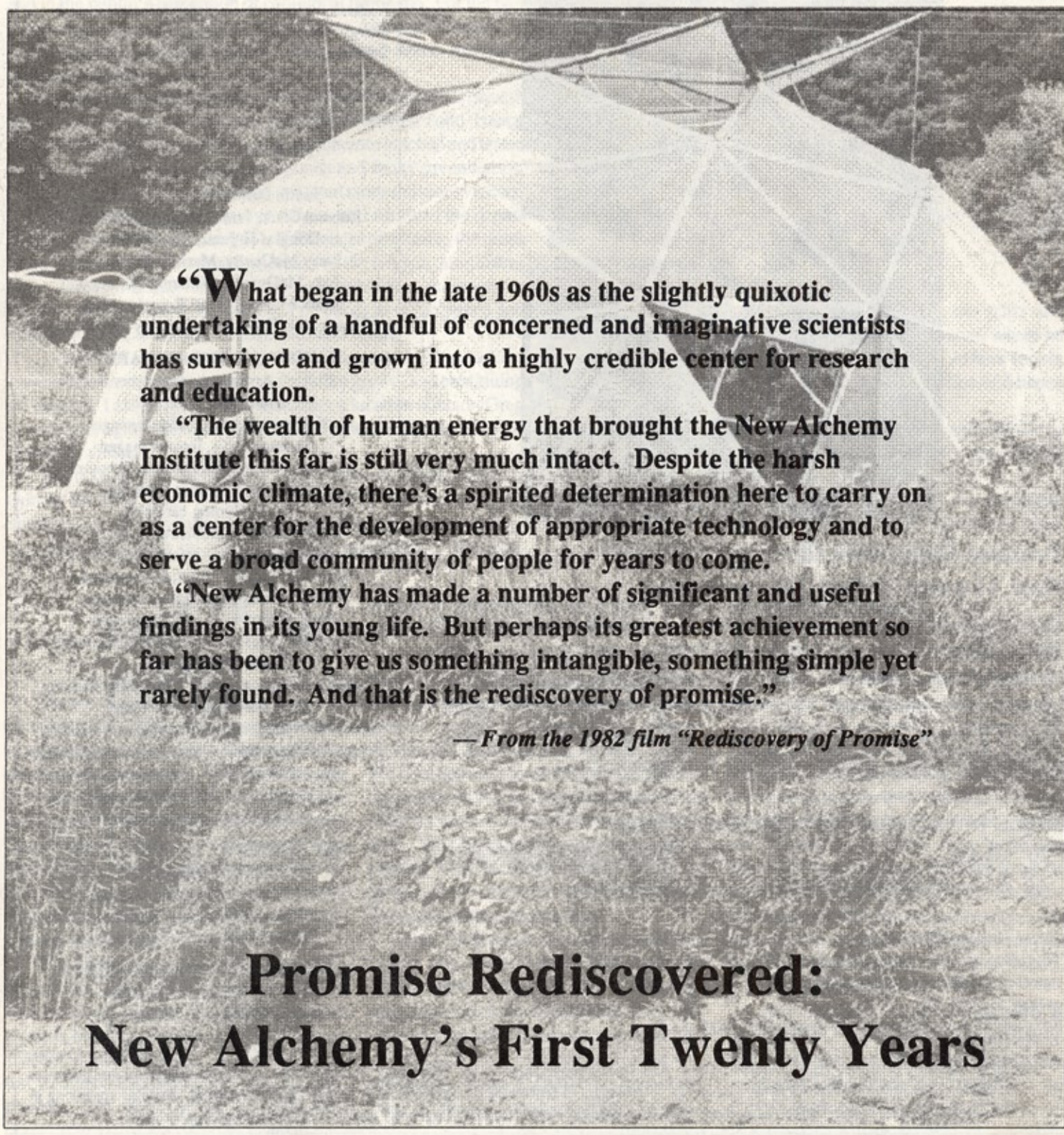


New Alchemy

\$2.00

Fall 1989, No. 37

Quarterly



“What began in the late 1960s as the slightly quixotic undertaking of a handful of concerned and imaginative scientists has survived and grown into a highly credible center for research and education.

“The wealth of human energy that brought the New Alchemy Institute this far is still very much intact. Despite the harsh economic climate, there’s a spirited determination here to carry on as a center for the development of appropriate technology and to serve a broad community of people for years to come.

“New Alchemy has made a number of significant and useful findings in its young life. But perhaps its greatest achievement so far has been to give us something intangible, something simple yet rarely found. And that is the rediscovery of promise.”

—From the 1982 film “Rediscovery of Promise”

**Promise Rediscovered:
New Alchemy’s First Twenty Years**



Promise Rediscovered: New Alchemy's First Twenty Years

By Kate Eldred

1969

In the summer of Woodstock, men on the moon and the Amazing Mets, New Alchemy was born. The creation process was extended and gradual, but when pressed to define the moment of inception Nancy Jack Todd points to the evening of September 12th.

After reading an article by Paul Ehrlich called "Ecocatastrophe," she turned to her husband and said, "John, we must do something." Just then Nancy felt the preliminary labor contractions that heralded the birth of their third child, Susannah. She later recalled, "I was momentarily distracted from my other mission, but since then I have come to think of it as something of a twin birth."

Nancy, John and Bill McLarney had already hosted a series of living room seminars to discuss ecological problems. Post-seminar talk focused on what, if anything, could be done to create a saner world. During the summer Bill and John took their San

Diego State biology class on field trips to a ranch where they researched the landscape in detail and drafted plans for an agricultural ecosystem. The plans were shelved when the landlady raised the rent and built a colony of cottages.

Thus, for its first year New Alchemy existed only as a vision in the minds of its creators.

1970

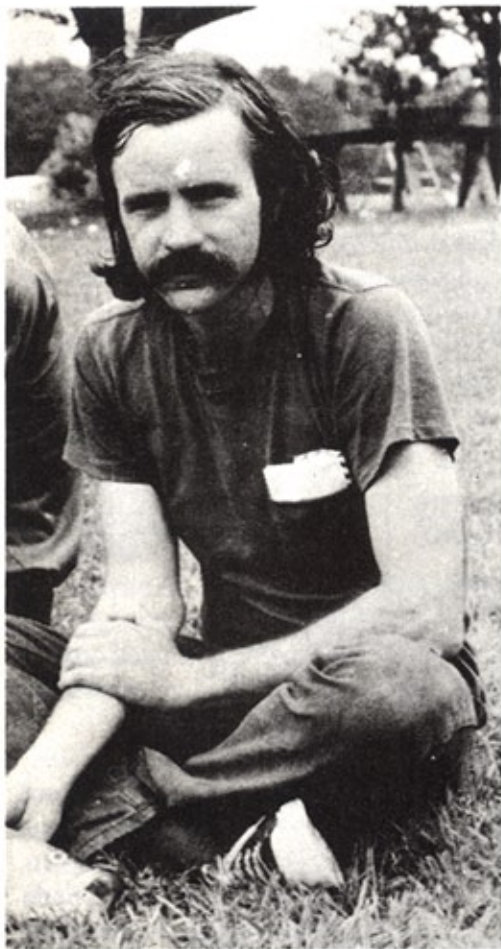
In June the New Alchemy Institute was incorporated and received its tax-exempt status as a nonprofit corporation. That summer the Todds and their children moved to Cape Cod. McLarney soon followed and joined John at the Woods Hole Oceanographic Institution. At this point New Alchemy's was still mainly a paper reality, but the Todds built our first bioshelter—a small dome in their front yard, complete with a children's wading pool for fish.

John Todd later wrote: "The New Alchemy Institute was formally organized in 1969 after a decade of discussions and gatherings on the part of a small group of scientists, artists and humanists. We were deeply unhappy with society's present course and were searching for ways in which a small group might aid in creating a saner world.

"The goals of the New Alchemists are both biological and social. As ecologists we are carrying out research in agriculture, aquaculture, power generation and other skills aimed at enabling man (sic) to satisfy his needs without destroying the resources which provide them. Where man has already scarred and partially destroyed the environment, we wish to enhance and restore it to make the earth, and its people, sing again. On a social level we seek to aid and foster the development of decentralized communities where people can live in a manner consistent with our ecological philosophy. Both our biological and social goals will be pursued at the New Alchemy centers, where individuals will learn good stewardship of the earth as they assist us in the development of new world skills and technologies.

"The main sources of support for the New Alchemy Institute will be granting agencies and contributions of the associate members. It is our intention to keep our costs as low as possible by eliminating frills and by purchasing equipment that is built to last. Much of our work is and will be done by volunteers, and the salaries of our paid staff will be conservative, as the highly skilled people who are attracted to our work are also those who are sufficiently involved

Kate Eldred, New Alchemy's publications manager from 1983 to 1987, now lives in Bethesda, Maryland, with her husband and two children. She is studying physical geography at the University of Maryland.



New Alchemy's co-founders: Bill McLarney, John Todd and Nancy Jack Todd.



and believe thoroughly enough in our work to work for subsistence pay. We measure the quality of our lives by our work and our associations, not by our possessions. We believe that the elimination of unnecessary expenses, and the high quality and ingenuity of our work will enable us to attract the support we need."

Projects that were slated for research included a program called "Harvest Garden," which looked for ways for people to produce their own food organically, geared mostly to warm climates, since the test gardens would be in Costa Rica and southern California. We intended to use volunteer participants and gather their data.

We were interested in finding and developing new methods of producing energy using wind, sun, waves, and tides. We hoped to have a hand in the development of communities that allow creative and diverse lives on the part of the inhabitants and enhance and preserve the landscapes that hold them.

We wanted to study decentralist technology and land skills. We were beginning

in the fields in which we felt we had some skills: aquaculture, agriculture, and power from natural sources. We expected that as individuals learned skills, they would move between New Alchemy centers and out into the communities that requested these skills. This seemed the fastest way to get the information out.

Years later, during the making of the film "Rediscovery of Promise" John and Bill reflected on the origins of the institute.

"To be correct in ancient alchemy," said John, "the microcosm always had to be a tiny mirror or image of the larger order. That just fitted us to a tee because the whole idea was to find a way of creating the building blocks of society that were in themselves whole complete systems. Hence the idea of alchemy or being able to transform base things like the soil and water and rocks and light and sky into gardens and into forests where previously there had been wasted fields."

Bill added, "I think that starting with the fact we were a bunch of upstarts and the choice of name and the holistic approach

and the idea that we were supposed to solve some real problems, we engendered a certain amount of hostility in certain corners of the scientific world. Other people have been very supportive from the start.

"We're always going to be oddballs, I hope."

1971

Letters flew back and forth, we talked into the wee hours of the morning, and a few folks had a fish tank in their basements or a scrapwood greenhouse in their backyards. But perhaps the most significant event of the year was the publication of "A Modest Proposal" by John Todd.

The modest proposal chose as its theme a return to diversification of energy sources, foodstuffs and human lifestyles. "It is my contention," John wrote, "that we are in danger of losing an important amount of social variability in the human community at the same time as we are losing the required amount of biological variability in our life-support bases. If we continue on our

present path, at the present rate, then man's chances of maintaining healthy communities and environments will be dramatically reduced before the year 2000, perhaps beyond a point where society as we know it will be incapable of functioning.

"The New Alchemists have begun studies to shape the skills needed to establish modern, relatively self-contained communities which capture their own power, grow their own foods and utilize their wastes. The adoption of such support systems would increase individual independence and re-establish a much needed link with the organic world. If such a bond were created, people may begin to relate more realistically with the larger world around them. It should not be overlooked that the findings of this new biotechnology, if widely adapted, would permit a nation to function more normally during periods of hardship."

Not many people were looking at problems of biodiversity in those days, and not many people tossed off terms like "indigenous biotechnology." The people who read these words, either receiving the newsletter from a mailing list compiled idiosyncratically, or finding it left in a bus station or borrowing it from a friend, responded enthusiastically. Hundreds of letters poured into the mailing address at Woods Hole, which was still called "New Alchemy East," taxing the resources of a fledgling organization. We were swamped with suggestions and reading lists and drawings on scraps of paper.

1972

It was time to test our rhetoric. New Alchemy had found its permanent home, an old dairy farm in Hatchville, and the gardens had been cover cropped. Richard Merrill, an old Alchie from California, was ready to set up a biodynamic garden here to correspond with one in Santa Barbara; he was to spend half the year each place and compare and contrast the soils and climates.

With the new plants came a flood of volunteers to keep busy, and tasks that seemed to justify the existence of the group. We had plans for a new building called an

"eco-barn," which would have animals husbanded on a lower level, greenhouse space on mid-level and a combined greenhouse/aquaculture installation on the top level.

John Todd, searching for alternatives to cows' milk for his allergic children, was caring for some milk goats, which led him to fence off a section of wooded area (heavily treed with oaks and sassafras at the time) and keep notes on how well they did in semi-wild conditions. Once the goats had cleared



away the underbrush of the oak/locust woods, we planned to test plant associations to see if livestock could be kept in woodlots, thereby meeting the standards of an organic homesteading agenda.

Bill McLarney and Bryce Butler kept some gouramis in a fish tank, feeding them rotted garden waste; they also were keeping 2000 small clams in aquaculture tanks, hoping to breed them and to use them in polyculture with channel catfish, where they should keep the water clean. The aquaculture program was still scattered around people's backyards in wading pools and tubs, but when we ran an ad in the local *Pennysaver* for old refrigerators to use as fish tanks, we acquired 24 in two weeks. Stripped of their insides by David Engstrom and others, and plugged by business manager Bob Angevine, they became 100- to 200-gallon fish tanks.

Two architects, Multi Fasset (sic) and Marsha Zilles, built an 18-foot vinyl geodesic dome greenhouse to accommodate an early fish pond for Bill McLarney's pilot studies. Tilapia grew readily enough in the pond until November, at which time the pond was drained. A vegetable garden was planted downhill from the pond, and the pond water was used to irrigate the garden. Then an inner skin of vinyl was applied to the dome and it was used as a winter greenhouse. "This has introduced a certain foggi-ness, but we believe that this would not be the case if the double skin were incorporated

at the outset." We also introduced a small wood stove and were sufficiently encouraged by the results to begin designing a larger dome that would combine greenhouse and aquaculture.

As always the structure of the Institute was matter of concern, as John Todd described in a fall newsletter: "If we are to have any measure of success towards our fundamental goal of assisting this frail planet, the New Alchemy Institute will have to be extended as a place for individual creativity within a framework of common endeavor. We will have to avoid hierarchical or rigid structuring which would enhance the position of some at the expense of others. A dynamic must be sustained which prevents interpersonal

oppression and expands individual responsibility."

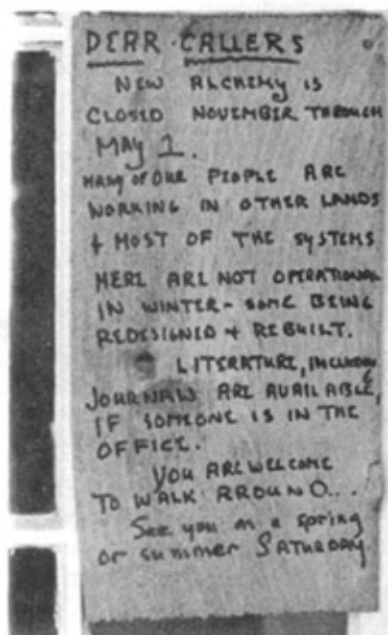
Late in the fall, Peter Jones of the BBC contacted us; he was making a film about dissident scientists and wanted to film our work. So he came with his crew one blustering morning. Marcus Sherman and Earle Barnhart were at their post at the top of the forty-foot tower. Windblown and heroic, they swayed on the high pole. After several hours of work, they sawed off the working platform, climbed down, then released the restraining ropes. The cameras whirled as we watched. After agonizing moments, for the first time, slowly, the blades began to turn.

1973

In 1973, we published our first *Journal of the New Alchemists*, the next step towards becoming an intellectual arm of the steadily growing eco-activist movement.

The Stern Family Fund gave money for "Biotechnic Science for Ecologically-Derived Communities." Stewart Brand, of Whole Earth Catalog fame, provided seed money to "begin developing and researching the energetics and productivity of a model, prototype year-round aquaculture and vegetable food growing system suited to northern climates. The system, which we have dubbed 'The Earth Ship,' will use no conventional sources of energy."

We realized that so many people were



When there was work to be done, even the kids pitched in. Farm Saturdays were a big hit. In the early years, we were a seasonal operation.

interested in stopping by the farm and helping out that we had to make provisions for them, so we began our Farm Saturday program, in which people were welcome to come and help work on some large-scale project that needed willing, if unskilled hands, and then share lunch and talk. We were only open from May until November; during the winter many of us left town, and the farm slept until the weather warmed up. Those of us left on the farm designed our landscape for the first time: a compost area, terraces, a root cellar, cold frames — all connected by the road from the old parking area that is now lined with Chinese chestnut trees.

We had three windmills turning on the brink of the hill overlooking the gardens:

one a large wind generator to produce electricity for tools and pumps, one a small wind charger to supply lesser amounts of electricity for radios, and the third a Savonius rotor to produce mechanical energy for water pumping.

1974

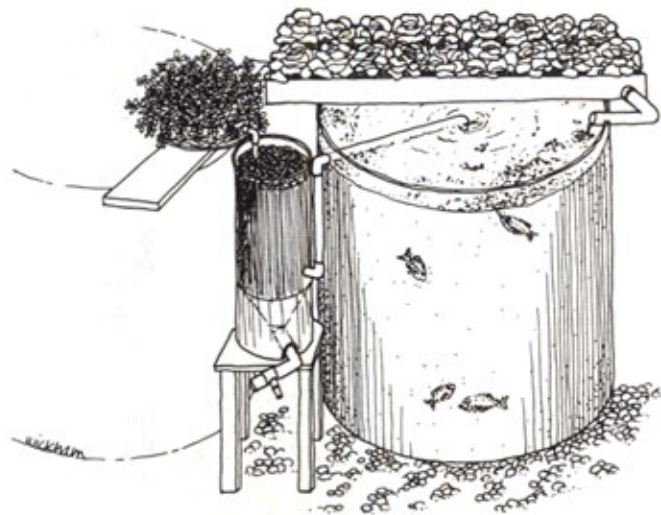
The gardens were magnificent. Earle Barnhart and Hilde Maingay took over from the California imports, Yedida and Rich Merrill, in planning the garden plots with the aid of an enormous chart that stretched the length of the kitchen wall. People who wanted to help, and they were legion, came in, looked at the wall, and found the seeds or tools they needed to use. We planted hedges

of marigolds, blueberries, strawberries, and grapes (hoping to find some wine-making ones that would flourish on the Cape). Despite applications of compost, we did not have fertile enough soil for sweet peas, though our field of sunflowers grew 14 feet high and provided rabbit, chicken and people food.

We had decided to try growing wheat, despite enormous objections from everyone; it didn't grow very well, but it did grow, and by the late fall we had to harvest it. We chose a Farm Saturday and many people turned out to harvest by hand. Many, many hours later we had harvested a small piece of the field. Days later we had harvested it all and had to winnow it. Well, we did grow wheat on the Cape, but we probably won't



Ron Zweig serves a tray of fish at the 1980 Harvest Festival. A hydroponic/aquaculture system. Jeff Parkin checks the fish in Coonamessett Pond in a cage culture experiment.



do it again soon.

John Hess, a food writer for *The New York Times*, called our bluff about tilapia. He and his wife Karen came up to the Cape armed with recipes and frying pans and ate heartily of our newly-harvested fish; then they returned to the city and wrote about it, adding to our growing media coverage.

Our old friend, E.F. Schumacher, author of *Small Is Beautiful*, came by to lounge around our fish ponds and make approving noises.

The National Film Board of Canada showed up that summer, too, to make a film about our work. John Todd's sister, Dorothy Hénaut, was the producer. The crew brought us our first video camera, and we played with it for hours, playing back our morning's work over lunch and laughing uproariously. As the day wore on, and we repeated actions over and over for the camera, we

grew less enchanted.

Marcus Sherman developed and built our first sail-wing windmill, a water-pumping windmill that we have been testing for endurance and durability. It held up well through some major storms, though we found the cotton sails did not stand up to high winds; we switched to dacron.

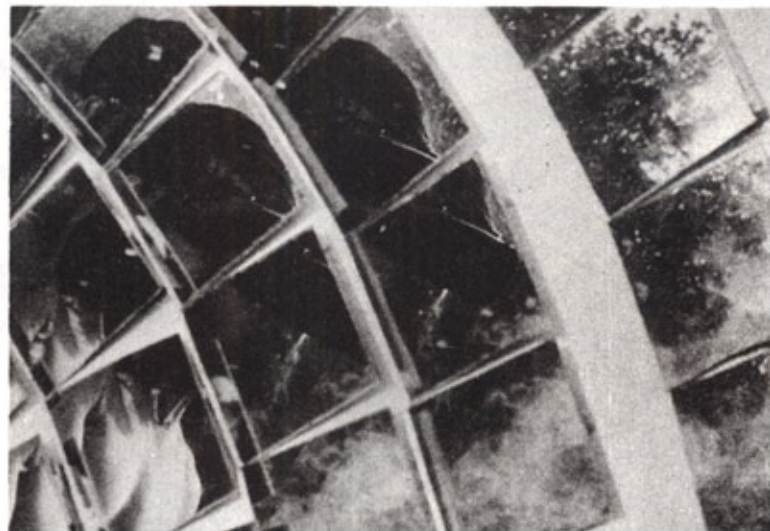
Bob Angevine, Earle Barnhart and John Todd wrote up their designs for an Ark, to include biological, solar and aquaculture systems integrated into a food-producing space.

We declared ourselves agricultural researchers and wrote extensively about the problems of commercial agriculture; we proposed a system we called "ecosystem farming," in which we would keep the diversity of a natural system, with its built-in resistance and food chains. We printed an agricultural research report on resistance to

cabbage worm butterflies, and one on the irrigation of garden vegetables with fertile fish pond water.

Dan Hemenway wrote to us proposing that our backyard fish farming methods were not feasible, and spelling out his solutions. We rebutted, hoping to open the debate up to our members and advancing the cause.

"Our financial house is not in order," we admitted in a newsletter. "Until now the institute has operated upon a shoestring, but the string has snapped and no new laces are in sight. Possible explanations for our financial plight are many: New Alchemy is a small and unaffiliated non-profit organization; our name is queer to some folks; New Alchemy's scale is defined by very human proportions and is smaller than those institutions that large foundations or government agencies seek to support. Yet we cost more to operate than small, socially or artisti-



Long-time New Alchemists (clockwise from bottom left): Christina Rawley, Colleen Armstrong, Susan Ervin, Hilde Atema Maingay and Earle Barnhart (reflected in the panels of a solar furnace).

cally-oriented foundations can afford. Finally those of us who were scientists in more orthodox institutions have not yet learned how to transfer our fund-raising skills to the more precarious milieu in which we now find ourselves.

"In any event, if some of what we have written seems premature, or conjectural, or if the data appear sparse, we would like to acknowledge these weaknesses, knowing that they can and should be corrected in the years ahead."

1975

In 1975, we were still mostly summer-only. A few people stayed around, supporting themselves any way they could, a few traveled to warmer or more interesting or cheaper climes, and the farm slept.

People came in ever larger numbers to

the farm on Saturdays, and we adapted again. Often we had seventy people following us around, eager to hear what we had to say. No longer could we simply ask people to pick up seeds and follow us to the gardens. So we changed the Farm Saturday format again: we offered tours of the grounds and afternoon workshops on aquaculture, agriculture, energy and bioshelters.

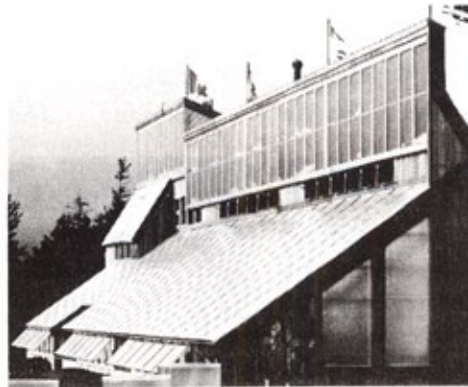
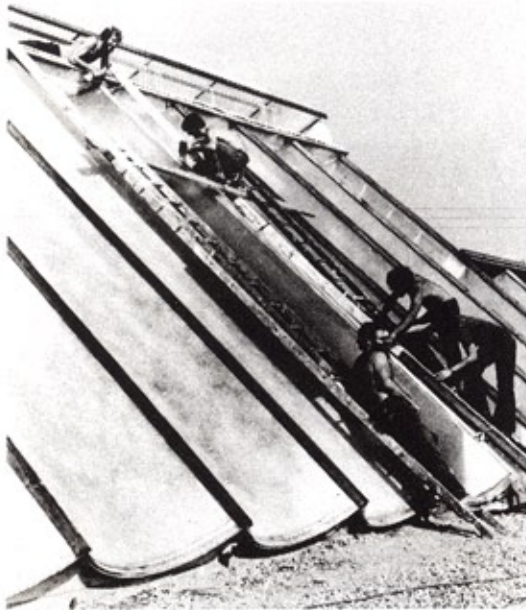
The world was still in the throes of the energy crisis, and most of the people interviewed by any daily paper felt that nuclear energy was the only viable alternative to fossil fuels. We proposed a windmill project on Prince Edward Island, Canada, to rebut the proposal of a nuclear generating plant there. A design for the Prince Edward Island Ark was proposed in brief by John Todd and the Solsearch architects, Ole Hammarlund and David Bergmark.

Hilde Maingay was in charge of the

gardens, and found that her research on the cabbage butterfly had to wait this year. After major infestations the past few years, we had very few this year. However, we had a major catastrophe with Mexican bean beetles, who happily chewed their way through field after field of ripening young beans.

Ty Cashman saw that the compost pile was always tended, and our compost output rose accordingly. We now had rich brown soil, compared to the sandy stuff of three years ago, and our vegetables loved it. Earthworms became very common.

Bob Angevine monitored our various technologies: he kept track of the weather, monitored the fish tanks, kept track of the solar heaters' output, and measured the fish's feeding patterns. John Todd monitored the biochemistry of the fish tanks, particularly noting that the algae in the tanks seem to



Both the Cape Cod Ark (above) and the Prince Edward Island Ark (right) opened in 1976.

hold the sun's heat better than plain water does. Ross McLain, Merrill Hall and Vince Dempsey were gathering data for electricity-generating windmill designs.

Bill McLarney and Bryce Butler printed *The Trash Fish Cookbook*, trying to convince people that many perfectly worthwhile fish were wasted every day in the markets.

A new windmill went up, the Wind-charger, built by windmill aficionado Jim Bukey, based on designs from the Thirties; the sails and rigging on "Big Red" were redesigned to accommodate Cape Cod's gusty winds; and the Savonius rotor was replaced by a new one, devised by Earle Barnhart.

McLarney and his associates reported that they were having a lot of success with cultivating midge larvae and feeding them to fish; furthermore, Bill used an old Russian method of sealing the bottoms of fish ponds by creating a sort of organic plastic called "gley," that occurs naturally in bogs.

1976

Certainly the biggest news of 1976 was the opening of the Prince Edward Island Ark in Canada. Prime Minister Pierre Trudeau attended the festivities, and we stood should-

er to shoulder, barely cleaned up from plaster dust and floor polish, receiving praise for our work.

Here on Cape Cod, we opened the Cape Cod Ark, a large solar greenhouse built along the lines, but with improvements, of the small solar greenhouse/fish tanks we had lined up along the garden path. We hoped that this enormous greenhouse would come to be called a "bioshelter," a new type of food-producing structure that would look quaint and outdated by new developments.

We produced *The Book of the New Alchemists*, a compendium of journals one through four, for E. P. Dutton and Company. Sales were brisk. We also produced a small New Alchemy cookbook within a journal, along with a followup *Trash Fish Cookbook*, to get people thinking along the lines of Frances Moore Lappé.

In our gardens, we continued to try to do more research and turn hearsay and folk wisdom into practical alternatives. Hilde Maingay built raised beds, a technique from biodynamic gardening, and applied sheet compost to the gardens.

Susan Ervin experimented with growing beans for drying: 16 varieties were tested, and their yields compared. (Light Red Kidney Beans were the highest yielding: at

8 pounds from two 25-foot rows.) She also mulched with seaweed from local beaches and irrigated the beds with fertile fish pond water.

1977

Conn Nugent became co-director of New Alchemy, sharing duties with John Todd. He said, "I like bringing my six-month-old boy to the office, working some Saturdays, skipping some Tuesdays, digging in the garden and lugging junk and writing papers. I like the religion of this place; there is an explicit devotion to the integration of ourselves and the earth. It is very moving."

We got our first computer and John Wolfe began to work on computer modeling. Our new technology occasioned a great deal of soul-searching and rumination about humans and machines and appropriate technology; several of our staff members were influential in creating public discussion about PAVE PAWS, an enormous microwave radar installation on Cape Cod. When Al Doolittle or Gary Hirshberg spoke at public meetings, people would challenge them, "Well, just what technology is appropriate? Plastic greenhouses?"



Paul Winter entertained at our first Harvest Festival in 1978. A fish pond in Costa Rica.

McLarney dug his first fish pond in Costa Rica, using entirely campesino labor and trying to encourage visitors as much as possible. The fish ponds were completed and survived the rainy season and a hurricane.

We had some feedback from second-generation New Alchemy applications. Meredith Olsen, an intern in 1976, reported on her progress growing trout with our techniques in a small community in Washington State. Ty Cashman built a sailwing windmill for a community in California, and Joe Seale did some further testing of the Hydrowind, the electricity-generating windmill we set up at the Ark on Prince Edward Island.

Kathi Ryan took over food production chores in our Ark (Colleen Armstrong was one of her interns). They monitored the large tanks for fish production and heat retention.

Susan Ervin applied a parasitic wasp, *Pediobius foveolatus*, to our bean crop to determine if it could keep the Mexican bean beetle at bay. She applied various mulches to different parts of the garden and kept track of productivity.

Jeff Parkin arrived and set up an earthworm farm; the worms were fed to caged

fish kept in the pond for cage culture aquaculture trials.

1978

Concerned about getting enough CO₂ into the Ark to replace what was lost to photosynthesis, we were collecting data and planning to add organic mulches, compost, or venting pure gas into the building. We introduced ladybugs into the Ark in April to combat whitefly; we also found that our *Encarsia formosa*, a parasitic wasp we had introduced into the greenhouse the previous summer, was still around and eating whitefly eggs.

Farm Saturdays were lots of fun: bigger than ever, with as many as 200 people showing up in the summer. Our workshops and tours were big hits and we had to be quite firm about people coming only on Saturdays.

The results of the various mulches in the gardens indicated that seaweed produced the highest yields of vegetables. We raised enough vegetables on one-tenth of an acre for thirteen adults to have three portions per day year-round.

The news from Costa Rica was positive, despite bad weather and drought. A

new building was put up on the land, the local neighbors had good luck growing produce using our methods, and we bought 200 acres down the road just ahead of a Panamanian cattle operation.

Robert Sardinsky initiated a pilot project of educational workshops for children. Groups of school-age children began to come to the farm for directed tours and special classes.

Our landlord began to take bids on the rest of the land he owned, with development rights. We asked for a community land trust to take it over, or suggestions for development that would appeal to the landlord and help us protect the land. Or a new landlord, of course.

1979

This was our tenth year of life, and we felt it. Not that many other groups had made it this far. The *CoEvolution Quarterly* people, Farallones, maybe a handful of others.

Windmills were as important to us that year as ever before or since. We had five new windmills at work around the farm, and two grants for wind research: one for a windmill in Boston, and one to fund a modeling project by Joe Seale. Our farm

windmills focused on water pumping and aeration, rather than electricity generation. We had an Aermotor water pumping windmill, a Bowjon Air compressing windmill, a Savonius rotor, a Windcharger charging batteries for a small water pump, and a Pondmaster, an aerator atop the Six-Pack (a small solar greenhouse webuilt in 1975 to test principles used in the Arks).

We dug a fish pond twenty feet wide, ten feet long and four feet deep, containing 6000 gallons of water; we planned to grow three kinds of fish in it, with different feeding techniques for each. We planted lettuce along the edges to help filter the pond water and produce food from it.

Shortly before Margaret Mead's death in 1978, the Todds had a conversation with her about the concepts of "village" and "bioshelter" and decided to try to combine them. In April we convened a conference, dedicated to her memory, on that topic: *Village as Solar Ecology*. We produced a book after the conference by the same name. John Todd started experimenting with designs for an efficient sailing ship to replace costly and inefficient gas-powered fishing boats; he thought he would call it "The Margaret Mead."

Earle Barnhart was hard at work with his tree crops research, planting all around the farm, keeping track of yields from different grafting techniques, and dreaming up new ways of combining trees and animals and crops (one of his new apprentices was John Quinney). This year we kept track of the yield of the big mulberry tree beside the farmhouse: about 400 pounds. We fed the unripe berries to chickens.

ABC's television show, "Good Morning, America" did a segment on us in October. The 3- or 4-minute show produced over a thousand letters to us, many written with strange and wonderful addresses (e.g. Alcohme Society in Facemouth, MA and the Solar Energy/Windmill Power/Fish Raising/Vegetable Experimental Farm), but all in response to the hopeful work they saw on their screen.

1980

We were seeking funding for a wide array of research projects, including wind-powered irrigation, a small insectary for

greenhouse biological control, biogas production from agricultural wastes, wind-powered refrigeration/heat pumping, cage culture and an agricultural forestry forum. Planned educational programs included the Farm Saturday program, filming the bioshelters, appropriate technology lessons in the schools and a workshop series for low-income residents.

Tomorrow is Our Permanent Address, a new book about bioshelters by Nancy and John Todd, was published by Harper and Row, and we signed a contract with Brick House Publishers to produce a series of books on our work.

John and Nancy Todd, after a decade of devoting their every moment to the New Alchemy Institute, decided to withdraw somewhat. While maintaining a loose relationship with us, they began to concentrate their considerable energy on their other project, Ocean Arks International. They wanted to design and build an oceangoing sailing ship that would be low-cost and efficient and still appeal to the constituency that uses gas-powered boats: fishermen in Central America, for instance.

Conn Nugent also left to pursue other interests. Gary Hirshberg, former windmill apprentice and right-hand man, stepped into position as executive director.

Greg Watson joined us from his job in Boston working with teenagers, to head up our new commitment to educational programs and community outreach. He and Gary helped establish the Cape and Islands Self-Reliance Corporation. A non-profit cooperative focusing on gardening and energy conservation, Self-Reliance's mandate was to provide information, materials and low-cost loans to Cape residents.

1981

We began to look carefully at our buildings, the farmhouse and the barn. They had always been old and funky, but in these austere energy-conserving days they were downright counter-revolutionary. Not only did we need more and better space for ourselves, but we were extolling the virtues of retrofitting to our constituents and ignoring our own problems. We sought funding and donations for our projects: insulating and tightening the farmhouse and expanding our

usable space in the old barn, a tremendous, and wasted, resource for a group that was always short of space.

The Prince Edward Island Ark was closed, up for sale. It made us sad, although we had not had a role in its management since 1978.

The old dome, which had covered the original in-ground fish pond, was creaking and leaking, and something had to be done. Fortunately this was the year we were joined by J. Baldwin and Liz Fial, techno-team supreme, who had a plan. We were to shift from the fallible but funky wooden supports to aircraft aluminum, and from the cheap but yellowing fiberglass to a new translucent plastic film, Tefzel, manufactured by DuPont. To further strengthen the geodesic elements, the plastic film was to be made into inflated triangular pillows.

We re-glazed the Ark. The sunlight had caused the fiberglass pieces to turn opaque. We analyzed the curved pieces at that time: the benefit was presumably more solar gain and fewer structural members; the negative aspects included 12 per cent more heat loss and much more difficult sealing and construction chores. For now, though, we stayed with the design and continued to monitor it.

Ron Zweig proposed a water treatment system utilizing ecological principles for the town of Falmouth, based on experimental designs currently being used in California and elsewhere. He also oversaw the digging of two one-tenth acre ponds south of the Ark. We planned to grow solar-pond-raised fingerlings to marketable size in these ponds, and also to experiment with different nutrient amounts and aeration techniques. We planned to eventually add ducks along the edges, and try to develop another integrated food-producing system.

John Quinney, with John Todd's assistance, set up the Model Farm Project, a plan to devise an agricultural experiment station bringing together the latest research being generated by the ag stations around the country. They proposed a small farm that would integrate pest management, soil conditioning, crop selection and economic analysis in a working model.

Tracy Calvin, former apprentice, joined us as editor for the series of books we were preparing for Brick House Publishers. One title came out, *The Water Pumping Wind-*

mill Book, featuring our sailing windmill, and we were looking forward to publishing two more, *The Backyard Fish Farm Book* and *Gardening for All Seasons*. Our seventh journal was published, the last of its kind. The *New Alchemy Quarterly* was now our main way of reaching members.

1982

We bought the farm in 1982, for \$300,000. That was an incredible amount of money for a struggling operation like ours, but we had invested so much in the place already we could hardly bear to move. And for prime developable land on Cape Cod, it was a good price. Nonetheless, it meant we had to find \$44,000 a year to pay the mortgage, at a time when Reaganomics was bearing down on non-profits.

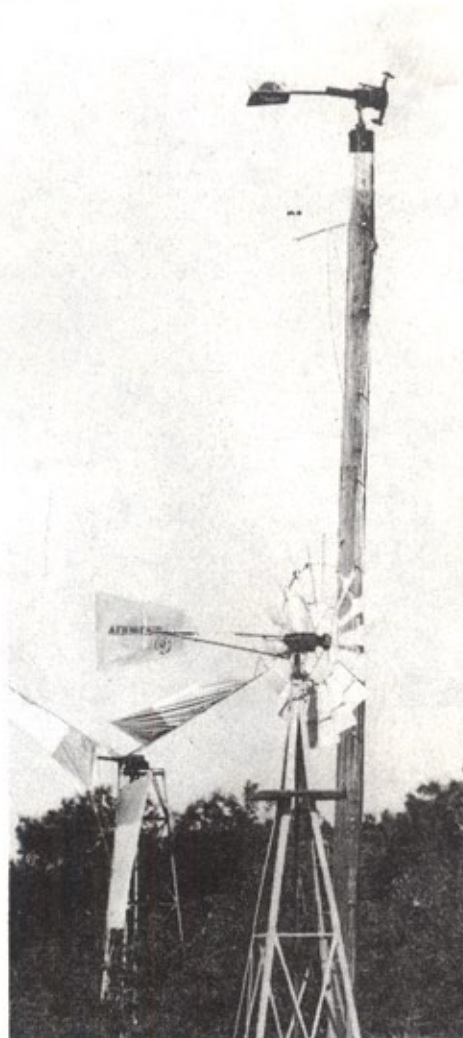
The Model Farm, John Quinney's design for a permaculture farm, got some funding and preliminary designs were worked out. It incorporated principles like succession, diversity and integration, and we called it "farming in the image of the forest."

The Pillow Dome design was finally finished. Joe Seale ran a number of experiments to determine the best gas for inflating the pillows, and published the results (the best insulator would have been krypton — except that it's extremely radioactive). We decided to use argon. In March, Liz and J. returned from China, and with John Wolfe oversaw the dome's construction.

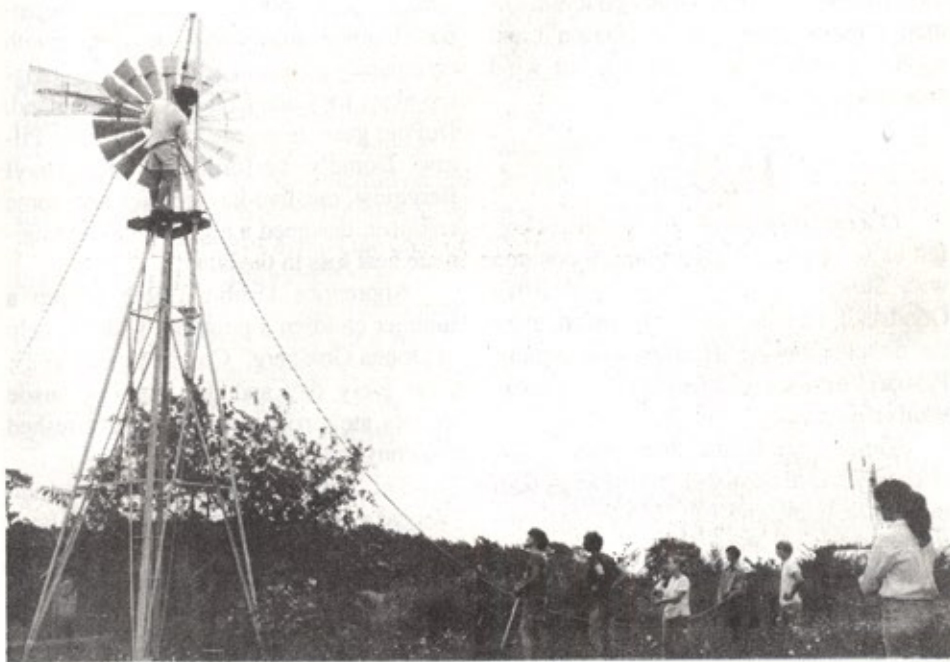
Camera crews and microphones followed us everywhere, as Bullfrog Films was making the second New Alchemy movie. Written, directed and produced by Lawrence Burke, it was called "Rediscovery of Promise."

We expanded our retrofit program to include building a superinsulated auditorium out of part of our old barn. We hired Bill Smith, a solar contractor from western Massachusetts, to oversee the project.

In the spring Sardo organized a Solar House tour, in which local citizens allowed ticketholders into their solar houses and talked about designs and benefits and drawbacks. Over 500 people bought tickets, and about 60 local people opened their houses. It was a real community effort, and highlighted our need to get more information out



Windmills were an integral part of our research for our first 15 years. Above, Earle Barnhart and Marcus Sherman make a few adjustments.





Inside the Ark. Jeff Michaels and Bill Smith work on a ramp leading to the superinsulated auditorium which opened in 1983. Gary Hirshberg.



to the people who wanted to do the right thing.

For the first time, we set up a small farmstand featuring produce from the gardens for sale to neighbors.

We began to dismantle our windmills this year, finding that the unpredictable Cape Cod winds, the unfavorable economic climate ("the winds from Washington") and staffing problems were making our wind program unfeasible.

1983

Our executive director, Gary Hirshberg, left us for New Hampshire and a position with Stonyfield Farm. We hired Allan Goodstadt, an educator from Boston, to be the director, but he left after five months. Research director John Quinney became executive director.

Times were harder than usual. New Alchemy had always had more energy than money to burn, and the Reagan era was really chopping away at our traditional sources of funding at the same time that our mortgage was weighing heavily.

Paradoxically, our energy was ex-

tremely high. We forged ahead on research into Model Farm techniques, turning out advice and trying to monitor our own permanent crops. We expanded our concept of market gardening, hiring Steve Tracy to produce vegetables and seedlings for sale in serious quantities. Greg Watson's apprentice, Ann Kingsolver, was tireless in organizing bioregional seminars and working with community groups in setting up wide-ranging plans for Cape Cod and New England. DuPont gave us money to monitor the Pillow Dome's performance and Daryl Bergquist, our live-in caretaker and dome engineer, designed a night curtain to minimize heat loss in the dome.

Apprentice Debbie Habib set up a summer children's program, with the help of Donna Goldberg. Children came to the farm every day and dug gardens, made teepees, ate berries and went away refreshed and converted.

Bill Smith and a crew of tireless and talented workers finished the superinsulated auditorium in the old barn.

Peter Burgoon and Linda Gusman capped a hydroponics study with an enormous project, a tray atop the solar ponds

in the Ark that could produce lettuce and watercress in commercial quantities. They raised about 300 heads of lettuce and five pounds of watercress using the system.

Colleen Armstrong started a long-term project working with an aphid predator, *Aphidoletes aphidimyxa*. She hoped to keep a balance of pests and predators in the greenhouse to keep pest damage to a minimum.

John and Nancy Todd's new enterprise, Ocean Arks, built its first boat, which they named the *Edith Muma* in honor of an old friend, and called "the Ocean Pickup" among themselves. Paul Winter played music as it was launched into the waters off Martha's Vineyard.

1984

Succeeding Greg Watson as education director, Merryl Alber opened 1984 with a bang: the New Alchemy Semester welcomed its first class. Four people signed up for our blend of hands-on experience and directed study in our areas of expertise. The former "Anna Pavlova" room in the barn, was transformed within weeks to a small library, members of the staff spent Christmas week



We built the Pillow Dome in the back yard, then moved it near the six-pack (in 1986 we picked it up again and moved it near the Ark). At the grand opening in 1982: Nancy Jack Todd, Liz Fial, Buckminster Fuller, J. Baldwin and John Todd.



preparing lesson plans, some for the first time, and the students arrived in January. Julie Chickering arrived with a young sheep, which she calmly penned up. We later found it very useful at mowing time.

We were becoming increasingly discontented with the historical mode of making decisions: consensus. For 15 years we had had weekly staff meetings, more or less well-attended depending on people's preoccupations, and had hashed out every decision in them. With the advent of the new educational arm of our farm, many key staff people were just not available for meetings. Change was in the air.

The composting greenhouse, designed by Bruce Fulford (Cap'n Compost) and based on ancient designs and some modern experiments from Holland, was completed and we had another grand opening. The piping hot compost and the dozens of seedlings it produced were both extremely welcome in the newly economic-oriented gardens.

We welcomed our first research associates, through a grant program that enabled recent graduates to do research that was of benefit to organic food producers. One of the first research associates was Norm

Marshall, here from Dartmouth where he had worked with our old friend Donella Meadows; with him was his new wife, Wendy, who quickly took up tasks that no one else was doing.

Another educational project was booming: we ran another summer children's program, and this time it ran into the fall, with local schools bringing their classes here for lectures. A graduate of the premiere New Alchemy semester, Kim Knorr, took on the project as her thesis for Lesley College.

We dismantled the last windmill on the site and also took down the old Mini-Ark, so proud and modern years ago on the crest of the hill overlooking the garden area.

Our sister project in Costa Rica continued to thrive. Bill McLarney got a grant to establish a research nursery to be run cooperatively; the idea was to do the research on useful plants that poor working farmers can't afford to do. Formally incorporated as NAISA, it is now an independent operation.

Our fifteenth birthday party was spectacular, a day-long bust-out that involved all the former directors and dozens of old Alchies, with workshops and kid games and food and music — the usual New Alchemy

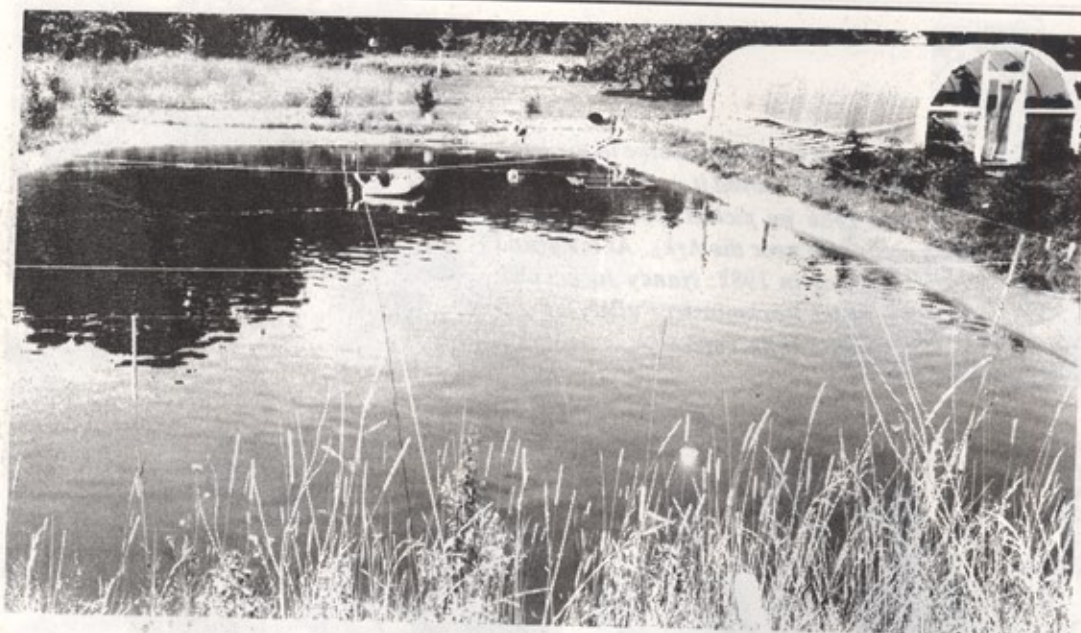
stuff. Special guests included Ernest Callenbach, author of *Ecotopia*.

Interregnum

The change due for New Alchemy began at our one-decade mark, when the Todds left, the institute realized it had a history, and the Reagan years began. The effects of Reaganomics exceeded our worst expectations, so we met and met to try to find alternatives to our depleted funding schemes. In 1982, we reluctantly formed an Executive Committee to make recommendations, though we still reserved the decision-making prerogatives for the whole group.

In late 1984, finances were bleaker than ever, and despite long and heart-rending meetings, no real direction had been set for the Institute in its new incarnation. An old friend of New Alchemy, Joan Diver, gave us grant money through the Godfrey Hyams Trust for an in-depth reorganization.

We hired Technical Development Corporation, from Boston. They interviewed staff members, board members, funders, former funders, neighbors, friends, competitors. They came up with an image of the



Intern Andy Bail transplants in the composting greenhouse. A solar fish pond and the composting greenhouse. A squash vine borer, one of the targets of integrated pest management.

New Alchemy Institute as a disorganized, likable, slightly wacky organization that didn't follow through on some excellent ideas.

TDC's main recommendation was a total restructuring of our old friendly non-hierarchical setup. We were to construct a real board with power to hire our executive director; to form a management group with real powers; to make managers responsible for those in their section; to set up realistic budgets.

We agreed, and in marathon meetings we hashed out the details of the reorganization. John Quinney remained our director, and Norm Marshall was named research director. Mary Gazda, Bill Smith's wife, remained as business manager and Earle Barnhart was appointed education director. When we found Jane Sorensen, who had recently graduated from the Harvard School

of Design, to be our site manager, our team was complete.

At that time, we had to start making decisions in earnest. We obviously were not supporting all of our ideas, and some had to go. We re-committed ourselves to establishing a site worthy of our ideals, setting up a Visitors' Center and a place to sell our own publications and those of fellow travelers, as well as our produce.

Coming to agreement on our future research priorities was the toughest, particularly since the aquaculture program was dropped. It had been the basis of the institute in its earliest days, and the break in continuity was painful, embarrassing and, to many people, inexplicable. We decided to focus on New England, on small farmers and market gardeners, on reaching them through small demonstration projects and visits to our site, as well as our established

educational programs.

But the change that was the most significant in the long run was the internal one.

Forging a hierarchy out of a consensus model was a painful and exhilarating task. On the negative side, tempers flared, accusations of demagoguery and dictatorship abounded, and old alliances were severed. On the positive side, people who were committed to projects found that their budgets were honored, that evaluations took place on time and that the outside world could count on reaching the people who were doing the job.

1985

We began to study the feasibility of designing, building and maintaining a house right here on the site. We were holding off a bit, to see what our final site plan was



Children are a key target for our educational outreach. Donald Watson and Jane Sorensen discuss the New Alchemy house. John Quinney.

going to look like, but we felt that the building of a real house would give us the chance to use and test a lot of the small-scale technology we were always going on about..

New research associates came on, including Kurt Teichert, who stayed on to become Jane Sorensen's assistant; and Bob Bugg, who besides being an entomologist, was a very funny man. He wrote and performed satirical songs about Reagan, taxes and even New Alchemy.

Mimi McConnell resigned her staff position and became president of the board; as her first duty she appointed some new members and began to transform the board with the strong leadership we had voted for.

We ventured in to economics in our research, looking into the economics of solar greenhouses and of organic farming in general. This research led to the publication of our first research reports. We also began

to update and publish guides for the visitors to the farm.

1986

During the winter, Jane Sorensen put the finishing touches on the master plan. It called for the demolition of some antique buildings and rearrangement of some others. As early as we could break ground, we were busy revamping the site.

Jane and Kurt were everywhere, assisted by interns and former students. We were always tripping over piles of dirt or balled trees or other manifestations of big changes. The back end of the barn was cleaned and renovated for the new Visitors' Center.

We moved mulberry trees, filled in old fish ponds, and had bulldozers dig us out a new parking area. One memorable June day

we all picked up the Dome and moved it to its new site, where the base had already been established; the fig tree, cut back drastically, was already in place, waiting for its roof.

We expanded our efforts to market our produce, both from the farmstand and by contract to local restaurants. Sales reached \$10,000.

Research went on under the research associate program, which now included Dave Simser, who worked on predatory nematodes; Mark Schonbeck, who looked at the problems of nitrogen in greenhouses; Tracy Ellis, planting green manure crops to attract predator insects.

Costa Rican activities continued under Bill McLarney's hand, increasingly independent from us, but still called New Alchemy (Alquimistas Nuevas, actually); this year it won a hard battle, as part of a team that got a great chunk of land labeled wild-

life refuge, making it safe from timber robbers and eligible for land titling, as well as protecting a lobster fishery, on paper at least. McLarney also published another book: *The Freshwater Aquaculture Book*.

In late 1986, we held another marathon meeting and retreat to look over our first year of the new system and to establish our agenda for the next few years. We agreed that our new direction seemed to be working well and drafted a couple dozen sample "mission statements."

1987

In a way, 1987 was the true test of our new system. Over the years, of course, staff members had come and gone with grants, new babies, better offers, travel opportunities — and the Institute had gone on. But now we had taken on a much more defined task, with definite responsibilities, and had contracted with outside operations to pull things off. In 1987 seven staff members had to leave, all to be replaced with new people.

We did fine. The job descriptions so laboriously written meant that people who were hired knew ahead of time what was expected of them. Of course each new person brought new energy and ideas to each job, but the overall effect was of a smooth transition, perhaps most evident at the time of the Harvest Festival, which had grown from its early loose beginnings in 1978 as a two-day party to a carefully orchestrated, exhaustingly overseen day of huge crowds. The new staff sailed through the day, which was made even more difficult by the fact that it rained all day and everything had to be shuttled inside.

We completed a research project on the composting greenhouse, and published the results, leading to ever more research, of course. Lee Goodell, a former semester student, produced a computer simulation model for the thermal performance of the composting greenhouse. Dave Simser and Pam Moran continued their research with entomogenous nematodes, working with farmers in their own fields.

Colleen Armstrong completed a two-year study of an aphid predator and published the results. She began working with commercial greenhouse growers to control aphids and thrips in potted chrysanthemums.

Penny Shibley installed various exhibits in our Visitors' Center: a large one describing our Master Plan for the site, and smaller ones on environmentally safe household products and on children's educational programs. We offered short spring courses in gardening and children's education. The children's program continued to grow, with all of Falmouth's fourth-graders involved in our Green Classroom program, and many children in our summer programs.

1988

The environment was an issue of public concern, more so than at any time since Earth Day. With medical waste on the beaches, chemicals in our drinking water and the threat of the greenhouse effect, people seemed more willing than ever to hear New Alchemy's message. One local paper, said in effect, that maybe we had been right all along.

Dave Simser concluded a third summer's work using entomogenous nematodes as biological controls. Mark Schonbeck and Ralph DeGregorio tested cover crops for soil enhancement and erosion and weed control. Work in the composting greenhouse focused on removing ammonia to cut nitrate levels and improving the efficiency of heat transfer.

We completed our theme gardens, designed in 1986 by Jane Sorensen and installed by Earle Barnhart and Hilde Main-gay. A popular spot on the tour, it features some 300 annual and perennial shrubs, berries, flowers and herbs.

Thanks to the composting greenhouse, we had small mountains of compost under the power lines. The finished product was used to build fertility in our gardens and, in association with cover crops, to prepare new sections of our sandy grounds.

1989

The media spent much time reflecting on the events of twenty years ago. We, too, considered the events of that summer and the progress we've made.

John Quinney wrote in *The Whole Earth Review*, "The New Alchemy Institute has survived, precariously at times, successfully at others. We have changed, often

testing the fuzzy line between ecological idealism and economic pragmatism.

"We have learned not to confuse progress toward an ecological future with that future itself. Clearly, much remains to be done. Our work will not be finished until greenhouse growers don't need pesticides, until every New England school has a students' garden, until Massachusetts residents compost all their leaves, and until New England's farms are profitable and sustainable. Until that time, we expect to busy."

We spent much of the spring and summer reconstructing our site. During the summer Kurt Teichert and his crew of interns peeled apart the Ark, leaving little but some wooden supports. Plans call for the installation of steel supports to allow a more open interior and replacement of the old Kalwall glazing with some new high-tech plastics.

At the same time a long vacant portion of the barn was being transformed into a new library and classroom. The house project, however, is on hold indefinitely, perhaps permanently.

The seven students in our sixth semester program learned about sustainable agriculture, ecological home technologies and community resource systems. Jane Sorensen returned to help John Quinney lead a two-week course on ecological landscape design.

Interns, always a vital force at New Alchemy, helped in the greenhouses and market gardens, with IPM and cover crop research, and with site design and renovation. Judy Salisbury published a teacher's manual for the Green Classroom, and Maureen McClelland's new technical bulletin on alternatives to toxic home products was a big seller.

Sales at our store were up dramatically. One week in July we sold \$2800 worth of books, gadgets and produce; not enough to challenge K Mart, but more and more people seemed to want what we had. Our catalogue also produced a steady flow of income.

As fall approached, it was time to prepare for Harvest Festival; time to say goodbye to John Quinney, departing after six years as executive director; and time to say hello to Greg Watson, who returned from a stint in state work to lead us down the path toward our next twenty years.