.

4) There was a war (Remember Kuwait?), and a postal increase. The commandeering of civilian transport aircraft for the Middle East airlift (Was that ever in the newspapers?) shunted much mail from air to surface transport and slowed the system down considerably. At the same time the change of rates caused a lot of mistakes in the Postal Service as employees retooled their brains: mail flipped back and forth, forwarding was disrupted, and many pieces were mis-directed.

5) I travelled to Nepal to report on the 4th Intl. PC Conference. Being gone a month and suffering the physical effects for several weeks after returning slowed me down and delayed the release of the Spring issue. We think it was worth waiting for.

6) Commitments to Permaculture Hawaii upstaged any summer recovery and we lapsed a full issue as both BJ and myself were left to organize and stage three design courses in September with limited assistance. The courses were successful—sixty people went through various combinations of the Basic, Advanced Design, and Teacher's Training Courses. We hope what the magazine lost in numbers, it gained in quality, both of written contributions (A lot of good networking went on.) and of our own deepened permaculture insights.

7) We've taken time to get to know permaculture people. This is a pleasant and very necessary part of the job. It does, however, interfere with some of the administrative detail. Our publishing depends on contributions by people doing work on the ground. So I have gone to conferences and reunions and courses. We are glad to have made so many new friends, and as the PC circle continues to expand, ever more talent becomes available to improve the quality of the work we all do.

8) We've made every mistake in the book: We mailed an issue in the middle of the Christmas postal rush (and I'm afraid we're doing so again...); we printed 48 pages when the press could only handle 40, (and paid extra printing and postage by the hundreds of dollars); we missed a printer's scheduled date and lost a week; we mailed issues to Canada without envelopes only to have the Post Office return them; I could go on but that's enough.

All that being said, every paid issue of every subscription will be sent in due course. As we aim to produce a resource of enduring value, we don't feel too bad about being a bit slow now and then. Our

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Producer-Consumer Co-Partnerships

Arthur Getz, continued from Page 1

producer groups formulating voluntary guidelines and standards; these mostly pertained to soil quality and to restrictions on the types of sprays and techniques that could be used, with a policy of third party inspections at the farms to confirm compliance. Recommended practices were informally incorporated into this organic approach. In general, producers found to comply with the established standards were then allowed to use the certifying authority's label on their farm products. Consumers purchased those products in small retail outlets, identifying them by the certification labels.

Organic Panic

In the last three years, demand for organic foods has jumped with mass media exposure of harmful pesticide residues in fresh and processed foods, bacterial contamination in fish and poultry, and hormones in red meat. Quite suddenly the private certification network was stretched beyond its capacity to supply the public through its small distribution channels of health food stores, farmer's markets, and u-pick operations.

Retailing giants and wholesale suppliers of supermarket chains acted quickly in an attempt to provide organic product as consumers willingly paid average premiums of 15-20% over the price of conventionally raised foods and produce sections expanded linear footage of organic displays accordingly. Stories of whole production lots being purchased well into the future accompanied the conventional food distribution system's lunge onto the organic food marketing bandwagon.

This process of organic empire building, and of overnight conversions, soon alarmed previously autonomous, independent-minded organic producer groups around the U.S. with the realization that unless they did something decisive and substantial to protect the integrity of their approach, the meaning of organic would become confused and greatly devalued.

In the winter of 1989, the first meetings of the Organic Farmer's Associations Council (OFAC) were held with the express purpose of arriving at a unified, national response to this development.

US Legislation Aims at a Standard

A catalyst in this process was the drafting of federal legislation which sought to unify the definition and draw input from the various sectors involved: organic

producer groups, organic processors, distributors and retailers, food-safety/consumer activists, and environmental groups.

Emerging from this process of pulling together input was a coalition of forces that ultimately demonstrated the strength in numbers and organization to overcome a powerful agriculture lobby's grip on the policy-making establishment. In a dramatic House of Representatives floor vote, the coalition overrode an agriculture committee's rejection of the proposed legislation and won approval of the original bill.

The legislation has as a key feature the sharing of decision-making authority between private and public agents, and of widening participation in the regulatory process through a system of referendum and appeals, and a nationally representative organic board structured to reflect a diversity of environmental, consumer, producer, and processor interests.

The law will likely have an impact well beyond the boundaries of the current organic market. One example: reciprocity clauses contained within the law limit international trade in organic products to those countries having a legal, national definition of the term.

Meanwhile, many of the same groups and individuals involved in developing that legislation are now turning their attention to related issues: support for alternative agricultural research, the promotion of sustainable agriculture in domestic subsidy programs, and at the international level, controls over trade in pesticides, the role of export subsidies in the destabilization of developing country economies, etc.

It is still early to judge the effect of national legislation on the organic food industry's economic vitality. The US law comes into full effect in 1993, and at the international level, the International Federation of Organic Agriculture Movements (IFOAM) is still working out the ground rules for accrediting national organic certification bodies. Polls have shown the American consumer is willing to pay more for a product that is reliably safer. But a recent slowing of the rise in demand has prompted several of the larger supermarket chains to withdraw from their earlier enthusiastic promotions of organic products, as premiums for organic food have at times dropped to within 5% of conventional product.

While doubts persist whether federal regulation can ensure strict compliance with these standards, I see more cause for concern in what such regulation can really accomplish by placing so much faith in the market. Problems paralleling those of conventional agriculture and food distribution remain, and provoke concern that the use of standards won't eliminate wasteful procedures, or create any better opportunities for small-scale farmers or for those in marginal areas.

In the search for some standards for the marketing of organic products in Japan, the question can be asked: for whose benefit are these standards to be developed, and what are the final objectives of such a system?

...the use of standards won't eliminate wasteful procedures, or create any better opportunities for small-scale farmers...

US/Japan: Parallels or Differences?

Though there has been a great deal of interest in the changes taking place in the US agricultural system, Japanese with whom I have discussed the American experience see little parallel in their political scene that might give rise to a similar organic law in Japan. Citizen participation in legislative processes is not supported by national organizations for environmental, public interest, or other grassroots causes which could lobby the Diet. Bureaucratic controls are far more authoritative and less likely to involve input from the public, while consumer activists suggest that any standard that may emerge would closely reflect the interests of the corporate sector and the highly centralized food distribution system.

An interesting attempt has been made to adopt a certification system at the prefectural level. Okayama prefecture, in the south of Honshu, has modelled a program after private certification groups in the US, yet relies on prefectural government to administer the standard and to evaluate farmers. It also differs from other standards by requiring a considerably shorter transition time from chemically-intensive to organic farming (six months instead of three years).

Against this background, an alternative and rather successful approach to supplying consumers with organic products has developed in Japan. This direct market-

ing approach, called *teikei* ("cooperation" or "partnership"), takes a variety of forms of interaction between producer and consumer groups. These mutually beneficial linkages clearly avoid the need for official criteria or standards, while accomplishing many of the stated goals toward which organic standards aim.

The *Teikei* Approach in Practice

To see how the co-partnership system works, I will focus on one relatively successful example that I have been associated with since 1985.

The Ohira farm in Setagaya Ward of Tokyo is the hub for the distribution of produce in the "*Wakabakai*" or "Young Leaf Society," which, after 20 years, involves 14 farmers from several surrounding prefectures, and nearly 400 consumer families in metropolitan Tokyo.

The system, if traced onto a map of Japan, would resemble a mass of radiating lines, one set of them converging from farms in various parts of the country onto the Ohira household, and another of shorter lines reaching out to the consumer households in greater Tokyo. The farmers in outlying prefectures personally deliver their crops to Ohira's farm, where the Ohira family then sorts the shipments into lots corresponding to clusters of families, combining their own produce with those of the other farmers. Careful records are kept of the amounts and prices of the food being sorted.

From there, members of the *Wakabakai* group handle the distribution of these lots along established routes by coordinating drop-off points and secondary sorting operations. At each drop-off point some of the members of that area divide the lots into family-sized portions which are in turn picked up by individual householders.

This sorting work is done on a rotating, volunteer basis, and usually involves three or four persons spending a few hours in an afternoon. Deliveries are made once or twice per week, depending on the season. Very often the food that has been harvested in the morning is on the consumers' tables the same evening. Minimal washing is performed in the fields; the bulk of the cleaning and preparation of the food remains the responsibility of the consumers.

While washing spinach, for example, mothers and children might occasionally spot a variety of ladybug they have seen in Ohira's field: the housewives help with weeding and other tasks at the Ohira farm on a rotating basis, though because of the size of *Wakabakai*, the same

people rarely manage to visit more than once a month. This on-farm assistance compensates for the extra role the Ohira family plays in the distribution system.

Beginning with Ohira, whose family has been farming in Setagaya ward for over 350 years, and a small number of housewives, the group has grown to its present size after an involved process of evolution and change.

Ohira-san abandoned his use of agricultural chemicals over 20 years ago because of serious health problems.

After several difficult years, he mastered a way to use locally available resources to develop compost and to restore fertility to his fields. His tasty crops attracted local housewives to the farm, and in recognizing the value and safety of his approach they also saw the importance of directly supporting a way of farming that was rapidly disappearing. The conventional market could not distinguish between Ohira's crops and those raised by other means, nor adequately reward him for the care and extra effort going into his farm. The neighborhood group decided to create a system that would

***Wakabakai* members speak of the "farmer's face on the vegetables"**

ensure enough of a steady demand for his product that he could concentrate on doing what he did best—raising organic crops. Veteran members recount that the ensuing experimentation was not always a smooth or easy process, involving high degrees of commitment and energy to make things work well.

Wakabakai members give a variety of answers when asked why they have joined the co-partnership: the aspects most highly valued are food safety and reliability of supply. They also speak of the "farmer's face on the vegetables," indicating that they value personally knowing the farming families who have raised their food.

Prices ranging from 10-15% above to at or slightly below the market price for conventional produce, are reached through mutual consultation at an annual meeting between all farmers and consumers. Records show remarkable price stability over the last several years. The key difference between food sold through the conventional distribution system and the produce exchanged through *teikei* systems is that a far greater portion of the price actually goes to the farmer, rather

than to intermediate handlers, distributors, or retailers.

At the same annual meetings decisions are made about the variety and quantity of products to be grown, and there is a good deal of discussion with input from both sides. In witnessing this process of bargaining and consultation, it is clear that the principles of mutual cooperation are highly valued, and that each side respects the advantages gained through direct contact with the other.

Farmers consider that they have fewer demands placed on them for the sorting and elaborate packaging required by the conventional distribution channels, and also that they save much produce that would otherwise not pass the strict cosmetic standards of the centralized market; for example, nothing but the straightest and most uniform cucumbers make it through the elaborate channels and reach the displays of the street greengrocers.

Consumers agree to accept all the produce that is raised; they see the natural fluctuations in crops as a given variable and agree to share the risk. In some cases even crop failures are compensated for. Since the relationship between the farmers and consumers is a multi-year arrangement, both are confident that losses one year will give way to surpluses another. This risk sharing over what Nature has to offer is one of the most unique aspects of the co-partnership system.

Monthly meetings are held between representatives of the farmers and consumers at which the process is fine-tuned, and updates on crop delivery and availability, as well as feedback from the consumers, are heard. Another communication link is the *Wakabakai* newsletter which frequently accompanies the produce and keeps each family informed about crop updates and the events of the last monthly meetings.

The newsletter is produced monthly by a committee of consumers. Other committees take responsibility for collecting the money, or for helping with peak shipments of apples and other products. The fruits and vegetables are packaged in paper bags and boxes which are re-used. Members delivering to drop-off points carry receipts for the food, and also submit receipts for their driving expenses.

Other Models

The *teikei* approach is also being applied on other scales with elements that differ from the *Wakabakai* model.

Across the Bay from Tokyo in a farming village near the southern end of the

Boso Peninsula, 32 households combine to produce the organic fruits, vegetables, and grains for nearly 1,000 families in the city. Conversion of many of the local farms to organic farming has meant that the entire village has been able to reverse the slide into collapse that characterizes many of Japan's farming regions.

Younger people have been able to remain on the land and continue to function as family-centered farming households. In operation for nearly as long as *Wakabakai*, this co-partnership has distinguished itself by building a community house in the village which acts as a center for many of the group's activities, including a summer exchange program for urban children.

Another example is the Kaneko household, situated north of Tokyo in the Saitama prefecture. This micro-level expression of the *teikei* system functions between the Kaneko family and eleven consumer households, all located in the immediate area. The farm strives to provide its members with as much of their fruits, vegetables, grains, and milk products as possible, and in exchange uses a barter system in which individual households determine the appropriate payment.

To a foreigner viewing the various co-partnerships between producers and consumers of organic foods, the *teikei* concept seems a remarkably simple and direct way to get safe foods to consumers at a reasonable price. One even wonders why the same approach isn't in widespread use in the West, until closer examination reveals a tremendous amount of cooperative effort, mutual assistance, and plain hard work that raises doubts as to whether such a system could function as well within cultures more inclined toward individual competition than social cooperation.

Social Pressure & Consumer Support

It is commonly held that the time required to convert successfully from chemical to organic farming and begin getting productive results is about five years. During the first several years most farmers seem to experience heavy crop losses and other frustrating problems in the field, and it is often difficult to produce enough for the family alone. As the fields recover their natural fertility and yields increase, there may still be difficulties that prevent crops from being sold through markets. Under these circumstances support through buying agreements with consumers can help the farmer proceed to abandon the use of hazardous chemicals.

This is typically a very trying period socially, for if the farmer is making the conversion and neighboring families are not, his actions may be seen as threatening the identity of the community or challenging the authority of local leaders. In this aspect of the changeover also, support from consumers can provide critical motivation and encouragement

association with consumers can provide the security needed to take such risks, as well as the personal incentive to improve existing techniques and varieties of crops provided to consumers.

Active sharing of experiments and methods goes on in farmers' study groups and through contributions to the various journals and newsletters serving

The *teikei* concept seems a remarkably simple and direct way to get safe foods to consumers at a reasonable price.

for a farmer acting within an often very conservative setting.

Risk-Taking and Farm Research

When we consider the pressures placed on farmers to predict the trends in demand for food crops, we see a very clear gap between the conditions over which they can exert some control, and those over which they have little or no influence. Modern farmers have become victims of trade decisions and price fluctuations that often originate in distant places, and in order to ride out these uncertainties they have increasingly sought to gain more control over production methods. Pesticides eliminate some of the gamble and add to the perception of control that a farmer needs in order to choose where and when to sell his crops. Typically, some of the heaviest chemical spraying occurs when a farmer has a crop standing in the field and is waiting for an advantageous price. This parallels the industrial practice of holding over inventories, although it is obviously limited by ripening and other biological factors not applicable to inorganic materials.

It is also possible to see a clear connection between market vulnerability and the amount of risk-taking and experimentation the farmer is willing to do. This has particular significance in the organic farming sphere, because experimentation is such a critical aspect of the progressive development of farming techniques.

Organic agriculture in Japan receives little or no support through conventional channels, such as the agricultural extension system, the agricultural schools, or the Ministry of Agriculture's research facilities. Nor does it benefit from access to credit, seeds, cooperative discounts on fertilizers and other products, or other forms of financial support to conventional farmers.

Organic farmers in Japan and elsewhere must rely on their own experiments to learn about what will work, and for this the support gained by direct

the organic farming community. The security of direct support from consumers tends to keep farmers from jealously guarding successful results, or from concealing experiments that have failed; the information is more likely to be shared openly and in a useful form. As consumers grow to understand more about farming, they too become an important source of new information and ideas, and because of their numbers and demonstrated interest, they represent a vast information-collecting potential.

Food Preservation

Because consumers in direct co-partnerships agree to accept all the produce coming from their farmers' fields, they at times have to preserve surpluses or utilize them in new ways. Conversely, when a particular crop is scarce, the amount is divided evenly among the households. The result is the revival of a culture of wholesome food-preserving techniques, (which in modern times have largely been replaced by food additives and chemical preservatives)—and is an added consequence of a social system which supports the organic production system. In contrast to the conventional approach of regulating supply with strict cosmetic standards and the wasteful discarding of "substandard" produce, occasional surpluses are dealt with by giving ample advance notice through the communication network. Some food preservation tasks are labor intensive, and consumers collectively organize on occasion to lighten the individual burden. Group canning of tomatoes or drying and pickling vegetables are examples of these tasks now rare in the Western tradition, while the making of *tsukemono* (pickled things) such as *takuan* (preserved daikon, a large white radish) are parallels in practice among *teikei* households.

Mixed Farming for Variety, Stability

The direct partnership between farmers and consumers also promotes mixed

farming, either in the form of a greater variety of crops, or through the addition of livestock to the farm. For most farmers this would be too risky or uneconomical to undertake when their decisions about what and how much to plant are best rewarded by guessing which crop will bring top profit during the harvest period and planting that crop exclusively. It also contrasts sharply with farmers working under the price-support system for rice and other grains, wherein centralized decision-making coordinates monocrop planting of a limited variety of grains, and government agencies absorb surpluses.

Short-term economic pressures discourage variety in the planting of crops. Loss of farm labor squeezed out of the farm economy by shrinking margins leaves most farmers unable to deal with the complexity in planting, harvesting, and cultivation which accompanies a balanced and diverse farm system. Government subsidy restrictions and the limits on the use of large machinery have also driven us towards the monocrop systems now dominating Western agriculture. Uniformity is the result of the demand of market forces to obtain "efficient" lower prices per unit, despite the already evident longer-term disadvantages and risks.

Like crop diversity, livestock may not be at all profitable on a small scale if only the meat, milk, and eggs are considered. This is because small-scale livestock operations, unlike the battery and feedlot industries, cannot obtain access to market channels unless they conform to industry standards that threaten the integrity of the organic approach. For example, the beef industry association may compel its members to use certain chemicals in order to sell their meat through the controlled distribution network.

But through the support of consumers who want eggs, milk, and meat produced under safer conditions, farmers can take advantage of the other benefits of raising livestock, such as manure and weed and pest control. With this support, the market diseconomies of scale applying to small livestock operations aren't the only factors affecting the farmer's decision. Livestock raising can again contribute to the overall efficiency and sustainability of the farm operation.

In the debate about "sustainability" in agriculture, much of the attention focuses on the reduction of inputs to the farm. However, in designing for self-sufficiency, we ignore at our peril the power of forces pressuring the farmer to special-

ize for a particular market. My point here is simple: when you have a certain and stable source of demand, it is much easier to develop the diversity of cropping systems we find so much biological value in maintaining. The consumers' need for variety in their diet along with their desire to be as reliant as possible on their farmer partners tends to promote mixed cropping, which in turn translates into enhanced ecological stability and greater immunity to pests in the fields. There is no simpler symmetry between the need for diversity in a farm ecology and the need for diversity in the human diet than when a diversity of crops on the farm go directly to the kitchens of *teikei* co-partners.

...in the organic farming sphere, experimentation is a critical aspect of the progressive development of farming techniques.

Consumers practising *teikei* tend to obtain as much of their food as possible from their link with farmers—*Wakabakai* members estimate they get about 75%. Items most typically purchased on the outside include fish, some grains, meats, and spices, but there are co-partnerships that supply all of these.

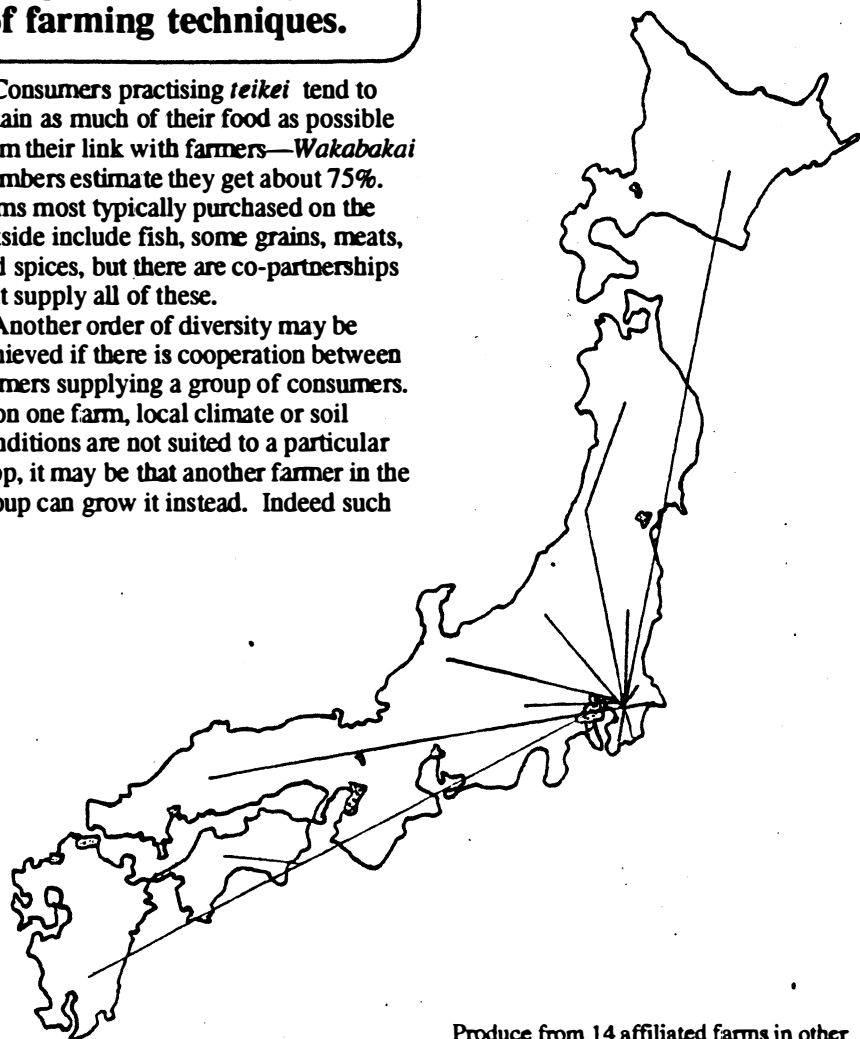
Another order of diversity may be achieved if there is cooperation between farmers supplying a group of consumers. If on one farm, local climate or soil conditions are not suited to a particular crop, it may be that another farmer in the group can grow it instead. Indeed such

complementariness may be the basis for membership among farmers' groups.

In the case of *Wakabakai*, Mr. Mizuno, whose farm is in Nagano prefecture, can supply apples and other regional fruits. In Shizuoka, another farmer raises tea and citrus, while another in Chiba prefecture raises root crops. The geographic distribution of farmers in the group contributes to the variety provided consumers, while linkages to these concerned urban households assure the outlying farmers that they can earn a livelihood while farming biologically.

Sharing Machinery and Costs

In the case of Miyoshi Mura, the *teikei* village mentioned above, other benefits are gained from the immediate proximity of cooperating farmers. The villagers coordinate production tasks in much the same way their ancestors responded to the demands of traditional rice cropping. Elsewhere, machinery has nearly elimi-



Produce from 14 affiliated farms in other districts of Japan flows into the distribution center at Ohira farm and from there to more than 400 households in greater Tokyo.

nated what was formerly a community-binding need for planting and harvesting as a group.

It is the purchase of this same labor-saving machinery that has made farming in Japan today a predominately part-time occupation totally dependent on expensive fuel and maintenance. The mainstream agricultural cooperatives have induced each small farmer to purchase machinery and to update equipment regularly, which translates into high production costs and certain inefficiencies which the government is pressed to absorb through price supports. Of course the consumer ultimately pays, both through the taxes that keep the price support system afloat and through the high cost of rice on the market.

The machinery required by farmers who have direct relations with consumers rather than with the agricultural cooperative can be purchased collectively at savings to the individual farmers. This results in reduced liabilities for maintenance and in lower instances of idle machinery. While these equipment-sharing practices are not confined to those farmers engaged in co-partnerships, it seems to be a practice more likely to take place among farmers with a common group of production demands and shared consumers.

In the case of machinery that might be needed by consumers, the collective dimension of the purchase is clearly beneficial. In the *Wakabakai* group, a large storage refrigerator for perishable crops and juices was purchased with group funds, as well as a small rice-hulling machine to do their own milling at the main facility.

Greater Human Contact

No discussion of the advantages of the *teikei* system would be complete without devoting some attention to the human factor and to the motivation that exists under a direct partnership between farmers and consumers. In addition to consumers appreciating "the farmer's face on the vegetables", these farmers take a reciprocal pride in their work because they know who will be eating their food. Greater care is taken in the fields, and in the handling and delivery of the produce.

In my visits to farms around Japan, I have sometimes found that farmers using chemical methods have isolated plots where they raise their own family's food using no or considerably fewer chemicals. It would be hard to find clearer evidence that markets have brought about a separation of economic responsibility

from concern for public safety.

Freshness, Taste, and Seasonality

Health and nutritional benefits of the direct market system may not end with the absence of chemical residues, or in lower exposure risks to farmers. There is good evidence to suggest that the freshness of the foods provides vitamin levels higher than those in produce that has gone through longer distribution channels. The superior texture and appearance

tions and diseases in a natural way.

The task of controlling pests and diseases in an enclosed system such as a greenhouse is a leading cause of pesticide poisoning among Japanese farmers. Harmful levels of chemicals rapidly build up in these close environments, and Mr. Ohira, whose father was the first to introduce greenhouse techniques to Japan, believes his father's early death and his own chronic health problems are

When you have a certain and stable source of demand, it is much easier to develop the diversity of cropping systems we find so much biological value in maintaining.

of these fresh vegetables and fruits is attributed to healthy growing conditions and to being picked closer to ripeness.

Which varieties farmers raise is also of growing concern to consumers. Most home gardeners will agree that the tastiest tomato would hardly survive a trip around the block, and those who have purchased "tomatoes" in stores have the sad memory of what real tomatoes can taste like compared with those green, hard versions.

In the *teikei* system decisions about what kinds to grow are made collectively, based on the farmers' experience and the consumers' desire for new or heirloom varieties. It is often hard for farmers to find seeds that are bred for hardiness or exceptional qualities that don't meet the criteria of commercial plant breeders. The preservation and control of open-pollinated and heirloom seeds are widely recognized as vital issues. In Mr. Ohira's opinion, jealously guarded seeds could ultimately fail to be viable if not shared with other farmers who plant them in different fields. Beyond being neighborly, seed swapping is in one's self-interest. Members of the YNK (*Yukinogyo Kenkyu Kai*: Japan Organic Agriculture Association) hold an annual seed-saving exchange where people from around the country convene to share seeds and seedlings, and give presentations on their propagation.

Some contend that the seasonality of foods has an important relationship to health, and that eating crops in season is an aid to physical health and relief from the ailments that typically accompany seasonal changes. At the very least, this belief frees the farmer from trying to raise crops that are not in synchrony with weather conditions, which lowers fuel costs for greenhouses and allows the seasonal changes to check insect popula-

a direct result of his earlier use of pesticides in those airtight enclosures.

The greenhouse system is also coming under criticism for its effects on soil quality. The high temperatures and heavy fertilizer applications that are common in greenhouses lead to a mineral salt build-up and hardness in the soil that is similar to the desert conditions that plague a growing percentage of agricultural lands in other regions of the world.

Ironically, while Japan enjoys tremendous rainfall and a long history of fertile soils, Japanese farmers are making a multitude of small deserts inside their greenhouses. The problem of how to flush these accumulated residues out and to restore fertility in greenhouse soils has become the focus of several researchers in Japan, as greenhouses are in such widespread use that the problem promises to be critical for some time to come.

Consumer Control Over Methods

As consumer demands become both more specific and more broadly-based, including not only the types of products desired, but also definitions governing their manner of production, it becomes apparent that current market mechanisms are inadequate to meet these demands. The conditions under which chickens and other livestock are bred and raised is an example of practices which call for ethical controls or some form of certification system because the ill effects are not visually apparent in the product.

Testing foods for pesticide residues has been proposed in several places, but the total screening of produce would involve considerable technical difficulty (in addition to prohibitive expense), and random sampling would inspire only partial consumer confidence. Efforts in this direction are sure to involve greater costs to the producers, and ultimately to consumers, who may still remain skepti-

cal of inspection labels and other forms of indirect assurance.

If we see that these standards and criteria for marketing are unnecessary in the direct market approach, then we must ask what benefits might exist in applying such a system, to whom advantages would accrue, and for which products?

It may be that standards would be of greater use to food processors than to producers. Perhaps standards will be needed for processed foods because a direct market co-partnership may find it impossible to supply themselves with all the items they need. Several co-partnership groups have sought processors of miso paste, soy sauce, health products, soap, and other household supplies. While their ideal is to achieve direct marketing in as many categories as possible, this may be an elusive goal for all but the most organized and determined.

A relevant consideration is whether the wholesomeness of the ingredients or the freshness and raw quality of the food is of greater importance. Food processors benefit from the view that it is chemical residues, not freshness or rawness of foods, that is of greatest concern.

Social and Ecological Goals

Many in the organic agriculture movement seek to advance broader social and ecological goals through the influence that can be exerted as organized consumers of safe foods. Many see democratic control over food production as a critical dimension to co-partnership and other alternative marketing approaches. Cooperative decision-making skills developed in co-partnerships help restore confidence and trust among group members, particularly when the results are so much greater than what they could achieve as individuals.

Some co-partnership groups have sought to affect political changes, and have voted their supporters into political office at local and regional levels. Consumers empowered by their experiences in circumventing the conventional food distribution system have turned their attention to local conservation issues, peace and anti-nuclear campaigns, as well as issues of international develop-

ment and injustices in the Third World.

Consumers benefit from gaining a broader awareness of the natural processes and constraints involved in raising food. The periodic visits of mothers and children to the farmer's field form a necessary link in accepting the difficulties and pleasures that farmers experience raising food organically. Such visits tend to modify their unconditional dislike of insects as they see and learn from people like Ohira that insects serve a vital role in the natural processes that bring them their meals. Putting their hands in the soil when they help with tasks such as weeding must make connections for them that are somewhat rare for present-day Tokyo residents.

On yet a broader level, the prospect of restoring some vitality and permanence to rural areas would be clearly furthered by the stability of consumer-farmer links. These problems, fitfully attended to at

Support from consumers can provide critical motivation and encouragement for a farmer acting within an often very conservative setting.

various government levels, may be better solved through more immediate work in direct co-partnership building and the formation of private sector urban-rural bonds. If such co-partnerships were widely adopted, their processes could help stem rural flight by providing the basis for sound local economies, ecologically sustainable cultivation, and cooperative, culturally vibrant communities.

For decades in Japan, the narrow election campaign slogan of standard-of-living "parity between urban and rural" incomes has resulted in the creation of an elaborate political machine which generates make-work projects and tourism schemes that have erosive ecological and cultural impact. Parodies of local authentic cultures, re-sold in scaled-up tourist-venture versions of the original are in evidence throughout Japan, and pork barrel schemes involving extraneous roadbuilding and other infrastructure projects are common. Beyond their serious ecological impact, they tend to create a cycle of dependency on the central government and on political forces that are bent on promoting such large construction projects in order to maintain that dependency, and thus their

own control. Local autonomy is perpetually undermined with such short-term, high capital investment from the outside.

Self-Sufficiency in Microcosm

Conventional Japanese farmers, like their American counterparts, spend much of their food-gathering time in the aisles of supermarkets. At the farm level, because a greater variety of foods is raised for consumers, *teikei* farm families enjoy greater variety at their own table. Co-partnership consumer families keep greater control over more of the food dollars they spend also.

On the national level, food self-sufficiency has been a low priority, as national development priorities have favored the industrial export sector and encouraged greater reliance on imported foods. Rice production has been the exception, in which Japan adamantly protects total self-sufficiency levels, and maintains an elaborate system of price controls and managed production. However, the heavily outward bias of the economy's orientation has led to trade frictions and calls for further trade liberalization, particularly for agricultural products. Claims of unfair protection of farmers through price supports and import quotas are serious challenges to the status quo of Japanese agriculture, and have already begun to take effect in the form of recent shifts of policy. GATT negotiations have soon to spell the final words for the Japanese countryside.

The signals being sent to Japanese farmers point towards upscaled farm operations, wider application of machinery, and industrialized agriculture techniques, resulting in greater rural flight and decreasing farming populations: "Get big, or get out!"-- Japanese style.

These changes will be heralded as improvements in the efficiency of Japanese agriculture, and seen as part of a necessary process of change despite hardships suffered by rural populations and the cultural impact of disappearing rural life. But perhaps a more alarming result will be the ecological damage that will be suffered as more of the landscape is shifted to other uses (golf courses?) and as the rice terraces, which now play such a critical role in water storage in Japan's hydrological infrastructure, fall into disrepair.

Accompanying this trend toward reliance upon foreign food producers are the energy and food safety costs of such a system. The long shipping distances involve steep fuel costs and will require applications of hazardous fungicides and



other preservative measures that are harmful to human health.

At the level of national economic policy and the consequent collapse of domestic agriculture, citizens have felt powerless to reverse these trends. Many find that their most significant and practical response to this process is to support Japanese farmers directly through the co-

and consumer representatives.

The organization is now facing a dilemma that threatens to split some of the membership. With the increasing pressure to develop standards for the certification and distribution of organic products, the YNK must decide whether to participate in and even lead the discussion, or to ignore these developments and

despite their having no intention of marketing their produce beyond the local area. The courts awarded them an injunction against the spraying of certain areas adjoining their fields as long as their applications to the certification program were being processed.

Looking at the effects of modern agriculture around the world, it seems that perhaps the greatest losers will be future generations, who will inherit depleted and eroded soils because the excessively biased pressure for production inherent in reliance on market forces did not guard the ultimate measure of sustainability—the health of the soil. It is probably this dimension that the pocketbook and the lawbook will have the greatest difficulty in protecting, because it involves values which are so difficult to translate into purchase orders or legal restrictions.

Projections about world population growth, the diminishing and shifting area of arable lands brought on by desertification and climate change, and concerns about food, health, and environmental quality all lead to some general conclusions: alternative methods for both producing and distributing food must be developed if we are to remain confident about agriculture's sustainability into the future. We can draw on both traditional sources and modern ecological research to reshape our food systems. But we must also develop social systems capable of supporting the technological shift towards biological agriculture. The *teikei*

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partnership system.

Comparing Organic Movements

While the *teikei* system can be seen as a positive small-scale approach to addressing many of the structural and social problems that modern agriculture has brought about, many questions remain about why it is not spreading more quickly and whether other alternatives are not as viable or appropriate under certain conditions.

The umbrella organization for the co-partnership movement, the Japan Organic Agriculture Association (*Yukinogyo Kenkyu Kai*, or YNK) has placed a strong emphasis on the promotion of co-partnerships to the exclusion of other means of distributing organic produce to consumers. The organization places a high priority on face-to-face contact, and sees the process of handling the distribution among members of the co-partnership as vital to maintaining the contact between producers and consumers. They therefore avoid the use of commercial transporters or distribution systems.

While the leadership does not dictate specific blueprints, it does offer a list of "principles of mutual cooperation" that act as a guide for those seeking to form new farmer-consumer links. The organization produces a monthly journal, *Tsuchi to Kenko (Soil and Health)*, which provides information on a variety of organic farming issues and has a fairly large readership. Estimates of the numbers involved in co-partnerships vary, but a number around 10,000 is often given.

Regular seminars and presentations are held in a variety of locations throughout the year, as well as at the offices of the Association. A national congress convenes regularly in the winter in Tokyo and regularly draws hundreds of farmer

rely on its own approach. Critics of the latter strategy argues that not everyone can or wants to join these co-partnership groups but everyone still has the right to safe and reasonably priced foods. Other criticisms are that there are not enough of these groups to meet the burgeoning interest, and that individuals trying to identify sources of organic foods or consumers to purchase them don't have adequate access to information and contacts. The organization could expand its role in catalyzing the formation of new groups or bolster a network to bring interested parties together, but at present it is not emphasizing those directions.

While certification schemes may be objectionable on several grounds, there

Citizens have felt powerless to reverse these trends. Many find that their most significant and practical response to this process is to support Japanese farmers directly through the co-partnership system.

have been unexpected benefits when we examine the protection that organic farmers need against threats to their operations. In the case of a small farm operating in rural Oregon, the fact that the farmers were involved in a subscription farming system supplying about ten local families with organic produce was not enough to protect them from the drift of sprays administered by the state forestry service. Control of forest pests overrode their commercial interest in supplying chemical-free produce to their customers because, until they joined some certification program, they could not clearly demonstrate damages in the courts, particularly over a protracted period. Thus the farm was prompted to join the certification scheme in Oregon

approach is clearly one of the possible ways in which individuals and groups can make a difference in the scale and structure of our agricultural web towards a more diversified, stable, and resource-conserving food supply. Δ

Arthur Getz has studied community-supported agriculture in Europe, the U.S. and Japan, where he has lived for the last five years, farming with his in-laws, and otherwise widening the edge between cultures. A fellow with the Institute for Current World Affairs, he has taught permaculture in Japan and now resides with his wife and daughter on the North Shore of Oahu, Hawaii.

Citizen Action: Networks and Global Change

Anwar Fazal

According to the Chinese proverb, "If you feed a man a fish, you feed him for a day. Teach a man to fish and you feed him for a life time." In our complex modern world it is no longer so simple. Consider the people of the South Pacific. They and their ancestors have fished for centuries. What use is their knowledge against the Japanese, the Koreans and the Taiwanese who ravage their oceans with miles of drift nets; the Americans who use their islands and waters as dumping grounds for toxic wastes and deactivated chemical weapons; and the French who continue nuclear testing. When development workers from these same "developed" nations come and presume to teach the natives "how to fish" they add insult to injury.

Increasingly we find that justice for the poor and protection of the environment depend on building citizen power to counter the abuses of powerful states and transnational corporations such as those that deprive Pacific islanders of their fish. The experience of the International Organization of Consumers' Unions (IOCU) provides useful insights into what this requires.

The IOCU was founded in 1960 as a rather polite membership organization that served as a clearing house for consumer product information. We evolved into a support body for powerful advocacy networks involving thousands of organizations and millions of citizens.

Our first global campaign centered on the irresponsible practices of transnational companies, such as Nestle, in the marketing of infant formula and other baby foods. These practices were causing thousands of infant deaths each year. Later, we helped form and support numerous other global issue networks dealing with pharmaceuticals, tobacco, toxic wastes, biotechnology, food irradiation and others. Our insights grow with our experience.

We have learned, for example, that effective networks are more like love affairs than conventional organizations. You don't become a "member," you become an actor. When you start doing things that support the network's goals, you are in. If you stop, you are out.

We have also found that when dealing with global issues, the most effective networks are those that link:

Protest and proaction. Immediate firefighting efforts must link with efforts to achieve larger structural changes that prevent future fires.

Grass and sky. Groups that work at community level must be linked to those that specialize in broader political spaces.

North and South. Many Southern problems have Northern sources and can be resolved only through mutually supportive action by citizens of both North and South.

We have learned to build networking strategies around the multiplication of:

Information. Countless citizen organizations are starved for information in a useful form.

People. The effectiveness of citizen networks depends on millions of skilled leaders.

Power. Political influence depends on the commitment of organized citizen lobbies.

We have formulated five basic principles for global networking:

Develop clear vision and mission statements that define the future we want and the specific operational outcomes we seek as steps toward its achievement. Both are essential.

Help people think of regional and global space as *their* space. Encourage them to see how their problems relate to, and derive from, the global context.

Understand and work with the sources and flows of power in society, at both local and global levels.

Engage energy sources, such as youth and women, that have lacked opportunities to participate in global policy processes.

Develop anti-bodies against attacking viruses. Nurture the independence and self-reliance of the network's elements so that if one part of the network is weak and threatened, other parts can step in as needed. Build on what exists. For example, work through existing publications rather than starting and financing new ones. Minimize funding needs and never become dependent on a single funding source.

Global networking is still a relatively

new phenomenon and we have much to learn. It is already evident, however, that it is an important key to the transformation of global society through people's action. The task is enormous, with ample need for the contribution of every responsible citizen. Δ

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The New Freedom

Decide to network.
Use every letter you write,
Every conversation you have,
Every meeting you attend
To express your fundamental
beliefs and dreams

Affirm to others the vision
of the world you want
Network through Thought,
Network through Action,
Network through Love,
Network through Spirit.

You are the Center of the World,

You are a free,
Eminently powerful Source
Of Life and Goodness.
Affirm it, Spread it, Radiate It,
Think day and night about It.
And you will see a miracle happen.

The Greatness of your own Life.

In a world of great Power,
Media,
Monopolies,
And Five Billion Individuals
Networking is the New Freedom
The New Democracy,
A New Form of Happiness.

*Robert Muller,
Assistant Secretary General
United Nations*

A Place To Start

Simon Henderson

"As soon as we start doing, we learn how to proceed." —Bill Mollison.

After studying with Bill Mollison for a month in the autumn of 1986, I returned to Vision Mountain infected with the contagious spirit of Permaculture. I would create a better life for my people. And I would do this without causing harm to the existing natural systems. Indeed, I would coax the landscape into a frolic of sustainable abundance and polycultural diversity. Members of the Bear Tribe Community would experience the "carefully ordered chaos of a consciously designed and maintained agriculturally productive ecosystem." We would become a part of the "wildlife" on site, would contribute our own patterns of movement, become translators of nutrients and energies, interceptors and extenders of boundaries and edges. We would be looked upon as one of the valuable resources of the site, as much as the deer, pheasants, ladybugs, comfrey, chickens, soil, sunlight, and water. An egoless component of the rich biotic community on Vision Mountain. And so it began.

I spent the next two-and-a-half years fine-tuning my powers of observation. I became a toad and squatted in the damp marsh where our springs originate. I crawled on my hands and knees through barriers of nettles to inspect the increased diversity that manifests at the edge between forest and meadow. I had a friend climb an eighty-foot pine tree to photograph the garden to discern the flow patterns of people, livestock, poultry, and nutrients. Another zealot flew over the site and photographed it from 2,000 feet.

From the perspective of each season I alternately shivered, baked, was drenched or blown away. I wanted to know exactly what happened on every square inch of our mountain in every conceivable situation. Four years later, I feel I have now become, in some aboriginal sense of the concept, a "far-seer" capable of knowing natural systems in both time and space; one who has developed talent for discerning what will be where doing this or that in a specific time. For example, if the lupine in the valley were

just beginning to break bud I would know, then, that the *Arnica montana* would be in full bloom on the top of the ridge behind the Longhouse, and thus ready for harvest.

A more far-reaching aspect of this specialized talent of observation is the "seeing and knowing" of a site, garden, or landscape within the gradations of succession. What the evolution of a system will affect, enhance, diversify, or stop the movement of, as natural systems emerge from pioneer species to a climax forest or orchard system. Surprises invariably reveal themselves even in man-made systems in the delightful order of chaos that arises as the designed ecologies take on a life of their own.

No matter how we persist in our linear interpretations (usually straight lines and 90 degree angles) of these patterns, the patterns themselves still derive from natural systems. And whether we realize it from naivete or arrogance, *Homo sapiens* is a species cohabitive with all other lifeforms on this planet. The conscious act of planting seeds in the earth, even in calibrated rows with package-instructed, per-inch spacing, is no less a natural act than the bluebird on the fencepost defecating berry seeds onto the earth while it ponders this bizarre naked ape with \$400 worth of Smith & Hawken's garden tools committing basically the same act.

Because our community was already living on land adjacent to the site, I enjoyed the luxury of two-and-a-half years evaluation and observation of our prospective "development."

The Bear Tribe gardens had been established on land approximately one mile down the mountain from the Longhouse. In consideration of available water, the gardens had been located in a sub-irrigated valley with an adjacent spring. The spring had been dug out by hand to make a small pond from which water was pumped through PVC pipe to irrigate the garden beds. Fruit trees, berries of several varieties, and some herbs were already established when I arrived in the spring of 1985. Within a year I had expanded the garden area by about four times, cycling through more than six tons of compost. It was a rude awakening when the spring nearly dried up late in the summer of 1986. That is when I came to understand the "carrying

capacity" of the land. Since then, more water conserving techniques have been implemented.

One of the considerations that arose for us, even before the design process began, was: Why do we want to design *this* site? Since we must always consider the primary client of a design to be Gaia, the Earth, certain questions had to be addressed: What was the carrying capacity of the site? Were the resources renewable, sustainable, or finite? Would we enhance or deplete the biotic species of the area?

After a few false starts, which included a search for land in Idaho and western Montana where we could relocate our community to a more benign landscape with better water potential, we looked again at our own resources and what it was we hoped to achieve as an intentional land-based community in the country. A dominant theme emerged after a series of heated community meetings: improving the quality of our lives.

With the expansion of the outreach and business ends of our organization it had become necessary, for the sake of accessing business services, and also because we lacked the necessary buildings, to locate our offices in Spokane. This resulted in a daily roundtrip of 80 miles for many members. Others had moved to town.

Certainly, by reducing transport and travel needs we would be able to reduce our energy requirements, especially for petroleum. Human resources would be greatly economized, especially with the much anticipated luxury of two extra hours a day *not* in an automobile. Also, the desire of the community was to live and work in a natural country setting that supported both life and livelihood.

We decided we would develop our site, but minimally, and that no trees would be cut unless absolutely necessary. Meadow areas would be left as meadowland, with an orchard eventually accenting the uppermost perimeter. Wildlife corridors would be maintained and even enhanced over the coming years, as well as refugia identified for protection. (Refugia are recognized and protected habitats which shelter particular populations of plants, animals or insects.) On site there are refugia for unique bitterroot populations, which grow only in dry, gravelly soil, as well as perennial breeding grounds for ladybugs in specific bunchgrass clumps in the garden.

It was of primary importance the site

be designed *with* the people in mind, walking them through the landscape while describing the phases, or succession, of the design, and explaining why putting this component here, or there, would be important.

We began interviews with community members in November of 1988. A battery of questions was posed, such as: What type of dwelling do you see yourself in? This included considerations for the size, location, kinds of material, type of heating system, allowances for alternative technologies and solar electric panels, and appropriate use of resources throughout.

Water use goes hand in hand with ethical use of resources and so for each

dwelling we agreed that water harvesting (from the roof), diversion of greywater to fruit trees, and composting toilets were the only way to go.

Our Buffalo Hunt Garden had already been established on the site as a garden for the whole community. Therefore, we decided that each dwelling would need an herb spiral near the kitchen door and perhaps a keyhole garden for fresh "plucking greens." A small fruit orchard was an option for two of the houses, and would perform the secondary function of shading the structures in the heat of summer while still allowing winter sunlight.


As our understanding of the site grows, we become able to identify specific needs

and concerns and develop ways to meet them. By observing the permaculture principles of starting small and building on a controlled front, we have been able to grow slowly and surely, avoiding the stress of developing the entire site in one fell swoop, a process neither possible nor desirable on our scale.

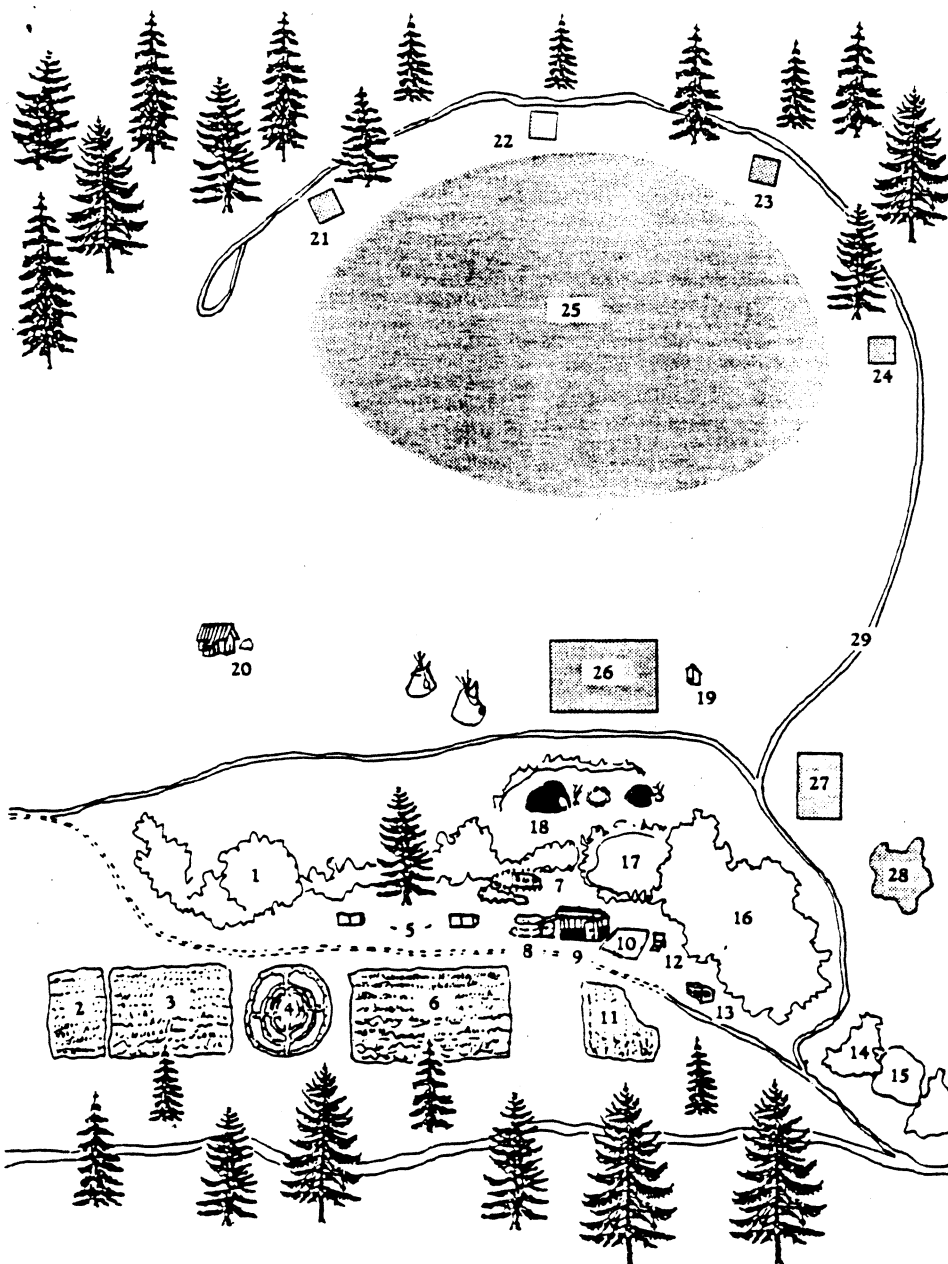
At the time of this writing we have broken ground for our permaculture teaching pavilion, after carefully considering the site possibilities (as well as its liabilities). We have already chosen an area to be developed for our office complex and attached greenhouse. These thus enter our design considerations, although we allow ourselves time for "succession" in the structural components of the design, just as we must allow for succession in our guild-associated orchard plantings. That is the part of design through which one becomes a "far-seer"...the vision shimmering before us in time, as small parts of it manifest. And the marquee at the end of the road will one day read, perhaps: "Our house is in order."

Key to Plan

- 1 Wildlife Corridor
- 2 Tree Nursery
- 3 Vegetable Garden
- 4 Herb & Flower Garden
- 5 Compost Bins
- 6 Vegetable Garden
- 7 Poultry Coop & Yard
- 8 Keyhole Garden
- 9 Mud Kitchen
- 10 Culinary Herb Patch
- 11 Plucking Garden
- 12 Solar Dryer
- 13 Tool Shed
- 14 Tree Coppice
- 15 Pond
- 16 Riparian Forest
- 17 Aquaculture Pond
- 18 Sweatlodge Site
- 19 Outhouse
- 20-24 House sites
- 25 Orchard
- 26 Office & Greenhouse
- 27 Teaching Pavilion
- 28 Guild Plantings
- 29 Access Road

 Grey Areas indicate proposed sites.

Simon Henderson teaches Permaculture and now tends his garden in the Skagit Valley of Western Washington.



Bear Tribe Village Plan

Drawing by Simon Henderson

Canopy Manipulation: A Tool for Watershed Restoration

Jeffrey A. Creque

Historically, the Central California coast watershed in which I live has been subjected in succession to intensive grazing pressure by domestic livestock, removal of tree cover for firewood (including blasting, with dynamite, of tree crowns and roots), and increased fire frequency, followed for the past two or three decades by fire suppression. Topography is steep and soil losses have been severe-to-complete. On some sites the soft shale parent material has been cut by gullies to a depth of six feet or more; such sites usually indicate the historical presence of a farm road.

Loss of vegetative cover and erosion of the uplands has transformed the canyon floor, which I farm, from its pre-agricultural condition as a wet meadow of perennial grasses, sedges and rushes watered by perennial seeps, to seasonally dry fields of annual European grasses and forbs. A gully caused by unimpeded overland flow has lowered the water table by at least several feet, healing over with willows and other riparian vegetation following the control of livestock over the past two decades. The resulting seasonal stream may flow from a couple of days to a couple of months per year, depending on the quantity and seasonal distribution of rainfall. A lowland soil profile reveals an inversion of natural soil horizons, as fertile topsoils washed seaward first, later to be overlain by eroding subsoils and shale gravel.

California Bay *Umbellularia californica*

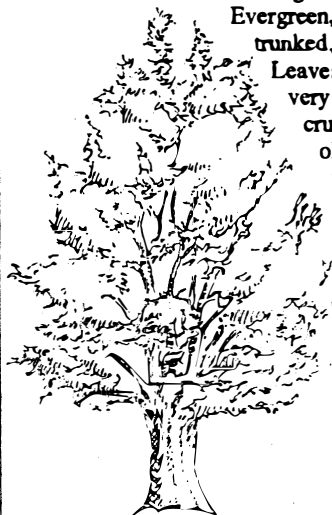
Sierra Nevada, Coast Ranges to SW Oregon

Evergreen, often multi-trunked, rarely 75-80', also a shrub.

Leaves 3-5" long, 1" wide,

very fragrant when crushed. Inedible olive-like

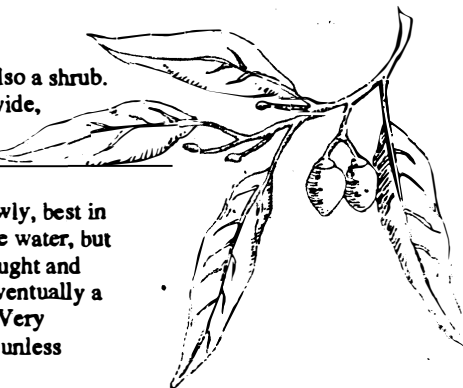
fruit. Grows slowly, best in deep soil, ample water, but tolerant of drought and deep shade, eventually a canopy tree. Very dense shade unless trimmed.



The quintessential objective in the management of this watershed is the transformation of this seasonal stream to a perennial flow. Toward this end, one challenge has been to maximize biomass accumulation of the watershed as a whole, particularly on the more degraded upland sites. Climax tree species include: Coast Live Oak, *Quercus agrifolia*; Canyon Live Oak, *Q. chrysolepis*; California Bay, *Umbellularia californica*; and Douglas fir, *Pseudotsuga menziesii*. The first three species are fire-adapted, with fire-resistant outer bark and the capacity to resprout following top kill by fire (or cutting). Ironically, the long history of fire suppression in this fire-adapted vegetation type has resulted in dangerous fuel loading in some areas, while other areas may carry no visible biomass whatsoever.

Prior to European settlement, frequent low-intensity fires maintained a coastal scrub oak/live oak/perennial grassland mosaic, restricting Douglas fir to wetter canyon areas. With fire suppression, Doug fir has come to dominate many upland sites, outcompeting the slower growing oaks. To encourage the growth of individual oaks as a means towards their overall dominance of the watershed vegetation, I began selectively to remove limbs of the competing Douglas fir. In the process, I found I was generating material that could be redistributed as mulch on adjacent barren areas.

The watershed supports a large deer herd and a diverse bird community, and is grazed by cattle in rotation. Several



factors thus come into play in the manipulation of tree canopies. Canopy manipulation is confined to that time of year when it will not conflict with nesting birds. A limiting factor in oak sap-

ling growth is browsing by both deer and cattle. Protection of oaks shorter than browse height by larger trees, of whatever species, is thus often of greater benefit than detriment, and subtlety may be required when removing apparently competing vegetation at this stage of sapling growth. In many cases thinning of the oak canopy itself may be desirable, as larger oaks may suppress saplings, or force prostrate growth that remains browsable indefinitely. While dense oak thickets may suppress saplings, they also provide unique habitat conditions and can prevent access by cattle, and even deer, to some areas. Similarly, selective pruning of lower limbs can allow cattle access to otherwise inaccessible forage, while providing biomass for mulching, or for blocking unwanted cattle trails. Cattle and deer are easily diverted from what may be an erosion-aggravating path

Douglas Fir

Pseudotsuga menziesii
North America

Evergreen, sharply pyramidal when young, crown compact and conical, 70-250' high, trunk 2-8'.

Forest trees have long clear trunk. Bark smooth grey when young, thick and furrowed black to reddish-brown when mature. Branches drooping with ends swinging up. Needles 1" to 1 1/2" radiating in all direction, sweet fragrance when crushed. Cones 3-4" long, oval, pendulous, reddish-brown 3-pointed bracts. Wood strong and durable. Tolerates sun, wind, or considerable shade.



by a simple barrier of tree prunings.

While canopy manipulation should be carried out in a manner consistent with basic arboricultural procedures—properly made cuts, etc.—it should not be “pruning” as applied to fruit bearing or ornamental trees. For example, the ecological importance of dead and dying trees and tree limbs should not be forgotten. A good rule of thumb is to take off a bit less than seems appropriate. Even very conservative canopy thinning can result in the generation of remarkably large quantities of organic material, some

Coast Live Oak

Quercus agrifolia

Pacific Coast Ranges

Evergreen, drops most leaves early spring. Rounded, broad, wide-spreading crown, dense foliage, 20-90' high, 2-3' diameter, short trunk, large branches. Leaves rounded or holly-like. Greedy root, needs water through first and second dry season. Once established needs no water.



"Some Natives of California" ©1991
D. Hunter Beyer



of firewood size. As a general rule, harvested biomass should be placed upslope from its point of origin as a means of reversing erosional losses of nutrients and organic matter.

This spring, I noticed annual grasses coming up among last year's prunings. Within a month or two of laying limbs over bare shale, a "shadow" of detritus had formed from leaves and needles dropped from pruned limbs and from other materials moved by gravity and wind and caught in the rough mulch. The shade and condensation surfaces provided by prunings resulted in increased moisture on these micro-sites as well. Limbs placed strategically over seedlings have sheltered new growth from browsing. Cattle and deer have been successfully diverted from eroding trails with brush barriers. Pruned oaks have responded with vigorous new growth. And limbing, rather than removal, of Doug Fir has allowed them to continue fixing atmospheric carbon while providing shade and wind protection for the seedling oaks.

After more than a century of agricultural abuse, changes in the nature of human demands on the resources of this watershed have allowed a slow natural recovery to begin. This process is most recognizable by the large quantity of biomass which accumulates in shrub- and tree-dominated areas, even to the point of suppressing climax tree species. In this fire-adapted ecosystem, such an accumulation is both a result of fire suppression and a precursor to a potentially catastrophic fire. Selective pruning and

manipulation of tree canopies is an easy way to redistribute biomass from areas of excess to nearby areas of scarcity while encouraging, and subtly directing, the process of recovery. Carbon is thus channeled to the soil as humus via mulch

rather than to the air as carbon dioxide via smoke. While the latter process is "natural" to this system, it cannot be considered desirable under present watershed, or global, conditions. Though not a specific objective of the procedure, some fuelwood and fodder may be generated as by-products of canopy manipulation.

Little more than a year has passed since the initiation of this experiment. The long term hydrological effects of this strategy remain to be seen. But with the aid of a folding pruning saw and a pair of hand shears, soil development on this historically degraded watershed has definitely been accelerated. Δ

Jeffrey Creque may be contacted at PO Box 1004, Bolinas, CA 94924.
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Expanding Food Production With Lesser-Known Perennials

Adam Turtle

There are several reasons to use lesser-known perennials to expand food production. Evidence suggests that we're in a period of climatic change. To what extent any of our erstwhile "mainstay" crops can be relied upon in coming times is at least an open question. There is increased pollution and degradation of soil, water, air, and even light quality which are altering the circumstances with which crop plants must cope. Of course, these things affect insect and disease cycles and balances as well.

Even disregarding the above, we have for years been narrowing our genetic base (i.e., more and more acres devoted to fewer and fewer species). Also, many of the crop species we now depend on are "input responsive" rather than naturally productive. Costs of that input, both ecologically and financially, are going to continue to rise.

We are currently (and forever!) losing potentially useful species to extinction—through disruption of and loss of natural habitat, and may soon have no backup. So, it seems timely that we consider expanding food production with lesser known perennials. We may in this way arrive again at the stability of diversity.

To begin, we must rethink our criteria for selection, or at least the priorities we assign. Bigger, juicier, prettier, and of greater productivity are becoming de-

creasingly tenable demands. If sustainability is important (consider the alternative!), then we need to include in our evaluation such factors as lessened input requirements, i.e., neglect tolerance, ability to perform on marginal land (much of our previously prime land now qualifies), suitability for polyculture.

No doubt, it is a challenge. But it beats almost certain disaster and famine!

We can go about hoping the "Government" or the land grant universities will take over and fix it all. But it seems that those institutions have something to do with how we got into this mess to start with. I'm not saying they did it to us; no, we did it to us, but if we can't turn it around, our grandchildren (those that survive) will be mighty upset. So what can you and I do?

We can explore the field called Ethnobotany. It covers both how people use plants, and plants people use. I'm not suggesting we all run out and enroll in a college course. Instead, we can approach the needed learning by trying, studying, revising and trying again; through joining and participating in organizations such as the Tennessee Native Plant Society, the North American Fruit Explorers, and the Northern Nut Growers Association; by subscribing to sympathetic publications such as *Coltsfoot*, *The Permaculture Activist*, *The Land Report*, *TIPSY*, and *Wonder Crops*; by utilizing local resources such as libraries, botanical

gardens, foraging, workshops; and of course lots of reading, thinking, discussing, observing, and taking chances.

Generally, I've found dealing with the smaller specialty nurseries to be not only most cost effective (less overhead), but also more productive, in that their catalogs have a higher ratio of information to promotion, and they tend to know their stuff (because they are growing, not merely selling) and they can carry the out-of-the-ordinary, with unusual traits noted.

It will be well worthwhile to make a start at learning and using the Latin binomials, genus and species, as they tend to be constant the world over. Common names are frequently local names, and can vary from place to place, causing confusion.

Don't worry how to say the Latin names. A few good books and some catalogs with pronunciation guides, some hanging out with experienced plant freaks, and a few years of practice, and you'll do well. Latin is, after all, one of the main languages which helped shape modern English.

Along with finding out which plants might be useful, we can be studying their needs (soil pH and type, moisture requirements, light, season length, temperature tolerance, etc.) and properties (height, woody/herbaceous, bearing age, general habits, etc.).

We can then compare these with the potentials and limitations of the given situation and begin to design intentional communities of plants, to more fully use the available space, time, and light, giving us greater net yields of diverse crops over longer seasons without constantly scratching it all up and starting over—sustainability! By observing and using such phenomena as microclimates, natural companionability, and succession, we can reconnect to the green world and become healers and stewards, ensuring our own survival as well!

References

Plants, Some Characteristics and Uses

- Rose Hips (*Rosa rugosa*)—beauty, fragrance, edible fruits, erosion control, hedge, 1/2 day + sun.
- Autumn Olive (*Eleagnus umbellata*)—fragrance, edible fruits, nitrogen-fixation, nurse plant, high hedge.
- Hazel (*Corylus americana*)—erosion control, edible nuts, crafts material, edge species, tall hedge. (European filbert doesn't like southeast US.)

- Milkweed (*Asclepias syriaca*)—herbaceous perennial, erosion control, weed tolerant, young shoots, leaves, flowers, and pods edible, three crops per year, butterfly forage.

- Bamboos (mostly *Phyllostachys* spp.)—soil binder, hedge, edible shoots (I'm experimenting with 40+ species.)

- Service Berries (*Amelanchier alnifolia*, especially Regent, Smoky, Success)—native, several species from 3' to 20', edge, sweet berry, pretty flowers, tolerant of early frost and drought.

- Boysenberry (*Rubus* hybrid)—thornless, large pink flowers and huge (1" x 2") juicy fruit over a 2-month period, medium hedge.

- Chinese Chestnut (*Castanea mollissima* & hybrids)—blight resistant, bears



Autumn Olive

year round, small tree, large sweet nuts.

- Daylilies (*Heemerocallis fulva* & hybrids)—herbaceous perennial with edible flowers, shoots, and bulbs, erosion control, some var. have long bearing period, wide range of colors, some with 8" blossoms, dried spent blooms substitute for tomatoes in soups and stews.

- Sunchoke/Jerusalem Artichoke (*Helianthus tuberosus*)—four kinds now available, edible tubers, grows in marginal land.

- Air Potatoes (*Dioscorea opposita*, syn. *D. batatas*)—quick summer screen on trellis, yellow fall color; small potatoes form in leaf aril annually or can dig large edible root; cinnamon smell to flowers.

- Black Currant (*Ribes nigrum*)—thornless, understory shrub, high in vitamin C, "Consort" does not host pine blister.

- Shiitake Mushrooms—easy to start

on oak logs, 16-18 mo. to first crop, 80% shade, 2 annual crops when temperature averages 50F.

- Native Persimmon (*Diospyros virginiana*)—specialty timber, high-sugar fruits keep on tree through early winter, eaten raw or dried, leaves high in Vit. C, roasted seeds for coffee substitute.

Organizations

North American Fruit Explorers. \$8/yr. Member-generated quarterly newsletter. RR 1, Box 94, Chapin, IL 62628.

Northern Nut Growers Assoc. \$15/yr. Newsletter & annual report. 9870 S. Palmer Rd., New Carlisle, OH 45344.

Periodicals

Coltsfoot (In appreciation of wild plants) \$10/yr, bi-monthly. Box 313A, Shipman, VA 22971.

photo by Peter Bane

The Land Report \$5/yr. (research into perennial grains) The Land Inst., 2440 E. Water Well Rd., Salina, KA 67401.

Wonder Crops \$5/yr. Natural Food Institute, Box 185 W.M.B., Dudley, MA 01570.

Books

Hortus Third, \$125 retail, \$19.95 from The Garden Book Club, 250 W. 57th St., New York, NY 10107 (agreement to buy four more books in a year—good deal).

Peterson's Field Guide to Edible Wild Plants. Δ

Adam Turtle is currently doing research, trials, and consulting on several hundred candidate species. He is requesting help with his research. If interested, write to him at Earth Advocate Research Associates, RD1, Box 334 A-2, Summertown, TN 38483. Include SASE.

In and Out of Demand

David Theodoropoulos and
Sheri Calkins

J.L.Hudson, Seedsman

Seeds for immunostimulatory plants and their relatives are in high demand. A steady request for *Echinacea* spp. remains while an increasing demand exists for *Baptisia* spp., *Lomatium* spp., *Althea officinalis*, and *Ipomoea* as a cardiovascular adaptogen and immune system modulator. Shortages of *Baptisia* and *Echinacea* are past and we are meeting demand, though *E. angustifolia* seed is passing \$300/# in cases, as compared with *E. purpurea* at \$10-\$20/#. As demand rises in the States, *E. angustifolia* has recently been declared a noxious weed in New Zealand. Residents of that country take note; noxious weed or

potential crop!

Demand continues for Chinese medicinal plants *Bupleurum*, *Astragalus*, and *Angelica*, but since seeds of the Asian species are rare, investigators are turning towards their relatives, particularly the North American *Angelicas*. The Ayurvedic medicinals and the adaptogens *Withania* and *Eleutherococcus senticosus*, Siberian ginseng, are also in demand with limited availability of *Eleutherococcus* seed this year.

Recent demands from blood workers for *Coriandrum*, *Dolichos* (*Macrotyloma*), and *Pueraria lobata* have subsided, while *Ricinus* varieties are receiving new interest among researchers, coinciding with a sharp rise in public demand, particularly from the Plains states.

Research demand for *Convolvulaceae*

has diminished and has been replaced by public demand for *Ipomoea quamoclit*, *Mina lobata* (both of which are particularly unavailable), *Merremia sibirica*, *Operculinas Calonyction*, as an ongoing trend away from double-flowered ornamentals and back to the grace of single-flowered types. The dried floral market is drifting away from common species like *Limonium*, and focusing on more unusual genera: *Fibigia*, *Desmanthus*, *Ludwigia*, *Banksia*, *Artemisia annua*, etc.

The demand for heirloom vegetables (old land races), continues to grow. Our most popular heirloom this year is the Purple Calabash Tomato, a cultivar resembling those pictured in 16th century herbals. They are described as "small, variable, knobby, ruffled fruits, the most intensely flavored and the most drought-resistant tomato we have ever grown." Letters raving about the taste are the rule,

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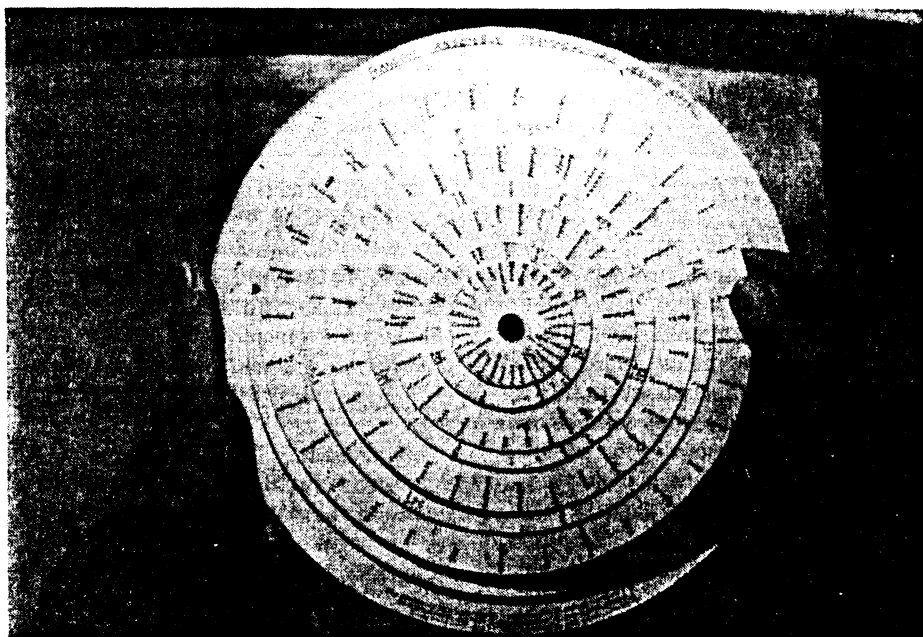
A New Tool for Permaculture Design

Peter Light

The "Random Assembly Permaculture Design Wheel" extends the usefulness of the random assembly method of design presented by Bill Mollison in *Permaculture: A Practical Guide for a Sustainable Future*, pp. 47-48, by placing and repeating design components and connector words on a series of concentric, rotating cardboard disks. The components are repeated four times, and the connectors three times. I have compiled 32 components and 18 connectors. More could be added, others dropped or reworded, although I can't think of any more connector words.

Working with two components and one connector at a time gives 17,856 possible arrangements; three components and two connectors give 9,642,240 connections; and four components and three connectors give 5,033,269,280 combinations!

The components I have chosen for this prototype are: *barrier hedge, chicken house, chickens, compost pile, compound, creek, ducks, fence, firecircle, forest, garden, greenhouse, house, lawn, orchard, outhouse, pasture, planis, pond, rabbits, raft, recreation, sauna, storage, tap, tree, trellis, vine, windbreak, windmill, woodlot, and woodshed*. The connectors are: *on, after, before, in, is, and, between, hanging from, around, crossing, attached to, facing, beside, away from, under, instead of, over and evolving into*.



Random Assembly Permaculture Design Wheel

photo by Peter Light

All the disks were cut from a single sheet of stiff (one millimeter thick), white cardboard obtained at a stationery or art supply store. The central pivot was improvised from a copper nail and a washer. Other possibilities could be experimented with.

Some method of waterproofing this tool, such as laminating the individual disks or coating them with some kind of urethane, would make it more durable, of course, and allow it to be taken outdoors during inclement weather.

Please, of course, feel free to copy and improve upon this idea for your own use. Anyone with entrepreneurial spirit, experience, and skill who would like to mass produce it, either as a home industry or by some commercial firm, please contact me for partnership arrangements. That's a matter of trust. Δ

Peter Light is a PC consultant currently researching slugs, sawdust, and sheet mulching. He lives and invents in Sechtel, BC, Canada.

and as expected, others find it too strong. Ugly but tasty is the consensus, a good choice for sauces, vinegars, specialty restaurants and small growers. Tomato breeders take note: there is strong public demand for more flavor than found in those "red round fleshy things" sold in the supermarkets. Unusual hot peppers are also popular. Together with the tomato comments, this demonstrates a clear rising trend away from bland flavors.

A Unique Plant

Nicandra physalodes is a vigorous 3-8' Solanaceous annual with inch-wide blue flowers, followed by five-winged, inflated, *Physalis*-like fruits. Bearing the interesting epithet, "shoo-fly plant," folk tradition in the South and Midwest holds that the plant either repels or kills houseflies. Also, according to an elderly seedsman, he grew it in his greenhouse because it "attracts and kills whiteflies." Several years ago we were startled suddenly to receive several thousand requests for this plant. I would like to share with you some of the many letters we received: "My grandmother grew it by the kitchen door." "We grew it around the house because we kept pigs."

"We grew it around the barn." Some claimed it killed the flies outright while others stated that it merely repelled flies. Some said that the plant attracted flies when immature, but when it flowered it had no effect on flies, while others declared the plant was only effective after several years growth.

We would be interested to hear of any research supporting these anecdotes. Some years ago a paper crossed my desk detailing the withanolides in the plant as anti-feedant compounds; but can these account for its actions? Considering the number of anecdotes we received and the remarkable interest the plant has generated in the public (surpassing by a factor of 10 anything else we have seen in nearly two decades), the plant merits further investigation.

War Affects Business

Geopolitical conflict continues to interrupt the free flow of germplasm. Communications from clients in Kuwait and Saudi Arabia has ceased and we regret to report that our main supplier of western Himalayan seeds, Ah. Virinender Suri, was shot to death before his wife's eyes by religious fundamentalists at his

home in Sringar, Kashmir. Mrs. Suri, now homeless and in exile, has succeeded in securing some seeds through intermediaries, but the outlook for continued supplies is poor. For decades Ah. Virinender Suri disseminated many plants of medicinal and botanical interest, contributed to our knowledge of the Himalayan flora, and preserved botanical diversity. We honor the memory of this fine man, his life and work, and love of the natural world. Δ

Reprinted from Seeds for Thought, an occasional column for the newsletter of the Society for Economic Botany by J.L. Hudson, Seedsman, PO Box 1058, Redwood City, CA 94064. J.L. Hudson specialize in ethnobotanical seeds, seeds of useful plants which have been in cultivation. Their catalog, a remarkable document still available for only \$1.00, lists many traditional and heirloom varieties from regions around the globe available through no other commercial source. Membership in the Society for Economic Botany is \$30/yr for individuals. Write: Economic Botany Business Office, PO Box 1897, Lawrence, KS 66044-8897 USA tel: 913-843-1221

Plants in Permaculture: Leucaena

Franklin W. Martin

Names: *Leucaena leucocephala*, leucaena, ipil-ipil, haole koa.

Principal Use: Tropical forage.

Brief Description: Small- to medium-sized, rapidly growing leguminous tree, with pinnately compound leaves, flowers clustered in a white to grey pincushion type flower, and clusters of flat pods containing flat, brownish seeds.

Climatic Adaptation: Adapted principally to the hot, somewhat dry tropics, growing best in almost neutral to somewhat alkaline soils. Once established it can tolerate very dry conditions, and yet can also be established, but with some difficulty, in heavy, poorly drained clay in the hot humid tropics.

Yields:

Food: The tender branch tips and the very young pods are frequently cooked as vegetables. The seeds are sometimes roasted as a coffee extender or substitute.

Feed: A favorite feed of cattle, leucaena is best used at a ratio of 1:2 leucaena: grass. Causes loss of hair in the case of some animals. A very valuable feed if used cautiously.

Other products: Green foliage for use

as mulch or green manure, or dried and used as fertilizer. Produces large amounts of firewood of fair quality.

Suitability for Special Purposes:

Living fence: Suitable, but cannot be established from cuttings.

Hedge: Excellent. Needs heavy pruning.

Barrier plant: Very good.

Living trellis: Suitable for some vigorously climbing crops.

Windbreak: Not tall enough by itself. May be used with other species.

Shade: No.

Erosion control: Useful to hold soil with deep roots, cover surfaces.

Earthworks: Fair, wood not durable.

Alley cropping: The material of choice for this activity.

Animal shelter: Fair.

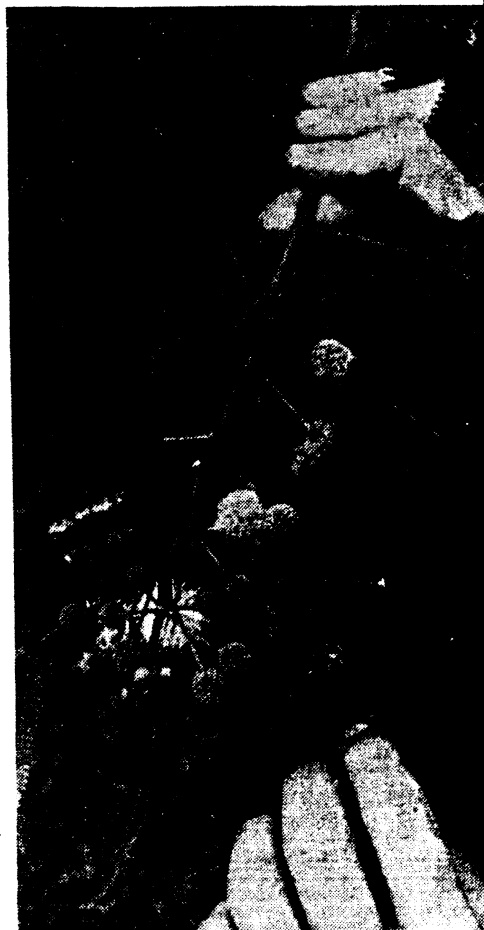
Nitrogen fixation: Yes.

Lumber: Fair, wood of poor quality.

Fuel: Excellent.

Culture: Soak seed in water of 80°C for 3-4 minutes, then cool in running water and air dry. Seeds may then be planted immediately or later. In some soils must be inoculated with *Rhizobium*. Strips for planting should be cleared and plowed.

In alleys the seeds are planted in furrows



Leucaena flowering

photo by Peter Bane

A Manual Indexed Filing System for Permaculture Information

Bill Fleming

Permaculture design work requires the consultant to collect, use and communicate a large amount of information. An effective information storage and retrieval system is an essential part of the consultant's equipment. This article describes briefly a proven manual indexed filing system (MIFS) developed by the author for his office and now being used to store and retrieve permaculture information.

Requirements for a working MIFS are: (1) Skilled people, for whom the filing system is a working "external memory." Without competent users, any information system becomes a channel for "garbage in, garbage out"; (2) Functional design, assuring a smooth working of the system internally, and in the exchange between system and users. This is a technical/psychological design challenge; (3) Physical equipment, kept as simple and inexpensive as possible. The elegance of the MIFS design lies in its achieving a powerful information storage and retrieval system with minimal equipment.

Filing System as External Memory

The MIFS is intended to contain current, high-value information frequently

used by the consultant. This information is supplemental to that held in the consultant's mind, or internal memory. The MIFS is designed to function as an external memory, operating in a manner similar to one's internal memory.

Access to personal memory occurs largely by association—a chain of thoughts, each linked to the next, draws ideas from memory into working consciousness.

The MIFS is also accessed through associative thinking, through the device

and for another "acorns," and both must point to the oak tree information.

The index is the mechanism that enables keywords to point to files. Each alphabetically ordered keyword is associated with the title and address of a file. This information is preserved, and displayed, in the index.

When the consultant has a question or other need for information, and wishes to probe her external memory for that information, the first step is to think of keywords. The second step is to refer to a desk-top card index, seeking keywords and noting titles of files. When the desired file title is found, the address of its folder is noted. The third step is to locate the folder and scan its contents.

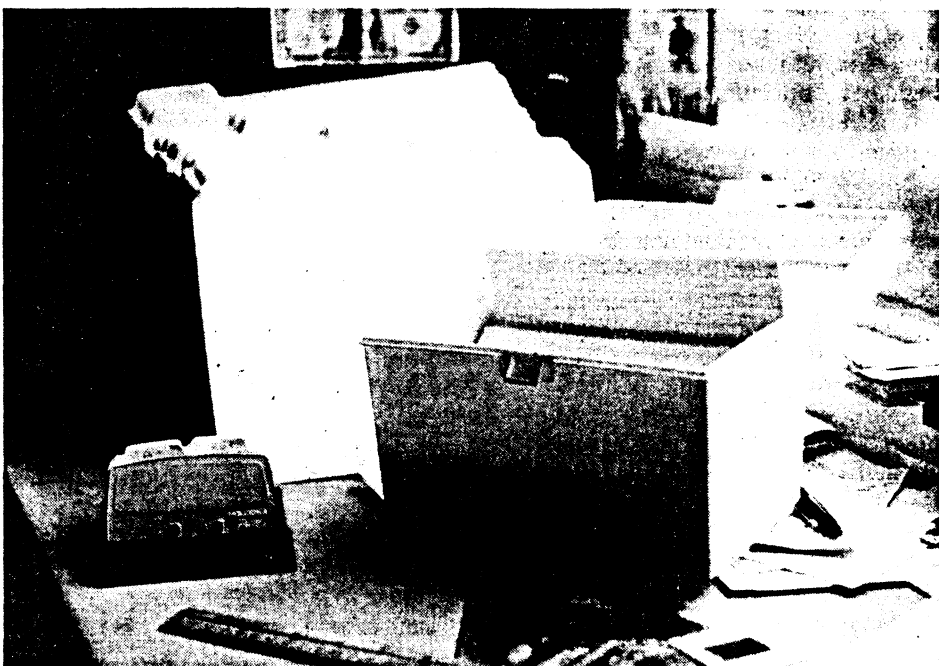


photo by Peter Bane

Leucaena, continued

2.5 cm deep and 1-2 cm apart (20 kg seeds/ha) and thinned to 10-20 cm between trees. Young trees need protection from weeds. They are established faster with some fertilizer. Growth is slow at first, then rapid. Frequent pruning is necessary, and prunings are used for mulch, fuel, and feed.

Special Problems: Often not successful in very acidic soil.

Toxic Characteristics: The foliage contains a poisonous amino acid, mimosine, that causes loss of hair.

Other: Appropriate varieties are very important. The giant type is best in alley cropping, Peru or Cunningham in pastures. The small West Indian form tends to be very weedy. Δ

Franklin Martin, author of "Edible Leaves of the Tropics," was for many years Director of the Mayaguez Institute of Tropical Agriculture. He now divides his time between Florida & Hawaii. His column, "Plants in PC" will continue here

of keywords. Keywords are the "gut" one-word descriptors that occur spontaneously to a person when thinking about a topic, problem, or question.

People differ in how they think, and in how they relate to different subjects. The keywords they generate will therefore be quite personal. This personal link must be preserved by the MIFS, as it is the essential element by which the MIFS functions as each user's external memory.

For example, a folder containing information about oak trees will have associations that vary with the user's reasons for thinking about it. One might be interested in lumber, another in firewood—keywords "lumber" and "firewood" must both point to the oak tree information. Or, each person might be interested in fodder from oak trees—the keyword for one person might be "mast"

In practice this search process is almost automatic, enabling the MIFS to function usefully as an external memory. In addition, the index can evolve and "learn" as associations change over time, keeping external and internal memories in tune with each other.

Functional Design of Filing System

Functional requirements for the MIFS include:

1. Adding information.
 2. Deleting information.
 3. Relating questions to information.
 4. Finding and getting folders from storage.
 5. Replacing folders in storage.
 6. Physical storage of folders and index.
 7. Securing, checking, and regenerating information.
1. Adding information

The MIFS starts as a series of numbered folders; 100 folders can make a very useful small system.

New information entering the system may be assigned to a folder that already contains related information. Or, an empty folder may be used if a new category of information is being started. Decisions about categories are made by users as the system works. An essential aspect of the MIFS is that it breaks the "filing bottleneck" by avoiding impossible decisions about subject filing categories. Every bit of information worth saving can be instantly filed, with full assurance that it can be found again, and that it can easily be relocated with associated information should that be desired.

Assume that the information to be filed is field notes from a site visit. First, a keyword is assigned—in this case, it could be related to client name. Or, several keywords could be assigned—perhaps client name, job number, and site location—if the user knows that she will want to access (and cross-index) her information along those dimensions. If a new keyword is used, new index cards are prepared and added to the index.

Next, the new information is related to a specific folder. If the new information is to join other information in a folder already assigned, the three-digit folder number will be obtained from the index (or, frequently, from the user's internal memory), the folder located (see #4 below), and the new information added to it. If a new folder is to be assigned, any empty folder is selected from the catalog of folders (described below), a title written upon its cover in pencil, and the new information added to the newly-assigned folder.

Finally, the folder is replaced in the series of folders, and the process of adding information to the MIFS is complete.

2. Deleting Information

Adding information to the MIFS is analogous to an organism's assimilation, and deleting information to its elimination. Without elimination, the organism or the MIFS—dies. Deleting information no longer useful is an essential, and continual, requirement for the MIFS.

Papers can be culled from a folder as it is used. Bits of information still useful can be consolidated onto a single sheet of paper. Duplicate information can be noted and eliminated. This steady pruning assures that only relevant information is retained in the MIFS, keeping its size under strict control and increasing its usefulness.

It frequently happens that an entire folder becomes useless. In that case, the contents are dumped, perhaps retaining odd bits to add to other continuing folders. The title and keywords written on the cover of the folder are erased (write in pencil!), the entry in the catalog list is also erased, the index cards pulled and thrown away, and the folder returned to its numbered place in the series of folders. A folder can be re-used many times.

The entire process of deleting information takes about as much time to read about as to do. The key to the process is that the user of the MIFS maintains it. A secretary cannot make decisions to delete information; the user alone can decide what to "forget" from external memory.

By continual selective deleting of information, the size of the MIFS is kept under control. For example, the author's hardworking MIFS occupies less than five feet of shelf space (using lateral folders) after eight years of use.

3. Relating Questions to Information

Information is brought to bear on questions through associative thinking, keywords, and the index, which were described in the section on External Memory.

4. Finding and Getting Folders from Storage

The first step is to identify the desired folder by its number. This is achieved by using the index. The second step is to find the folder, scanning for its large, color-coded number without touching the folders. The folders are in numeric order, and the scan and locating process is very fast and certain. The third step is to remove the folder, perhaps substituting a red folder-size "OUT" card on which the user has written the date and his name.

5. Replacing Folders in Storage

Replacing folders in storage is a bottleneck in many filing systems, and also a source of major difficulty when folders are misplaced and lost among unrelated folders.

The MIFS uses color coding and numerical sequencing to make refiling fast and accurate, and to make any misplaced file easily visible.

Accuracy and speed of refiling is further increased by replacing folders anywhere within a color-identified "bucket" of ten folders. (Search within this bucket for a folder is done randomly, a fast and easy process.)

6. Physical Storage of Folders and Index

The use of lateral folders—the type with the tab on one end, rather than on

top—makes it possible to store the MIFS folders on open shelves. It is convenient to use 4"-wide open-front bases to hold the folders, as this provides support and makes it very easy to place the MIFS on any flat surface, such as the back of a work table.

The index is small—about 13" x 12"—and can be stored on shelf, desktop, or in a drawer.

Closed filing cabinets are, of course, widely available and can be used when their cost is justified by need for physical and fire security.

7. Securing, Checking and Regenerating Information

Loss of small but important pieces of information from the MIFS is considered to be a greater practical problem than either physical or fire protection, which can be effected by simply using suitable cabinets.

It is essential that folders within the MIFS be locatable even if the index fails. Two levels of redundancy are provided: (1) First, a catalog list of all folders containing their date of assignment, the title assigned, and the keywords is kept in folder number 000, the first folder in the numerical series of folders. This can be used to locate folders, and to regenerate the index; (2) Second, each folder is marked on its cover with the title and keywords assigned to it. Folders can therefore be scanned by title and keyword, bypassing the identifying number. Provided that all folders are available, this information is sufficient to completely regenerate catalog list and index.

Locating folders removed from the MIFS is achieved by substituting for the folders red, folder-sized OUT cards, signed and dated by the user.

Regathering the contents of folders after being dropped, scattered and/or mixed is achieved by noting on each piece of paper the number of its "home" folder. This information, the date and perhaps the name of the person adding it, is routinely noted in pencil on papers when they first enter the folder.

The absence of a folder, unmarked by an OUT card, can be discerned by noting the missing number in the numerical sequence used to identify folders. The catalog will show the title of the missing folder, if it has been assigned, or will show that it is empty.

There are additional levels of security and redundancy available. However, considerable experimenting by the author has shown that the protections described above are achievable with little extra

time or cost, and meet almost all of the practical problems encountered in using the MIFS.

Physical Equipment

The power of the MIFS lies in its software. Its hardware is simple, compact and inexpensive.

Supplies needed for a basic MIFS are:

100 (or more) letter-size lateral file folders

10 rolls (numbers 0 through 9) adhesive folder numbers

1 Rolodex File Jr.TM, with A-Z tabs and 1000 2" x 4" index cards

20 "OUT" cards

10 boxes, 4" wide and open at top and front

These items can be ordered from local office supply stores. If there is sufficient demand, the author will organize and sell MIFS kits of materials selected by him, delivered direct by UPS. Cost has not been determined—if you are interested, write MIFS KIT, Rt. 1, Box 419, Otto, NC 28763, enclosing self-addressed stamped envelope. Ordering information will be to sent you.

It is highly recommended that your MIFS be near your desk. It can be on shelves (combined with books), on the back of desk or table, or on a "work organizer" above the back of your desk. The author has for three years had a MIFS in an overhead cabinet in a motor home used as a portable office.

Conclusion

The basic MIFS will be a workhorse information storage and retrieval system for permaculture consultants. It can absorb and recall all kinds of data—plant species data, job records, messages, accounting records, etc.—without separation, in a single organized body of information.

The serious problems inherent in subject-filing schemes are completely avoided. Initial classification and filing, finding of files, avoiding loss of files, and purging files are all facilitated by the design of the MIFS.

The basic MIFS can be easily and inexpensively expanded. And it can be computer-indexed whenever necessary equipment is available; however, the manual index will be found to be remarkably fast, simple, reliable, and forgiving.

Various data-base schemes can be designed to work within the MIFS. For example, the author and Chuck Marsh, in coordination with John Wires, have developed a database scheme for organizing plant species data within a bi-

oregion. (For a copy of the data-base scheme, write to PLANT DATABASE, Rt. 1, Box 419, Otto, NC 28763, enclosing SASE.)

Effective application of permaculture design concepts requires clear seeing and listening; access to a rich base of relevant, accurate, and reliable information; and effective communication of designs and other information to clients, associates and the general public. Skill in

communication and information management will contribute greatly to the success of permaculture. The MIFS described in this article is offered as one contribution to the achievement of that success. Δ

Bill Fleming is an engineer, inventor, and permaculture consultant in the Katiah Bioregion. Send comments to him at PO Box 7572, Asheville NC 28802.

Why Did God Make Root Maggots?

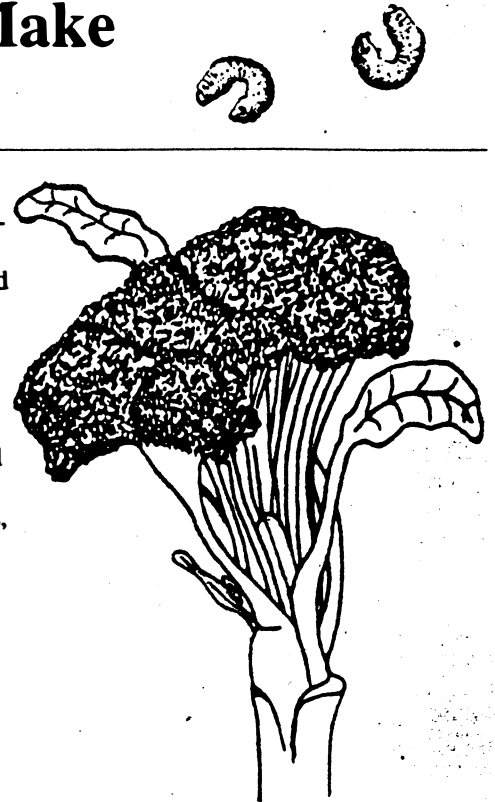
Elaine Myers

I am passionately dedicated to cultivating a vibrantly healthy garden with the natural energy of a diverse, well balanced system. I experience my garden as a place to practice unconditional love.

When the slugs mow down the young lettuce plants, and the root maggots devastate the broccoli, I have another opportunity to respond with love, instead of anger and poisons. Neither the slugs nor the root maggots have evil intentions, to be countered with an attitude of war. Rather, we humans have created and manipulated such an imbalance in our gardening environment that the natural actions of these innocent creatures are interpreted as evil and vicious. We are blind to our own inappropriate actions, and we project destructive intentions onto these other beings.

Most traditional gardening information and techniques focus on how we humans can get rid of the pests. My relationship with my garden was totally transformed when I asked "Why did God make root maggots?"

Instead of asking *how* I can *kill* root maggots, I asked "Why did Gaia-Earth Mother-Goddess-Planetary Energy, materialize in this configuration?" Or, to put it another way, "How can root maggots be *good* for the broccoli?" Organisms naturally evolve to be in harmony with their environment. Predators, by culling the weak and infirm, keep the overall population of their prey strong. As Farley Mowat relates in *Never Cry Wolf*, the wolves keep the caribou strong. My question about the root maggots led me through a thoughtful, protracted series of observations on the natural life cycle of the *Brassica oleracea* (broccoli, kale, cabbage, Brussels sprouts, kohlrabi).



Stalking the Wild Broccoli

Left to their own energy to live and reproduce, the brassicas adopt the habit of living as *winter annuals*. They evolved in an area of mild maritime winters, and warm, dry summers. As winter annuals, they germinate in the late summer, when the first windy wet storm rolls in off the ocean and thoroughly soaks the soil after the summer heat has passed. The dry seed heads are shattered by the wind, and the seedlings germinate on moist soil. A single mature plant produces tens of thousands of seeds. If the soil is disturbed and free of competing plants, brassicas come up in a thick carpet that totally covers the surface of the soil. Germination is enhanced when there are several weeks of cool, moist weather, around the autumn equinox.

Often, around the end of September or the beginning of October, there is a little burst of warmth. The geese are flying

south, the spiders are spinning webs, and root maggot flies are laying their eggs. And it is a *good* thing that those maggots are there to thin that thick carpet of seedlings. When the brassica plants are crowded, they produce small, stunted plants. If the root maggots kill nine out of 10 plants, there will be a natural selection for vigorous growth, and the surviving plants have more room to grow.

These nicely thinned plants now grow slowly through the winter, surviving short periods of very cold weather under a blanket of snow. Space between the plants is covered by other weedy winter annuals, like chickweed and henbit. This living mulch keeps dirt from splashing up on the leaves and infecting the plants with rot organisms that live in the soil.

Starting in February, as the weather warms and the days lengthen, the brassicas shoot up, from 12" to 30" in just a couple of months. By April, when the overwintered fly pupae emerge and start laying eggs, the brassicas are large, fast-growing plants with a living mulch around the base of the plants.

This living mulch provides cover for various beetles and ground spiders. If a fly lands at the base of the plant to lay her eggs, she just might be attacked by a spider before she can lay very many eggs. Even if she does lay a nice clutch of eggs, a hungry beetle might find and eat those eggs before they hatch.

By the end of May, the brassicas are in full bloom, providing nectar for various beneficial wasps and bees. Gradually, as the days grow warm and long, the seed ripens, to stand dry and dormant through the summer drought. By August, with population explosion of the cabbage white butterfly, the leaves are dying and ready to be recycled as fodder for their larvae. All those green worms and maggots are doing us service as garbage disposals. As the seed dries, the plants die, and any root maggots that made it past the spiders and beetles help fertilize the soil with their manure as they chew up the roots of the dying plants.

In this natural cycle, these plants and animals interact in a mutually beneficial, balanced dance of life. Unfortunately, the usual spring planting by humans pushes the system out of balance. Unnatural timing and cultural practices create pest problems in the garden.

The Gardener Interferes

There are several factors that create an imbalance in the brassica/root maggot system. First, we humans do the spacing

of the plants. Whether it is by direct seeding, or setting out transplants, we want most of the plants to survive, not just one out of ten, especially when we are buying expensive hybrid seed for high production. Secondly, most gardens that have early brassica seedlings have a lot of freshly tilled, bare soil around the plants. When the heavy spring rains come down, the soil splashes up on the leaves, rot organisms stress the young plants, and their growth slows down. The soil surface becomes compacted into a tight crust, restricting the oxygen flow through the soil, and becoming a desert inhospitable for spiders, beetles, and other predatory critters. Finally, in late spring, when the main egg-laying season begins, the plants, instead of being 30" with extensive roots, are only 3" tall, with small, stunted, stressed root systems.

When there is no protective cover around the plants to shelter any predators, the fly can take her time and lay lots of eggs. With the beetles and spiders living elsewhere (under cover), most of the maggot eggs survive, hatch, and descend to feed on the roots. The same number of root maggots do proportionately greater damage to the small root systems. As long as the weather is cool and wet, the damaged roots can cope with the moisture needs of the plants. However, on a warm day in late spring or early summer, plants may quickly wilt and die.

As spring plants, the brassicas are out of step with their natural environment.

Unfortunately, for the cold-winter continental climate that most of North America experiences, over-wintering is not possible. Not adapted to prolonged, hard freezes, the plants turn to mush. If your winter cold spells seldom go below 20 degrees F, great, plant in August for spring broccoli and cauliflower. For the others, how can we have spring plantings, and still be in harmony with the natural cycle?

Most of the garden information on controlling root maggots recommends poisons (diazinon) or a barrier (energy intensive, non-biodegradable, non-recyclable). I didn't want to use poisons, as that is contrary to my philosophy of love in the garden, and besides, poisons upset the delicate balance of prey/predator in the small organisms that live in a healthy soil. I also want to minimize my use of non-renewable energy, and keep the garden an energy-producing system, not a net energy loss.

A Tender Balance

It is possible to create a dance of love and life energy that honors the natural evolution of the brassicas and their related organisms, while extending their habitat to spring-sown gardens.

Preparations start the previous fall with a compost pile on the site of the future brassica stand. The soil becomes well fertilized, loose and well-aerated, with lots of beetles, spiders, and other predators living there.

After February 1, I listen carefully for bird songs and peepers calling; the sign here that early spring has arrived. I seed



my early flats to the sonic bloom of the winter wren song.

Around the Spring Equinox, when I set out my little seedlings or start pinches of seed directly in the soil, I cover each plant or pinch with a durable cloche or cover. These cloches are made from recycled pop bottles or milk jugs. I cut the bottom off, take off the label and the lid, and press the cut edge into the earth so the cloche won't blow away. These covers protect the plants from slugs, root maggot flies, and heavy spring rains. I do not have any trouble with pests entering the open top, but a friend with especially ravenous slugs puts cheese cloth over the openings. I lay a thick mulch between the covered plants to protect the soil surface and to provide shelter for the spiders and beetles.

After about three weeks (for transplants) to a month (for direct seeding), the plants are too big for their covers. When I uncover the plants, I pull the mulch close to the stem of the plant, and make it at least 2" thick. As the weather warms up, and the general biological activity starts to rev up in the late spring, I start inspecting for root maggot eggs. The fly usually tucks them under a couple of crumbs of earth. By very lightly brushing the soil away from the base of the plant, the eggs can be seen. They are white, oblong, and about 1/2 millimeter long, about the size of this period:

When the flies start laying, I start "changing the diaper." I put a handful of fine soil, sand, or grass clippings around the base of the plant. Twice a week during the height of the laying season, I remove the "diaper" (with the maggot eggs in it), drop it on the path or compost pile, and replenish with a fresh handful. For any brassicas which are large because they have overwintered, the fly can perform her natural function unmolested.

I find changing the diaper to be much more effective than either sawdust or wood ashes for survival sand and general vigor of the plants. It takes less than two minutes per plant per growing season to provide this crucial protection.

By the end of May, the egg laying

starts to taper off, and I rely on the predatory critters under the thick mulch to keep things in balance. To help the young plants outgrow the maggots that get past both me and the beetles, I give weekly feedings of a dilute liquid fertilizer such as compost tea, fish emulsion, or liquid manure. My favorite liquid fertilizer is made by mixing urine and rock phosphate, letting it sit a day, then pouring about one tablespoon around the base of each plant. After a few hours, I water the plants, and wash the diluted brew into the root zone.

By the beginning of June, the rapidly growing plants form a solid canopy of leaves over the ground, and by July (before the green cabbage worms are out in great numbers), I am harvesting beautiful, clean heads of broccoli. By planting in rich inhabited soil, giving the predators safe shelter, and keeping the soil loose and aerated under a thick mulch, protecting the plants with cloches when they are very small and vulnerable, and giving regular feedings for maximum growth, we can co-create a loving, dynamically balanced environment for spring-planted brassicas.

When an organism creates a disproportionate disruption in my garden, I do not respond with anger and poisons. I accept those beings with love, and remember that they perform a necessary function in the complex web of life. I make careful observations to see why the system is out of balance: my actions? the soil? the weather? a variety not suited to this environment? What is the most loving touch that will help restore balance and harmony to this natural process? I experience great joy and happiness co-creating a garden growing with unconditional love.

"Love in the Garden"

-- Sunrise and Jessica Fletcher*

Love in the garden, think and feel.
Love in the garden, grow and heal.
Love in the garden, hoe and rake.
Love in the garden, give and take.
Prepare the soil, and plant the seeds.
Take time to watch for what it needs.
Eat it!

*Lucky Mud Music
Skamokawa, WA 98647

Δ

Elaine Myers gardens in Rosburg, WA overlooking the mouth of the Columbia River. Her radio show may be heard Sunday mornings in Astoria, Ore. and vicinity.

The Permaculture Network A Design and Resource for a Sustainable World

To exercise responsibility for our actions on the large scale and to help make connections between elements of the network, *The Permaculture Activist* encourages Design Course graduates and readers of this magazine to contribute to the 1991 PC Designer's Directory.

We would like curriculum vitae (c.v.) from everyone living in North America who has completed a design course (anywhere in the world) and from everyone living anywhere who has completed a design course in North America. Please copy this page and send it to your friends and acquaintances who should be listed. The 1987 edition of this Directory listed over 400 individuals, an extraordinarily large proportion of the 450-some known graduates at that time. We imagine the number has nearly doubled.

Please read and respond to the questionnaire printed below. If you require more space, attach additional sheets. Feel free to enclose a resume, business card, or professional brochure. Return the completed form to us by March 1st.

We anticipate a price for the completed Directory of \$13.50. Those contributing to the directory may take advantage of the pre-publication price by sending \$10.00 to "The Permaculture Activist", U.S. funds please. All prices are post-paid anywhere in the world. Airmail postage extra, (U.S., Canada, Mexico-\$2; Western Hemisphere-\$3; Europe-\$5; Asia, Africa, Pacific-\$7).

Please provide the following information about yourself:

Name

Date, location, and teacher(s) of Permaculture Course you completed

Telephone: Home, Work, Fax, Email...

Business or Organization

Address

Occupation

Group Affiliations

Special Licenses

What land do you own or manage?

Bioregion. Any organizing activity?

Products and Services you provide for Permaculture:

Other skills related to Permaculture:

COMMENTS OR SUGGESTIONS?

Coming Soon--

- A Native American Permaculture
- The Fifth Bioregional Congress
- Mushrooms in the Edible Landscape

The Permaculture Activist
Route 1, Box 38
Primm Springs, TN 38476

Re-creating a Rainforest

Marsha Hänzi

This is the story of one family's solitary adventure which promises to transform Brazilian agriculture. The place: Pirai Bahia, hidden in tropical mountains once green with luxuriant rainforests, now a sad landscape of semi-abandoned cocoa farms, poor secondary forests, and even poorer pastures.

Ten kilometers beyond the village, however, the bleak landscape changes. The road is lined with tall cane grass behind which one spies a profuse mixture of banana, cocoa, jackfruit, palms, and native rainforest trees. The shady entrance leads to a primitive three-story wood chalet, all hand-hewn including the shingles, making it hardly distinguishable from the surrounding trees. If you arrive at mealtimes, you may be astonished to hear Bach motets perfectly sung in four-part harmony!

This is the home of Ernst and Renata Gotsch and their five children, ages five to seventeen, a family embarked on a long adventure of re-creating a tropical forest and learning to live from its products; this in a country where the common attitude toward trees is to cut them down to implant imported monoculture crops, leading invariably to ecological imbalance and even to desertification. The world today knows about the vast destruction of the Amazonian forests, destruction resulting from ignorance of the riches which such a forest can offer in foods, oils, waxes, fibers, and medicinals, not to mention water and oxygen.

Ernst Gotsch is proving that it is possible to manage a productive forest which is sustainable over hundreds of years. This forest, he affirms, not only produces typical crops such as bananas, cocoa, and pepper, but can also support chickens, pigs, and milk cows on its by-products, thus making the forest-dweller virtually self-sufficient. He makes the astonishing calculation that with his system one family should be able to live on one hectare of land!

But the road to this abundance has not been an easy one. Ernst, son of a Swiss farmer, experienced as a child the destruction of his family's centuries-old fruit trees in the name of "progress." The Swiss government paid each farmer a large sum of money for each tree cut. This proved to be the end of the small farmers' independence as the annual crops planted in the former orchards

could never duplicate the productivity of the adult trees. "Before we cut the trees, we bought practically nothing, not even sugar," he recalls nostalgically. "We made a syrup from pears which was our only form of sweetener." Ernst's father finally gave up farming, but his son never forgot the lesson: trees signify stability and independence.

Many years passed, and Ernst found himself working in experiments in plant genetics. Two Brazilian visitors to the Swiss laboratory invited him to pay them a visit in Brazil, and what he saw changed his life.

"The shock I received was so great that I became seriously ill, almost dying in a Brazilian hospital. Here I was, trying to manipulate the habits of plants to make them adapt to the artificial conditions we create for them instead of choosing plants in function of the natural ecosystem already existing. I saw ancient, complex forests being cut down to plant soybeans which then had to be protected with insecticides because there were no more natural insect predators. It became clear to me that agriculture, in order to survive, had to respect or re-create the natural conditions of each region."

The road back to Brazil after this first visit was a long one, passing via Costa Rica, where he first began testing his



The rainforest and its keeper

photo by Marsha Hänzi

Some of Ernst Gotsch's principles:

1. Trees will accept dense plantings as long as you respect the distances needed between individual species. It is better to plant too much than to risk leaving some areas bare. In any case, excess trees, when cut, serve as mulch.

2. There is no problem of introducing exotic plants as long as they originate from similar climates. (Even the banana is not native to Brazil.)

3. The plants transmit information to each other. It is important, therefore, not to let short-term plants reach fruiting, as they would pass this information along to the slower-growing trees, retarding their growth. (If they could talk, these plants would say something like: "OK, guys, let's stop growing now in order to put out flowers.") Ernst tries to maintain

all plants in a peak of growth.

4. Vegetable seeds are thrown on the mulch of newer plantings which are not yet in dense shade. Native vegetables are being investigated. Beans are planted in newly-cut areas, in holes opened in the dense mulch with the point of a machete.

5. Seeding directly in the forest produces stronger trees and is far cheaper than growing seedlings in the nursery.

6. There are no fixed formulas for creating a forest. It is better to observe the forests of the area and the gardens of the local houses to see what is growing well there. Each area is unique, and even different corners of the same farm can have drastically different conditions. Observation and intuition are essential.

agricultural insights, back to central Europe, and finally, in 1985, to Bahia. Backed financially by a Swiss businessman, Ernst bought a 400-acre farm covered with secondary forests. He intended to begin planting cocoa in the better, more primary forests of the land, taking advantage of the native fertility of these better pieces, but disaster struck, changing all his plans.

Some neighbors, hearing that a "gringo" had bought the farm, assumed that he would never frequent such a remote place, and burnt down 100 acres of the forests to make pastures for their own cattle. Thus Ernst took possession, not of a healthy secondary forest, but of a blackened wasteland and in his firm intention to resist all invaders, almost lost his life. The villagers, however, began to respect this "crazy Swiss" so determined to plant his trees in spite of every difficulty that they began to pressure the invaders to leave the family in peace, and in peace they have lived ever since.

But the situation was urgent: the land, impoverished and scarred, was in danger of eroding under the tropical rains. The family, working feverishly, planted the whole area in bananas, their favorite pioneer plant, to produce the maximum of organic matter. Under the protection and shade of the bananas, they then began to plant the seeds of the future forest. The going was at first slow, but as mulch built up, the land regained vigor and the trees began to grow.

Today, looking into this dense and healthy forest, one finds it hard to imagine that this all took place just five years ago. "Knowing what I know today, I think I could get the same results now in one and a half years," says Gotsch. Now that the naturally humid climate is re-established, rivers and streams, once dry, are flowing again, and native flora and fauna are beginning to reappear. Where rainforest seedlings appear, Gotsch's six employees are instructed to plant a pineapple, a living marker to indicate that this tiny tree is to be left alone in the periodic cleanings of the forest.

The first difficult phase is drawing to an end. The "crazy Swiss" is quickly becoming known in organic farming circles. The fruit trees are reaching maturity, and there are already buyers interested in their excellent dried bananas (prepared in a solar-wood oven). In fact, the exceptional quality of all the farm's products, pepper, cocoa, cloves, bananas, etc., has caught the attention of the European natural foods market. Ernst prides

himself on this, even though his way of processing is much more time-consuming than the normal industrial processes.

And now? The Gotsch family intend to dedicate themselves more to the social aspects of the farm. They will distribute lots to sharecroppers on an exchange basis, and hope to soon have a school there. (Their five children, fluent in German and Portuguese, study by correspondence.) They also dream of a visitor's center and a social area for the employees with a football field, etc. But one family, even if numerous, is not enough to handle so many projects. They depend on the arrival of more people willing to roll up their sleeves and work along with them, helping them to create a new way of living in a tropical forest.

And, Ernst confesses, there is another dream tucked away to be brought out when the Pirai project no longer needs his complete devotion: a similar project in the Bahian semi-arid region. He believes that it should be perfectly possible to create a productive forest in the near-desertic areas of Brazil. Who knows, maybe with an abundant tree cover these areas won't even be so dry any more. Perhaps "Sertao" (the name of this region) need not necessarily rhyme with misery and starvation. Δ

Marsha Hânzi is a permaculture consultant and teacher. For more information write her at Cond. Aguas Finas, Quadra E, Lot 4, Lauro de Freitas, Bahia, 42700 BRASIL.

Exotic Species and the Preservation of Diversity

J. L. Hudson & S. Calkins

From the beginning I have stressed open-pollinated seeds and the preservation of our genetic resources. I support the free and unrestricted worldwide exchange of seeds and knowledge.

This year I would like to talk about the popular idea that "non-native" species are somehow harmful, that "aggressive exotics" can invade ecosystems and destroy "native species." It surprises me to see the public and biologists alike uncritically accept this absurd notion.

"But the Emperor has no clothes!" — Folktale.

In this spirit, I would like to point out that there is absolutely no biological validity to the concepts of "native" and "exotic" species, nor is there evidence that man's introduction of species into new habitats has any negative impact on global biological diversity. On the contrary, the aid we have given species in their movement around the world has served to *increase both global and local diversity*. It is one of the few human activities which is beneficial to the non-human creation. It cannot be distinguished from the movement of species by wind or ocean currents, or the aid other species give to their fellows, such as the distribution of seeds by migrating birds.

"All living beings have the right to engage in the struggle for existence." — L.H. Bailey.

There are no adequate definitions of "native" and "exotic," since there has

been constant movement of species since the beginning of life. Witness the migration of species across the Bering Straits and the Isthmus of Panama. Great exchange of species has occurred between both oceanic and continental biota in these areas as they have been repeatedly submerged and exposed, alternately being corridors for aquatic and terrestrial life. In response to the Ice Ages, great movement of species has occurred. Even now, I understand that the armadillo is extending his range north from his native Mexico. Is he an exotic invader? If we naturalize elephants in the tropical Americas, will they be exotics, or will this simply be the return of the *Proboscidea* to their pre-glacial range?

Apparent cases of destructive invasion by "exotics" are usually examples of the beginning of an outbreak-crash population sequence occurring as a species moves into the niche provided by a heavily man-disturbed habitat, to be followed by the inevitable crash and subsequent adaptation and integration of the "exotic" into the local ecosystem.

Intact ecosystems are highly resistant to invasion, and there are also many cases of "exotics" acting as nurse-plants and revegetators, helping the native ecosystem to reclaim its man-destroyed habitat. I have seen a grassy meadow and a field of star thistles side by side, with only barbed wire separating them. The fence can't stop the thistle seed, yet it does not invade the intact meadow, showing the thistle to be an antibody-like

response of the prairie ecosystem to overgrazing by cattle.

New species create niches for more species, further increasing potential diversity. Many species are extinct in their original habitat, existing only where they have been introduced to new areas by man. We are changing the world through our destruction, pollution, and now possible climate change. Local ecosystems need the infusion of new species to help their adaptation to a changed environment.

"You stay, I go." —Ishi, last of the Yana.

It is ironic to me to hear people of European ancestry accuse other organisms of being "invasive exotics, displac-

ing native species."

Even the wildest unfounded claims of invasion by "exotics" pale in comparison to the land area occupied by technological man's monoculture crops. These crop-deserts and modern man's extractive land-domination economy are the threat to bio-diversity, not "escaped exotics."

There are documented cases in which attempts to exterminate "exotics" have in fact pushed native species to the brink of extinction!

Attempts to eradicate so-called non-native species are impossible, absurd, and destructive to the very habitats they hope to preserve. As an alternative, I propose: The protection of all intact

ecosystems from human destruction, and the deliberate introduction of species into the areas we have already damaged. Introduction priorities should be based on phylogenetic relationships; non-represented groups and taxa of restricted distribution should be given priority.

"Migrants of ape in gasoline crack of history." —William Burroughs.

We have only a brief moment in history when fossil fuels will continue to allow us rapid world-wide travel. Let us use this time wisely, to the benefit of all species.

J. L. Hudson, Seedsman are purveyors of ethnobotanical seeds. Their catalog is available for \$1.00. Write P.O. Box 1058, Redwood City, CA 94064.

Food for Your Skin

Anne K. Devlin-Firth

Would you like a bath soap that feeds and rejuvenates your skin, that you can make in less than an hour, that helps the environment, and is safe enough for a baby to eat? Then you're ready for the joys of liquid clay soap.

Eons ago aborigines watched animals instinctively walk, stand, or roll in clay mud for its healing effects. Soon these indigenous people discovered this good earth—besides its curative and ceremonial uses—removed deep-seated grime, restored tone and balance to weather toughened skin, and served as a natural deodorant. For centuries, our ancestors washed with clay, plant roots, leaves—even powdered horse chestnuts—until another more modern body freshener became popular.

This new soap, made from animal fats and wood ashes, has been a mixed blessing. The fat/lye combination worked for clothes and other cleaning chores, but the highly alkaline pH irritated skin which needs an acid mantle to maintain health. Perhaps this harshness explains why Prime Minister Gladstone, who grudgingly repealed the English soap tax in 1853, described soap as "most injurious both to the comfort and health of the people."

The Quest

Ten years ago I agreed with Gladstone. A switch to whole foods in the seventies improved my skin and overall health, but polluted air and alkaline soaps laden with additives still took their toll. Thinking soap should help, not hinder, I tested

Ingredients for clay soapmaking: (l. to r.) Non-metallic pot, spoon, and spatula; kaolin clay, goldenseal tincture, olive oil, honey, and small plastic squeeze bottles for use and storage.

various products with little success. By deciphering ingredients lists, I learned many promising products eliminated the intrinsic value of fragile herbs and oils with stringent chemical processing. Others simply added botanicals to an alkaline base. Many combinations actually counteracted the effects of good diet. Even the best stripped oil from my beleaguered skin which overcompensated with increased oil production.

Since the 1950's, many scientists and cosmetic companies seemed to treat the body's largest organ as a one-way street. Out of ignorance or intent, focus narrowed to skin's eliminative and protective functions, its absorptive ability largely ignored. Yet, what's applied to the skin's surface registers internally. (Agatha Christie ignored the experts. An excellent chemist, she structured plots

around deadly skin creams laced with poison, giving "for external use only" new meaning.) It was time to make my own soap, using nature's marvels.

More Than Skin Deep

Raymond Dextreit's brief mention of soap in *Our Earth, Our Cure* sent me to our household's first aid kit—clay, honey, and olive oil. My husband and I already used them for everything from facials and toothpowder to cuts, bruises, and fire ant bites. Nature's diversity delighted me as the soap took shape. Nature did all the work. I just added water.

Besides the qualities mentioned earlier, clay powder stops bleeding almost instantly, removes foul odors in privies and sickrooms, ends dysentery (remember kaopectate?), renders harmful bacteria in contaminated water innocuous, increases red blood cells, eliminates unhealthy



cells, and stimulates new cell growth. Mixed with brewer's yeast, it even becomes an effective flea dust for animals. "Clay is a catalyst rather than an agent in itself," said Dextreit. "This is possible because clay is alive—living earth."

Clay's diversity is a PC designer's dream. Its restorative powers don't stop with humans and animals. Clay makes excellent moist poultices for tree wounds, increases humus, and, as silica, is essential to the cation exchange capacity of red, heavily-leached tropic soils.

Biodynamic farmer Trauger Groh wrote about silica's importance to plant growth in *The Journal of Sustainable Agriculture*. Silica, a major clay component, works via soil microorganisms to strengthen plant connections to the elemental rock below and the approximately 90 elements in the air above. Groh believes "the whole question of trace elements would be superfluous if we could condition the plant to connect to the air and deeper elements of the soil."

Yet, clay's most spectacular feat as a catalyst occurred in glacier mud eons ago. Kaolinite clay minerals created crystal spirals to protect themselves from harsh weather and the glaciers' relentless grinding. Their ingenious communication and growth methods attracted organic molecules which layered themselves between the spiral's crystal surfaces. Reports indicate that the DNA spiral imitated clay's crystal structure. Clay provided the basis for the greatest sculpture on earth—life.

If clay helped create life, then honey helps sweeten it. Raw, unfiltered honey offers balanced sugars that eliminate rollercoastering blood sugar levels. (Vital for clear thinking.) Its essential vitamins and minerals are present in a balanced predigested form easily assimilated by mouth or skin. Honey's natural formic acid prevents putrefaction while its potassium destroys bacteria. The high percentage of vitamins B-2, B-6, and C makes honey a healing balm for burns and infected wounds, and a preventative for skin disease.

Recently pronounced beneficial by the medical community, something the Greeks and Italians have known for centuries, olive oil improves our skin, liver, and general health.

Olive oil soothes sunburn, helps prevent peeling, and stops itching from insect bites or dry, chapped skin. Like clay and honey, it balances oil complexion, fights infection, and kills staphylococci. Because olive oil doesn't clog pores, it's

often used as a healing massage oil.

Water. We can't live without it, and because the human body is 75% water, it's not surprising that water promotes healthy, supple skin. In clay soap, it's the final blending agent which regulates both texture and thickness.

Originally, this recipe's final ingredient was pure water. Now it's replaced with goldenseal root powder tea, **except** when the soap will be used for babies under three years old. Goldenseal is wonderful stuff, but large doses can be toxic and a baby's continuous daily exposure would worry me. For reference, a normal adult dose is 1-2 t of tea, 3-6 times/day for 2 or 3 weeks, then rest 1 week. (See John Lust, *The Herb Book*.) We only take 1 T/day, 30 minutes before breakfast.

Topically, this tea clears acne, promotes rapid healing of cuts and sores, and is an excellent eyewash. Internally, small amounts ease stomach upset, drain sinuses, help liver function, lower blood sugar, and stimulate appetite. (Women shouldn't take goldenseal internally during week of menstruation or if seeking pregnancy.)

To make the tea, bring 2 1/8 cups water to a boil (no metal), remove from heat, add 1 t goldenseal root powder, and stir. (The plastic teaspoon won't melt.) Cover and steep 45 minutes or longer. Strain through a cloth, bottle, and refrigerate until needed. Makes enough for 1 batch of soap plus 1 cup for other uses.

Making the Soap

You'll need a **medium-sized mixing container** made of enamel, glass, or wood—no metal, as clay can absorb and carry metal impurities to your skin. Enamel saucepans work well. Other utensils include a **wooden spoon**, a **plastic one cup measure**, a **small rubber spatula** (optional), and **3-5 clean, plastic squeeze bottles**. We use old shampoo bottles and the clear, mustard-like squeeze bottles available at restaurant supply companies. Shampoo bottles work best for traveling, while the usually capless mustard ones work best at home. Capless is okay—clay likes light and air.

Now get out your ingredients—**4 cups Kaolin EPK clay powder**, **2 cups local, raw honey** (unfiltered is best), and **1 cup pure water** (not distilled) OR **1 cup goldenseal tea**.

Put clay powder in container. Stir with wooden spoon to minimize lumps. Add honey and stir until blended. Don't worry if small amounts of powder stick to the pan bottom; it's eventually ab-

sorbed. If the mix becomes difficult to stir, add 1 or 2 t water.

Add the olive oil. Use a folding stroke by lifting the mixture from the bottom and gently covering the surface oil. Stir slowly or the oil splashes everywhere. This is the longest part of soapmaking, but don't despair—all the oil will be absorbed. (Impatient? A *little* unmixed oil's okay.)

Add water OR goldenseal tea. Use a full cup even if you added water earlier. Stir slowly, then gradually increase speed until all bubbles vanish and the soap's a uniform color—usually tan, but a dark-colored honey, olive oil, or clay vein can change the color to a rich brown. Different honeys and olive oils also change the aroma. Experiment and use what's best for you.

If the soap looks *rumpled*, it's probably too thick. Again, add water a teaspoon at a time until the soap sheets smoothly off the spoon. Caution. If it's too runny, it's hard to use. Do not overwork the soap. Clay loses some of its absorptive powers if mixed too thoroughly.

Don't Worry

If small lumps still remain, just cover and let sit overnight. Clay absorbs lumps unaided. Refrigerate if room temperature is over 75-80 degrees. Honey and water will ferment if too hot, producing a yeasty smell. This won't alter the soap's effectiveness, but most folks choose not to smell like fermenting mead. For immediate use, bottle a small amount, and let the rest sit contemplating its lumps.

If you're interrupted during soapmaking, just cover so critters can't fall in. Clay soap will wait patiently until you return. Refrigerate for long breaks, then pick up where you left off.

If your face feels a bit oily after your first use, relax. This goes away quickly, leaving your skin soft and smooth. Remember, your body is used to feeling "too clean" and may need adjustment time. (Impatient? Rub extra water into your skin with your fingers.)

Hints

Add a bit of water to each almost empty bottle, shake well, and use for shaving. (You may have to hold the razor at a slightly different angle.) Clay soap also makes an excellent after-shave wash for men. Rinse well.

Clay soap suits the special needs of babies and the elderly, whose bodies produce less oil. Clay soap works intelligently, enriching skin with oil when necessary, yet removes tar and grease with equal ease.

Most soaps use lather to lift bacteria off the body's surface until rinsed. This soap doesn't need foaming action because the ingredients fight harmful bacteria naturally while strengthening resistance to infection.

A Job Well Done

This recipe makes 8 cups of concentrated liquid soap. Pour into the bottles using the rubber spatula and/or the measuring cup. Wipe any spills from the bottle lip, and cap. Clay soap is a skin food. Just treat empty containers like your dishes—wash with hot, soapy water and rinse well.

The soap keeps for 1-2 weeks in the bath without becoming yeasty. Use some, refrigerate the rest until needed. Enjoy!

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* Major sources.

RESOURCES

Kaolin EPK (Edgar, Fla.'s Plastic, or easily worked, Kaolin clay) clay powder. Available at ceramic stores for about .35/lb. Store only in glass, or paper which can then go into plastic sacks for humidity protection. Other clays may be used if lead and additive free. I use Kaolin EPK because it's effective, safe, and inexpensive.

The Feldspar Corporation, Hwy 21, P.O. Box 8, Edgar, FL 32149, tel: 904-481-2421. Clay analysis sent on request—SASE.

Goldenseal root powder. Available at health food stores. Buy only 1-2 tbs.

It'll last a long time. Good forest/orchard understory cash crop (needs 60-70% shade). Δ

Anne Devlin-Firth studied nutrition, medicinal herbs, massage, and healing for 19 years, during which time she was also an assistant midwife for two years, and a theatrical technician for 14 years. Introduced to Bill Mollison and Permaculture by the Plowboy interview with Bill in Nov.-Dec., 1980 issue of Mother Earth News, she distracted herself using PC techniques in an urban garden for ten years until graduating from Patricia DuBose's design course on September 1990. She has completed two designs and will be teaching a series of six weekend PC workshops February-September 1992.

I Can Spend All Day Pondering Earthworms

Learning from an Internship Program at Gap Mtn. Permaculture

Brian Bishoff

This spring Gap Mountain Permaculture (GMP) began formal internships at its 100-acre facility in southern New Hampshire. Here's what we learned:

Internships serve a valuable function, broadening and deepening the range of educational experiences that are available in permaculture. Learners get to practice permaculture instead of just hearing, reading, thinking about, or seeing it. A deeper level of commitment is possible than in a workshop or a design course. The pace of work is (usually) more relaxed and allows time for reflection. It is possible to see some results of one's actions in a long-term internship.

The program at Gap Mountain is a valuable source of information and labor for both the homestead and learning communities here. All the interns have skills and knowledge to share with the sponsoring organization. Research can develop along lines of mutual interest. For example, a study of cold-climate chicken-forage species by one of this year's interns will apply both here and at her new home. Interns can help get projects going or completed. The program here has included construction of a solar batch water heater, surveying one of the homesteads for a base map, monitoring orchard pests and building traps to catch them, building part of a greywater/woodchip composting system, and lots of mulching, weeding, watering, and other essential gardening tasks. And not to be overlooked, by writing this article, I am

helping to organize and publicize GMP's educational program.

Community building can be another aspect of permaculture internships. A regular Wednesday meeting has let us talk about our current work and plan for the week ahead. Afterwards we have dinner and a discussion of permaculture and its implications for ourselves and our culture. We also have a potluck on Friday nights, and these gatherings, combined with living and working together, afford many opportunities for good social interaction. The diversity of this small community increased tremendously with the energy of six new people. Our program may eventually provide homesteading members for the community as well.

Gap Mtn. Permaculture established three types of internships based on length of time and community involvement in exchange for different levels of residential benefits. A contract is negotiated with each intern to make responsibilities and expectations clear for both parties.

Non-residential internships are designed for students and others who live nearby. These interns negotiate their work schedule individually. On seasonal internships, people camp the grounds or live in a cabin and commit 20 hours work each week. Residential interns making a minimum work commitment of 300 hours over the course of the year live in an old farmhouse and share housing costs and chores. This arrangement allows people to work part-time at outside jobs. By contributing a combination of work and rent, resident interns help maintain

and improve the existing housing and other community infrastructure, while pursuing their permaculture studies. A fourth category, part-time seasonal/resident internships, has evolved as a practical adaptation for people who live farther away and cannot commute to GMP. In addition to the various housing arrangements, all interns enjoy the use of garden vegetables and eggs produced on the site.

Comments at a recent evaluation meeting revealed that:

It's been enjoyable for the most part, and people have worked well together. The residents have welcomed interns into their homes and lives and made them feel a part of the Gap Mtn. community. People felt that the staff had well-defined roles and were very open to listening to the needs of interns. The GMP staff have been pleased with the amount of work that the interns have accomplished and with their maturity in taking initiative on projects. The interns have appreciated the variety of resources and skills that different people had to share. Much praise was given to the people here for demonstrating environmentally sound lifeways. Residential interns talked about work and life blending together. Others appreciated being able to choose work that interested them. Matt McMillin said about designing a greenhouse worm-compost system, "I can spend all day pondering earthworms." People said it was a great place, and they could imagine no better location. Residences being not too close but within walking distance lent for a fair amount of privacy within the community. People felt they could have lives of their own yet the many connections to the outside world kept them from feeling isolated.

On the down side, priority initially seems to have gone to short-term interns and short-term projects. Resident interns didn't have complete contracts before they started and they felt less clear about the focus of their work. At the beginning things were disorganized and an orientation would have been helpful. Staff seemed to be short of time for working with and supervising the interns, possibly based on the number of interns and other obligations. Part-time seasonal interns felt a need for more clearly defined "home." Frustrations stemmed from a lack of funds for larger projects or to pay staff and interns for their work. Many desired more individual feedback along the way from staff and other interns.

In considering the above responses, it seems that the success of our program

derives from the clarity of expectations and tasks as laid out in contracts, openness and communication in our relationships, and the community and facilities we have available to us. The primary reason for our failures, it seems, is our unrealistic expectations of how many interns we could handle at one time. We had thought we were limited by how many people we could house, whereas the reality is that available staff time is the key limiting factor which should determine, for us, how many interns we can incorporate in our community at one time. Learning this, we will probably reduce the size of our internship programs in 1992.

It is clear from this year's experience however, that the primary function of our internship program should remain education—both for interns and for GMP staff. Learning is the driving force that makes internships work, and subordinating the educational function to labor provision, cash flow, community building, or other purposes bears the risk of undermining the whole program. Other functions can and should be fulfilled, but the learning aspect must not get lost in the shuffle.

Some recommendations for people setting up internship programs: Be realistic about how many people you can work with at one time. Make sure that things are well organized before the first intern sets foot on your place. A contract spelling out the terms of the internship is very useful to both parties. Flexibility is essential, but so is adequate structure. Make a determined effort to keep communication open. Be clear on why you are setting up an internship program.

For prospective interns it really helps to know what you want from the deal and to make sure the place can provide it. Make sure the internship is a real learning opportunity, not just a source of cheap labor for the organization. Both parties will learn from each other and with good will should have some fun.

Gap Mountain is reviewing its internship program for 1992. If you have comments or questions, contact us at 9 Old County Rd. Jaffrey NH 03452 or call 603-532-6877. Brian Bishoff may be reached at 7 Old Mill Rd, Jaffrey NH 03452, 603-532-6347. Δ

Permaculture Drylands

Quarterly Journal, \$12/yr, back issues \$3.00
Permaculture Drylands Institute
P.O. Box 27371 • Tucson, AZ 85726

PERMACULTURE COMMUNICATIONS

Permaculture I & II: \$16.50 each

Permaculture: A Practical Guide For A Sustainable Future: A new iteration of Bill Mollison's definitive permaculture design manual with improved cloth binding and a new price, covering all aspects of property design and natural farming techniques. It includes: Trees • Microclimate & broadscale techniques • Species selection, placement & management • Multipurpose shelterbelt, forage woodlot & orchard systems • Plant succession & Ecology • Home gardens • Zone & sector design • Revegetation and Afforestation • Arid- & humid-land methods & strategies • Wildlife and Rangeland mgmt • Soil conservation & rehabilitation of degraded lands • Water & irrigation systems • Earthworks: terraces, swales, dams & canals • Recycling/waste disposal • Bioregional organization • Land access strategies • Community finance • Village development • Business strategies • Ethical values for a new world—and more! **\$34.95 + \$3 p & h per book.** Cloth, 576pp w/ 130 color photos & hundreds of illustrations.

Permaculture, Journal of the International Permaculture Association - Back issues—an incredible reference on permaculture! Issues #7 - #35, \$5. ea. #31 indexes all back issues.

Subtropical Fruits - A Compendium of Needs and Uses, 2-color poster, 26"x30", lists 100 species/varieties of subtropical fruit trees, vines, and shrubs. Great for nurseries, farmers, and home orchardists. Info on fruit characteristics, climatic tolerance, plant uses, cultural requirements, maturity times. **\$14.00**
Permaculture Designers Directory, 1987 edition lists 450 graduates of Permaculture Design Courses in N. America with bio info, skills, resources, svcs. offered. Cost: **\$6.00.**

Perspectives on Plant Symbiosis: **\$2.50;**
Symbiont Inoculation Strategies for the Nursery: **\$3.50.** Both: **\$5.** Michael Crofoot. Covering: • nitrogen-fixing bacteria • mycorrhizal fungi • their symbiotic interactions w/ plant roots • methods for the plant propagator

Other Titles:

Designing your Edible Landscape	
Robert Kourik	16.95
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1988 Int'l Green Front Report, Pilaraki	7.00
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The Earth-Sheltered (Kem & Mullan)	9.95
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The Natural Way of Farming, Fukuoka	15.95
The Road Back to Nature	17.95
The Ohlone Way, Malcolm Margolin	6.95
The Owner Built Homestead, Kem	9.95
The Owner Builder & the Code	
Kem, Kogon, Thallon	5.00
Water for Every Farm, P.A. Yeomans	20.00

**Permaculture Communications,
P.O. Box 101, Davis, CA 95617**

Permaculture Educational Programs

A 16-Day Intensive Permaculture Design Course Belize, Central America

Dates: February 19 - March 6, 1992
Location: The Belize Agroforestry Research Center and Botanical Garden, Toledo District, Belize, Central America.

The Research Center and Botanical Garden is a 150-acre field station situated between the Columbia Forest Reserve and San Pedro Indian Reserve, on the banks of the Columbia River in the foothills of the Maya Mountains. It is about 20 miles from the coastal town of Punta Gorda. The Mayan Ruins of Lubaantun are a 10-minute walk from the Center. Accommodations are rustic; be prepared for camping and rain. The last mile of access is only by foot or dugout canoe.

Description: In addition to core permaculture curriculum, this course will also include: Subtropical and tropical strategies and techniques, as well as temperate; Ethnobotanical field collecting; Traditional Mayan agriculture; Eco-tourism; and Networking between developed and developing countries.

Instructors: Michael Pilarski, Rick

Valley, Chuck March, Jose Caballero, and Mark Cohen, guest speaker.

Language: Primarily taught in English. Latin Americans with English as their second language are invited. Rick Valley speaks some Spanish and Jose Caballero's first language is Spanish.

Cost: \$500. This includes all organic meals, camping, curriculum materials and field trips. This course is limited to 25 participants. \$150 is required for registration (\$75 non-refundable).

Contact: Tropical Conservation Fdn.
 14 N. Court St., Suite 301
 Athens, Ohio 45701

Urban Permaculture Design Course in Houston

Dates: Six weekends beginning Feb. 28-Mar. 1, 1992, continuing April 11-13, May 15-17, June 26-28, July 31-Aug. 2, and concluding Sept. 11-13, 1992.

Anne K. Devlin-Firth will teach a series of six weekend workshops on urban permaculture beginning February 28-March 1, 1992. Taken together the 114-hour series will fulfill the requirement for certification under the permaculture design training program. All of the standard 72-hour curriculum will be covered. The additional 42 hours will allow students time for hands-on projects. The series evolved to meet the needs of busy city dwellers juggling work, family, and community involvements, but still wishing to obtaining permaculture design certification.

Students will pursue projects of their own choosing at home, as well as complete work on a class project. Hands-on work will include setting up a Local Exchange Trading System (L.E.T.S.), building a spiral herb garden from salvaged bricks, installing a free-standing "tree-pot" pond, grafting practice with willow sticks, building various levels for correcting front and side yard swales on the design site, and building two solar ovens. The graduation feast, weather permitting will be cooked in the newly-built ovens.

Instructors will include guest speakers on grafting, community gardens, integrated pest management, ecocity architecture, Third World economics, and successful local and native species.

Contact: Anne K. Devlin-Firth, 213 E. 24th St., Houston, TX 77008.

Elfin Permaculture 1992 Schedule

10-Day Workshop in Michigan

Dates: August 21-30, 1992
Location: near Grand Rapids, Michigan

During this 10-Day Workshop, students will design a rural homestead in the area. They will interview the intended residents and develop a draft permaculture design that meets their goals in provision of water, food, fibre, shelter, energy, access, income, community, play, and aesthetics. Participants will take into account climate, microclimate, seasonal winds, contour, solar access and orientation, water flow and storage, soil type, plants and animals present, history of site use and the influence of neighboring land uses.

Contact: Dave Van Dyke
 15580 Stanton
 West Olive, MI 49460

This workshop was designed to complement the longer Permaculture Design Course and is suitable for people seeking skills to apply permaculture to their private lives, people wishing to have a solid preparation for the Permaculture Design Course, and design course graduates who seek a more intensive design experience. For more information, contact Dan Hemenway, 7781 Lenox Ave.,

Jacksonville, FL 32221. Send SASE and U.S. \$1 for a reading list.

Elfin Permaculture presently plans two permaculture and Fate-of-Our-Forests teaching circuits in 1992. At this juncture, we are looking for groups to host additional workshops and lectures, and will also schedule site visits for consulting and permaculture design work.

May-June. We will travel through the U.S. South and South West as far as Phoenix, Arizona, and possibly to the Los Angeles, California area. This trip will also cover Florida, Alabama, Mississippi, Texas, New Mexico, Northern Mexico, Colorado, Kansas, Oklahoma and Arkansas.

August. Elfin Permaculture is looking for hosts for lectures, workshops and/or a Permaculture Design Course in the other Great Lakes states, Ontario, Kentucky, Tennessee, Georgia and/or Alabama. Alternate routing one-way can bring us through Georgia, South and North Carolina, Virginia and West Virginia.

Other dates: Workshops, lectures and courses can be arranged for other regions at other times of the year. We work worldwide. At least six months lead time is recommended for 10-day or longer workshops and the Permaculture Design Course. Write for a brief description of our programs and other details.

Eastern Washington Permaculture Design Course

Dates: July 7-21, 1992
Location: In the Okanogan Valley, Eastern Washington
Instructors: Chris Evans, Michael Pilarski
Costs: \$600
Contact: Friends of the Trees
 PO Box 1068
 Tonasket, WA 9885
 509-486-4726

Introduction to PC Weekend Workshop in Pennsylvania

Dates: September 18-20, 1992
Location: One World Environmental Ctr. Spring Mills, Pennsylvania
Instructors: Dawn Shiner, B'J Bane
Contact: Dancing Green
 PO Box 157
 Cochranton, PA 16314

2nd Annual Permaculture Teachers Reunion

Dates: March 14-16, 1992
Location: The Lodge at Gearhart's
Little Beach, Gearhart, OR

About 25 people gathered together last March 16 and 17 for the first annual Permaculture Teachers Reunion at The Lodge at Gearhart's Little Beach, situated on the beautiful edge of Gearhart Bay on the northern Oregon coast. It was an exhilarating few days, a time for networking, relaxing and taking long walks on the beach.

The group worked together establishing a clear agenda, some of which included: Introductions, Updates on NAP and Great Northwest Permaculture by Larry Santoyo; Friends of the Trees and IPC4 by Michael Pilarski; The PC Activist and the Nepal Conference by Peter Bane; a slide show on Michael Pilarski's journey to Nepal; and a thought-provoking exercise on assumption checking, facilitated by Tom Ward (The key elements to ponder were: what are you doing, and why? And what are the key assumptions that drive decisions?).

Having many of the NW movers and shakers there gave us the opportunity to schedule courses so that conflicts do not arise throughout the year. We dubbed this "pattern scheduling." Some marketing ideas, such as publishing and curriculum development, were tossed around at a round-table discussion. "Where do we see ourselves a year from now?" was an interesting closing exercise.

PC Design Course in Wisconsin Driftless Bioregion

Dates: June 7-21, 1992
Location: West Lima, Wisconsin

Description: This course will emphasize north temperate climate zones with a look Third World cultural, economic and political systems.

Instructors: Chris Evans
Michael Pilarski

Chris has worked for 7 years in Nepali villages; first with British Voluntary Service Overseas, and now with Nepal Community Support Organization (NECOS). He has been Chief Technical Officer for INSAN (Institute for Sustainable Agriculture Nepal), and has taught permaculture design in Nepal, Britain, and the U.S.

Michael is an orchardist, homesteader, author, community organizer, and director of Friends of the Trees. He has taught permaculture for the past five years in the Northwest, Colorado, and Nepal.

Cost: \$550-650 sliding scale
Contact: Friends of the Trees
PO Box 1068
Tonasket, WA 98855
509-486-4726

And now, next year is here! The 1992 Second Annual Teachers Reunion is scheduled for March 14-16 at the same lodge in Gearhart, Oregon. Proposed agenda items are: 1) Strategies for the Present: Political and Economic Realities of Our Time; 2) Teaching—What Works; 3) West Coast Curriculum; 4) Marketing; 5) Updates on regional groups and the International PC Designers Guild; and 6) Network and Communications. We are asking individuals to prepare a one-page "paper" on a topic of their expertise, i.e., basic steps for building a ferrocement water container, or steps to be consid-

Aprovecho Intern Program

Internship positions will be available at The Aprovecho Institute Research Center in Cottage Grove, Oregon, starting from January 1, 1992. An initial three-month internship is necessary to qualify for a 12-month program in any combination of the following:

1. **Ecological farm management.** Includes organic food production, sustainable forest management, agroforestry, soil care, and health of the land and wildlife.
2. **Permaculture and sustainable development in the Third World.** Includes specific training in design work and curriculum planning for courses.
3. **Building.** Covers design and construction of small, ecological, organic buildings.
4. **Research and demonstration centers.** Covers how to start up and manage a public demonstration facility.
5. **Appropriate household technology and ecological living.** Involves learning how to design, make, and use a variety of energy-saving devices, as well as learning lifestyle techniques that emphasize deconsumerization.
6. **Newsletter publication and public relations.** Covers how to start up and maintain newsletters and small magazines, as well as how to write press releases, articles, and proposals.
7. **International information services.** Involves experience in running a low-cost international information service on the above subjects.

Interns commit to a 3-month initial programme that involves several of the above activities; participate in the day-to-day management of the land, facilities, and office of Aprovecho's research center; work under staff supervision five days per week, including two hours of tutorial time; and have access to on-site workshops at one-half price and may be given preferential options to help with foreign work and courses.

Cost: \$250 per month for on-site board and lodging, and \$100 per month tuition—a total of \$350 per month. The initial three months' fees are to be paid in advance.

Learning at the Aprovecho Research Center

ered in designing the edible landscape, etc. This will be an excellent time for professionals to learn from each other.

Cost: The lodge accommodates 26 people. There is no camping on the grounds. Registrations will be on a first come, first served basis. The cost will be about \$110, which includes prepared vegetarian meals, and lodging. For those who wish to stay elsewhere, the cost will be about \$25 a day for meals and lodge use.

Contact: Jude Hobbs
1661 Willamette Street
Eugene OR 97401
503-342-1160. Telephone C
Calls of inquiry will be returned collect.

is largely by involvement in the work and daily life of the center. Persons taking part need to be organized and self-motivated. Benefits of the center include but are far from limited to: the opportunity to be part of original, practical research; contact with fascinating visitors and other cultures from around the world; access to library, workshops, and information files; and beautiful wilderness environment and hiking trails.

After completion of the 3-month initial internship, there will be an evaluation by all concerned. Interns may then be offered a 12-month internship to specialize in one or more of the areas in which we work, within a negotiated learning contract.

Fees do not include materials or books. Upon successful completion of the total 15-month programme, interns will be reimbursed up to \$1,000 for resettlement. Aprovecho will assist the graduate in finding work opportunities in this country or overseas.

Contact: Aprovecho Institute
80574 Hazelton Rd
Cottage Grove, OR 97424
503-942-9434

Willamette Valley PC Course Rescheduled

"Skills for a Sustainable Future:
The Permaculture Quest"

The Willamette Valley Permaculture Course previously set for Feb. 16-March 1 has been rescheduled as a four-day event in March. The new weekend event, "Skills for Sustainable Living—the Permaculture Quest," will be held March 19 through 22. Skills emphasized will include Fruit Tree Guilds, Ecosystem Identification, and Edible Landscaping

Contact: Kristin Andersen
Willamette Valley PC Assn.
80262 Hwy 99N
Cottage Grove, OR 97424
or call 503-942-7065.

A Feast of Gifts

Eastern PC Conference Wrap-up

Peter Bane

With the theme of "Gifting One Another," the 6th Annual Eastern Permaculture Conference opened October 12, 1991 under brilliant blue autumn skies amidst the river mists and blazing oaks and hickories of Standing Stone State Park in Middle Tennessee.

The most southerly venue for EPC since its inception in 1986 brought out the largest crowd ever as more than 80 persons (grads/non-grads, young/old children) gathered from 17 Eastern states plus Hawaii and Norway.

Organizers Sue and Adam Turtle hosted two dozen early arrivals for a field day and Introduction to Permaculture at nearby Earth Advocates Research Facility in the hills outside Livingston on Friday, Oct. 11. Adam showed important edible and useful plants which he had collected over a number of years including akebia, autumn olive, thornless boysenberry, native persimmon, hazelnut, and many species of bamboo. Sue Turtle delivered a morning talk on principles of permaculture.

Highlight of the field day was the construction of a solar thermal collector for high temperature steam generation based on designs developed by Prof. Francis Vanek of Cornell University. Vanek's engineering work creating effective energy harvesting devices from inexpensive and common materials is being continued and disseminated through the STEVEN Foundation, 414 Triphammer Rd., Ithaca NY 14850. STEVEN intern Karen Cowgill delivered pre-cut galvanized steel sheet, plywood, threaded pipe fittings, and adhesive mylar coating on the way through Tennessee to a similar delivery in Mississippi. On her return, she led field day participants through hands-on assembly of the donated materials and other wooden salvage at hand, while others looking

on picked through the leaves for persimmons.

Conference goers carpoled the 22 miles from Nobody's Mountain to the Overton Lodge at Standing Stone S.P. to find old friends and new acquaintances from half a continent thronging the modest waterside facility. The park setting proved ample for the demands of the conference, as sunny skies and mild temperatures throughout the week-end permitted good use of the grounds for the trade fair tables, auction, convocation circles, and camping by nearly half the attendees. The lodge, a clean log structure consisting of meeting hall with fireplace backed by a modern kitchen and flanked by two dormitory wings, provided beds for about half the participants in children's and non-children's wings. The remainder camped on the lawn.

Following drumming and morning councils led by Dan Schellenberg, a Baptist minister and shaman from Kenya, in which speakers voiced the spirit energies of the assembled community of beings, formal presentations began at 9:00am and continued throughout the morning and afternoon of both days. Volunteer timekeeper/facilitators kept speakers and participants to a tight schedule which saw new material about every hour with brief pauses in the rhythm for lunch and supper prepared by cooperative self-organizing teams in the kitchen to the rear of the hall. During breaks people gathered outside to peruse the trade fair tables, swap stories, or simply soak up the bright sunshine.

Solar Tech Costs Nearing Breakthrough

Appropriately, technology wizard Bob Fairchild of Dreyfus, KY began the presentation series with a rapid survey of the state of photovoltaic, 12V, and solar collecting technologies. He has developed and refined many applications from scratch through his company Eastern Kentucky Appropriate Technologies. Discussion centered on the relative toxicity of wind, hydro, and PV/battery arrays, with the latter involving arsenic doped in silicon, toxic solvents for manufacture, and extensive use of lead. Bob

pointed out that while these were points to consider, the panels themselves, once manufactured have extremely long life and are chemically stable, that the lead in batteries is already recycled widely and safely, and that the offsetting value of solar versus conventional power generation with its consequent coal and uranium poisoning needed to be kept in mind.

Commenting on the evolving state of PV technology, Fairchild said that trackers are not economical, their cost exceeding the energy premium gained. The economics of PV have a geographic analog. When the industry began installing units some ten years ago, locations five miles or more from the electric grid were economic for PV. Now the distance is about 1/2 mile. Soon we will cross the solar Rubicon for small-scale applications at almost all locations. Advances in silicon manufacturing, especially a low-cost process for producing the crystals promises a sharp drop in the per-kilowatt cost of PV energy within the coming year. For current design and building application, he says, "Efficiency pays best." Mentioned was the ultra-efficient "Sunfrost" refrigerator which draws only 1/10th the energy of a conventional appliance—it's now available at about \$2,000.

Mouldering Toilet Shown Successful

Doug Clayton of Gap Mountain Permaculture in New Hampshire followed with a comprehensive slide show of his work on the mouldering toilet, solar building design, and orchard establishment. Doug reported that the toilet, built under experimental permit from the State of New Hampshire, has performed well. It breaks down domestic solid waste at cool, not hot temperatures, thus the name, mouldering. The first chamber, emptied this summer after three years, yielded a modest quantity of excellent compost material which he distributed as mulch around young fruit and nut trees. He estimated the actual time needed for waste to break down in the toilet was between six and twelve months, but said they have been "playing it safe."

The toilet is built under the house with user access from indoors, and features a sloping mesh bottom for maximum aeration, chimney ventilation to prevent backflow of gasses to the house (and cold bums), two chamber construction, alternating toilet seats, and outside access door for removing compost. Other than the toilet seat lid and access door, the whole arrangement has no moving parts. Doug shared that the toilet tolerates a moderate amount of urine without becoming anaerobic; although they try at GMP to use urine, which contains far more nutrient than feces, directly on orchard and gardens. Kitchen waste added to the toilet digested properly, but bred fruit flies which became a sporadic problem in the house. Limited to human waste and modest feedings of carbonaceous material such as straw or sawdust, the toilet harbored no flying pests. Cold winters obviously provide a control for crawling insects which in the tropics would love such

"Creating Right Livelihood"

A Permaculture Chautauqua in E. Washington

Dates: July 1-31, 1992

Location: Deerhawk Retreat Center
near Spokane, Washington

People of the Dawn will present a coordinated series of programs during the month of July, 1992 focusing on economic self-reliance in the cold, arid forest regions of Eastern Washington. The roster includes the following events:

- Permaculture Design Course led by Patricia Dubose, July 1-15.
- Advanced Permaculture Design Course led by Dan Hemenway.
- Tree Crops for Small Orchards, Workshop led by Michael Pilarski.
- Mushroom Cultivation Workshop with

Paul Stamets (unconfirmed).

- Herb-growing Workshop with Richard A. Miller (unconfirmed).
- Housing Construction from Salvage Materials, Workshop.

Fees have not yet been set, however food will be included in all event prices. Participants should be prepared to camp; some indoor accommodation is available by arrangement.

Contact: Lynn Craig
7131 Owensmouth, #22G
Canoga Park, CA 91303
818-348-4025
(phone requests will be returned collect)

an environment.

Land Trust Issues Surveyed

Saturday morning's presentations concluded with a panel discussion of land trust issues featuring Sandy Hepler of Whitleyville, TN, Marie Cirillo of Clairfield, and Joni Smalle and Liz Hoag of Edmonton, KY. All live on or work with land trusts in the Cumberland Valley. Marie is a senior community organizer who left Brooklyn in the '40's for the coal country of eastern Tennessee. For decades she struggled against coal company oppression and deviousness and the social outwash of stripmining in the rugged Clear Fork Valley while trying to build health clinics, women's and daycare centers, craft guilds, and other tools to help the local people reclaim some of their culture and sovereignty. She was drawn into land trust organizing when it became an appropriate vehicle for holding title to the community center she and her fellow workers were finally able to secure. A community development corporation has now been set up by which the people are organizing economic renewal through integrated timbering/woodworking.



Adam Turtle and Karen Cowgill
Orient Low-Tech Solar Concentrator

photo by Peter Bane

Sandy Hepler emphasized the concept of a true trust as distinct from the conventional land trust based on a corporation, or contract with the government. He compared true trusts with the fiduciary instruments most often used to preserve assets passed from parents to children. Being a contract between two persons, trusts are based in old law, much more ancient than corporate law which most land trusts use. Elements of a true trust are 1) a trust body (the goods); 2) a trust agreement; 3) trustees with fiduciary responsibility; 4) grantors (who donate the trust body); and 5) beneficiaries (in the case of land, these are the stewards). As part of the trust agreement under which Sandy's land is protected, a sixth element, a council consisting of trustees and stewards meeting once a year, is added. The council must approve major changes in the agreement or management of the trust body.

Joni Smalle and Liz Hoag shared their experience in establishing a small-scale land trust to protect the 43 acres on which they live in south central Kentucky. Committed to a simple way of life and as the only residents, these two valued the legal vehicle of the land trust because it helped assure them that the land would never be sold or converted to non-homestead use. Maintaining the trust required some very simple reporting procedures, which they had nevertheless once failed to submit and which caused them some grief in trying to restore. Advice: Make your annual report; pay the five bucks!

Keyline Demonstrated

Saturday afternoon sessions began with Beth and Eric Ardapple-Kindberg presenting the concepts of Keyline fertility management. The two and their five children farm 35 acres of vegetables in the Ozark Mtns. of Arkansas. They are also the U.S. distributors for the Yeomans chisel plow and related farm implements. Active in community organizing for over a decade, their experience in presenting progressive ideas to a wide range of audiences shone through.

In a completely authentic, yet professional manner, they illuminated Yeoman's key insights about water in landscape and the process of making soil: the economy of water storage in soils and in dams, how to determine best placement of dams, how water can be redirected from the valleys to the ridges through subsoil channels just slightly off-contour; how progressive applications of the chisel plow to greater and greater depth can be assisted by the sowing, flood irrigating, and controlled grazing by livestock of pasture grasses and legumes; how trees planted in contour belts within the fields can control runoff, buffer wind, shelter livestock, augment farm yield, yet need not compete with other crops.

Report from Europe

Frederica Miller, surprise guest from Oslo, Norway, presented a slide show and talk on the work of GAIA, an architectural firm with which she is associated, and on the permaculture scene in Northern Europe. She had pictures of Declan and Margrit Kennedy's village project at Steyerberg, Germany, as well as shots of innovative buildings in both Oslo and the Norwegian countryside. An important group is working in and out of the village of Lista at the very southern extremity of the country. Their windswept site at 58 degrees North latitude is one of the more challenging venues in which PC consultants are working today. Nevertheless, in a landscape where trees grow horizontally, the gardens looked to be flourishing in a wonderfully untended manner.

Entry to the EC common market with its subsidies for large-scale and more southern-oriented agriculture spell doom for Norway's rural farm economy, Miller reported. Norway's rocky soils, small traditional fields, cold damp weather, and short growing seasons cannot compete with the sunny climes and relatively broader spaces of Spain, Italy, France, and Greece. This will present both a challenge and an opportunity to rural designers in Norway in the future.

Building Biology

Key to successful building design in harsh Norwegian conditions, Frederica said, is the concept of "the third skin." GAIA has developed the use of non-toxic building materials such as wood shavings treated with lime for insulation, and iron salts for weatherproofing and termite-resistance in wooden siding. Contrary to recent developments such as airtight buildings and super insulation, they design buildings to "breathe" or exchange air completely about every thirty minutes, but by adding a third wall or outer skin, heat losses are kept very low. Because it needn't be airtight, this third skin, sort of a windbreak fence hung on the outside of the house, can be somewhat fanciful. It can be sculpted to look like a drapery, a slicker, or a growth of moss by cutting the boards to irregular length and leaving some of them open at the bottom. These conservative and healthy techniques augment the value of the traditional tile stove at the "heart" of the house—an old design of continued use and great merit which has always used "waste" heat to good advantage.

IPC 5 Now in Preparation

The Scandinavian Permaculture Group has agreed to host the Fifth International Permaculture Conference and Convergence in September, 1993, and Frederica is making a circuit of the globe visiting and

networking with permaculture groups along the way. She solicited feedback from the participants about the management and impact of the Nepal conference.

Compulsory silliness reigned Saturday evening as master-of-ceremonies Matthew Arnsberger invited, cajoled, and shamed people into sharing their talents after dinner. Skits, dance, animal impersonations, singing in rounds, instrumental performances, and all manner of hijinks graced the stage.

Plant Breeding Secrets Revealed

Sunday morning brought us round to serious business again as Donna Hudson, of Cookeville, TN addressed the audience on the state of her research into cold-hardy citrus, *Poncirus trifoliata* and crosses, and cultivars of *Prunus institia*, the yellow Mirabelle and purple St. Julien and Damson plums which propagate true from seed. Donna is a patient researcher, and a brilliant speaker, who delivered more information word for word in an hour than anyone this listener has heard in many years. Besides sharing the ins and outs of which citrus cross with which and their relative degrees of hardiness, she gave us fascinating insight to the world of dedicated amateur plant breeders and their constant challenge to the USDA experiment stations.

We learned that a serious limitation on breeding cold-hardy citrus (which Donna suggested might mean a reasonably good-tasting small- to medium-sized fruit for Zone 7 in 50-70 years) was the absence of wild citrus hybrids—the natural F1 crosses and backcrosses from those extramarital flings between grapefruit and calamondin that had yielded an ordinary offspring with no noteworthy characteristics, but spectacular genetics—the kind of thing one might find in the back of an old orchard. Well, apparently they don't exist because the citrus industry is so well-tended and so commercially-oriented that there's not enough benign neglect let alone hanky-panky as happens in more desultory fruit-growing regions.

So friends, remember, let your citrus free, and we'll all get to heaven sooner.

"Technology Designs Your Imagination..."

Dawn Shiner swept us up in the tale of the Three Sisters Bioshelter—what had worked and what hadn't. It was a cautionary tale of the caustic effects of too much money too fast, but not told without hope. The project, built with Pennsylvania Energy Department grants, had aimed to create an indoor climate for salad vegetables the year round. Pressures to employ contractors (who proved indifferent and worse), to meet government-mandated timetables, and to build a reproducible structure led to shoddy workmanship, great hassles in supervising the construction, and use of the usual array of toxic materials. In the process the subtler aspects of cultivation were ignored, too much space was enclosed, and even the construction itself failed as glass panels laid in too hastily by the contractor cracked and fell one by one.

While the bioshelter eventually began

producing vegetables for market, the original \$75,000 grant had to be supplemented by one-third to provide a second round of glazing on the upper levels. Shiner's warning: "Tools design your work; technology designs your imagination." Since finishing out the grant, including a documentary video which we viewed, she has turned her efforts toward earth-sheltered straw-bale greenhouses on a smaller scale.

The basics of solar-heated greenhouses are well stated in Fischer and Yanda, *The Food & Heat Producing Solar Greenhouse*:

- 1) Maximum solar gain (efficiency)
- 2) Retention of solar heat
- 3) Stop-loss of heat after collection
- 4) Zonation within the greenhouse

Shiner added to these the concept of flow within and without the structure. Control of insects within the greenhouse, for example, depends as much on plants in the vicinity as on practices within. The bioshelter needs to emphasize "bio-" as much as "shelter" by retaining its connections to the larger environment.

Vince Kosik led a panel discussion on disorder in the larger environment, something which has impressed him strongly from his vantage as an airport worker in Boston. He brought and showed the recent video documentary, "Message from the Elder Brother."

The last afternoon took us outside for a demonstration of simple Keyline techniques by the Ardapple-Kindbergs, and a talk on the community-supported agriculture model by local farmer Jeff Poppen. Jeff has raised potatoes, sweet potatoes, squash, corn, and apples on 250 acres near Red Boiling Springs, TN for 17 years. The land, which we visited the next day during our field trip, is hilly, but obviously fertile. Jeff and his wife, Debbie Beaver, were just bringing in a magnificent harvest of Indian corn and squashes. Mountains of deep red, blue-purple, black, and golden-white ears lay heaped in the barn. They market produce to Nashville and Knoxville stores.

Formal presentations concluded Sunday afternoon with a talk and slideshow on the International Conference and Convergence in Nepal by Cynthia Edwards, Chuck Marsh, and myself. Linkages between cultural and physical erosion were emphasized along with the significant work already undertaken by grassroots groups in that country. The importance of international networking so evident to those of us who attended IPC4 had been underscored by the excellent presentation of Frederica Miller, whose attendance pointed to the continuity of such processes. (Ed. note: Much broader coverage of the situation in Nepal and of the Conference and Convergence events may be found in *The Permaculture Activist*, Volume 7, No. 1.) Auction Supports Tree Nursery, EPC7-- Before supper, we took time out to auction off contributions to the EPC fund. Books, plants, clothing, jewelry, tools, computer software, and sundries raised \$681.00 towards next

year's conference and the announced goals of publishing this year's proceedings and of funding a village tree nursery in Mexico. Last year's EPC had raised funds to start a similar nursery in Nepal, which Cynthia Edwards reported had been successfully launched.

A tree planting and blessing at dusk concluded the weekend event for many, with the evening and early morning given over to packing, cleanup, and farewells. A few dozen of us who had the time toured the nursery of Hector Black at Hidden Springs, near Gainesboro, where we tasted many cultivars of autumn olive, viewed the interplant experiments with black locust, and caught tips on propagating from a master nurseryman. Monday's tour ended at the farm of Jeff Poppen and Debbie Beaver, where cornshucking and a walk in the cold rain left everyone thinking of the winter ahead. We parted, leaving the torch of EPC7 in the capable hands of Doug Clayton, who, with partner David Jacke and the rest of Gap Mountain Permaculture, will host next year's events.

Organizers Make the Difference

Growth of the Permaculture movement in Eastern North America has been hampered by the dearth of design course opportunities in recent years, valiant efforts by Grailville, Gap Mountain, Elfin Permaculture, and Dancing Green notwithstanding. The hinterland of Detroit and Washington, DC is tough territory. Conversely, the openness of the annual conferences (they are public events) has strengthened and deepened the current in the Permaculture channel. Goodwill, high spirits, and keen interest marked this autumn's gathering. With low cost, smooth operation, and a modest surplus to their credit, organizers Sue and Adam Turtle deserve the gratitude of everyone in Permaculture for creating a successful event. May the blessings of this circle extend to all who learn of it.

Collectors Needed for Red Maple Seed

Forest Ecosystem Rescue Network (FERN) needs seed collectors for its Tree Bank program. Tree Bank is a grassroots effort to establish genetic reserves of species endangered by pollution and other causes of tree decline. This spring we are gathering red maple (*Acer rubrum*) to be planted by the volunteers in New Zealand on land they have committed to TreeBank Trust, Ltd., the New Zealand arm of Tree Bank.

Our goal is to sample genetic diversity of the species over its vast range and to enable establishment of living red maple trees in New Zealand where they are less subject to pollution and other factors causing decline of red maple in North America. Red maple naturally occurs from the Canadian Maritime Provinces south to Florida and west to south-eastern Manitoba in the north to eastern Texas in the south.

We need seed gathered from trees in a

Permaculture Asia Limited

The world's first Permaculture Corporation was recently formed in Hong Kong. Following the visit of Bill Mollison in late 1989, the first Permaculture design course to be held in Hong Kong was taught by Richard Webb in Spring 1990. The course participants have now formed Permaculture Asia Ltd. (PAL) as a non-profit company limited by guarantee.

The aim of Permaculture Asia Ltd. is to promote integrated design solutions and the principles of sustainable development to: the public, business, social development organizations, and governments within the region (Hong Kong, China, & SE Asia) through research, teaching, and practical demonstration.

The role of Permaculture Asia is to facilitate the transition from the high energy, low quality, inefficient, and destructive culture that is now dominant, to a high quality, lower energy and sustainable culture.

The PAL team of eight directors brings together a wide range of relevant professional skills, including landscape design, project management, farm management, agroforestry, horticulture, public relations and investment banking. Chris Lonsdale is the managing director, and manager of the training and education aspects of PAL's work. Chris has a long experience in public relations, marketing and in fund raising and environmental education. A Board of Advisors provides additional professional expertise within the areas of finance, marketing, legal affairs, energy, rural resource management and in business development and communications. Max Lindegger, director of Ecological Solutions—a Permaculture design consultancy based in Queensland, Australia—is also a member of the Board of Advisors.

Permaculture Asia Ltd works in a number of areas, the profits from which will ultimately be invested in land rehabilitation projects within the region.

Red Maple, continued

variety of regions to ensure that we rescue as much of the gene-pool as possible. Correspondingly, we encourage collectors to select seed from a wide variety of trees for each site. Please do not collect seed strictly from the viewpoint of usefulness (e.g. sap sugar content, timber, nuts, etc.) We are trying to preserve as much of the whole species as possible. Please keep seed from each site in a separate container which should include identification. We need to know as much ecological information about the collection site as possible. So please provide as much of the following information as possible. Do not send seed that is infested with insects, fungi, etc.

Red maples are readily identified when in seed by the bisymmetrical winged seed which is red and generally appears on the tree before leaf formation although there is sometimes overlap. Red maple seed germinates immedi-

ately after falling if there is sufficient moisture. Therefore it is important to gather the seed before it has a chance to sprout, soon after it falls. Air dry seed upon collection. A report should accompany each seed sample including the following information: your name and address, species common and botanical names, location of tree from which collected (city, state, local landmarks, or street address), location on slope, elevation, soil moisture conditions, longitude, latitude, USDA hardiness zone, annual rainfall, mean summer and winter temperatures, associated species and any microclimate information where relevant (sheltered, low-lying, exposed, windy, etc.) A suitable collection form is available from FERN c/o Yankee Permaculture, 7781 Lenox Avenue, Jacksonville, FL 32221.

Business training. More and more businesses and organizations are realizing that environmental issues must be taken into account. PAL provides focused education and training on environmental issues, leading to environmental management programs and environmental audits. Given the prominence in Hong Kong of business and finance, and the impact these activities have on the environment of the region, the development of ideas for environmentally sustainable business assumes the utmost importance.

Investment and Economics. Ethos Asia, a specialist section of PAL, is developing a research and action centre for promoting alternative economic solutions. Under the guidance of David St. Maur Shiel, who has wide experience in banking and securities, Ethos is working to integrate positive ethical criteria into the existing investment research of financial management companies in the Asia-Pacific region.

Project Design and Management. The Permaculture design team, headed by landscape architect Gavin Coates, has completed a number of small schemes in Hong Kong. A plan for an existing island camp accommodating 10,000 Vietnamese detainees is awaiting approval, while a \$170,000 contract for the first stage of a permaculture layout for a YMCA adventure centre has just been signed.

General Education. In tandem with our design work we run training courses to teach the techniques of Permaculture and sustainable development. A series of workshops, in Cantonese, were held in Autumn 1991, while a full design course will meet in conjunction with Hong Kong University extra-mural department in Spring 1992. A "Green Architecture Award" for an energy-efficient high-rise, producing its own power and food, and recycling wastes, is under discussion with Hong Kong University Department of Architecture.

Resources. The following items are available from Permaculture Asia Ltd:
Provisional Checklist of Potential Permaculture Plants for SE Asia and South China. Uses and growth requirements of 100 trees, shrubs, climbers, herbs, & grasses. \$5.00 US.

Permaculture Teachers Resource Directory. References to over 160 books, periodicals and organizations worldwide relevant to Permaculture. \$5.00 US.

Applying for Sponsorship. Notes for hopeful applicants. \$1.00 US.

We would like to hear from other Permaculture people, environmental groups, agriculturalists, and researchers within the region with a view to networking and exchanging information.

Permaculture Asia Ltd, 1/F. Lot 1969 Tai Wan New Village, D.D.3 Lamma Isl., Hong Kong. Tel. 852 9820703. Fax 852 9821452.

EOS Institute, So. California

Believing that problems in our "built environment" have reached crisis proportion, an Orange County, California, group of architects, designers and planners, in cooperation with the Permaculture Institute of Southern California, is sponsoring Eos Institute, a proposed education center that would demonstrate new, more socially responsible ways to build homes and communities.

"A deficient understanding of sustainable land-use has led to widespread problems in the design of communities," according to Lynne Spitalny Bayless, Eos Institute Project Director. "Sprawling suburbs built for cars separate people great distances from their workplaces, shopping, recreation, public facilities, and in general from all their social interactions. Air pollution, traffic congestion, and endless pavement are a plague in all urban areas. The vulnerability created by a gluttonous, oil-fueled transport system is all too painfully known.

"The American Dream House is a voracious energy sink," she said, "creating toxicity and impacting space with limited consideration to its surroundings. Many common construction materials are damaging to the environment in their extraction, manufacture or import. In addition, the increasing use of synthetic chemicals in construction materials and finishes which emit toxic fumes has contributed to higher incidence of cancer, allergies, psychological abnormalities and birth defects.

"Home energy consumption accounts for about 17% of all energy use in the US. Most of this energy is produced by the burning of fossil fuels, contributing to acid rain and pumping 3.2 tons of carbon dioxide per person per year into the atmosphere—a major cause of the greenhouse effect. Residential development has focused on the cost of construction, with little regard for long-term environmental impact. Rare is the home that takes advantage of climatically sensitive architecture, engineering, landscaping or

ecologically sound site orientation to minimize maintenance costs or to maximize productive yields."

As a group of professionals and tradespeople involved in the design and development industry, who are concerned about the quality of life not only for themselves but for their fellow inhabitants of the planet and for future generations, Eos believes that the largely unacknowledged problems in our built environment are actually of crisis proportion and should be addressed honestly and immediately. They consider it irresponsible to continue the old habits when many rudimentary solutions could easily be incorporated in homes and communities that are currently being planned and built.

In 1990, Eos conducted an eight-month lecture series on "Sustainable Living," bringing together applied ecologists, researchers and other concerned professionals to help examine the relationships and consequences of today's way of living, and to present new

options. Beginning in July 1991, they sponsored a series entitled "Building the New American Dream," focused on sustainable development issues ranging from pedestrian-oriented urban planning to non-toxic building materials. Eos also publishes an educational quarterly journal and resource guide, *EARTHWORD, The Journal of Environmental and Social Responsibility*.

Eos Institute is currently planning to open an education center for the study and promotion of ecologically balanced living, providing resources, technical assistance, teaching, and research in the development of sustainable urban environments. The center will pioneer innovative and appropriate lifestyles, technologies, systems and products for resource management derived from holistic and socially responsible values. The following will be addressed:

1. Community planning.
2. Site planning.
3. Principles, processes, and materials for

architecture, interiors, and construction.

4. Urban agriculture. Landscaping. Irrigation.

5. Energy technologies and systems.

6. Water recovery and waste treatments.

Utilizing these principles, and maximizing the participation of the greater regional design and development community, the Eos Institute plans to construct:

1. A public facility to house a resource library, shared meeting room, and staff office.

2. A co-operatively planned and managed, affordable residential community of 20 to 40 households for staff, faculty, and other participating families, with guest quarters for interns, visiting faculty, and other visitors.

Contact Kermit Dorius, Chairman, Orange County Chapter, Architects, Designers and Planners for Social Responsibility, 1550 Bayside Drive, Corona Del Mar, CA 92625, or Dr. Bill Roley, Director, Permaculture Institute of Southern California, 1027 Summit Way, Laguna Beach, CA 92651.

Allied Groups

Solar Cooking Intl. Conference "Use and Technology Worldwide"

Date: June 19-20, 1992

Two days of paper presentations, roundtable discussions, and displays on all aspects of solar cooking, open to presenters and participants from all relevant disciplines, including environmental studies, appropriate technology, health, humanities, social studies, scientific, engineering, governmental, and other fields. This conference is a forum among those individuals who recognize that Solar Cooking can play a major role in the quality of life on Earth in the coming decades.

Papers, posters, audio visual materials, and displays of solar cooking devices are solicited on all aspects of Solar Cooking and Water Purification: solar cooker designs or analysis; cultural or social impact of solar cooking; health and nutrition; promotion of solar cooking; project updates; solar cooker devices, commercial and experimental.

Submit two copies of a one- or two-page abstract or letter describing your display, poster, or audio-visual material to: Univ. of the Pacific, 102 Khoury Hall, Stockton, CA 95211 USA, 209-946-2377.

Ecological Horticulture Apprenticeship, UC-Santa Cruz

Each year, the Agroecology Program UC Extension, Santa Cruz, offers a training course in organic farming and gardening. The 6-month residential Apprenticeship in Ecological Horticulture, April 6-October 2, 1992 at the UCSC Farm and Garden, emphasizes hands-on learning with instruction in organic horticultural methods (soil fertility, cultivation, composting, propagation, irrigation, greenhouse); cultivar requirements (vege-

Botanical Preservation Corps Tropical Field Ethnobotany Course in Mexico

Two six-day field courses will be offered December 5-10 and December 14-19 by the Botanical Preservation Corps (formerly Botanical Peace Corps), based in the primary rainforest of Southern Mexico. This presents an opportunity for students to be immersed in the tropical forest, study the powerful medicinal plants employed by indigenous healers, and to learn how to do tropical field ethnopharmacology.

Laguna de Catemaco, a large lake surrounded by climax tropical lowland rainforest, is in southeast Veracruz state, along the Caribbean side of Southern Mexico. It is

New Organization to Stem Loss of Agricultural Diversity

The Institute for Agricultural Biodiversity has been formed to address the problem of the escalating loss of agricultural genetic diversity. It will develop models of livestock preservation through training, research, interdisciplinary education, policy analysis, and direct conservation. Contact: Shan Thomas or Hans Peter Jorgensen at The Institute for Agricultural Biodiversity, RR 3, Box 309, Decorah IA 52101, tel: 319-382-5947.

tables, herbs, flowers, fruits); pest and disease considerations and marketing. Both garden and field-scale production are included.

Tuition: \$1,500 (includes books, tools and living expenses). (Students can live on the 29-acre farm in their own tents free of charge.) Annually, two tuition waivers are offered to minority systematically disadvantaged individuals.

Contact: Apprenticeship, Box F, Agroecology Program, University of California, Santa Cruz, CA 95064, telephone: 408-459-2321.

one of the few remaining areas of intact, high canopy primary forest in the region.

The courses will be based at a large private rainforest reserve on the lake, working out of a unique facility particularly appropriate for botanical field studies. A film was recently made at this site, with Sean Connery cast as a plant collector in the Amazon. Three different tribal groups were brought up from Brazil to construct an authentic traditional Amazonian village in natural detail. This will serve as base camp for the course, which will consist of formal and informal talks and discussions, training workshops, hands-on practice sessions, presentations by local medicinal plant specialists and excursions within the rainforest reserve and to a monkey-inhabited island, plus ample time for individual exploration of the forest. Two meals daily will be provided from the poolside restaurant in the reserve.

An introduction to the following topics will be presented: 1. Introduction to Pharmacognosy and Botanical Chemistry; 2. Ethnopharmacology of Central and South America; and 3. Botanical Field Collection Techniques.

Instructors will be Jonathan Ott, a natural products chemist and botanical researcher, and Rob Montgomery, experienced botanical collector and founder of the Botanical Preservation Corps.

The course fee of \$480 includes round-trip ground transportation between Veracruz airport and the reserve at Catemaco, six days of instruction, use of the reserve and its facilities and two meals daily except lunch (you are asked to bring daypack foods for lunches, since participants will often be hiking at mid-day).

Send full registration fee of \$480, payable to Botanical Preservation Corps, Box 1368, Sebastopol, CA 95473.

Letters

Permaculture for Cuba

Dear Permaculture Activists,

I am invited to initiate a permaculture project coming January in La Habana, Cuba. Myself, I am a planner and architect specializing in shelter and settlement in the Developing World. Over the past years I visited Cuba on several occasions and managed to win the *Grupo por el Desarrollo Integral de la Ciudad de la Habana*—a kind of think tank for the future development of the country's capital—for the idea of permaculture.

However, convincing the experts within the authorities is not enough. I consider my main task for the future is winning the interest of the population concerned: the residents of a medium-rise mass housing scheme of the 1970's. As these people do not speak foreign languages, I am looking for literature and contacts in Spanish. I wonder whether you can help me further in this respect.

Dipl.Ing. Kosta Mathey
TRIALOG Geschäftsstelle Süd
Hofangerstrasse 21
D-8000 München 83, Germany

Tree Planting: Top Down or Bottom Up?

Dear Activists:

I'd like to comment on a couple of the interesting articles in No. 24.

First, I'd like to add to the arid Hawaii piece by Craig Elevitch, whose article was an excellent addition to an issue on design. I was on Oahu for a bit in 1987, leading permaculture workshops and making contact with some native Hawaiian groups, one of which had reclaimed some unused acres from the Army. I had the occasion to explore the land.

On much of Oahu, as on many tropical islands, invasion by European society has had catastrophic effects. Land abuse had cleared vegetation, lost the presumably shallow soils atop the lava, and resulted in parched prominences of baked black rock. Mesquite (*Prosopis* sp.) growing in cracks between the lava was tortured by searing winds into twisted forms at most a few inches high. The other major vegetation was *Opuntia* cactus. The ocean was right at hand.

Normally, with hills parched because of deforestation, one plants from the top down. Here that clearly would not have worked. The black rock soaks sun, heating and drying air as it rises from the ocean both night and day, making the crest the

most desiccated site on the slope. Gravity flow irrigation with rain catchment was possible, however, using a bit of lime mortar or cement to seal the lava. It took a full hour or more of walking up and down from the crest to the ocean to realize that the reverse of the usual planting procedure needed to be practiced here.

Trees there needed to be established at the ocean edge. The cooling effect of the trees would increase the relative humidity of the air, particularly at night, providing a softened, moist microclimate upgrade (but below the crown of front trees) for the next generation of vegetation. In that way as the moisture-saturated winds came off the ocean, they'd be progressively cooled as they rose, releasing moisture and eventually reestablishing a local hydrology.

The tree planting piece ("Organic Soil Amendments for Tree Establishment") was a bit retarded for a permaculture publication. It has been well known for decades that, in general, soil amendments in planting holes stunt trees. The way to provide soil is from the top down, as nature always builds it. We can substitute energy for time to some degree in this process by bringing in waste organic material as mulch then stocking chickens to shred and inoculate the mulch as they dine on decomposer invertebrates. Simultaneously, we need to start successional plantings, first pioneers, then species which are progressively more demanding (In general, the latter are also successively more rewarding ecologically and economically). A caution: I recommend natives for the most rugged pioneers. Exotic pioneers tend to rampancy in a degraded situation. Rampancy of native pioneers is unlikely. Only experienced designers should consider working with the exceptions (non-natives).

Finally, it is beneficial to amend planting holes of trees with rock mineral supplements of low solubility, such as granite dust (for potassium), etc., and modest amounts of bone meal, which should also be broadcast around the planting to encourage feeder roots to extend, etc.

The best way to establish trees is to remineralize soils with rock powders proven effective in the region in conjunction with keyline cultivation or organic crowbars (e.g., daikon); plant on contour to permit easy irrigation and efficient crown stacking; mulch completely with a period of poultry stocking, establishment of pioneers, and a regime of direct planting of species in natural temporal succession toward the desired forest community. Chickens can be retained or reintroduced by piling brush where scratching is unacceptable. Bear in mind that chickens eat leaves of many useful early-succession trees and shrubs, e.g. *Caragana* and honey locust (*Gleditsia triacanthos*).

Permaculture Books

Introduction to Permaculture, Bill Mollison w/Rene Mia Slay (1991) 198 pp. paper. illus. The basic argument for permanent agriculture honed to a keen edge by a dozen years' teaching and thousands of demonstrations. How to feed and house yourself in any climate with least use of land, energy, and repetitive labor. If you talk permaculture, you need this book. Supercedes PC 1&2. 23.00

Permaculture: A Practical Guide for a Sustainable Future, Mollison (1990) 576pp. cloth. 450 illus. + 130 color photos, N. Amer. reprint of *The Permaculture Designers' Manual*. Global treatment of cultivated ecosystems. Resource for all landscapes and climates. 40.00

The Best of Permaculture: A Collection, Max Lindegger & Robert Tap, eds. (1986) 136 pp. paper. illus. Choice examples from around the world: PC, building biology, urban forestry, land restoration. 15.00

Conceptual Permaculture Report: Crystal Waters Village, Lindegger & Tap. (1989) 80pp. pap. illus. Advanced proposal for an agricultural economy at the 1st PC village in Australia. Original work. 22.50

Crystal Waters Permaculture Village Owner's Manual, 2nd ed. Nascimancere. (1990) 54pp. pap. illus. Nuts and bolts for the owner/builder. Passive solar design; hard-to-find info on rammed earth, sod roofs, pole construction, building biology. Subtropical focus. 11.00

Western Permaculture Man'l, ed. David Brown. 160pp. pap. illus. "A significant contribution to the development and explanation of permaculture"—David Holmgren. Ethics, ecology, design, technology, silviculture, animals-10 yrs work by the PC Assn. of W.Australia. 14.00

Designing and Maintaining Your Edible Landscape Naturally, Robt. Kourik. (1986) 370 pp. pap. illus + 19 color photos. Permaculture in the home garden. Mulch gardens, double digging, root zones, intercropping, pruning, companion crops, natural pest control. 17.00

City Food, Crop Selection in Third World Cities, Isabel Wade (1986) 54pp. pap. illus. Efficient food production with limited resources. Treats many tropical fruits, nuts, & vegetables not familiar to N. Americans: cultivation, food values, planting calendars; common & botanic names & uses for 100+ crops; extensive biblio. 7.50

EcoCity Berkeley: Building Cities for a Healthy Future, Richard Register. (1987). 140pp. pap. illus. Valuable and visionary view of Berkeley and the Bay area 25, 50, and 120 years in the future. Scenarios of ecological city transformation. Design for city regions. 11.00

EcoCity Conference 1990: Report of the 1st Intl Conference, Urban Ecology. 128 pp. pap. illus. 150 presenters on 80 topics. Communities, design, transport, workplace, wilderness, cohousing, recycling, cultural models, new towns—a feast of examples. Directory of resources. 7.00

The Man Who Planted Trees, Jean Giono. (1985) 56pp. paper. 20 woodcuts. Beautifully illustrated by Michael McCurdy. 6.95

Dwellers in the Land: The Bioregional Vision, Kirkpatrick Sale. (1985) 217pp. paper. A sourcebook for much of the current bioregional movement. His vision of a community-based governance points to a new paradigm for politics appropriate to permaculture. 13.00

Directory of Intentional Communities 1990-91, 312 pp. pap. illus. 300+ N. American and 50+ int'l communities, 200 alternative resources and services, 35 articles on community living. Comprehensive, exciting survey of a maturing movement for cultural transformation. 12.00

Cornucopia: A Sourcebook of Edible Plants, Stephen Facciola. (1990). 678 pp. paper. Lists over 3,000 species with all commercially available named cultivars, sources of seed, plants, descriptions, uses, cultural notes, food products; indexed by common name, families, and genera. A monumental work useful to every designer/gardener. 36.00

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| II, 1 | Feb. '86 | Garden Design | | | |
| II, 2 | May '86 | IPC 2 & PC Design Courses | | | |
| II, 3 | Aug. '86 | Int'l PC Conference Program | | | |
| II, 4 | Nov. '86 | Conference Wrap-up #1 | | | |
| III, 1 | Feb. '87 | Conference Wrap-up, #2 | | | |
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| IV, 4 | Nov. '88 | Multi-Story Tree Crops: Greening Dom. Repb, Runoff Gdns | | | |
| V, 1 | Feb. '89 | Permaculture: A Designer's Manual, Tree Bank, Water in PC | | | |
| V, 2 | May '89 | Plant Guilds, Roof Gardens, Small Livestock | | | |
| V, 3 | Aug. '89 | Rainforest Conservation in Ecuador, Gaia, Weed Gardens | | | |
| V, 4 | Nov. '89 | PC Def's, Water Conservation, Small Dams, Ponds, Keyline | | | |
| VI, 1 | Feb. '90 | Household Greywater Systems, Soil Imprinting | | | |
| VI, 2 | May '90 | Insectary Plants; more Greywater; Land Use for People | | | |
| VI, 3 | Aug. '90 | Forests & Atmosphere; Catchment; Nepal; Pond Design | | | |
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| #23 | May '91 | Politics of Diversity; Greenhouse Mkt Gdn; PC in Nepal | | | |
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From the Editor, continued from page 2

prices went up this year, following postal rates, but they had been stable since 1988, and we will hold them steady for several more. We also increased the size of the magazine from an average of 28 pages to 40. There was no Summer issue this year. Volume Seven will contain only three numbers, #23-25, Spring, Autumn, and Winter. These were posted in late May, early October, and mid-December respectively. Those who had paid for four issues of Volume VII will receive the Spring '92 issue as one of them, etc. We will not make up the lost issue; we will however, edge our releases back onto the Feb. 1, May 1, Aug. 1, Nov. 1 schedule which prevailed for the previous five years.

WE'RE MOVING!

Yes, again. But this time to the mainland. BJ, Liberty, *The Activist*, and myself will be locating in the Nashville, Tennessee area where we hope to find land for a farm and stay put while Liberty grows up. Six years in Hawai'i have been stimulating, but land is not available for homesteading. The transport system on and to the Islands is perilous, and we need both a home and good communication.

Nashville is a major printing center and we hope to move *The Activist* onto recycled paper in the next year. Tennessee is also near major distribution hubs. Our subscribers (and our nerves) should benefit from faster delivery. We will enjoy lower costs of production and distribution and better access to resources. In the long run, having a home will improve our performance immensely.

To all of you who've hosted us in the past year, and to all who invited us to join you, we give our most sincere thanks. You'll see us again. We still intend to travel, but the distances won't be as great.

We believe that locating *The Activist* east of the Mississippi and south of the Mason-Dixon line is now appropriate. While the majority of our readers still live west of the Rockies, some of the fastest growth in Permaculture has been in the East, and we feel the area is ripe for community development. We hope too that our move will be part of a larger exchange of people, goods, teaching, and organizing between different regions in North America and with the global permaculture movement. It is important that we be able to understand and support our colleagues and allies, wherever they may live.

Our new address (beginning January 1, 1992) appears on pg. 3. Mail sent to our Hawai'i address will be forwarded, just as mail sent to *The Activist* in Davis, California still reaches us eventually.

Be patient, it takes time to make a permanent culture.

(thos). They are beneficial to *Prunus* genus and particularly like *Rubus* and *Smilax* spp. for cover and nesting. I believe that chickens can lay well with the bulk of their diet coming from what they scratch out of deep mulch.

This set of recommendations should reduce establishment time for a mature tree species community by an order of magnitude.

Dan Hemenway,
Elfin Permaculture
7781 Lenox Ave.
Jacksonville, FL 32221

Ethics for Botanical Work

Society for Economic Botany
Ethics Committee:

I have read with interest your draft of ethical guidelines for economic botanists, and am very happy to see how well you have addressed our responsibilities to the peoples who are kind enough to share their knowledge with us. Having been "on both sides of the notebook," so to speak, at times as investigator, and as informant on other occasions, I am particularly heartened to find the Society directing its attention to the ethical considerations inherent in this relationship.

May I suggest that we forgo the formality of the third person "they," and use "we" when we phrase our principles? "They" implies someone else, another upon whom we are imposing our principles. "We" is more accurate, involves the reader directly, and may be more effective in inspiring voluntary adherence to the guidelines. An ethic which is internal, arising from the heart of the individual, is stronger than one imposed from without. Using "we" may foster the confirmation of the principle by the individual's internal ethics. For example: 1. We have responsibilities to the public., or We, the members of the Society for Economic Botany, have responsibilities. Or 1A. We will strive to use our knowledge. Etc.

Could the Newsletter be used as a forum for the exchange of ideas on the ethical guidelines? This would allow the many far-flung members who may not be able to attend the meetings to contribute their valued insights. If there is urgent need to adopt the guidelines, perhaps they could be provisionally approved until the greater part of the membership has had the chance to comment. The Newsletter would be a good place for ongoing discussion by the more distant members.

Recommendations: To Article 1. (Members' Responsibilities to the Public)—add:

D. Germplasm resources being the common heritage of all humanity, we will refuse to work professionally on projects which will result in the

appropriation of such resources by private interests via patent protection, or the restriction of the free flow of such resources by governments through the misuse of agricultural regulations or their classification as "strategic resources."

E. Imbalanced economic conditions being harmful to the well-being of humanity, we will not use our knowledge and skills on projects which will further the undue concentration of wealth in the hands of the few.

To Article 2. (Members' Responsibilities to Those Studied), add:

F. The preservation of ethnobotanical knowledge and germplasm resources being essential to the future well-being of humanity, and *in situ* preservation being the most effective and efficient means of insuring this goal, we will use our knowledge and skills to enhance the self-respect and self-determination of our informants and their peoples. We will foster the peoples' pride in their ethnobotanical traditions, local landraces, and wild plant resources, and assist them in preserving their plants and recording their knowledge, for themselves and their descendants. When introducing new crops or methods to an area, we will fully inform them of the value to the people of preserving their traditional crops and methods alongside the new.

Perhaps the following category of responsibilities was overlooked due to its obviousness, but it can't hurt to codify this fundamental principle:

Article 6. WE, THE MEMBERS OF THE SOCIETY FOR ECONOMIC BOTANY, HAVE RESPONSIBILITIES TO THE NON-HUMAN WORLD.

A. As no organism can exist without habitat, as all basic materials essential to human well-being originate in the non-human world, and as we ourselves are derivative of it, we have a fundamental responsibility to attend to the well-being of the non-human world.

B. Whereas every species has intrinsic worth, beyond any possible utility to, or indirect benefit to humanity, we recognize the fundamental right of all species to exist and to partake of their fair share of the earth's resources. *In situ* conservation, being the most effective and efficient means of insuring this, we will specifically refuse to engage in work which compromises the ability of a species to exist as a sustainable wild population.

C. As all organisms are related through our common ancestry, and as each individual organism has intrinsic worth, we have a fundamental responsibility to treat all living beings with respect. Specifically, each individual will examine his or her use of other organisms in research to insure as far as possible their humane and ethical treatment,

and that the research is fully justified by a necessary increase in our knowledge.

D. The use of our knowledge to benefit humanity must always be balanced by concern for the possible effects our actions may have on the well-being of the non-human world.

To comment on the above, "Natural world" is a more elegant phrase, but might imply the exclusion of cultivated or intensively managed areas, so my preference is with "non-human world."

Frequently the respect and ethical treatment extended to other organisms is offered according to their level of kinship. Beginning with the basic self-preservation instincts of the individual, and extended to the family, tribe, nation, race, and species, in concentric circles based on level of relatedness, and as our ethical awareness has evolved, our concern is extended to ever more distant relations. Although it may be the logical and desirable outcome of our ethical evolution to attain equality in our ethical relations with other organisms, in practice it would seem impossible; we have to eat, and we have no method of extending voting rights to bryophytes. However, this should not dissuade us from at least extending the basic courtesy of respect to all living beings and providing ethical and humane treatment according to the three basic criteria of extent of relatedness, level of intelligence, and ability to feel.

Since the guidelines are just that, and do not carry the force of law and prescribe no penalties, we should not be too timid in drafting them. After all, the heart and conscience of the individual will always serve to educate, raise questions, and provoke thoughtful consideration in the reader of his or her actions.

As the president has pointed out, we do not want our Society to remain small and reactive to world events. I think the drafting of ethical guidelines is a good step in the right direction.

Respectfully,
D. Theodoropoulos, Prop.
J. L. Hudson, Seedsman
PO Box 1058
Redwood City, CA 94064

(Ed. note: We thank the Society for Economic Botany for sharing the insightful comments of Mr. Theodoropoulos. References to both J. L. Hudson, Seedsman and to the Society may be found on pg. 18. Serious consultants are encouraged to join the Society and to avail themselves of the offerings of these two fine organizations.)

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TECHNICAL BULLETIN on Gap Mountain Permaculture "Mouldering" Toilet Describes basic functioning, design considerations and construction details for cold climate privy. \$12 ppd from Dave Jacke, 9 Old County Rd, Jaffrey NH 03452.

Waste of the West - Explores step by step a remarkably sordid, unjust, cruel, wasteful, and destructive situation—the obscure and secret world of public lands ranching. A complete account for the general reader, specialist, or activist. Many ideas for activism, a contact list, complete statistics, inspirational quotations, a 500-item bibliography, and index. More than 1000 photos. 8-1/2"x 11". \$28 per copy. Lynn Jacobs, POB 5784, Tucson, AZ 85703 or 602-578-3173.

Portable Dwelling Info-letter: about living in tents, yurts, domes, trailers, boats, remote cabins, other mobile or quickly-made shelters plus plans for

simple, low-cost low-impact comforts and conveniences. Sample \$1. Box 190-pa, Philomath OR 97370.

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Help Wanted

The Permaculture Activist seeks one or more volunteers to assist with typing, editing, correspondence. Retired journalist, English student, teacher, or PC-oriented resident of Middle Tennessee preferred for 2-4 hrs per week; or visiting assistants the month prior to publication. Typing skills necessary, but we will show the ropes. The business is lively, the work interesting, and the enterprise deserves support. Can you help? Write: Editor, PC Activist, Rt.1, Box 38, Primm Springs TN 38476.

Educational project in Oaxaca, Mexico, needs permaculture designers. University credits available. Spanish studies on site. We will supply all facilities for initial team. Challenging opportunity for those seeking work in a sub-tropical setting. Long term relationship with village and project possible. Please send short resume to Anthony Raab at 2834 N. Shore Rd., Bellingham, WA 98226, or call (206) 671-7241.

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December 5-10 and 14-19, 1991. Tropical Field Ethnobotany Course. Mexico. Contact Botanical Preservation Corps, Box 1368, Sebastopol, CA 95473. pg. 36.

January 27-May 20, 1992. Ecofeminism and Ecology, American Multiculturalism: A Semester for Women. Loveland, OH. Contact Grailville, 932 O'Bannonville Road, Loveland, OH 45140-9705. ph. (513) 683-2340.

January 24-25, 1992. Eco-Fair Texas 1992. Austin, TX. Contact Eco Fair Texas, PO Box 1991, Austin, TX 78767, (512)478-4060.

February 19-March 6, 1992. Permaculture Design Course. Toledo, Belize. Contact Tropical Conservation Foundation, 14 N. Court St., Ste 301, Athens, OH 45701. pg. 30.

February 28-Sept 13, 1992. Six-Weekends Urban Permaculture Design Course. Houston, TX. Contact Anne K. Devlin-Firth, 213 E. 24th St., Houston, TX 77008. pg. 30.

March 14-16, 1992. Gearhart, OR. PC Teachers Reunion. Contact Jude Hobbs, 1661 Willamette Street, Eugene OR 97401. pg. 31.

March 19-22, 1992. Cottage Grove, OR. Skills For A Sustainable Future-the Permaculture Quest. Contact Willamette Valley Permaculture Association, 80260 Hwy 99N, Cottage Grove, OR 97424. pg. 30.

May 17-24, 1992. Camp Stewart, Kerrville, TX. Turtle Island Bioregional Congress V. Contact Gene Marshall, PO Box 140826, Dallas, TX 75214. (214) 324-4629.

June 7-21, 1992. West Lima, WI. Village Permaculture Design Course. Contact Friends of the Trees, PO Box 1068, Tonasket WA 98855, (509) 476-3678. pg. 31.

June 19-20, 1992. Stockton, CA. World Conference on Solar Cooking. Contact Univ of the Pacific, 102 Khoury Hall, Stockton CA 95211 (209) 946-2377, fax -3086. pg. 36.

July 1-31, 1992. W. of Spokane, WA. Permaculture Chautauqua. Contact Lynn Craig, 7131 Owensmouth, #22G, Canoga Park, CA 91303, 818-348-4025. pg. 32.

July 7-21, 1992. Okanagan Valley, WA. Permaculture Design Course. Contact Friends of the Trees, PO Box 1068, Tonasket, WA 98855, 509-476-3678. pg. 31

August 21-30, 1992. nr. Grand Rapids, MI. 10-Day Permaculture Design Intensive. Contact Dave Van Dyke, 15580 Stanton, West Olive, MI 49460. pg. 30.

September 18-20, 1992. Spring Mills, PA. Introduction to Permaculture. Contact Dancing Green, PO Box 157, Cochran, PA 16314. pg. 31.

CLASSIFIEDS

Volunteers wanted to help organic farmers in Pushkin. Soviet authorities will pay all expenses but airfare. Contact Alex Jack, One Peaceful World, Box 10, Becket MA 01223, 413-623-5742.

Internships

Intern openings for evolving small community education centre. Focus on office, forest, A.T., gardening, building. Aprovecho Institute, 80574 Hazelton Rd., Cottage Grove, OR 97424. (503) 942-9434.

The Howell Living History Farm offers ten-week internships in draft animal power to people interested in international agriculture development. Contact Robert Flory, Howell

Living History Farm, RR2, Box 187, Hunter Rd., Titusville NJ 08560, (609) 737-3299.

Maine Organic Farmers and Gardeners Assn. seeks apprentices to work from May to September, possibly longer in some cases. Contact Bill Thayer, Placement Coordinator, Box 520, West Bay Rd., Gouldsboro ME 04607, 207-963-7771.

Tabard Farm, a certified organic farm, offers food, lodging, and stipend for 1991 season for farm workers/apprentices. Contact Susan Peterson, c/o Tabard Farm, Rt 1, Box 2444, Middletown VA 22645, 703-869-5815.

Situations Wanted

Want to meet other permaculturists near us in E. Ohio/WV panhandle.

614-695-3008. Cindy & John Irwin, 104 Gaywod Dr., St. Clairsville, OH 43950.

"TERRA NOVA" ecological Landscaping seeks networking with person involved in landscaping with ecology in mind. Terra Nova, attn: Ken Foster, Box 677, Santa Cruz CA 95061-0677.

30-year old man wants to live on land trust. I can buy a share. College grad, Dartmouth & Sterling, masseur, vegetarian. Will Corson, P.O. Box 1766, Soquel, CA 95073.

Communities

The KANIKSU PROJECT intentional community. Sun, water, wind and wood power. Private and shared spaces. 20-page prospectus \$1.00. P.O.B. 849, Glen Ellen, CA 95442.

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ELFIN Permaculture Design Associates offers permaculture design and consulting services in all regions. Contact: Dan Hemenway, 7781 Lenox Av. Jacksonville FL 32221 USA for details.

Protect your permaculture project. Place your land in trust. Legal, technical expertise. Turtle Island Earth Stewards, Box 39077, Point Grey RPO, Vancouver, BC V6R 4P1, Canada.

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