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A SOCIAL HISTORY OF THE ORGANIC FARMING MOVEMENT

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Abstract

This thesis examines the ideas, assumptions, and activities of the predecessors and later advocates of the American organic farming movement. The central argument is that organic practitioners and sympathizers have shared a concern for the "balance of nature" and for man's role in that natural balance. I also argue that in the United States this natural ideal has been linked to the "myth of the garden", a vision of an agrarian nation and of the independent family farm which has shaped recurrent American rural reform movements. I contend that although they express apparently diverse goals -- for spiritual renewal, for political "revolution", for personal self-sufficiency, and for a "new science" -- advocates share an underlying sense of their common crusade. Fundamental to this crusade is the value they place on "Nature", on the farmer's experience, and on rural revival. Thus, we can understand their diverse visions as expressions of a common cast of mind.

Sommaire

Cette thèse traite des fondements, des idées ainsi que des activités des précurseurs et des nouveaux partisans du mouvement américain de "l'agriculture biologique". Elle met en évidence le fait que ceux qui pratiquent cette forme d'agriculture et leurs sympathisants sont préoccupés par "l'équilibre de la nature" et par le rôle que l'homme peut y jouer. Elle démontre également qu'aux Etats-Unis, cet idéal de la nature a été lié au "mythe du jardin", c'est-à-dire à cette vision d'une nation agraire et d'une ferme familial indépendante, notions qui ont fortement marqué les mouvements de réforme rurale en Amérique. Malgré les objectifs apparemment divergents qu'ils épousent, lesquels varient du désir d'un renouveau spirituel, de la poursuite d'une révolution politique, de la recherche de l'auto-suffisance à la constitution d'une nouvelle science, les partisans se trouvent unis par un même esprit de croisade. A la base de cette cause se trouvent les valeurs de la nature, l'expérience personnelle des agriculteurs et le renouveau rural. Ainsi peut-on entrevoir, parmi ces visions diverses, l'expression d'une attitude commune.

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Preface

This thesis is the first historical treatment of the organic farming movement. As I detail in the introduction, this is a social history, one which opens the discussion of the social conditions which have shaped different visions of the movement, and traces some of the common themes which have prevailed as essential elements of the organic crusade. It is based on the writings of organic advocates over the last fifty years, as well as on interviews which I conducted with contemporary advocates. Organic consumers, gardeners, farmers, publicists and sympathizers gave unsparingly of their time, energy and hospitality to make this account of their efforts possible. As such, this discussion owes its greatest debts to individuals who, to differing degrees, will take exception to the conclusions it offers.

It is impossible to acknowledge here everyone in the organic movement who helped me. Most of them are listed in the interviews at the end of the thesis. Nevertheless, I would like to especially thank a few of my most helpful "collaborators". Among those who deserve special mention is Dr. Stuart Hill who played a curious role as both organic advocate and advisor to my work. Stuart found time, within his efforts to create a Centre for Ecological Agriculture at Macdonald College of McGill, to sponsor my study and to keep me informed of the movement as he lived it. Although we acknowledged differences of opinion and interpretation, Stuart continued to support and encourage my efforts. Robert Rodale, editor and publisher of Organic Gardening and Farming magazine, and his staff, gave me both their time and access to the Rodale Press files and library. Anna Rodale kindly allowed me to visit her home and work with the files of her deceased husband, J.I. Rodale. Their cooperation proved an invaluable asset to my work. Eliot Coleman, director of the Small Farm Research Association in Harborside, Maine, organized a tour of European farms and research centers which I joined with 25 American enthusiasts. On this trip, I not only made the acquaintance of European farmers and advocates, but shared daily in deep and enlightening conversations and "interviews" with my travelling companions. To Eliot, and all the members of the European Farm Tour, I owe special thanks. Members of the Center for the Biology of Nature Systems (CBNS) in St. Louis, Missouri, also welcomed my scrutiny. Barry Commoner, director of the Center, made it possible for me to attend the meeting of the CBNS - National Science Foundation overview committee; William Lockertz, chief investigator of a comparative study of organic and conventional farms, briefed me about the operation of his research team. My conversations with and observations of these researchers suggested a great deal about those scientists committed to

'relevant' research and open to organic questions. Among many others in the organic community who also helped, I would like to make special mention of Isao Fujimoto, Sam Smith, Nick Veeder, Elaine Davenport, Miriam Harris, Michael Gertler, Roger Blobaum, and Marty Jezer.

Another sort of debt must be acknowledged to my friends and advisors in writing this thesis. Benson Brown made valuable suggestions which helped to shape the overall argument I present. The members of my thesis support group, Frances Early, Eileen Mannion, Mimi Morton, Catherine Watson, and Elaine Bander, read and criticized my early drafts, as well as listening to the routine anxieties of the doctoral candidate. Roger Krohn, my departmental advisor, went through my drafts helpfully and quickly, pointing out vagueness and obscurities in my discussion.

Many thanks to all these individuals. While many of the ideas in this thesis have been generated with their help, the flaws in this discussion remain mine alone.

Finally I would like to acknowledge and thank the Canada Council and the Quebec Ministry of Education for financial assistance during my research. The Council provided me with a doctoral fellowship from 1975 to 1979, as well as a generous stipend for my research travels. The Quebec Ministry offered its scholarship during the final years of my project, from 1976 to 1979. Without their help this project could not have been undertaken.

Suzanne Peters

Chapter One

The Organic Vision - A Natural Ideal

The organic farming movement, in the eyes of a growing number of practioneers and sympathizers, cherishes a sacred covenant: in work on the land, the organic farmer respects Nature and its subtle and mysterious laws. These enthusiasts embrace organic farming not merely as a negative "non-chemical" system, but as a positive venture in growing more nutritious food, restoring fertility to the soil, and generating a permanent and self-sustaining agricultural system.

This thesis traces the development and expression of this natural ideal espoused by organic farming advocates. Enthusiasts point to a rich and varied heritage. The non-chemical agricultural ideal first appeared in England and Switzerland in the 1920s. Diet reform and chemical food processing worried many early American reformers, including nineteenth-century utopian communalists, abolitionists, and Progressive muckrakers. The explicit notion of 'organic' farming, first popularized after 1942, marked the beginning of a systematic American movement. In the 1960s, both back-to-the-land communalists and self-sufficiency individualists embraced a new crusade devoted to 'ecologically-sound' farming. Throughout this history, and most strikingly in the

1970s, advocates have promoted the notion of a "new science" based on the principles of the organic method. This thesis attempts to discuss the underlying ideals and assumptions of organic enthusiasts across this diverse history. What are the shared myths and symbols, who are the widely acclaimed heroes of the organic movement? How have these common ideals evolved?

There is no available history of the organic movement. Biographies and autobiographies of a few of the early organic advocates are available, but these are seriously limited. The lives of Rudolf Steiner¹ and Sir Albert Howard,² the European founders of the non-chemical ideal, are portrayed only through their own eyes or those of their disciples. The biography of J.I. Rodale, the chief American exponent of the organic method, hedges on Rodale's personal impact and falls far short of a discussion of the movement.³ On the other hand, studies are available of the environmental movement and of these contemporary sympathizers of the organic cause.⁴ These studies, however, do not focus on the ideals of the environmental movement, but on enumerating and describing its recruits. Two studies of the current "alternative agriculture" movement, written by political scientists, have appeared in the last two years. Garth Youngberg, from a study of current "ideology", dwells on the "political implications" of the movement.⁵ In his forthcoming paper, Mark Rushefsky deals with the scientific claims of the movement as part of a technological dispute over future agricultural policy.⁶ The

discussion here is then the first history of the organic farming movement.

This discussion has, however, precedents in the histories of other social movements. Christopher Hill, in writing the history of Puritan reform movements in seventeenth-century England, attempted to unwind the diverse threads and seek the common inspiration that made these enthusiasts turn the world "upside down".⁷ George Mosse, in exploring the ideology of National Socialism in twentieth century Germany, directly portrayed his task as one of understanding the buried social roots of a mass movement.⁸ As Mosse put it, the social historian looks for the "attitude of mind" within a mass movement.

When I am accused of making a cultural interpretation of fascism, I say all right. Let us take fascism as an attitude of mind -- as a myth by which people define themselves and their place in the world. But then let us also say that this myth, this attitude of mind, connects to reality because it functions within a social and economic context.⁹

The history of the organic farming movement in the United States presents a similar challenge. Current enthusiasm borrows and builds on a complex social heritage, one often unrecognized and unacknowledged by advocates. The character of the current crusade is shaped and constrained by its past, by the echoes of its founders, by the appeals of its early advocates, by an "attitude of mind", a set of myths which inspire advocates.

The most common images used by organic enthusiasts,

"Nature" and "Nature's balance", take many forms. Today this imagery is expressed in language borrowed from the discipline of ecology -- the organic farmer, in this new lexicon, respects ecological criteria, the boundaries of the agricultural ecosystem. The same images, however, show up in other metaphors. For the first organic advocates, and many since, respect for "Nature" implied a spiritual covenant, a recognition of "deeper essences" in agriculture, of a "Wheel of Life" in which the farmer shares a part. For others, cooperation with "Nature" included a vision of political action conforming to a higher 'natural' law. With these various metaphors, the organic movement has given its advocates not only the satisfaction of work on the land, but a set of visions through which their efforts have been linked to universal ideals, to questions about the state of "Nature" and the state of society. These metaphors, and the sentiments they express, have been mixed and interchanged by enthusiasts - the significance of one or another at times muted, at times paramount. Always, however, one of the central concerns has been the expression of man's place in Nature's grand system.

The United States organic movement both conformed to this respect for Nature and endowed it with classical American imagery. In the United States, the organic farmer has been seen as a 'pioneer', a 'homesteader', a 'grass roots crusader'. The American organic movement has appropriated as its own the image of the United States as an agrarian nation, a vision

idealized by Jefferson and transmitted by populists reformers. Here the organic crusader has shared in what has been called the "myth of the garden", the image of American life as tied in essence to agriculture, to the soil.¹⁰ In Henry Nash Smith's analysis of this myth in its traditional form, the garden ideal shaped the direction of American western migration and the democratic sentiments of the nation.

The master symbol of the garden embraced a cluster of metaphors expressing fecundity, growth, increase, and blissful labor in the earth, all centering about the figure of the idealized frontier farmer armed with that supreme weapon, the sacred plow. ¹¹

Smith and others, however, saw the "myth of the garden" as a dying artifact of an early rural inspiration.¹² In fact, organic enthusiasts have revived this myth by tying the image of rural independence to the crusade for chemical-free farming. In the view of organic advocates, "the laws of Nature" require both a responsible approach to soil fertility and a responsible, independent rural populace. In the United States movement, both the garden and its gardeners remain sacred elements of a lasting rural revival.

And, in the United States as elsewhere, concerns for the natural ideal and rural revival have been complemented by questions about the nature of scientific agriculture. Although they reject the chemical technology of conventional agricultural research, organic enthusiasts have not entirely forsaken the scientific ethos. Science has been rejected when it seems to cast doubt on their basic beliefs, but it has been

entertained when it seems to promise practical benefits or ultimate vindication. Organic enthusiasts have in fact generated their own brand of 'popular science' which consists in part of promising conventional research, in part of intuition and specific 'crackpot' claims, and in part of research for and by enthusiasts. Throughout the history of the movement, advocates have questioned the role of scientists, the standards of scientific verification, and the possibilities of "organic research". Deep ambivalence makes up their "attitude of mind" with regard to the scientific ideal.

Within these common myths and assumptions, however, no 'typical' organic farmer, no 'typical' enthusiast, is easily identified. The themes that run through the movement are confused not only by the diversity of metaphors chosen to express the crusade, but by the wide variety of advocates that make up its constituency. The organic cause, and its implicit garden ideal, are espoused by a vastly heterogeneous cast of characters. No surveys are available of organic farmers; the 'best' estimates of their numbers are poor. In some respects, organic farming is a movement without an identifiable membership. Does one count the over one million subscribers to Organic Gardening and Farming magazine, who are more likely to have a backyard plot than anything resembling an operational farm? What about the members of organic and natural foods groups, who are more likely to have home and hobby gardens than anything remotely resembling operational

farms? There simply is no 'average' organic farmer. An organic farm may involve a single family on five to thousands of acres or a community of ten to fifty people on several hundred. At the largest commune in the United States, The Farm in Tennessee, over 1,000 people live on 500 acres. The eight organic family farms 'sampled' for a recent mid-west study barely resembled one another, much less representing a set of concerted sentiments in the movement.

Nor can we identify organic farmers by their methods. Some may choose a 'package' of available techniques, but more often a farmer puts together his own set of methods, picking and choosing among a variety of non-chemical possibilities. These advocates may see themselves as 'organic', 'bio-dynamic', 'biological', or 'ecological' farmers. Thus we must search beyond the methods employed and beyond superficial differences in order to discover the unifying themes of the movement.

My own search was probably more laborious than most. The problem, however, was never one of accessibility. One can easily make the acquaintance of organic enthusiasts, one can quickly be invited to farms and conferences. By the same token, one can readily be caught up in the movement's fervor; the anthropological dilemma of "going native" is more than an incidental feature of the study of this on-going social movement. When I started my research, I was an innocent bystander who had scarcely heard of organic farming; within weeks, at least in the eyes of advocates, I was a full-fledged insider.

In May 1975, when I began this study, I hoped to concentrate on what organic enthusiasts were hailing, on the basis of ecological interests, as the "new science" of the organic farming movement. Even before meeting my first organic enthusiasts, I had been informally briefed about the problems of "research" in the movement by academic sympathizers. My purposes fit conveniently into the expectations of enthusiasts. Organic advocates, especially those part of the "research" orientation, were thoroughly familiar with the paradigmatic interpretation of scientific revolutions offered by Thomas Kuhn and predominating in the sociology of science.¹³ They were eager to talk about the new paradigm offered by the organic crusade: as a sociologist, I was enthusiastically encouraged to examine the problems and rejection, the controversy surrounding their "research" in contrast to conventional agricultural science. Enthusiasts saw me as a potential affirmative voice for the "new science" they hoped to create.¹⁴ Sensitive to the critiques of conventional agriculturalists, they hoped for approbation from my study. Even later, when I made my reservations clear, advocates retained their optimism. In responding to my comments about the "new science", their enthusiasm overrode their caution.

As I said to you, I'm very excited about your dissertation topic. Even if it throws some cold water on the movement optimism, it will be of importance. In fact the more critical your study is of the movement, the more it will be appreciated in the long run. I say this because I believe that biological farming is right and therefore criticism can only help. 15

However, my reservations emerged much later; my first contacts with the organic movement were exclusively 'scientific'. My invitation to study the new "organic research" came in the form of a conference sponsored by a group of students and faculty at Macdonald College, the agricultural campus of McGill University. This small group of advocates within the university had obtained funds from a private donor to present a three day panel of qualified organic "experts", both laymen and scientists, to their conventional colleagues. Their ultimate goal was the establishment of a Centre for Ecological Agriculture at Macdonald. Even in the rumored preludes to the conference, enthusiasts pointed up their own honor and openness in contrast to the narrow-mindedness of their conventional opponents. The idea of an open conference, for instance, one which would include a public audience, had been rejected by the college administration. Enthusiasts scoffed at conventional fears of a conference audience full of "little old ladies in tennis shoes", at the built-in "biases" of their critics. In contrast, they saw themselves as a new breed of academics, noble and crusading, willing to debate all issues openly.

In the midst of this conference, I managed to retain only a portion of my sociological distance. I caught the flavor of scientific enthusiasm in the movement, and I went home each night puzzling about what this "new science" might be. The constant encouragement and helpfulness of these researchers

reinforced my interest. In the course of three days I met several of the acclaimed researchers of the organic movement, and found myself engaged with individuals striking in their articulateness, congeniality, enthusiasm, and energy. The intense self-consciousness of these scientists about their research careers became the chief point of my early fascination. These enthusiasts, critical of the academic establishment and drawn to the promise of an ecological perspective, saw themselves as initiators of a "new science". Only later would I come to see this self-consciousness as part of a scientific salesmanship through which organic advocates proselytized their claims.

In initially accepting the scientific salesmanship of the organic movement, I bought a rather distorted picture of the place of science in the visions of enthusiasts. Since I entered the study at the peak of a research bandwagon, and through the aid of scientists, I had little opportunity to put their 'scientific' claims into perspective. In my rush to be comprehensive, I failed to examine their claims critically. I began to catalogue the kinds of research undertaken, and to plan an interview schedule which would allow me to visit as many of the "new scientists" as possible.

Fortunately, further acquaintance with the movement proved a self-correcting mechanism for my errors. Not all enthusiasts, as I discovered, shared the same sense of research commitment. As discrepancies in their scientific salesmanship surfaced,

the "new science" of enthusiasts appeared more and more problematic. In the first place, I found that many researchers did not see themselves as part of the movement. These scientists disavowed the "mysticism" of the organic crusade. Others did not interpret their results as substantiating organic claims. Thus the first small cracks in the movement's scientific facade emerged. Second, I found scientists, labelled as part of the new "research" orientation, who were not actually doing work tied to organic concerns. As much as these researchers sympathized with the claims of their colleagues, they could not describe their own research as part of the "new science". Finally, my interviews and field work continually drew me to popular rather than scientific elements in the movement. As I continued to interview scientists, these researchers themselves sent me again and again to enthusiasts outside the scientific community -- to local advocates, farmers, food co-ops or health store owners, journalists, and others -- to anyone who 'might' know of other research work.

Slowly it became clear that the "research" effort of the movement was scanty at best, and coordinated only through the activities of advocates. Understanding this tangential quality of the organization of the enthusiasts' "new science" turned me away from a strict examination of proclaimed "scientific" concerns and toward a study of the organic movement as a whole.

In looking for "research" contacts, I made my first unsystematic contact with organic advocates of a 'political' persuasion. Even though I had already met a few of the political old guard in the movement, I was unprepared for the pervasiveness of this self-image among advocates. Many of the 'political' enthusiasts were hangers-on from the 1960s, initially student, civil-rights, and environmental activists, turned now to the land. These enthusiasts frequently thought of themselves as organizers, bent on mobilizing the organic movement to a new political self-consciousness. To the extent that these enthusiasts concerned themselves with research, they saw it as a political issue. Research, however, was far from their main interest. These advocates were articulate in other visions of the movement, including anarchist, marxist, communal, and decentralist ideals. This 'politics', vaguely stated, left many questions unanswered, but it created a distinct identity for many enthusiasts.

With even less advance warning, I also began to encounter a previously unsuspected sentiment among enthusiasts: frank spiritual faith. The scientific salesmanship of the movement all but ignored those advocates who cherished religious or mystical beliefs. The scientific facade of the organic crusade, secular and intellectual, devoted itself to stamping out the stigma of "mysticism". In the eyes of many enthusiasts, however, spiritual commitment underlay the organic vision. At times these spiritual advocates opposed the scientific

rationale and research strivings of other enthusiasts, at times they tolerated the "new science" as a necessary concomitant of the modern era. I found a curious mixture of science and spiritualism at the heart of much of the movement.

Slowly, as my understanding of the organic movement expanded and deepened, I began to see organic concerns not simply as those of food and farming fought on scientific grounds, but as reflections of underlying themes of reform and cultural resistance. I expanded my interview schedule to include more enthusiasts and farmers, and began to see my task as one of mapping out the temperamental differences in the movement, of distinguishing shades of organic zeal. I also made the assumption that I could place enthusiasts into appropriate niches, that 'spiritual', 'scientific', and 'political' labels could be clearly attached to different kinds of advocates. Upon reflection, however, I found that enthusiasts only partially conformed to my analytic map. Just as not all scientific advocates were alike, I found crucial differences among those enthusiasts inspired by religious and political visions. At times, the divisions inside these groups seemed to be wider than those among them. Each 'faction' held within its borders divergent, at times antagonistic, proponents.

In October 1976, after completing more than 90 interviews with North American enthusiasts and scientists, I travelled to European farms and research centers on a trip that would once

again lead me to revise my estimates of the organic movement. The European tour, organized by a New England advocate for a group of 27 'farmers', was largely designed to sell the European research effort as a mecca of organic 'science'. Many of the farmers and enthusiasts with whom I travelled, however, remained unimpressed by this research campaign. For them, the opportunity to visit farms was the paramount attraction of the trip. Nor were they particularly enthused by visits to large estates and huge farms. They wanted to meet small farmers like themselves.

Day-to-day acquaintance with these advocates led me to understand the claims of the movement in a new way. As much as they might want verification of the organic method, and viable farms, they insisted on the need for practical examples. I was unprepared for the centrality of the small farm vision in their lives. Nor did I expect the seeming confusion I sensed in the sentiments of these enthusiasts. Many advocates espoused, with apparent equanimity, thoughts which seemed self-contradictory from my point of view. How did these enthusiasts make sense of a jumble of political, spiritual and scientific claims? Caught up as I was in academic assumptions of coherency and continuity, I misunderstood the popular mind of advocates, one so foreign to my own. Again and again I pondered the seeming contradictions, only slowly realizing that this sense of confusion was not shared by my companions. They were content with a set of ideas I saw as incompatible.

Only after months of reflection, did I begin to see this apparent confusion as a clue to underlying beliefs held by organic advocates. As I complemented my interviews with readings of the work of the founders and first disciples of the movement, I began to see the continuities among old and new advocates, among spiritual, political, and scientific visions. The historical leverage provided by my reading became the driving force behind the present discussion of the natural ideal in the organic movement, and of its various expressions as facets of the same fundamental sentiments.

The ensuing chapters present the vision of the natural ideal from its first expression through forty years of American advocacy. Chapter Two deals with the European founders of the non-chemical movement, the mystic Rudolf Steiner and the agricultural scientist Sir Albert Howard. Chapter Three examines the attempts of the first indigenous American food reformers, vegetarians, Grahamites, and pure food crusaders, to question the safety of chemicals in the diet. Chapter Four explores the Americanization of the 'organic' ideal under the leadership of J.I. Rodale, founder and publisher of Organic Gardening and Farming magazine, during the 1940s and 1950s. Chapter Five presents the impacts of the discipline of ecology and the popular environmental movement on the established organic vision. Chapter Six examines the back-to-the-land movement of the 1960s: presenting the revival of spiritual, political, and self-sufficiency visions by these advocates.

Chapter Seven explores the celebration and construction of the "new science" of the 1970s, and the attempts of enthusiasts to organize and institutionalize their diverse sentiments under the banner of organic research. Chapter Eight questions the limits of the "new science" in the larger movement, especially the attempt of advocates to reassert fundamental values against the encroachment of a purely utilitarian scientific mandate.

Footnotes - Chapter One

1. Steiner prepared weekly autobiographical essays between December 9, 1923 and April 5, 1925 for the magazine Das Goetheanum. These were later collected and published by his widow as a book length autobiography in September 1925, Mein Lebensgang. See, for a current translation, Rudolf Steiner, An Autobiography, transl. Rita Stebbing, ed. Paul M. Allen, (Blauvelt, New York: Rudolf Steiner Publications, 1977). There are, in addition, several biographies of Steiner which have been written for the inspiration of his followers. See Jean Hemleben, Rudolf Steiner: A Documentary Biography, (London, Henry Gouldner Ltd., 1975) and Arthur Pearce Shephard, Scientist of the Invisible: An Introduction to the Life and Works of Rudolf Steiner, (London, British Book Center, 1959).
2. Both of Howard's popular books contain extensive autobiographical material. See Sir Albert Howard, An Agricultural Testament, (London, Oxford University Press, 1940) and The Soil and Health: A Study in Organic Agriculture, first published as Farming and Gardening for Health and Disease in 1947, (New York, Schocken Books, 1974). Howard's widow and fellow worker, Louise Howard, published a biography and account of their work together which praised Howard's originality and initiative. See Louise Howard, Sir Albert Howard in India, (London, Faber and Faber, 1953). Contemporary organic enthusiasts who have picked up on Howard's work also popularize his value for the movement.
3. Rodale's biographer, Carleton Jackson, wrote a very sympathetic account just after Rodale's death. He styled the American enthusiast a "Renaissance man". See Carleton Jackson, J.I. Rodale, Apostle of Non-Conformity, (New York: Pyramid Books, 1974). Rodale wrote an autobiography which was never widely published. His articles as editor of Organic Gardening and Farming magazine, however, provide extensive biographical data. A few shorter and distanced articles on Rodale appeared in the early 1970s. See especially Wade Green, "Guru of the Organic Food Cult", New York Times Magazine, (June 6, 1971), p. 30-31, 54-60, 65-70.
4. See, among others, Frederick H. Buttel and William L. Finn, "The Structure of Support for Environmental Movement 1968-1970", Rural Sociology 39 (Spring) p. 56-69; Riley E. Dunlap, "The Socioeconomic Basis of the Environmental Movement", paper presented at the Annual Meeting of the American Sociological Association, San Francisco (August, 1975)

- p. 1-22; Leslie L. Ross, Jr., The Politics of Ecosuicide, (New York, Holt Rinehart and Winston, 1971). The exceptions include a study of movement themes by Stephen Cotgrove, "Environmentalism and Utopia", Sociological Review, 24, (February 1976), p. 23-42.
5. Garth Youngberg, "The Alternative Agriculture Movement: Its Ideology, Its Politics, and its Prospects", Policy Studies Journal, 6, (Summer 1978), p. 524-531.
 6. Mark Rushefsky, "Policy Implications of Alternative Agriculture", forthcoming, Policy Studies Journal, (March 1980). In his dissertation, however, "Organic Farming: Science and Ideology in a Technological Dispute", State University of New York at Binghamton, 1978, Rushefsky does explore some of the connections of environmental sentiments to the organic crusade.
 7. Christopher Hill, The World Turned Upside Down: Radical Ideas During the English Revolution, (New York: Viking Press, 1972).
 8. George S. Mosse, The Nationalization of the Masses, (New York: Howard Fertig, 1975), The Crisis of German Ideology, (New York: Grosset and Dunlap, 1964).
 9. George S. Mosse, Nazism, An Interview with Michael Ledeen, (New Brunswick, New Jersey: Transaction Books, 1978), p. 108-109.
 10. Henry Nash Smith, Virgin Land: The American West as Symbol and Myth, first published Harvard University Press, 1950, (New York, Vintage, 1957).
 11. Ibid., p. 138.
 12. Ibid.; Richard Hofstadter, The Age of Reform, From Bryan to F.D.R., (New York, Vintage, 1955); Leo Marx, The Machine in the Garden: Technology and the Pastoral Ideal in America, (New York: Oxford University Press, 1964); Grant McConnell, The Decline of Agrarian Democracy, (Berkeley and Los Angeles: University of California Press, 1959).
 13. Thomas S. Kuhn, The Structure of Scientific Revolutions, second edition, enlarged, (Chicago: University of Chicago Press, 1962, 1970).

14. As my own research became known to enthusiasts, they began to contact me for suggestions and help in getting funds for their projects, and for suggestions about other interested researchers.
15. Personal letter from Sam Smith, owner and farmer at Caretaker Farm, Williamsburg, Massachusetts, February 28, 1977.

Chapter Two

The European Founders of Chemical-free Agriculture

The explicit appeal for a systematic chemical-free agriculture had European origins. Sir Albert Howard, a British agricultural scientist, and Rudolf Steiner, an Austrian mystic and philosopher, each fathered a seminal agricultural vision for what later became the North American 'organic' farming movement. Howard and Steiner, strikingly different in temperament, training and experience, were highly unlikely counterparts. Nevertheless they both created a farming system that relied on compost and avoided chemicals: Howard called his the Indore Process; Steiner's instructions became the basis of the Biodynamic method. Perhaps even more surprising given their differences, Howard and Steiner shared a common animosity to conventional science and a sympathy for new forms of agricultural investigation.

Rudolf Steiner and the Origins of Bio-Dynamic Agriculture.

Rudolf Steiner set forth the guiding principles for his new agricultural method in a series of lectures given to farmers in Keyserlinck, Austria in 1924. Steiner was no farmer, nor was he an agricultural researcher. Like the rest of his work, Steiner's agricultural instructions emerged from his mystical intuitions; the farmer, he argued must recapture the

"astral-athereal forces" on his land. Yet, despite this mystical basis, Steiner's teachings would be acclaimed fifty years later as "the most scientific" method for non-chemical agriculture.

It is important to understand that agriculture represented only a small fragment of Steiner's teachings. He spoke on many practical matters: on dance, on medicine, on architecture, on theatre, on astronomy, on vegetarianism - all tempered by his occult vision. In his view, no practical questions should be investigated without the guidance of universal spiritual forces.

Steiner called the new Christian mysticism he proposed "Anthroposophy"; he defined his work as the attempt to unite the material knowledge and spiritual understanding of man. He hoped to create a "Science of the Spirit". And this mixture of material and spiritual elements reflected Steiner's own conflicts. He spoke often of the duality which shaped different periods in his life. Thus, in his autobiography, he recounted his early childhood intuitions, his deeply personal visions:

My mental pictures were of two kinds; I differentiated between things that were "seen" and things that were "not seen". This, though as yet undefined, played an important role in my inner life even before my eighth year.¹

and underscored as well his fascination with geometry, with the mechanics of the railroad, the mill, and the textile factory in his home village.² Torn between these inner experiences

and an outwardly material and intellectual life, Steiner attempted to synthesize these dual experiences. Anthroposophy, "the knowledge of man", became his answer. By the time of his death, he had created one of the significant mystical sects in twentieth century Europe.

Nevertheless, Steiner's home life, schooling, and early career (as an editor and translator) were quite conventional; he gave away no hints of his spiritual leanings.

It was always the same in those days. I had to come to terms with everything that concerned my spiritual perception entirely alone. I lived in the spiritual world; not one among all the people that I knew followed me there.³

In fact, Steiner claimed to share the reluctance of his early contemporaries - he agreed in principle and practice with his intellectual colleagues about the poverty of conventional mysticism.

The desire to reach inner fulfillment by plunging the life of ideas into a soul life void of ideas seemed to me a lack of true spirituality. I saw this a path not to light, but to spiritual darkness.⁴

By this account, Steiner suffered for many years in what must have been to him a spiritual limbo; in striving for intellectual successes, he denied his spiritual instincts.

Early in his career, however, Steiner seems to have been relatively content with his conventional life. He worked first as a free-lance translator in Vienna, and later as an employee of the Goethe-Schiller archives in Weimar. In these years, from 1883 to 1896, he fulfilled his intellectual and social ambitions; by his own report, whatever spiritual

domains he covertly appreciated remained completely dormant.

Perhaps not surprisingly, a crisis in his intellectual life precipitated Steiner's switch to overt mysticism. In 1897, at the age of 36, Steiner moved to Berlin to become the editor of the Review of Literature. He was married (for the first time) shortly after this move, to the mother of a widowed family he had lived with in Weimar. During this period, Steiner lectured briefly at a worker's school in Berlin; within months, however, he was fired for 'idealist' leanings. Eventually, arguing for more control with the editorial board of the Review, Steiner broke openly with the academics whose esteem he had cherished. And, in the midst of this career crisis, Steiner made his first contacts with the spiritualists he had earlier disavowed. Although he later denied any special significance to these disruptions in his life, it is difficult not to see his new commitment to mysticism as an outcome of a failed intellectual career.

For the next twelve years, Theosophy became Steiner's full-time occupation. Even his career within the Theosophical Society, however, was unsettled. On the one hand, he was a tireless worker, founding and heading the German section of the Society in 1902, on the other, he demanded independence for his group, and recognition for his personal spiritual vision. At the time he first joined, these claims for autonomy apparently did not pose major problems -- the Theosophical Society was still a catch-all for many different spiritual styles, and

Steiner travelled throughout Europe promoting his own brand of theosophy under the guise of the Society. But the tenuous peace of this early eclecticism finally collapsed; a rift between members came in 1912. Steiner had slowly evolved his own 'intellectualized' spirituality; he became less and less receptive to the unproblematic 'soul' visions of his colleagues. The moment of confrontation came when Annie Besant, president of the Theosophical Society, returned from India acclaiming a Hindu boy, Krishnamurti, as the newly reincarnated eastern Christ. Steiner, unwilling to accept this 'irrational' vision, split from the Theosophists.

After 1915, Steiner insisted that he alone sought true mysticism; the personal 'soul' visions of other mystics were inadequate. Marked by the faith in science characteristic of his age, and by his sense of himself as an intellectual, Steiner began to draw these qualities into an intellectualized and articulated mystical movement -- he wanted to "carry the light of ideas into the warmth of inner light".

When he founded the Anthroposophical Society, Steiner began to revive his early academic reading and translations of Goethe and to incorporate them into his "science of spirit". Steiner called Goethe's "science of nature" a step toward the new "science of spirit". In his view, Goethe's work provided the solution to one of the major dilemmas posed by modern science - the otherwise incomprehensible theory of evolution. Darwinism, without the spirit, seemed to Steiner "as a science

impossible". The theory of evolution ran against his "picture of the inner being of man. This inner being was of a spiritual nature".⁵ Yet Steiner was unwilling to go against the wide acceptance of Darwin's theory; he sought a compromise.

The idea of higher organisms evolving out of lower ones seemed fruitful to me. But to combine this idea with what I knew directly from the world of spirit was difficult beyond measure.⁶

With Goethe's idea of metamorphosis, Steiner restored the notion of spirit to the theory of evolution. Every element in nature, in his view, had undergone a purposive development; from plant, animal, and to man, evolution had proceeded toward those species with the highest potential to realize true spirituality.

Ascending from the plants to the various animal-species the organic formative forces can be seen to become progressively more akin to the spirit. In the organic structure of man spiritual formative forces are active which bring the animal form to its highest metamorphosis. These forces are active in the growth of the human organism and they finally come to expression as the spirit of man, having shaped a vessel in the natural foundation in which they can live their own existence independent of nature.⁷

Man, regrettably, had not yet attained this final state of grace. Steiner's Anthroposophy, however, could show the way, leading man to a higher state of spiritual evolution.

In this way Steiner struck a bargain with material science, always molding its rudimentary theories into his new spiritual message. He treated a second scientific 'dilemma', the mechanics of optics, in a similar way.

Outside him are waves in the ether : if these come in contact with the optic nerve, they will cause sensations of light and color to arise within him. 8

Here again Steiner found a prime example of the failure of materialistic science.

This point of view I met with everywhere. It caused my thinking unspeakable difficulties. It drove all spirit from the objective external world. It was clear to me that observation of natural phenomena could lead to such assumptions; but it was equally clear to me that when one beheld spirit, it was impossible to arrive at such conclusions. 9

Steiner resolved this particular dilemma by coming to the conclusion that just as the material world is perceived by sense organs, the spiritual world is given through spiritual organs of perception. Again, Anthroposophy could help man to attain his perceptive power.

Steiner spoke of his spiritual insight as one of direct contact - it often seemed more concrete to him than the "shadowlike" forms of the physical world.

The merely intellectual life is not sufficient - it can never lead into these depths. We must begin again from such things. After all, the weaving life of Nature is very fine and delicate. We cannot sense it - it eludes our coarse-grained intellectual conceptions. Such is the mistake science has made in recent times. With coarse-grained, wide-meshed intellectual conceptions it tries to apprehend things that are more finely woven. 10

Material science, continually blind to spiritual sight, might yet be opened to spiritual sight. This was the mandate of anthroposophical science, of the new "Science of the Spirit".

Steiner's Anthroposophy, mystical, yet avowedly scientific,

reflected both the Youth Movement in Europe of the early twentieth century and the new scientific ideal.¹¹ His claims were both romantic, demanding a respect for ancient mysteries and folk wisdom; and rigorous, responding to the claims of modern science. Its duality was Steiner's duality, the pairing of the mystic with the intellectual.

The study of agriculture gave Steiner an almost perfect opportunity to contrast the limited vision of material science with the positive benefits of ancient mysteries and new spiritual insights. Here he could make the most of his abundant complaints against materialist science, and at the same time exploit a rich lode of images amenable to spiritual interpretation.

Science, Steiner claimed, had split agriculture from "deeper essences". He pointed to two outstanding scientific failures in perceiving fundamental agricultural realities - science failed to understand agriculture in its "totality", and it failed to perceive the farm as a "living organism". Science, he said, studied the artifact, never the thing itself - it examined the corpse, not the living unit.

That is the fate of every science that only considers the physical. It can only understand the corpse. In reality, oxygen is the bearer of the living ether, and the living ether holds sway in it by using sulphur as its way of access. ¹²

Agricultural science, in his eyes, missed the "truth in itself"; it failed to see the farm as a total unit, a living unit.

What help, Steiner asked, can science be: "unless one really knows what it means to grow mangolds, potatoes, and corn?"¹³ He embraced the notion of "peasant wit" as the best basis for a new agriculture.

I have always considered what the peasants and farmers thought about things far wiser than what the scientists were thinking... ¹⁴

The peasant held out the possibility of a new appreciation of the land; Steiner disavowed all attempts to quantify what he saw as essentially empathetic understanding:

For rather would I listen to what is said of his own experiences in a chance conversation than to all the Ahrimanic statistics that issue from our learned scientists. ¹⁵

Without the peasant, and with the peasant, Steiner hoped to create a new agricultural science, guarding secrecy, but checking the usefulness of his intuitions.

Steiner gave his new guidelines in the Agricultural Course in June 1924, at the home of Count Carl von Keyserling. He had first been approached to answer agricultural questions just two years before, and the first compost preparations had been dug up that same summer. Steiner's agricultural advice was not then based in farming experience, but in the same intuitive insights upon which the whole framework of Anthroposophy rested. Steiner gave instructions. He said "Do this" and "Do that". His instructions were taken as minute formulae by his followers.

Farmers must, in his eyes, work with the "life of the earth". Like oxygen, he said, soil was alive not only with

living organisms, but also alive as a sentient force on the earth. Composting was the means of increasing and maintaining this life force; composting created nitrogen which "not only becomes alive but sensitive inside the earth".

In a word, nitrogen pours out over all things a kind of sensitive life ... nitrogen is not unconscious of that which comes from the stars and works itself out in the life of plants, in the life of the earth, nitrogen is the sensitive mediator, even as in our human nerves and senses system it is the nitrogen which mediates for our sensation. Nitrogen is verily the bearer of sensation. 16

Conventional agriculturalists mistakenly assumed that agricultural life ended at the root of the plant. To the anthroposophist, the whole farm must be seen as a vessel of spiritual and biological life.

In addition to composting, Steiner advocated "spiritual manures". The first was a preparation made with animal horns.

Have you ever thought why cows have horns, or why certain animals have antlers? 17

In answer to his own question, Steiner outlined the spiritual significance of the cow's horn, the collector of "astral-ethereal forces".

In the horn you have something radiating life - nay, even radiating astrality. It is so indeed: if you could crawl about inside the living body of a cow - if you were there inside the belly of the cow - you would smell how the astral life and the living vitality pours inward from the horns. 18

The farmer, by following Steiner's instructions, could utilize these forces. First he should fill the horn with manure, and bury it over the winter. When dug up, this manure should be

diluted in water and stirred - for at least an hour - quickly in one direction and then in the other. The result would be the liquid spray, the spiritual manure.

A whole set of procedures followed in the lecture series. Six basic substances could be added to the manures - yarrow, camomile, stinging nettle, oak bark, dandelion, and valerian blossom. Yarrow, for instance, should be packed into the bladder of a stag, exposed all summer to sunlight, buried over the winter, and then added to manure. Again this procedure promised dual benefits.

As to the yarrow, we have learned to know it. Its homeopathic sulphur content, combined in a truly model way with potash, not only works magnificently in the plant itself, but enables the yarrow to ray out its influences to a greater distance and through large masses ... the bladder of the stag is connected rather with the forces of the Cosmos. Nay, it is almost an image of the Cosmos. We thereby give the yarrow the power quite essentially to enhance the forces it already possesses, to combine the sulphur with the other substances. 19

Anthroposophy, based in minute preparations, always aimed at spiritual forces. "The indications of Spiritual Science invariably consider the great and wide circles of life - the macrocosmic, not the microscopic conditions".²⁰

Steiner's instructions were admittedly esoteric. No matter how far-fetched, however, his followers always questioned seriously, never facetiously, his instructions. They asked for details.

Question : Can the cow-horns be used repeatedly, or must they always be taken from freshly-slaughtered beasts?

Question : Where can you get the cow-horns?
Must they be taken from Eastern-European or Mid-European districts?

Question : How old may the horns be? Should they be taken from an old or a young cow? ²¹

Steiner answered the questions in the same tone : the horns could be re-used, they should come from the farmer's home district, and a cow of medium age would be the best. Not once, to any of his instructions, did his listeners raise the question "Why?"

Steiner gave his instructions to the elect. He was very cautious about publicizing these new guidelines before the farmers themselves had the chance to try them out on their farms. He asked his disciples "to exercise the necessary restraint" to keep his intuitions secret; he was not willing to risk the general scepticism of conventional agriculturalists. Steiner worried even about the dangers of exposing his insights to faithful followers;

I know perfectly well, all this may seem utterly mad. I only ask you to remember how many things have seemed utterly mad, which none the less have been introduced a few years later. ²²

And, looking back at the unexpurgated but published Agriculture Course today, his caution seems not at all surprising.

Steiner died in 1925, months after he gave the agricultural course. Now his followers faced a real dilemma: they were advised to wait, to "experiment" with his guidelines, but they were also asked to carry forth his teachings. The responsibility for carrying out these almost contradictory

instructions fell to a self-appointed 'research circle' at Dornach. Within the anthroposophical movement, of course, enthusiasm was high. Outsiders, however, as Steiner had recognized, were likely to be sceptical. It was no small matter to suggest, either to farmers or to scientists, that yarrow buried in the bladder of a stag constituted a "spiritual manure".

The research circle needed results - examples of farms or fields successfully managed in terms of Steiner's indications. This task became the major work of Ehrenfried Pfeiffer, a medical student who, although Steiner's protégé, was not even present at the agricultural course. It was Pfeiffer and the research circle that labeled Steiner's guidelines the "bio-dynamic" method, and worked to perfect his "indications". They nicknamed the preparations "500" thru "508". "Preparation 500" sounded far less mysterious than a preparation of manure buried over the winter in a cow's horn in order to capture the astral forces, then diluted and used as a spiritual method. A process of secularization had begun, whereby the research circle avoided the most visible stigma of mysticism.

Similarly, the institutionalization of the research circle deviated from Steiner's exact instructions. Where he had advised peasant wit, and the help of the farmer rather than the scientist, his followers drew on more conventional credentials. Pfeiffer traded on his scientific background in medicine, and became the official expert on the Bio-dynamic

method. Even without Steiner, Anthroposophists still looked for a prophet, if now a more secular one.

Pfeiffer started and managed the largest Bio-dynamic undertaking in Europe, the Demeter greenhouse and garden in Holland. He had to make sense of Steiner's mandate "to make experiments in confirmation of these guidelines and demonstrate how well they can be used in practice".²³ Through Pfeiffer's teachings the Bio-dynamic procedures were expanded and simplified, and the Demeter produce label became a famous brand-name outside anthroposophical circles.

Biodynamicists found it hard, then, to be scrupulously faithful to Steiner's original vision. To accommodate his dual mandate for secrecy and verification, his followers ended up presenting a secular face to the world, and retaining its mystical basis to a closed circle. Only devoted anthroposophists had access to the Agriculture Course; outsiders relied on Pfeiffer's secularized teachings. Neither group looked to peasant wit.

These divisions would be exaggerated and further institutionalized in the American migration of the Bio-dynamic instructions. Pfeiffer would eventually settle in the United States where he would receive an honorary doctorate and be known as "Dr. Pfeiffer" to anthroposophical disciples. The innovations he would introduce, including a "Compost Starter" that combined the various preparations, would all but eradicate the last vestiges of Steiner's mysticism from the popular and

secular front that the American Bio-dynamic movement would build on. As "Dr. Pfeiffer" he would carry forth the dual mandate for secrecy and verification.

Sir Albert Howard and the Tragedy of the Chemical Establishment

Sir Albert Howard approached the question of chemical-free agriculture from his experience as a British colonial research scientist in India. By 1923, Howard was world-renowned in scientific circles for his composting crusade. Regardless of his fame and reputation, however, he was no conventional scientist. Howard was an agricultural rebel, an opponent not only of chemical agriculture, but of what he condemned as a hierarchical and "fragmented" research establishment. From a very different background he came to conclusions startlingly parallel to Steiner's. By the 1940's, Howard's zeal would lead him far beyond the bounds of scientific reform; his became a popular crusade, and the basis of the British non-chemical farming movement.

In his attempt to create a popular movement, Howard stepped outside the bounds of the language of research, unabashedly mixing religious and scientific metaphors. In his two popular appeals for agricultural reform, An Agricultural Testament (1940) and The Soil and Health (1947), Howard evoked a pantheistic respect for "Mother Earth", for the "Wheel of Life", for "God's Green Carpet", and for "Nature's Law of Return". He borrowed both from the Christian sensibilities of his English farming family:

Now without truth have poets and priests paid worship to "Mother Earth", the source of our being.²⁴

and from the Buddhism of the Far East in which he worked:

An eastern religion calls this cycle the Wheel of Life, and no better name could be given to it. The revolutions of this Wheel never falter and are perfect. Death supersedes life and life arises²⁵ again from what is dead and decayed.

But at the same time that he personified Nature, and extolled her virtues as those of the "supreme farmer", Howard's scientific impulse remained undiminished. In his evangelical appeals, he looked for the "mechanisms" and the "perfect timing" of "Nature's farming".

Nature herself is never satisfied except by an even balancing of her processes - growth and decay. ...secured not only by means of a very even balancing of her Wheel, by a perfect timing, so to say, of her mechanisms, but also rest(ing) on a basis of enormous reserves.²⁶

Howards's mix of metaphors underlined a practical sense of duty - to the land, "the laws of Nature", and to the farmer, "for whom the entire research establishment was created" - that united his life and work. He was willing, in his mixed scientific and popular crusade, to use any language that might express this duty, and carry it into the hearts of his listeners. In this sense, agricultural reform was for him both a scientific and a religious mission.

Howard entered agricultural research in the 1890s, at a time when the system of chemical agriculture had already been entrenched for close to forty years. His first research experiences became the template for his deep disillusionment with the traditional system. In his eyes most agricultural

researchers were "laboratory hermits" who failed to understand the practical needs of farmers. In 1898, at his first job in Barbados, Howard found himself perplexed by what seemed a dual life - he worked both as a mycologist at the research station, and travelled on the islands lecturing to agricultural teachers.

In Barbados I was a laboratory hermit, a specialist of specialists, intent on learning more and more about less and less: but in my tours of the various islands I was forced to forget my specialist studies and become interested in the growing of crops. 27

How, he wondered, could he ask the farmer's questions from the laboratory?

It was borne in on me that there was a wide chasm between science in the laboratory and practice in the field, and I began to suspect that unless this gap would be bridged no real progress could be made in the control of plant diseases; research and practice would remain apart; mycological work threatened to degenerate into little more than a convenient agency by which - provided I issued a sufficient supply of learned reports fortified by a judicious mixture of scientific jargon, practical difficulties could be side-tracked. 28

Howard began to see this split between his life as a researcher and his life as a farming advisor as characteristic of the basic flaw in all agricultural science.

This divorce of conventional agricultural research from the farmer's problems was, to Howard, a tragic story. The "intrusion of science" into agriculture had created a disastrous switch from "the ancient art of agriculture" to "farming with artificials". The tragic hero of this tale was Justus von Leibig, the nineteenth-century father of agricultural chemistry. Leibig's personal flaw was his lack of practical

experience.

He...failed to realize the supreme importance to the investigation of a first-hand knowledge of practical agriculture, and the significance of the past experience of the tillers of the soil. He was qualified for his task on the scientific side; he was not a farmer; as an investigator of the ancient art of agriculture he was only half a man.²⁹

Leibig had set the stage for what Howard dubbed the NPK mentality; nitrogen, phosphorus and potassium came to be seen as the only important elements to the plant. Howard maintained that Leibig, in following the "science of the moment", had involved himself in an erroneous attack on humus as the food of the plant. This was Leibig's technical flaw. Howard contended that Leibig was right in theory, but wrong in practice. He agreed with Leibig that humus was insoluble in water, and that it was not directly taken up by the roots of the plant; he did not agree, however, that humus was therefore unimportant to plant growth. Despite the chemical findings, humus was living organic matter that greatly enriched the soil and thereby the crop: here Howard found one among many conflicts "between Mother Earth and the analyst". The benefits of humus might be indirect, but they could nevertheless be seen in improved yields and health for animals and crops. Any really practical experience on the farm would have alerted Leibig or other "laboratory hermits" to the error of their ways.

Yet whatever his objections, research remained the center of Howard's life. Seeking to reunite research with practice,

he returned to England after his stint in Barbados. There, at Wye in Kent, he began practical work on the growing of hops, looking optimistically at the opportunity to meet "the practical men on their own ground": Howard's experiments here led to a restoration of hop pollination, which "amounted to a demand that Nature be no longer defied". He began doing the thinking that shaped the rest of his career - he looked for the state of the plant before man's interference.

This, my first piece of really successful work, was done during the summer of 1904--five years after I began research. It was obtained by happy chance and gave me a glimpse of the way Nature regulates her kingdom. 30

In 1905, however, Howard again took up the opportunity to be posted, this time to India, where he managed to claim 75 acres of a new research station for his proposed work. His assigned work at the station in Pusa involved improvements of the Indian wheat varieties; this was Howard's conventional research success, the basis for his scientific reputation, and for the title he later received. Howard's passion, however, was the improvement of his land as a whole:

I decided to break new ground and try out an idea which had first occurred to me in the West Indies and had forced itself on my attention at Wye, namely to observe what happened when insect and fungous diseases were left alone and allowed to develop unchecked, indirect methods only, such as improved cultivation and more efficient varieties, being employed to prevent attacks. 31

Although he worked in India, Howard's interest turned even further east, to China and the peasants there who devised "permanent" systems of agriculture. His basic agricultural

'innovation', a system of composting animal manures and vegetable wastes, copied intensive Chinese practices. "In the end the substitution of the compost heap for the manure heap in my work proved to have been the most significant step in my education as a scientific investigator".³² Howard's method of composting involved the collection of animal and vegetable waste into a heap, where, with sufficient air, water and some alkaline base, they rapidly decayed into rich, dark living organic matter: humus. This was Howard's "Indore Process". With humus, the farmer replaced on the land that which he borrowed; he attempted to balance Nature's cycle, recognizing that "... if we have stopped the Wheel of Life even for a moment, we must set it spinning again".³³

Intervention there must be: the most elementary act of harvesting is an interception: the acts of cultivation, sowing, and so forth are even more deliberate intrusions into the natural cycle. But these interruptions or intrusions must not be confined to mere exploitation: they must involve definite duties to the land which are best summed up in the law of return... ³⁴

To Howard, a truly permanent system of agriculture, a respect for Nature's rules, depended on ultimately practical decisions on a farm: care of its livestock, its system of management, and the building of humus. Above all else, "the soil must have its manurial rights".³⁵ This then was what the scientist must aim for; Howard spent 19 years at Pusa trying to study practical effects of soil fertility.

There was little room at Pusa however, for the kind of study which Howard ideally hoped to undertake. He found

himself engaged in a running battle with the research administrators; at Pusa his worst fears about "specialized" research were confirmed. Howard wanted control over a piece of land, and freedom from the interference of his colleagues; only with land, crops, and livestock would his complete study of soil fertility be possible. Yet Howard faced obstacles both bureaucratic and intellectual in nature; the research system was not routinely equipped to provide a scientist with the range of facilities that Howard demanded, nor were his fellow researchers ready for a colleague who ignored their specialist concerns.

An approach to the problems of crop production on such a wide front was obviously impossible in a research institute like Pusa in which the work on crops was divided into no less than six separate sections. The working out of a method of manufacturing humus from waste products and a study of the reaction of the crop to improved soil conditions would encroach on practically every section of the Institute. ³⁶

He wanted, for instance, the chance to take care of his own oxen, as part of his "self-contained unit".

This request was refused several times on the grounds that a research institute like Pusa should set an example of cooperative work rather than of individualist effort. I retorted that agricultural advances had always been made by individuals rather than by groups and that the history of science proved conclusively that no other progress had ever taken place without freedom. ³⁷

But Howard was not only an individualist and dissenter, he was a remarkably persistent adversary. He took his request to a higher court, to a member of the Viceroy's Council in charge

of agriculture, Sir Robert Carlyle. As a result, he got six pairs of oxen, but no doubt further alienated the already tenuous goodwill of his fellow researchers.

These personal encounters were the root of the broad attacks Howard later made on the scientific establishment. His confrontations with "fragmented" specialists and his rejection of the split between research and practice would later be expressed in four specific critiques. First, Howard wanted to abolish the "excessive machinery" of the research bureaucracy, which took the scientist further and further away from the practical problems of the farmer.

The reports of these research institutes describe the activities of large numbers of workers all busy on the periphery of the subject and all intent on learning more and more about less and less. 38

These departmental divisions not only paralyzed practical work, they left whatever results obtained totally inaccessible to the farmer. The researchers talked exclusively to each other; their work was lost in technical language and technical journals. Here Howard saw a second problem - esoteric modes of scientific communication.

The farmers complain that the research workers are out of touch with farming needs and conditions; that the results of research are buried in learned periodicals and expressed in unintelligible language; that these papers deal with fragments of the subject chosen haphazard; that the organization of research is so cumbersome that the average farmer cannot obtain a prompt answer to an inquiry and that there are no demonstration farms at which practical solutions of local problems are to be seen. 39

Teamwork, widely heralded as the healing bridge among

specialists, was a third anathema to Howard: "The net woven by the team is often full of holes".⁴⁰ The failure of agricultural researchers to solve the problems of the potato crop was Howard's favorite example of the blunders of the team.

Potato blight fell within the province of the mycologist; a group of investigators dealt with eelworm; a special experimental station was created for virus disease; the breeding and testing of disease resistant varieties was again a separate branch of work; the manuring and general agronomy of the crop fell within the province of the agriculturalist...

The net result has been that all this work on the periphery of the subject has not solved the problem of how to grow a healthy potato. ⁴¹

Last, but not least, Howard wanted to eliminate quantitative studies from the agricultural syllabus. Quantification was to him the final step away from "Nature's law of return", and from the needs of the farmer.

Are not the means (quantitative results and statistical methods) and the subject of investigation (the growth of a crop or the raising of livestock) entirely out of relation to one another? ⁴²

Quantitative studies led the investigator into plot comparisons, which missed the "esprit de corps" of the farm, and into economic studies, which "can hardly be worth the paper they are written on".⁴³

Mother Earth does not keep a pass-book. Almost every operation in agriculture adds or subtracts an unknown quantity to or from the capital of soil-fertility -- another unknown quantity. Any experimental result such as a crop is almost certain to be partly due to the transfer of some of the soil's capital to the profit and loss account of the farmer. The economics of such operations must therefore be based on the purest of guess work. ⁴⁴

Again, with quantification researchers talked to one another, not to the farmer.

Howard was attacking not only conventional agricultural research results, he was on the offensive against a research empire. Scientists, in his eyes, served their own purposes, not those of "Mother Earth" - seeing themselves as an elite, like "esoteric priesthoods of the past". Howard wanted to bring this empire under control, to abolish it if necessary. Fewer agricultural researchers, but immeasurably better ones, became his goal.

Howard finally decided to make his own move back to the land. In 1918 he began to make plans for a new research station at Indore, where

the plant would be the centre of the subject and where science and practice could be brought to bear on the problem without any consideration of the existing organization of agricultural research.⁴⁵

The station at Indore began operation in 1924. Here Howard hoped to create a model of the new synthetic agricultural science. The researcher should be involved not in the "discovery of new things", but in the understanding of the old ones. Above all else, the land itself would dictate the scientist's approach: his job would be to observe and serve the laws of Nature.

All the phases of the life cycle are closely connected; all are integral to Nature's activity; all are equally important; none can be omitted. We therefore have to study soil fertility in relation to a natural working system and to adopt methods of investigation in strict relation to such a study.⁴⁶

The scientist must become a "brother cultivator" with the peasant, understanding the need to produce on the land. Only then would the "new investigator" succeed where, in Howard's eyes, past researchers have failed.

Howard's ideal of the "new investigator" put a single researcher at the center of a single practical problem. Agricultural science, in fragmenting practical questions, created new problems rather than solving original ones. The individual researcher would succeed not because of greater genius, or by gaining wider expertise in many specialized disciplines, but because he would understand the problem as one basic process. If the problem is "how to grow a healthy potato", then the answer would come only from the individual researcher's efforts to grow potatoes, not from isolated questions asked in the laboratory. Howard could not resist the temptation to spell out the contrast between the failures of teams of scientists in solving the potato problem with the successes of individual gardeners.

Evidently something is very wrong somewhere,
because this crop, when grown in thousands of
fertile kitchen gardens throughout the country,
is healthy, not diseased. 47

Only when the scientist became a single-minded practitioner, in Howard's view, would he stand any chance of matching the success of the ordinary kitchen gardener. The problem was really quite a simple one; it was the conventional scientist who insisted on making it complicated.

The multiplication of workers obscures rather than clarifies this wide biological problem. The fact that these potato diseases exist at all implies that some failure in soil management has occurred.⁴⁸

For Howard, here it was the gardener, and not the scientist, who succeeded by following Nature's Law of Return.

The new investigator must also learn to talk to his fellow practitioners in their own language. Demonstration farms and not "unintelligible language" were for him "the simple method of publication [which] never fails to secure the respect and attention of the farming community...".⁴⁹ Howard spent seven years at Indore perfecting his Indore method of compost, and inviting the peasants to follow his example. In all his work the scientist and the peasant shared the same language; their mutual successes were "written on the land".

The researcher's new appreciation of nature's balance was also a return to qualitative concerns. Agriculture was to Howard in its best sense an immeasurable enterprise - its standard should be quality, not quantity.

Many of the things that matter on the land, such as soil fertility, tilth, soil management, the quality of produce, the bloom and health of animals, the general management of livestock, the working relations between master and man, the esprit de corps of the farm as a whole, cannot be weighed or measured. Nevertheless their presence is everything; their absence speaks failure.⁵⁰

Comparisons of composting and chemical techniques, if necessary, should be run not on small test plots, but on complete farms. Only then could the true value of each method be appreciated; what was needed was "a fight to the finish on the

land itself".⁵¹

Underlying all his critiques, and his new reforms, was this idea of qualitative judgement on the farm. Howard was creating a new synthetic science; he wanted to understand the health of the farm as a whole.

Instead of breaking up the subject into fragments and studying agriculture in piecemeal fashion by the analytic methods of science, appropriate only to the discovery of new facts, we must adopt a synthetic approach and look at the wheel of life as one great subject and not as if it were a patchwork of unrelated things. ⁵²

Nature, not the test tube, would provide the answers; the questions must be posed around the health of the land, its crops and livestock. "The base line of the investigations of the future must be a fertile soil. The land must be got into good heart to begin with".⁵³

Disease was a warning which should guide the farmer and instruct the scientist in this new appreciation. "The response of the crop and the animal to improved soil conditions must be carefully observed. These are our greatest and most profound experts".⁵⁴ At his new Institute in Indore, Howard exposed his oxen to hoof and mouth disease, as a "simple experiment" to demonstrate the benefits of humus. He saw soil fertility as a preventative method of disease control - he claimed that his animals resisted all but the most minor infections, from which they soon recovered. Foot-and-mouth disease was not, as commonly thought, a virus, but in his eyes "should perhaps be more correctly described as a simple

consequence of malnutrition".⁵⁵ Similarly pest, fungi and parasites "should be regarded as a warning from Mother Earth to put our house in order".⁵⁶ These experts, the "new professors" of agriculture, would lead the scientist towards sounder agricultural practices.

We must watch them at work; we must pose them simple questions; we must build up a case on their replies in ways similar to those Charles Darwin used in his study of the earthworm. ⁵⁷

At this point, however, as concerned as he was about health, Howard never explicitly attacked the new agricultural chemicals as poisons. His position indirectly avoided them, but, with his new standards, disease became the "censor", a regulator of agricultural management, not an insoluble problem in itself.

Yet Howard's vision of a newly practical agricultural science, and of new standards of scientific progress in agriculture, never led him entirely away from traditional scientific questions. He struggled to find a harmony between his vision and his scientific training. In the meantime, Howard speculated on two possible related causes for the health benefits of humus: the mycorrhizal association in the soil, or the differential protein synthesis in the plants. In both cases, however, he proceeded with the caution associated with his scientific training. This wariness proved wise. The mycorrhizal association, a symbiotic association between the plant and nitrogen fixing-bacteria, had just been discovered; subsequent research pinned this phenomena to only a few

crops. It did not prove to be the overall explanation for the value of humus that Howard hoped it might be. Similarly, the claims of more perfect protein synthesis in organic produce have not yet borne fruit. In retrospect, we can see that Howard's scientific caution, his deferral of the "complete scientific explanation", left him on safe ground.

Yet, even given the lack of a "complete explanation", Howard was never at a loss for words, nor for a course of action. While he set out general laws of Nature within which the scientist should operate, he was, nonetheless, both by nature and necessity, an improviser. The very importance of the principles of Nature's agriculture prompted him to act first, explain later; it was just this impulse to action that shaped Howard's proselytizing efforts for agricultural reform.

Although he retired from official service in 1931, Howard quickly turned to new horizons, starting a personal campaign for soil fertility. In 1934 and 1935 he gave papers to the Royal Society, but more important, he began to travel - presenting the Indore method to all on the land who would listen. Howard's support in this campaign came from the plantation industries in Rhodesia, South Africa, and Kenya; from the growers of sugar, maize, tobacco, sisal, rice, cotton and tea. Now his successes with growers came from work with industries, not with peasants.

But even this large-scale success was in marked contrast to Howard's reception among scientists: "It was, with few

exceptions, definitely hostile and even obstructive".⁵⁸ Again, he saw this resistance as symptomatic of entrenched scientific authority.

The production of compost on a large scale might therefore, prove to be revolutionary and a positive danger to the structure and perhaps to the very existence of a research organization based on the piecemeal application of the separate sciences to a complex and many-sided biological problem like the production of cotton.⁵⁹

Both in England and abroad Howard found little welcome for the Indore Method among his scientific brethren. In at least one encounter, they refused to take up his challenge to compare the Indore and conventional methods on full-scale farming projects. Howard's astonishment at this lack of practical experience among conventional scientists apparently out-ranked even his discouragement with his previous colleagues in India.

I felt I was dealing with beginners and that some of the arguments put forward could almost be described as the impertinences of ignorance.⁶⁰

On another occasion, he expressed his unwillingness to engage in fruitless debates with these laboratory hermits.

In winding up the debate, I stated that I did not intend to devote any time to a detailed reply to these superficial criticisms, but would shortly have my answer thereto written on the land itself.⁶¹

The conventional research establishment, and all it stood for, became Howard's opposition, and he, in this respect, became to them the enemy within. Where Steiner could be discounted as a lay fanatic, Howard's credentials gained him a much wider hearing for his composting crusade.

As a result of these confrontations within the scientific community, Howard, following his work among the plantation industries, began extensive appeals for popular agricultural reform in England. For the first time he linked his initial agricultural concerns to nutritional claims made by other researchers; he turned his attention directly to the question of human health. This new popularizing zeal now led Howard to use testimonial data--second-hand case studies which extended beyond his original model of the "single investigator alone on the land". Among these were Sir Robert McCarrison's study of healthful farming of the Hunzas of Pakistan and a report of nutritional marvels at a New Zealand boys school. But the most important of these testimonials was the Cheshire Medical Testament, which became a cornerstone of Howard's new evangelicism, and of the subsequent claims made by the emerging British Soil Association. The Medical Testament, a document prepared in 1939 by 45 physicians in Cheshire, called for a new preventative stand on health. The Cheshire doctors blamed malnutrition for most of the ills they diagnosed and called for a nutritional re-evaluation of existing medical practice; their work brought the problems of soil infertility close to home. The health of the human population became a chief selling-point of Howard's popular campaign.

When Howard finally sat down to write his first popular treatment of the agricultural dilemma, An Agricultural Testament (1940), he became a missionary in the broadest sense.

Now he openly mixed his scientific claims with religious images. He appealed on moral grounds for better nutrition as well as spiritual grounds; he evoked, as we have seen, both the Buddhist "Wheel of Life" and a more puritan sense of duty. It is not easy to make out the tie between Howard's practical, scientific, and religious concerns. To briefly anticipate our story, he was hesitant and even critical of the religious esotericism of the Biodynamic farmers, of what he called their "muck and mystery". Yet his own pantheistic imagery was intimately tied to his scientific claims; his religious appeals, while they came only late in his life, all ring true. Our clue to understanding Howard's missionary zeal is his rigorous sense of duty -- practical concerns of production on the farm subsumed both his 'science' and his 'religion'. His mix of scientific data and spiritual metaphor was bent to the service of the farmer - whether peasant, gardener, or plantation grower. In this mission there was no conflict in Howard's mind. Unlike Steiner's teachings, popularization led Howard in the opposite direction; he moved toward, not away, from spiritual metaphors. At the same time, in his last book, The Soil and Health (1947), Howard briefly turned to new political questions. His politics, however, was evangelical in tone. He pointed to the destruction of soil fertility as the kingpin of the "disastrous failure" of our civilization.

Our industries, our trade, and our way of life generally have been based first on the exploitation of the earth's surface and then on the oppression of one another - on banditry pure and simple. 62

In these last years Howard the scientific renegade became Howard the social reformer: his crusade bent itself not only against farming techniques, but also against the social system which they predicated. The crime of chemical agriculture, in his eyes, was to set societies on a track to profit; ignoring Nature's law of return, they were left to disease, war and ruin. He now made his most damning charges on artificials - they had not only created a fragmented agricultural research, they were creating a disoriented society. The task of agriculture reform became the possibility to "found our civilization on a fresh basis - on the full utilization of the earth's green carpet". Only the individual researcher or farmer could love the land and pay it the attention necessary to guarantee its future.

But we cannot leave Howard here; we have understood something of his mixed mission, but little of the growing popular movement of his last years. What may be most surprising was Howard's success, in twentieth-century England, at romanticizing the peasant and his labour. Somehow, for Howard's British followers, the peasant's efforts became a model of self-sufficiency. Howard started by looking at the peasant as a brother cultivator; later he readily accepted the support of plantation growers. But now, in its British edition, the new agricultural reform movement took on not only the concern for individual health, but the cast of individual enterprise. Among his early supporters we find not only small

gardeners and farmers, but Lady Eve Balfour, creator of Haughley Farm, and Lord Bradford, the third largest land holder in England. On English soil, Howard's iconoclastic vision was adapted to the possibilities of the individual and independent farmer. And, as his message began to reach North American farmers, the romanticization of the peasant would be adapted to the classical vision of the entrepreneurial farmer. American disciples would convert his idealizations of individual farming enterprise to their campaign for rural revival.

Conclusion

Rudolf Steiner and Sir Albert Howard, approaching agricultural reform from apparently drastically different perspectives, came to strikingly similar conclusions. However, there may be underlying similarities in their careers and crusades which explain something of their unanimity. For both of these European founders, personal crisis shaped the agricultural vision. For Steiner, farming reform was one element in a career crisis resolved by spiritual revelation. For Howard, popular agricultural reform was a crucial expression of his resentments and frustrations at the confinements of the research establishment. And, in the same vein, both of these founders seemed to respond to the intellectual fashion of their period -- they both warned against the 'decline' of Western civilization and sought solace in the promise of the East. Howard's antagonisms to Steiner and his disciples must be understood in this light. Thus, we find that, each in his

own distinctive language, these reformers built crusades revolving around the concern for "Nature" and "Nature's laws"; they shared a disdain for conventional research and a regard for the peasant's appreciative understanding of the land.

Despite their respective impacts in Switzerland and England, however, the non-chemical agricultural visions inspired by Steiner and Howard made only a slow and difficult journey across the Atlantic. In the United States, as elsewhere, conventional agriculturalists had long ago converted to chemical farming techniques. Nor did the tone of the European movements readily suit the temper of indigenous American agriculture. Steiner's esoteric and intellectualized mysticism was remote from the sentiments of most American farmers. Even Pfeiffer's secularized efforts would need further translation. And, although Howard's peasant ideal suited the American temperament, his critiques of the British research establishment seemed remote from a United States land grant research system which prided itself on service to the farmer. Experience would later prove this expectation over-optimistic, but American reformers did not initially share Howard's disenchantment with conventional research.

There was, however, a tradition of food reform in the United States which paralleled some of the concerns articulated by these European founders. The American composting crusade would be shaped by the heritage of early food reform

movements; on this continent, the non-chemical agriculture movement would be built on nutritional claims and on fears of processed food. Later still, Steiner's and Howard's visions would be Americanized and synthesized into one undivided 'organic' movement.

Footnotes - Chapter Two

1. Rudolf Steiner, An Autobiography, transl. Rita Stebbing, ed. Paul M. Allen, orig. Mein Lebensgang, ed. Marie Steiner, 1925, (Blauvelt, New York: Rudolf Steiner Publications, 1977) 29.
2. Ibid., p. 23
3. Ibid., p. 214
4. Ibid., p. 151
5. Ibid., p. 65
6. Ibid., p. 66
7. Ibid., p. 105
8. Ibid., p. 64
9. Ibid., p. 67-68
10. Rudolf Steiner, Agriculture: A Course of Eight Lectures, (London, Bio-dynamic Agricultural Association, Rudolf Steiner House, 1974), p. 52.
11. Walter Lacquer, Young Germany: A History of the German Youth Movement, (London, Routledge and Kegan Paul, 1962), p. 116-117.
12. Steiner, Autobiography, p. 246
13. Steiner, Agriculture, p. 19
14. Ibid., p. 64
15. Ibid., "Araham" was Steiner's evil god of quantification.
16. Ibid., p. 48
17. Ibid., p. 72
18. Ibid.

19. Ibid., p. 68
20. Ibid., p. 94
21. Ibid., p. 101
22. Ibid., p. 95
23. Ibid., p. 57
24. Sir Albert Howard, The Soil and Health: A Study of Organic Agriculture, originally published 1947, (New York, Schocken Books, 1974) p. 23
25. Ibid., p. 8
26. Ibid., p. 19
27. Ibid., p. 1
28. Ibid.
29. Sir Albert Howard, An Agricultural Testament, (London: Oxford University Press, 1940), p. 182
30. Howard, Soil and Health, p. 2
31. Ibid., p. 3
32. Ibid., p. 207
33. Howard, Testament, p. 195
34. Howard, Soil and Health, p. 194
35. Ibid., p. 43
36. Howard, Testament, p. 40
37. Ibid., p. 18
38. Ibid., p. 189

39. Ibid., p. 190
40. Ibid., p. 196
41. Ibid.
42. Ibid., p. 197
43. Ibid., p. 198
44. Ibid., p. 197
45. Ibid., p. 40
46. Ibid., p. 22
47. Ibid., p. 195
48. Ibid., p. 196
49. Ibid., p. 190
50. Ibid., p. 195-196
51. Howard, Soil and Health, p. 260
52. Howard, Testament, p. 22
53. Ibid., p. 222
54. Ibid.
55. Howard, Soil and Health, p. 162
56. Ibid., p. 146
57. Howard, Testament, p. 22
58. Howard, Soil and Health, p. 245
59. Ibid., p. 246

60. Ibid., p. 249

61. Ibid.

62. Ibid., p. 257

Chapter Three

Food Reform prepares a Path

The central notions of the American organic crusade, as it would emerge in 1940, were imported. Yet, while the movement had no direct indigenous origins, it did have precedents in earlier food reform movements. For over one hundred years, long before the composting ideas offered by Steiner and Howard appeared on this continent, American reformers fought against suspect factory food and for diet reform. Like their European counterparts, these early reformers cherished a respect for Nature and a concern with man's role in Nature's balance that would later be voiced under the guise of the organic movement. More significantly, they created a distinct and native tradition of reform that would influence the non-chemical farming ideal in the United States. This is the central question of this chapter: What was the legacy that early American food reformers bequeathed to the organic farming movement?

This chapter explores three areas of the food reform legacy, first, the early vegetarian and whole wheat crusades, second, the pure food campaigns, and third, the first back-to-the-land enthusiasts that embraced these food reforms. Each

of these reform movements offered something different to the organic enthusiast; the three together created a tradition on which the non-chemical farming movement would later build.

The legacy inherited by the organic crusaders was at best full of controversy. In the United States, early food reform movements travelled a roller coaster track -- riding crests of popular enthusiasm or sinking to near oblivion. In raising a wide spectrum of questions about the American diet, from scriptural proscriptions against animal fare to the toxic effects of food additives, early food reformers met with both delight and displeasure. Early vegetarianism, the oldest of food reform movements, was generally the least accepted. The pure food reforms of the progressive era, on the other hand, gained wide popular support. At times the queries raised by food reformers contributed substantially to safer and better food for the public, at other times, their appeals were denigrated.

Whatever their successes, early food reformers were most often discounted as fanatics. The controversy surrounding food reforms was characterized by debates on the 'scientific' basis of nutrition. "Quack", later to become the favorite condemnation directed against non-chemical farming advocates, exemplified the line drawn between "experts" and enthusiasts. Food reformers found themselves belittled by an increasingly organized opposition of food producers, agriculturalists, nutritionists, and physicians. The exaggerations and

evangelicisms of the most esoteric reformers were painted into a pejorative portrait of their collective sentiments.

In fact, many of the assumptions made by both officials and advocates were based on little more than guesswork. The 'scientific' basis of nutrition would emerge only slowly. Many experts, even to the present day, would acknowledge their reliance on a "dark age" of nutritional knowledge.

Nevertheless, battle lines were drawn early. Part of the heritage offered by early food reform was the story of successful safeguards to the American diet, but much of it was a continuing state of war with official critics. These controversies came to rest on the heads of non-chemical farming advocates.

With these outlines in mind, we can turn to the history of early food reform movements. However, a note of caution is necessary. In this chapter I can offer only a tentative analysis of early food reform. My discussion relies heavily on available histories of the reform impulse prior to 1940.¹ For this reason, this survey of food reforms antedating the organic crusade remains merely suggestive. Nevertheless, the central question remains: What was the legacy offered by early food reformers to the emerging non-chemical farming movement?

Vegetarians and Grahamites

Religious inspiration and political fervor fired the campaigns of the first American food reformers. Yet these

crusaders intertwined their moral and social arguments with attempts at 'scientific' justification. In the whole wheat and vegetarian movements of the nineteenth-century, the first dividing lines emerged between enthusiasm and expertise.

The first American vegetarians, twelve Bible Christians, migrated to Philadelphia under the leadership of Reverend William Metcalfe in 1817. Metcalfe's flock, disciples of William Cowherd, a dissenting Anglican minister and homeopathic doctor from Manchester England, sought scriptural confirmation for their diet reforms. Cowherd had warned them that "meat commendeth us not to God".² From this admonition the Bible Christians built the early American vegetarian movement, expanding their community to seventy members by 1849.

In the New England States, especially in Boston, the Bible Christians found native compatriots. The most compelling and notorious of early American food reformers, Sylvester Graham, shared their religious fervor. Graham, an ordained Presbyterian minister, discovered vegetarianism in the course of his temperance crusade. In 1831, Graham, a zealous lecturer on New England circuits, proselytized in pulpits and in public meetings for the merits of temperance, exercise, sunshine, and fresh air. After meeting Metcalfe, he added diet reform to the criteria of moral virtue and physical excellence he extolled.

In the same period that Graham and Metcalfe expounded the new catechism of food reform, a second vein of American

vegetarianism emerged. In mid-nineteenth-century New England, the fervor of social reformers came to rival that of the Bible Christians and Grahamites. William A. Alcott, cousin to the author Bronson and a physician and scholar at Harvard, put a political intent at the heart of the vegetarian crusade. Alcott's book, A System of Vegetable Diet, offered economic and political rationales for the vegetarian regime. "A vegetable diet", he announced, "lies at the basis of all reform."³

A wide variety of political reformers grouped together under the vegetarian banner. As William S. Tyler, a tutor at Amherst, described the boarders of a Graham hotel in New York, they included:

not only Grahamites but Garrisonites -- not only reformers in diet, but radicalists in Politics. Such a knot of Abolitionists I never before fell in with... Arthur Tappan... Goodell... of the Genius of Temperance... Dennison of the Emancipator.⁴

Vegetarianism slowly became one of the central reforms raised by mid-nineteenth century radicals. Alcott's claim, if ambitious in theory, became true in practice: vegetarianism came to lie at the basis of all early reform.

The 'scientific' claims made by both the moral and political stream of early vegetarianism bound the two groups. Graham and Alcott, both striking personalities and self-proclaimed originals, only reluctantly shared the spotlight of the new reform movement. Yet these two crusaders, on the basis of their scientific appeals, joined forces at the 1851 meetings of the American Vegetarian Society. Among this mixed

coalition of vegetarians, religious convictions and political reforms gave way to new anatomical and physiological 'evidence' offered for the vegetarian regime.

What was this new 'scientific' evidence? In matter of fact, these 'scientific' appeals had very real limits. In 1839, when Graham published his Lectures on the Science of Human Life, very little was known about the nutritional values of different foods. In the nineteenth century, despite the myth of boundless plenty, the average American probably ate very poorly. Scurvey, the plague of the seas, was the only disease which had been linked to diet. Our contemporary everyday fascination with the details of balanced nutrition would have had no meaning to either the nineteenth-century vegetarian or gourmet. The pro-offered 'scientific' notions of diet were hazy, debated, and most often a matter of guesswork.

In the midst of this general ignorance, Sylvester Graham attempted to draw his 'scientific' guesses from two bodies of evidence -- the anatomical and the physiological. Unlike many of his fellow vegetarians, Graham generously acknowledged man's omnivorous capacities. Where others denied that meat could sustain the human body, Graham merely insisted that vegetables and grains could provide a better daily fare. Nevertheless, Graham's crusade created a strange mix of evidence and ethics. Although all of his anatomical and physical investigations led Graham to point out man's "unique physical

complexity", the crux of man's problems was moral. Man's complexity, for Graham, distinguished him from more simple animals. Man alone was open to depravity, to "artificial wants". More than better health, vegetarianism in Graham's view promised higher spiritual development.

But in thus multiplying his wants, man necessarily not only depraves the natural instincts, propensities, and sensibilities of his body, and increases the force and despotism of his wants upon his intellectual and volutary powers, but he also impairs his mental faculties, and deteriorates his whole nature, and tends to the destruction of mind and body. 5

In Graham's view, only moral strength could conquer these complex desires.

To prevent this natural tendency of man's animal nature, and to excite his intellectual powers to elevated and extensive efforts in the attainment of knowledge and wisdom, a wise and benevolent Creator has endowed him with MORAL POWER, and made him the subject of moral government. 6

Vegetarianism, for all it was a natural instinct and a physical boon, would always be a moral battle. Ultimately Graham's claims of 'scientific' evidence for vegetarianism remained window dressing on his moral crusade.

The scientific arguments offered by Alcott and other political reformers offered little more in the way of evidence. Alcott, like Graham, offered testimonials:

Most of this one hundred persons are, or were persons of considerable distinction in society; and more than FIFTY of them were either medical men, or such as have made physiology, hygiene anatomy, pathology, medicine, or surgery a leading or favorite study. 7

While he summarized his arguments under anatomical, physiological, medical, political, economical, experiential, and moral subheadings, often he had little more to offer than the claims that vegetarians endured heat and cold better, and they were more agile.

These early vegetarian crusaders knew how to raise questions about the adequacy of the American diet in 'scientific' terms, but they had no corresponding answers. 'Science', for both Graham and Alcott, was an element of faith in their moral and political campaigns. However, we must remember that their 'evidence' was no better or worse than that offered by 'experts' of the age.

In the whole wheat crusade, the most enduring facet of Graham's early vegetarianism, we find many of the same confusions. Here, however, the distinction between official and popular wisdom would be drawn over the course of a century long debate.

Sylvester Graham was the unchallenged 'authority' of the early whole wheat campaign; other reformers relied again on his brand of 'scientific' evidence. In this crusade, Graham made a second distinction based on anatomical evidence. Unlike, however, the distinction drawn between simple and complex animals, here Graham offered no moral judgement. In distinguishing between nutritious and innutritious food, he failed to find any moral grounds to condemn injurious diet practices. In fact here Graham presented a case that linked,

rather than separated, man and other animals: both had some requirement for innutritious sustenance, "to stimulate the digestive organs". The ideal innutritious substance, in Graham's view, was the bran of unrefined whole wheat flour.

To prove his point, Graham relied a great deal on testimonials about the lack of roughage and ensuing sickness. One of his major statements was supplied by the Governor of Maine, William King:

A vessel from New England, with a deck load of horses, bound to the West Indies, was overtaken by a violent gale, which swept away all the hay on board, and carried away the masts. The captain was obliged to feed his horses on corn. After a while they began to droop and lose their appetite, and at length wholly refused to eat their grain, and began to gnaw the scantling and spars within their reach... After this, he regularly supplied them with a quantity of cedar shingles, which they eagerly ate as they would hay, and soon recovered their appetite for the grain, and improved in health and sprightliness, and continued to do well on their food of corn and cedar shingles, till they got into port. 8

For man, not cedar shingles but unbolted wheat flour should provide the necessary innutritious matter. Again turning to testimony from a shipboard incident, Graham pointed to illness among sailors aboard the Isis.

When she arrived, the owner asked Captain Dexter what was the cause of the sickness of his hands. He replied, "the bread was too good". 9

Refined white bread was the chief culprit of man's physical ills in Graham's eyes. He advocated a return to unbolted flour, to the whole wheat loaf with its innutritious food value.

The graham cracker and graham flour remain today as remnants of this early whole wheat crusade. Graham's immediate legacy, however, involved his followers in a dramatic battle that reveals the heterogeneity and harangues of the early American food reform impulse. Unlike the vegetarian crusade, the whole wheat campaign was espoused by both enthusiasts and officials. The fight over the best 'scientific' evidence raged with few respites until the 1930s. It is an issue that has been reingaged by organic crusaders time and time again.

In its early years the whole wheat crusade was confounded, and probably hindered, by continuing moral advocacy. The Graham gospel became one of the unifying threads among a host of diverse health reformers. When the 'water cure' of intense baths inherited the banner of the most popular health reform, Grahamism and vegetarianism were retained among its central tenets. Ellen G. White, prophet of the Seventh Day Adventist version of this hydropathic cure, preached the word of Graham along with her own revelations; she became one of the chief evangelists of the whole grain crusade.¹⁰ Annie Besant, president of the English Theosophists, linked her spiritualistic claims for vegetarianism to the whole wheat campaign on her visit to the United States.¹¹

It was outside these religious circles, however, that the really serious battles in the war against the introduction of refined flour took place. Graham and his followers not only

compounded the issue with religious sentiments, but they anticipated the real whole wheat crisis by several years. The power of their opponents was yet to be felt. The consumer today tends to think of white flour as a personal preference. In fact, producer decisions shaped consumer tastes for white rather than whole wheat bread.¹² In the 1840s, white flour had a fairly limited popularity - and even this flour retained much of the whole wheat berry. This first white flour, against which Graham protested, was 80% extraction flour - the whole grain was ground into fine particles and then sifted. After 1860, however, steel rollers introduced from Italy made truly white flour possible. The new rollers crushed the grain, leaving the oily germ and bran intact, with only the starchy heart of the berry making up the new flour. This new whiter flour was a big bonus to millers and bakers. Without the oil or 'rough' endosperm, the flour no longer went rancid. The shelf life of this 20% extraction flour made massive milling and storage operations practical. The possible disadvantages of white flour seemed to weigh only on the consumer. The nutritional merits of whole wheat versus white flour continued to be hotly debated, but more and more, white bread became the only widely available product.

The prevalent scientific notion of food value, the calorie, gave little support to the whole wheat crusaders. After the caloric notion was introduced in 1889, all food appeared equivalent in quality. The value of food as fuel for

the efficient operation of the body became the only important question. If anything, acceptance of the caloric theory made white and whole flour appear indistinguishable. Yet many American nutritionists weren't willing to give up the whole wheat battle. Before America's entry into the first World War, a survey indicated that 65% of American nutritionists favored whole wheat bread as part of a recommended diet.¹³ Only 8% recommended white bread. It seems that at this time the nutritionists had little more to go on than the kind of scientific argument that Graham had offered, but they still opposed the growing use of white bread by the American public.

It was 1910, when vitamins were first discovered, that clear evidence favoring whole wheat bread began to accumulate. Ironically, these discoveries, which seemed to supplement the claims of the food reformers, dealt the death blow to the whole wheat argument. The discovery of vitamins paved the way for the policy of "protective foods", for enrichment programs, and for the labelling of whole wheat advocates as food fanatics.

The discovery of vitamins put an end to the simple caloric theory of nutrition. Foods could now be evaluated for their vitamin adequacies or deficiencies: the absence of vitamins in suspect foods like white bread could be verified, the necessity of fresh foods like leafy vegetables could be demonstrated, and the benefits of whole wheat became clear. All of this evidence, however, was used against the whole

wheat reformer. Vitamins, as indentifiable properties of food, became the single issue on which the whole wheat argument hinged. Once the millers could show that the vitamin benefits of whole wheat could be provided by other foods, the claims of reformers were belittled as mystique. Vitamins were not elusive, nor were they specific to particular foods - they were available everywhere. Whole wheat had no special bonus not to be found in other products.

This argument became the basis of a new policy of "protective foods". Although the evident superiority of whole wheat flour had been confirmed, the proposed nutritional policies side-stepped this evidence. Originally, in 1916, the U.S. Public Health Service, based on new data about the causes of pellagra and beri-beri, warned that refined flours were suspect in creating deficiency disease. This warning, however, was shortlived. Just six months later, it was revoked in favor of a new "correcting" bulletin.¹⁴ Millers and bakers organized effectively to protest any damning statements about white flour. The newly "corrected" bulletin proclaimed the innovative concept of "protective" foods, which set the basis for medical policy for the next thirty years. This bulletin recognized white flour as nutritionally adequate when supplemented by the advised "protective" foods. In theory at least white bread posed no threat to the well-balanced diet. The accumulating evidence in favor of whole wheat went unrecognized. The discoveries, in 1918 of Vitamin

B as the essential anti-neuritic substance of wheat germ, and in 1921 of a 90% advantage of whole wheat flour in Vitamin B content, had no effect on official policy. A few concerned nutritionists continued to argue for the necessity of whole wheat bread, but their pleas went unheeded.

After 1925, when the organized medical profession joined the millers' side of the controversy, whole wheat crusaders effectively lost not only the battle, but the war. At first, physicians were split on the whole wheat issue: "during the nineteen-twenties many American physicians, members of good standing of the American Medical Association, were actively crusading for a return to whole wheat flour and bread".¹⁵ In 1925, however, the AMA took a new official stand, in favor of white bread. In an unprecedented move, Arthur J. Cramp of the AMA offered his support to the milling industry.

In effect, what happened was that the Bureau of Investigation and Propaganda of the American Medical Association, on its own initiative, offered to place its whole apparatus of publication at the disposal of the baking industry in a campaign defending ordinary white bread and attacking its critics as quacks and faddists. 16

The most generous construction of this change of heart would grant the physicians a desire to protect the health of the nation despite the entrenched use of white bread. Perhaps their new policy reflected an acceptance of white bread as a fait accompli, and a desire to improve the American diet by encouraging the use of "protective" foods. Less charitably, one could suspect that the American Medical Association

bargained for the advertising of the millers. Food reformers would later charge the A.M.A. with selling out to the millers for financial support in their on-going crusade against the National Health Act of 1921.¹⁷ Whatever the motive, the consequence was a new official policy.

No one denied that the whole wheat grain was superior in vitamins, but they insisted that white bread was "satisfactory". Morris Fishbein, editor of the Journal of the American Association, quoted McCollum, discoverer of Vitamin B, on this point.

The important thing is to insist upon the consumption of a sufficient amount of what I have termed the protective foods - milk and vegetables of the leafy kind - to insure that calcium deficiency and the vitamin deficiency of white bread will be made good.¹⁸

Nowhere did Fishbein, the authoritative voice of the organized medical profession, concern himself with the many Americans who could not afford the "normal diet" or "protective foods" necessary to good health.

In 1930 the final repeal of official federal support for whole wheat was announced by a bulletin from the Department of Agriculture. Once again, the concept of "normal diet" was evoked.

Bread, either white or whole wheat, is always an economical source of energy and protein in any diet. The form may be left to the choice of the individual when the remainder of the diet is so constituted as to contribute the necessary minerals, vitamins, and any necessary roughage.¹⁹

With this issue seemingly settled in official document after

document, very little room was left for lay or professional protest against white bread.

Now, in the official view, whole wheat reformers became "quacks". As self-appointed guardians of the nation's health, physicians began to see their campaign against whole wheat reformers as an extension of their crusade against patent medicine vendors. The most esoteric and uninformed claims of whole wheat enthusiasts, the popular rather than the confirmed arguments, were chosen as targets. Morris Fishbein now lampooned "Bread and some Dietary Fads" in his catalogue of New Medical Follies.

There is not an iota of scientific evidence that the eating of white bread, or any other kind of bread, will cause cancer, and not the slightest reason to believe that the use of whole wheat will in any way prevent it. 20

Yet as late as 1938 the whole wheat crusade had not completely lapsed. A new enrichment program for white bread restirred the seeds of contention. Some nutritionists and scientists took the view that enrichment was the real folly. Ajax Carlson, called to testify on the addition of synthetic vitamins to white bread, pointed out the Alice in Wonderland quality of a program which replaced nutrients just milled out.

Finally to me it does seem a little ridiculous to take a natural foodstuff in which the vitamins and minerals have been placed by nature, submit this foodstuff to a refining process which removes them, and then add them back to the refined product at an increased cost. 21

Enrichment was so widely promoted, however, as a publicly conscious health measure, that Carlson later changed his mind,

and even Bernarr McFadden, originally a Grahamite, endorsed it in his Physical Culture magazine. While the enrichment program seemed almost an admission of guilt on the part of the millers, the dominant focus was on the public choice of white bread, not on the ways in which the industry promoted it. After World War Two, refined white bread, enriched and protected by supplementary foods, universally replaced the whole wheat loaf in the bakery and on the grocery shelf.

Vegetarians and grahamites created a tradition of reform that concentrated on the nutritional value of foods on the American table. Despite their failure to implement their specific reforms, these crusaders insistently raised the problem of food quality as one not to be ignored by officialdom. In turn, they were branded as quacks.

As we will see later, this legacy would shape the development of the non-chemical farming movement. Coming on the scene just as the whole wheat issue was laid to official rest, these farming advocates reraised questions of food quality. In their turn they would be discredited as food fanatics. Yet in the United States organic enthusiasts, although not necessarily vegetarians or whole wheat advocates, would as likely be consumers as producers, bent on asserting the superiority of organically raised produce, combining the concern with consumption with those of care of the land.

The Pure Food Movement

Widespread scrutiny of the purity of the American diet

marshalled a different set of pressures for food reform at the turn of this century. In the Progressive Era of reform, a climate of testing was born in which food additives, food preservation, agricultural pesticides, and often outright food frauds became popular and scientific crusades.

Like the vegetarian and whole wheat crusades, pure food reform was part and parcel of other reforms -- both of the challenge to industrial interests and the dedication to consumer protection that characterized this "decade of conscience".²² The food reform movement provides many clues to the progressive conscience -- food reformers, many sincere and committed questioners of the American diet, often found that their inspirations could be dissipated and coopted into legal mechanisms over which the food industry had the greatest share of control. Food reformers were neither innocents or latent monopolists, but committed rebels whose best energies were deflected.

The creation of the Pure Food, Drug and Insecticide legislation of 1906 was a curious mixture of missionary zeal and bureaucratic red tape. Harvey Washington Wiley, chief of the bureau of chemistry in the Department of Agriculture, officially fathered the new law. His efforts, however, were only a small part of an encompassing storm of public protest over the safety of prepared foods. What Wiley did in Washington, the journalistic muckrakers of the day echoed in the newly popular national magazines and on the front pages of

salicylic acid and salicylates, benzoic acid and benzoates, and formaldehyde, were found to be "definitely harmful".²⁴

Most of Wiley's research efforts were more routine than the notorious "Poison Squad", but no less committed or enthusiastic. Wiley's bureau created the 'science' of regulation, slowly building the case for the first proposed food laws. Studies by his staff were regularly reported in his bulletins, which examined adulteration across the whole range of prepared foods. Even when the bill proposed in 1899 failed, Wiley was undeterred.

Nonetheless, Wiley had more than a little difficulty steering a course on which he could be known as a reformer without being condemned as a quack. The climate of progressive food testing was also the climate of muckraking extremes. Wiley, in his campaign against the fraudulent and sometimes dangerous practices of the food industry, went outside the confines of his own department in his public writings and his visits to concerned women's clubs across the nation. As both a scientific and a public figure, Wiley's own habits came under scrutiny. Raised as a farm boy, he was not a vegetarian, but he was sympathetic to the whole wheat crusade. Although his main concern for years was fraud, not food fanaticism, Wiley began to get the reputation in Washington as an overly enthusiastic advocate of "quack" reforms.

Wiley also refused to become the perfectly obedient civil servant. Although the new Progressive administration under

Roosevelt at first seemed to promise the opportunity that food reformers awaited, Wiley's zeal put him on the wrong side of the President. Roosevelt had agreed to pass the Pure Food Law in 1906, but he was less certain of the enforcement and inclusiveness of the new legislation. Wiley, on the other hand, never saw the law as sufficient. He suspected, all too correctly, that vigilance was his best course as a public servant. The break between Wiley and Roosevelt came over the questioned safety of saccharin. Here the fate of food reforms seemed to hinge on personal, as well as scientific biases. In a presentation to Roosevelt, Wiley presented the alleged dangers of saccharin, which the President used daily on his doctor's advice. The lines of battle were clearly drawn: "Anyone," boomed Teddy, "who says saccharin is dangerous is an idiot!"²⁵ Wiley, later recalling his reaction, said that he knew he had been dubbed "Sir Idiot". Roosevelt's ire had immediate public repercussions. He set up a new advisory board for pure food control, headed by George Remson, the discoverer of saccharin. If Roosevelt, in view of Wiley's public popularity, couldn't get rid of his "idiot" chemist, he certainly could try to contain his influence on policy. The Remson board put definite limits on the chief chemist's powers.

By the time he left Washington, Wiley was in great disfavor. He resigned in 1912, facing embezzlement charges that were never cleared, and which his admirers claimed were

faked.²⁶ Wiley did not, however, fade quickly from the public eye. He stayed at the forefront of pure food reform for another 20 years-continuing to travel and make public speeches, and joining the editorial board of Good Housekeeping magazine, where he wrote a regular column. Wiley also found the time to write his autobiography, The History of a Crime, justifying his own position.²⁷ He attacked the irresponsible enforcement of the Pure Food Laws, and charged that government had sold out to industry.

The Pure Food and Drug act of 1906 merely brought the worst abuses of the food industry under control. Food which came directly from the farm, without factory treatment, still created some of the biggest health hazards. The first progressive legislation had specified control levels for agricultural pesticides only on produce that travelled across state boundaries. Public objections to sprayed fruit never became front page news until 1919, and the first seizures under the 1906 law took place in 1925.

Paradoxically, the spraying of insecticides was widely accepted, even by regulatory agencies, as necessary to a bountiful harvest. Fruit was the chief crop in question, and its susceptibility to insects was reknown. Federal policies in fact encouraged farmers to spray against the most virulent pests.²⁸ In keeping with this official line, the first controls proposed in the 1906 act were simply interpreted as informal standards of tolerance. Education programs for

growers, and the expectation that they would freely cooperate, set the official tone. Even Wiley, in a 1907 popular book, suggested that his readers peel their apples without telling them anything about what toxins the unpeeled fruit might contain. This paternal attitude, apparently much to the surprise of the federal agricultural department, proved ineffective. Although growers continued to exceed the tolerance level without compunction, a toughened regulatory stance was years in the making.

Given the extremely poisonous nature of these first insecticides, it seems surprising that the debate revolved largely around levels of tolerance. The most widely used insecticide in the U.S. in 1900 was Paris green, or lead arsenate, a derivative of arsenic. The 1906 legislation focused on controls of lead arsenate "residue" - working from the assumption that fruit naturally "weathered" and most toxic matter came off in the rain.²⁹ Yet lead arsenate was a known toxin. As early as 1830s, deaths had been attributed and warnings issued against wallpapers and lampshades dyed with substances related to Paris green. Even so, the most critical issue for agriculturalists was tolerance, not toxicity. The 'world tolerance' for lead arsenate was .001 grams per pound of fruit. The first U.S. regulation specified a .005 tolerance - well above this level, and not even applicable to fruit that stayed inside state borders. Both the gap between the "world tolerance" and the U.S. level, and the interstate

regulations, became important elements in the fight for changed pesticide regulation.

The first public fervor over sprayed fruit demonstrated the initial disagreement over levels of toxicity, and over the bans on interstate fruit transport. An inspector in a Boston fruit market on August 18, 1919 noticed white specks on pears which had been imported from Washington. Subsequent tests proved the white specks to be arsenic residue well above the .005 tolerance. Public outcry led both to a new municipal inspection program for Boston, and to a conference on contamination held by the Bureau of Chemistry in Washington. "From the date of this conference forward, spray residues were to attract increasing attention from pure food officials, and were eventually to become the single most serious concern of these officials."³⁰ At this conference, many toxicologists from the Bureau of Chemistry warned that even the maximum allowable residue levels risked chronic intoxication. Growers, on the other hand, were supported by a second professional opinion, from the Bureau of Plant Industry - based on the belief that small amounts of arsenic were normal or even beneficial.

The crux of the issue, however, rested on the dilemma faced by growers. In the first place they had been urged to spray, and now their sprayed fruit was in danger of being confiscated. The grower's frustrations planted the first seed of resentment against federal intervention. More and more

growers began to suspect an eastern conspiracy against higher quality western fruit. This theme shaped the ensuing controversy. The government wanted the growers to clean fruit in the future - an expensive prospect that few growers relished. Both sides agreed, however, that publicity would do more harm than good. From this first conference came a compromise under which the Department of Agriculture set about an optimistic education program for growers, and a campaign to avoid overspray and to wipe fruit.

Despite these efforts, the same problem continued. Municipal governments in both Boston and Los Angeles destroyed contaminated fruit and vegetables between 1921 and 1924. The first federal seizure took place in Philadelphia, where 150 bushels of New Jersey apples were destroyed. Even here the penalty was minimal, and the bureau policy still hopeful.

The Bureau is interested in preventing the merchandising of this fruit which contains excessive arsenic. It is not interested in prosecuting citizens of New Jersey and I may say to you that if the problem can be solved without the necessity of bringing these prosecutions and if prosecutions are not needed to prevent the recurrence of these shipments in this or other years, the Department will probably not prosecute. 31

Despite this lenient attitude, a second voice for residue control was making itself heard. American growers were now faced with a demand from their export markets, especially the British, for adherence to the 'world tolerance' level. The tarnished international reputation of United States fruit was the object of more than 900 cartoons and reports in the

British press. The Apple Shippers Association began to take remedial action against these critiques, hoping to re-establish the popularity of American fruit. They implemented a self-enforced inspection procedure, ensuring the safety of export fruit.

This international fervor had its domestic repercussions. The Bureau of Chemistry ineffectually tried to put into practice a secret "informal" tolerance - not to be published, but also not for prosecution. The new policy did nothing, however, to alleviate the frustrations of the growers.

Here is a law, drastic and penal in its nature, and yet the citizen may not know when he is violating the same. 32

The protest of the growers came to a head under the symbolic leadership of Lewellyn Banks, a large grower in Oregon. Banks fought for and won an injunction against seizure of fruit on his farm, threatening to shoot any inspector who dared to step on his land. When his fruit was ultimately tracked across state lines to Chicago, however, it was condemned. In the meantime Banks had indeed killed a federal inspector, ending his drama in jail. A second major highly publicized case was tried against Richard Martin who tried to skirt the law by appearing to ship his fruit as non-food produce. He labelled his boxes "Sprayed Fruit Unwiped". Martin won his case on the first round, but the government immediately appealed the decision. The appeal, however, never came to trial. Martin died first, and his son released the judgement

by agreeing to condemn the fruit. The Banks and Martin cases publicly dramatized the conflicts of fruit growers and federal bureaucracy, but legislation still lingered behind.

Throughout the 1930s, pure food crusaders continued to publicize abuses of the legislation they now saw as inadequate. And these crusaders contributed to the end of government quiescence in agricultural abuse. In 1933, Arthur Kallet and F.J. Schlinck published a sensational exposé of chemical contamination called 100,000,000 Guinea Pigs.³³ Following the traditional muckraking tone, Kallet and Schlinck complained of governmental indifference to abuses of the law. They widely publicized the agricultural controversy, bringing the Banks and Martin cases to public attention. Feeling about the lack of government concern was matched by outrage over the lack of social conscience among growers. In 1936, Russet Mantle, a sharp parody of growers, began a year and a half Broadway run, alerting audiences to the abuses of the food laws. In the same year, Ruth de Forest Lamb, one of Wiley's original staff, published a book, The American Chamber of Horrors, which included agricultural threats with other abuses.³⁴ Lamb based her book on a 1933 display prepared by the Department of Agriculture. Unlike other critics, she emphasized not government callousness, but federal powerlessness under the law. The momentum for new legislation on food, drug and cosmetic purity gained strength with these appeals.

Finally, in 1938, after years of debate new legislation

matching international levels and providing regulatory agencies with new clout passed through the Senate.³⁵ And although vociferous muckraking now abated, a mood of suspicion nevertheless prevailed. A heritage of chemical suspicion had been laid upon which the first non-chemical farmers in the United States would build.

Back to the Land

The early back-to-the-land movements in the United States tied the vision of food reformers to one of an idealized rural life. The utopian communities of the nineteenth-century may have given vegetarianism and the graham crusade their most eloquent expression. In their turn, rural radicals of the 1920s and 1930s tried to recapture this communal inspiration in a search for pure food on the land. For many years, however, the communal and radical elements of the reform heritage lay dormant. Although these ideals would recur as explicit mandates of the 1960s back-to-the-land movement, they played only an implicit and tangential role in the non-chemical crusade of the 1940s. For the most part, only the classical stream of an individualist "myth of the garden" would be recognized by the first chemical-free farming enthusiasts. Nevertheless, these early rural reformers laid a foundation on which, in its hesitant and limited way, the organic movement would occasionally borrow.

In the nineteenth-century utopian commune, everyday problems like child-rearing, dress, health, sex, temperance, and

diet were joined to mysticism, economics, and political organization. Few, if any, of these early utopians would have identified food or agricultural reforms as central motives of their return to the land; yet how one lived one's daily life mattered intensely to these utopians. Here spiritual and political ideals, the concern for harmony with Nature and with one's fellow man, could be demonstrated in day to day practical experience. At the Oneida community, for example, the leader John Humphrey Noyes complemented his faith in spiritual healing with a strict Graham diet.³⁶ Alcohol, coffee, and tea were banned at Oneida. The Brook Farm communalists, under the influence of William Alcott, adopted a strict vegetarian regime. The extreme of this natural rural ideal was expressed in fictional form by J. William Lloyd in his popular novel, Vale Sunrise. Karl, one of Lloyd's 'natural' protagonists devoted himself to life in the deepest forest.

He says animals have the same rights as men and so he never tames any, for tame animals, he says, are slaves...When birds, squirrels, etc. are babes in the nest he vied with the mother in bringing them food, and they grow up with the feeling that he is a foster parent.³⁷

Thus, although we have no record of distinctive farming practices, both the spiritual and political branches of the early food reform movement found voice in this first rural experimental migration. Yet the great majority of these early utopian communes were shortlived. Only a few communities, like the New Harmony Society and the Shaker villages, would

outlast their first inspirational leaders. The optimistic vision of rural life they offered, however, set an example for later rural reformers.

In the 1920s, for instance, Progressive reformers tried to recapture some of this utopian spirit. Upton Sinclair and other socialists financed a communal farm in central New York state where many contemporaries visited.³⁸ Once again, however, these experiments were shortlived. Although these reformers, drawn to sun and water cures, sought in farming the purity unrealized in industrialized urban America, few stayed to make a life on the land.

Then, during the depression, the return to the land became a question not only of communal idealism, but of personal survival. In the 1930s, at least two rural experiments materialized which tied rural reform to non-chemical agricultural production. Ralph Borsodi and Scott Nearing, one a disciple of Henry George and the other an ex-communist, returned to the land in search of a healthful and self-sufficient way of life. Long before non-chemical farming became a popular crusade, these two rural migrants adopted the principles of Steiner's biodynamic methods as the basis of their own operations. The visions of rural revival they offered, however, despite this advocacy, received little in the way of immediate recognition. Although both Nearing and Borsodi borrowed from the ideal of individual strength and perseverance on the land, they each gave it their own

distinctive stamp. Neither Nearing's "collectivism" or Borsodi's "decentralism" would be easily assimilated into the emerging 'organic' tradition. However, like the nineteenth-century utopian communalists, they laid an implicit foundation that received intermitent acknowledgement in the years to follow and full-blown plaudits in the 1960s back-to-the-land revival.

In 1929, Ralph Borsodi and his wife converted to a dietary notion of disease. When they moved to the land, health through diet and pure food were central elements of what Borsodi called their Flight from the City (1933). They adopted bio-dynamic farming techniques on their small plot outside New York city, but stripped these methods of their occult overtones.

Once on the land, Borsodi, an economist, set out to demonstrate the feasibility of his self-sufficient life as a model for a wider rural revival. Although he still commuted daily to the city himself, he thought that thousands of urban residents suffering the rigors of the Depression could turn to homesteading as a full-time enterprise.

Instead of spending more and more millions to support the unemployed while the depression is dragging its weary way over the years, why shouldn't we use the public's "will-to-give" to enable the unemployed to support themselves? Why shouldn't we furnish them land, tools, lumber, seed, livestock, wool, leather, raw materials of all kinds to enable them to establish themselves once again in the homesteads which they should never have abandoned as many of them did perhaps generations back? 39

Borsodi connected his homestead vision to the decentralist rural rent policies initially advocated by a nineteenth century amateur economist, Henry George. In this spirit, he envisioned massive developments of rented three acre homesteads, accessible to the city and available to every family. Here the new homesteader could resist the central economic failure, could explore the possibilities of developing his own self-sufficient skills.

During the New Deal, Borsodi got local and federal support for the purchase of 50 homestead units outside Dayton, Ohio. The first unit, 160 acres, was designed to support 35 to 40 families; each family would rent its land on a long term lease, build its own buildings, grow its own food -- "making the home, rather than the factory, the economic centre of life.."

With this development, a new frontier will have been established around Dayton to which the enterprising, industrious, and ambitious families shipwrecked in some way by the depression can migrate, just as in all the great depressions of the past century, they migrated from the industrial East to settle on the old frontier. 40

Here Borsodi borrowed explicitly from the "myth of the garden". Yet his vision of the new frontier failed miserably. As William Issel reported, Borsodi's farmers were disillusioned relief victims, not committed homesteaders.⁴¹ As the project came under greater and greater federal control, exactly the kind of central structure he had hoped to avoid, Borsodi resigned from the Dayton experiment.

From the failure, however, Borsodi turned his attention to the individual homestead without the trappings of a massive experimental community. At Suffern, New York, he founded a School of Living; he turned his original homestead into a model of how the rural home could function as a new center of life. The idea of a School of Living grew out of the Borsodis' efforts to create an acceptable education for their two sons. Unhappy with the traditional schools and syllabus, they turned to domestic education.

In this school the members of the family, old and young, and those who have lived with us, have been both faculty and students. The subject which they studied has been living, the pedagogic system has been what might be called the work-play method, the textbooks have been anything and everything printed which touched⁴² upon the problems of the good life in any way.

Thus, even while embroiled in the Dayton project, Borsodi kept this notion at the back of his mind. "Such a school", he said, "if it included enough families to demonstrate really what is the good life experimentally, would furnish a demonstration of how to live to which the whole world might listen."⁴³ In 1935, he made this hope a reality, founding a "research and experimental sociological laboratory", built to "demonstrate how productive and self-sufficient living may redress the insecurities of our industrialized and urbanized society".⁴⁴ His first School of Living became a self-conscious example of the skills of rural life and the direction of a decentralized future society. For a brief period, Borsodi's experiment received wide publicity in the popular press, including The New Republic and the

Commonweal.⁴⁵ But by 1948, when he published a second book, Education and Living, to promote the School of Living concept, Borsodi had retired from the direct control of the project.

After 1941, when Borsodi took an academic job and left the work of his project in the hands of his disciples, the decentralist ideal waned. Although his most vocal follower, Mildred Loomis, remained committed to Borsodi and to Henry George, hers was a solitary voice. Loomis continued to operate the School of Living and to publish a series of journals, but with little impact on the emerging 'organic' tradition.⁴⁶ Only in the 1960s, would a new wave of recruits join her crusade and help to revive her adulation of Borsodi.

Scott Nearing, Borsodi's contemporary, also went unheeded for many years. Like Borsodi, Nearing saw his rural life as an experiment. His socialism, however, left him even further on the outskirts of the mainstream movement. His 'rediscovery', in turn, would be even more dramatic.

Scott and Helen Nearing moved to a 65 acre farm in Vermont in 1933. Helen's theosophical background led them to vegetarianism and to the Biodynamic method. The Nearings left New York city at a time of social and personal turmoil.

It was, of course, an individual experience, meeting a special need, at a particular time. When we moved to Vermont we left a society gripped by depression and unemployment, falling prey to fascism, and on the verge of another world-wide military free-for-all; and entered a pre-industrial, rural community. The society from which we moved had rejected in practice and in principle our pacifism, our vegetarianism, and our collectivism. So thorough was this

rejection that, holding such views, we could not teach in the schools, write in the press or speak over the radio, and were thus denied our part in public education. 47

This decision to return to the land involved then a quasi-retirement from a life of activism for the Nearings. Scott had already gained national prominence as a radical at an early age. He had studied as an economist, been fired as a teacher, and been indicted as a pacifist. In 1918, Nearing ran against Fiorello LaGuardia as the Socialist congressional candidate in New York's fourteenth district. The national attention he had already attained was magnified not long after he lost the election. In 1919, Nearing was charged, with the Socialist party as co-defendant, under the Espionage Act. In a paradoxical decision, Nearing found himself personally acquitted, the party convicted as charged. Later Nearing joined and 'left' the Communist Party, expelled shortly after his resignation. By the time he returned to the land in 1933, Nearing could well feel that he had exhausted the possibilities of life as a political activist. He would remain a publicist, but he was no longer a joiner.⁴⁸

Even after he bought his farm and settled in Vermont, Nearing split his life between farming and politics. He made room for Marxism in his farming life. On the land, he continued to write his economic and political books and pamphlets; and, for almost twenty years, from April 1953, his by-lined column, "World Events" appeared in the socialist theoretical journal, Monthly Review. He travelled to Hungary, Albania,

Russia, and eventually China during the seasonal breaks in his agricultural work.⁴⁹ However, Nearing the political publicist never reflected Nearing the farmer. His "World Events" column dealt with international analysis, never with agriculture, much less his Vermont homestead experience.⁵⁰

He tried, however, to bring his politics to his homesteading experience. The self-sufficient farm for the Nearings became a political experiment. They wrote two books about their first homestead, The Maple Sugar Book in 1950, and Living the Good Life in 1955. Although the first was largely a technical manual, the second book presented their farm as a "social laboratory". For the Nearings, the return to the land became not only a break with capitalism, but an opportunity to create a vital personal and social alternative. They came up with the notion that their individual efforts afforded a social mandate.

We were not seeking to escape. Quite the contrary, we wanted to find a way in which we could put more into life and get more out of it. We were not shirking obligations but looking for an opportunity to take on more worthwhile responsibilities. The chance to help, improve and rebuild was more than an opportunity. As citizens, we regarded it as an assignment. 51

The Nearings sought to create, out of personal defeats, and in a time of national depression, an economic and political system that might rejuvenate rural life. They justified their life as a new unity of theory and practice, as not only a rejection, but as "an affirmation - a way of conducting ourselves, of

looking at the world and taking part of its activities that would provide at least a minimum of those values which we considered essential to the good life."⁵²

As we live in the present, so is our future⁵³
shaped, channeled and largely determined.

In all this, the Nearings seem to anticipate much of the new sense of 'what is political?'; they wanted their lives to be samples of the society they saw as possible.

Yet the personal was still for them only one level of political expression. In summing up their Vermont experience, the Nearings pointed out its personal success, its collective failure. They had many visitors, 'working guests' at the farm, but no real social commitments tied them to their Green Mountain neighbors. Individual lifestyle would, in their view, better be combined with communal action - a force sadly lacking in rural life.

There is no positive force, in rural Vermont or in rural America, drawing communities together for well defined social purposes. ⁵⁴

Socially our experiment was a failure because the social set-up doomed such experiment before it was born. ⁵⁵

But even as they admired rural communes as a better solution than their own, the Nearings still saw this as a very limited option.

Confined rigidly to the few, rarely endowed and super-normally equipped men and women who are willing and able to live as altruists after being trained, conditioned, and coerced by an acquisitive, competitive, and ego-centric social system.⁵⁶

Ralph Borsodi's vision provided one such model for them, and

one which seemed to create the kind of community the Nearings felt they lacked. Nevertheless, by 1955, the Nearings concluded that their kind of experiment suited only a select few, and became possible only in extreme circumstances.

Just as his radicalism left him on the fringe of conventional politics, it left him outside the mainstream organic tradition. J.I. Rodale refused to publish a review of Living the Good Life in 1955 for fear that his readers would be offended by references to "collectivism".⁵⁷ Then, in the late 1960s, Helen and Scott Nearing would find themselves hailed by a whole new generation, one they never expected to return to the land. As we will see, Scott Nearing would be applauded as a "prophet" of the movement by 1970.

Nevertheless, the radical vision of rural life had only a tangential impact on the beginnings of the non-chemical farming movement. These early rural utopians offered visions that would go unrecognized for many years. In the intervening years, the first 'organic' crusaders would take their cues from a more conventional image of rural possibilities, one which emulated the classical "myth of the garden".

Conclusion

Early food reformers created a template for the birth of the non-chemical farming movement not in a rural utopian vision, but in a campaign against food adulteration. Better personal health would become a dominant claim of the emerging American movement. The attention and controversy aroused by

vegetarians and by whole wheat crusaders made many reformers sensitive to questions of nutritional value. Against the tide of unqualified enthusiasm for America's record production levels, organic enthusiasts would insist on quality as an equally important criteria of the agricultural system. When they claimed that organic foods were nutritionally superior, they would be carrying on the heritage of vegetarians and grahamites. In the same way, the fear of poisoning from chemicals in the organic movement filtered down from the progressive pure food movement. While the claims made by Howard and Steiner had hinted at deficiencies in artificially fertilized produce, the American concern for pesticide levels and for food additives put danger in the mind of the organic enthusiast. At the same time, a few 'experimenters' put these claims into practice on the land. Agricultural efforts in the America of plenty and promise were portrayed as elements of a system of waste and disease by these non-chemical farming advocates. And, although not immediately embraced, their food reform campaigns laid a foundation upon which organic crusaders later would build.

Footnotes - Chapter Three

1. The history of food reform has been studied largely under the more general heading of health reform, and many of these histories have been written by later sympathizers. A judicious eye is necessary when reading and sorting through much of the food reform history.
2. Gerald Carson, Cornflake Crusade, (New York and Toronto: Rinehart and Company, 1957), p. 2.
3. William Amos Alcott, A System of Vegetable Diet as Sanctioned by Medical Men and by Experience in All Ages, (New York: Fowler and Wells, 1849).
4. Carson, Crusade, p. 53. Carson himself commented: "It was sort of a Club des Jacobins where radicals of the day assembled over a convivial cup of cold water and planned the coming of their kingdom".
5. Sylvester Graham, Lectures on the Science of Human Life, (London: Horsell and Aldine Chambers, 1849), p. 104.
6. Ibid., p. 105
7. Alcott, Vegetable Diet, p. vii.
8. Graham, Human Life, p. 133.
9. Ibid.
10. At Battle Creek, Michigan, religious health reforms of the Adventists were carried out at the Western Health Reform Institute under the guidance of Dr. John Harvey Kellogg. Although today's cornflake consumer hasn't the slightest suspicion, the giant Kellogg Corporation was born from a religiously-inspired water cure and whole grain heritage. Dr. Kellogg ran the Adventist Battle Creek Sanitarium and fought for 'scientific' vegetarianism-he went even further than Graham, pointing out the physical dangers of meat eating. When Kellogg created Granose, his first 'quick' breakfast cereal, and later his flakes, he offered the profits to the Adventist Church. Ellen White's revelations, however, failed to guide her in this particular transaction. Already unhappy with Kellogg and other scientists in the cause, she turned down his generous offer.

Eventually White banished Kellogg from the Adventist fold. William Keith Kellogg, John Harvey's brother, reaped the benefits of his brother's dismissal. W.K. Kellogg created the Kellogg Corporation out of his brother's modest whole wheat bakery, making them both millionaires. The last vestiges of reform in Battle Creek, however, died slowly; John Harvey continued to operate the Sanitarium without Adventist support, until it failed during the depression. It was 1933 before the spirit of the original Adventist crusade was completely extinguished at Battle Creek. Only the Kellogg brand name remained to carry on a cereal empire that abandoned its religious history and its strict whole grain legacy, Carson, Crusade, p. 140+.

11. Ibid.

12. This thesis is presented in two books by sympathetic reformers, see James Rorty and N. Phillip Norman, M.D., Bio-organics: Your Food and Your Health, originally published as Tomorrow's Food, 1947, (New York: Lancer Books, 1956) and Ross Hume Hall, Food for Nought: The Decline in Nutrition, (New York: Vintage Books, 1976).

13. Rorty and Norman, Bio-organics, p. 91.

14. Ibid., p. 89-90. As sympathizers, Rorty and Norman point to the improbability that the poor could achieve the recommended "protective foods" that might allay the problems of refined flours.

"Reading this bulletin, many local health officers and physicians working in the South, or in our urban slums, must have ground their teeth in impotent rage. Obviously their impoverished clients could not afford those protective foods even if they could have been taught to use them".

However, many nutritionists and physicians voiced these concerns. In 1921 Sir Robert McCarrison, Howard's compatriot, travelled throughout the United States, criticizing the policy of protective foods. Sir Arthur Newschombe, an English critic, speculated about "How much better it would be, were whole meal bread to become universal again ...". More and more, however, these became isolated calls for reform from abroad. American physicians faced the new threat of the Flexner report: heresy, with the profession now had a much more formidable sanction: professional ostracism. Slowly, whole wheat renegades within the U.S. medical profession were silenced.

15. Ibid., p. 93
16. Ibid., p. 94
17. Ibid.
18. Morris Fishbein, "Bread and Some History Fads", The New Medical Follies, (New York, Boni and Liveright, 1927), p. 132.
19. Rorty and Norman, Bio-organics, p. 67.
20. Fishbein, Follies, p. 133.
21. Hall, Food for Nought, p. 318.
22. Harvey Swados, ed., Years of Conscience: The Muckrakers, (Cleveland, Ohio: Meridan Books, 1962). Swados has collected the muckraking writings across all issues, including food and drugs, religion, prisons, worker exploitation,
23. Upton Sinclair, The Jungle, (London, T.W.Laurie, 1906).
24. James Whorten, Before Silent Spring: Pesticides and Public Health in Pre-DDT America, (Princeton, New Jersey: Princeton University Press, 1974), p. 104.
25. Ibid. / p. 106.
26. Rorty and Norman, Bio-organics, p. 250.
27. Harvey Washington Wiley, The History of a Crime, Emmaus, Pa., Rodale Press, 1957), p. 30.
28. Whorten, Pre-DDT America, p. 121.
29. Ibid., p. 161.
30. Ibid., p. 96.
31. Ibid., p. 132.
32. Ibid., p. 140

33. Arthur Kallet and F.J. Schlink, 100,000,000 Guinea Pigs: Danger in Everyday Foods, Drugs, and Cosmetics, (New York: Vanguard, 1933).
34. Lamb, Ruth de Forest, The American Chamber of Horrors, The Truth About Food and Drugs, (New York, Farrar, 1956).
35. Whorten, Pre-DDT America, p. 240.
36. Robert David Thomas, The Man Who Would be Perfect: John Humphrey Noyes and the Utopian Impulse, (Philadelphia: University of Pennsylvania Press, 1977).
One of the most comprehensive looks at early communes was written by Rosabeth Moss Kanter, Commitment and Community: Commune and Utopias in Sociological Perspective, (Cambridge, Massachusetts: Harvard University Press, 1972).
37. Quoted in Lawrence Veysey, The Communal Experience: Anarchist and Mystical Counter-Cultures in America, (New York: Harper and Row Publishers, 1973), p. 27.
38. Stephen J. Whitfield, Scott Nearing: Apostle of American Radicalism, (New York: Columbia University Press, 1974).
39. Ralph Borsodi, Flight from the City, (New York and London: Harper and Brothers Publishers, 1933), p. 142.
40. Ibid., p. 161
41. William H. Issel, "Ralph Borsodi and the Agrarian Response to Modern America", Agricultural History, XLI, (April, 1967), p. 155-166.
42. Ralph Borsodi, Flight, p. 90.
43. Ibid., p. 95
44. Ralph Borsodi, Education and Living, (Suffern, New York: private, 1948), p. viii.
45. Issel, "Ralph Borsodi", p. 155-166.

46. Mildred Loomis, "Green Revolution - A Beginning", Green Revolution - A Voice for Decentralism, 34, (1977), p. 19.
47. Helen Nearing and Scott Nearing, Living the Good Life, 2nd ed., (New York, Schocken Books, 1970), p. vii.
48. Whitfield, Scott Nearing: and Nearing, Good Life.
49. Travel was a controversial issue, not easily mated with the Nearings' socialism. They privately printed a pamphlet which deals with this question; see, Our Right to Travel, (Harborside, Maine: Social Science Institute, 1959).
50. This is indicated by a survey of "World Events", published in 1955, the year the Nearings' published Living the Good Life. Nearing's column remained anomalous even with the radical context. Apparently he instituted it only after a small journal of his own folded. In order to continue this political comment, Nearing decided to bring his own name and support to the Monthly Review, a socialist theoretical journal.
51. Nearing, Good Life, p. 5.
52. Ibid., p. 6
53. Ibid., p. 184
54. Ibid., p. 195
55. Ibid., p. 196
56. Ibid., p. 185
57. Ruth Adams, a Rodale Press editor, wrote Helen Nearing of J.I.'s decision. Her letter is still extant in the files of the Rodale library.

Chapter Four

An American Stepfather

J.I. Rodale, New York Jewish businessman and health advocate, coined the name 'organic' for non-chemical composting techniques in 1942. For the next thirty years, Rodale reigned as the chief exponent of the organic farming movement. Initiating his crusade with no farming experience, Rodale borrowed from both the European founders of the composting ideal and from the American tradition of food reform. And, with Rodale at its head, the organic movement forcefully began to promote the classical "myth of the garden", an image of American society based in agricultural production. Rodale, a disenchanted urbanite, idealized the unspoiled rural community, the homestead as center of life, and the earth as plentiful provider. Now, long after the main push of western migration and the death throes of the rural dream, Rodale and his followers appropriated the garden myth as their own, linking the vision of the independent and self-sufficient family farm to the crusade for a non-chemical farming regime. In the process, Rodale would transform the non-chemical agricultural ideal. He created under the organic banner a secular and apolitical message inoffensive to the mainstream farmers he

wanted to recruit.

Before Rodale began to publish his first magazine, The Organic Farmer in 1942, the new composting ideas had gained scarcely a foothold on the American continent. Only a few popular articles had appeared on non-chemical farming.¹ For close to twenty years Steiner's Anthroposophical disciples remained the only systematic non-chemical farmers in the United States, and even their best early efforts were meager.² Henry Huggens of Princeton, New Jersey started the first Bio-dynamic garden in 1925, only a year after Steiner gave his agricultural course. Two other Anthroposophists, Elise Stolting and Gladys Barnett, wanted to serve Bio-dynamic produce in their New York restaurant. They made the pilgrimage to Dornach in 1926 to learn the method, and purchased Threefold Farm in Spring Valley, New York in 1927. Spring Valley would become the center of the American Bio-dynamic movement.

In these early years, the Bio-dynamic community looked only inward. The agricultural course, available to Americans only in mimeographed form, was placed only in the hands of initiates.

Meanwhile each copy given out was signed for and the owner had to keep it for his personal use only. When I became involved in Biodynamics in 1933, my mimeographed copy was "English No.58".³

Even after their American migration, Anthroposophists still followed Steiner's cautions for secrecy; Bio-dynamics remained the exclusive affair of believers.

In 1933, when Ehrenfried Pfeiffer made his first U.S. visit, these humble beginnings took on new life and new

direction.⁴ Following his European successes, Pfeiffer became the logical candidate to spread the Bio-dynamic message to North America. Pfeiffer originally came to this continent only for the first Anthroposophical Conference at Threefold Farm, but he quickly established himself as a star on the American scene. He had worked with Steiner, he had lived at Dornach, and he had extensive experience with the Bio-dynamic method; his presence personalized the abstract and occult elements of Steiner's agricultural course. A man of great personal charm, Pfeiffer was not only respected but loved; over the years he combined this personal appeal with a claim to scientific credentials, shaping the American movement in a popular and increasingly secular direction. He helped to bridge the gap with Rodale's organic movement.

Over the next five years, as Pfeiffer made increasingly frequent visits to the U.S., translations of his books became the first American Bio-dynamic texts and Bio-dynamicists began to act as a unified group within the Anthroposophical community.

The first strictly Bio-dynamic Conference in this country met at Threefold Farm on the weekend of April 10 and 11, 1937. The timing was geared to take advantage of another visit from Pfeiffer. 5

Yet the movement had no organizational body until the next year, when the Bio-dynamic Farming and Gardening Associates, Inc. was founded. In February 1938, Bio-dynamicists met in New York City to set forth their goals:

To foster, guide and safeguard the Bio-Dynamic method of Agriculture, Horticulture and Forestry on the North American Continent; to spread the

accurate knowledge of and to insure the correct application of the Method by means of literature, agricultural courses, the publication and distribution of literature, the establishment of research centers, consultations with farmers, gardeners and foresters and similar activities.⁶

With the opening and assurance of this new mandate, Pfeiffer made his permanent move to the U.S. The founding of the Bio-dynamic Association at least implicitly guaranteed him a niche in the American membership, and seemed to promise funds for his research as well.

After his move Pfeiffer became the editor of the newly established Bio-Dynamic Journal. It was quickly apparent, however, that Pfeiffer was not only editor but chief author as well. Journal articles, authored by members never introduced to his associates, began to appear. Pfeiffer, embarrassed by his dominance, used pseudonyms to disguise the extent of his contributions.⁷

Pfeiffer showed less reticence, however, when it came to the question of directing the American membership. In the midst of quarrels and disagreements, he pushed for the secularization of the Bio-dynamic movement. Pfeiffer never lived Steiner's instructions to the letter; he modeled his farming efforts after Steiner's, but felt free to improvise. In this spirit he took the American movement one step closer to a popular appeal. Nonetheless the sphere of influence for Anthroposophists remained much more limited than Pfeiffer wanted. When new directions opened up under the 'organic' banner in 1942, Pfeiffer quickly explored them.

J.I. Rodale, founder and editor of what became Organic Gardening and Farming magazine, wanted to incorporate the agricultural visions inspired by Howard and Steiner into a single American 'organic' farming crusade. In the early 1940s, Rodale envisioned one great undivided movement -- he saw himself as a disciple of a critical cause. Enchanted by Pfeiffer's enthusiasm and impressed by his reputed "expertise", Rodale looked to Steiner's disciple to support his new "organic" crusade. Either innocent of or cunningly sidestepping the mystical basis of the Bio-Dynamic tradition, Rodale never acknowledged any problems in incorporating Pfeiffer's help. As a self-appointed proselyte, Rodale wed the European manifestos of agricultural reform into a popular American message. He fused Steiner's esoteric mysticism and Howard's research reforms into a secular and practical mission. The Indore and Bio-dynamic methods, with some of Rodale's innovations, became one "organic" method.

Rodale's hopes for an alliance among non-chemical farmers had, however, only limited expression -- he convened no meetings, led no delegations, and organized no demonstrations. Rodale wrote, and he published his own writings. He was a self-made millionaire with a printing press and a will to be heard. Thus, in the early years of his crusade, Rodale often found himself in difficult positions. His dream of a single organic cause was built on rather shaky beginnings; untrained in either practical agriculture or agricultural science,

Rodale had enthusiasm, not experience. Once he had chosen the organic cause, however, he slowly built his publications into a badge of leadership among organic advocates.

To understand the vision of the organic movement Rodale offered, we must understand something of the man. J.I. Rodale was a complex and eccentric achiever.⁸ Primarily a businessman of vast energy and ambition, he made his chief mark in the name of organic farming, but had many other passions as well. The American dream of success shaped Rodale, and thereby shaped his vision of a farming movement. Horatio Alger stories were his secret passion in childhood and his open enthusiasm as an adult. Growing up in a New York Jewish immigrant family, he was struck by the opportunities that America seemed to offer. In setting out to be a success, Rodale tried his luck in many directions. Originally he trained as an accountant, and worked for over five years in Washington, and in industry, as an auditor. Then, in 1923, at the age of 25, Rodale started a business to make electrical wiring devices with his brother Joe in Pennsylvania. Despite troubles during the depression years, this first commercial venture was Rodale's most unqualified success. It was the Rodale Manufacturing Company that made him a millionaire, and that eventually underwrote his other endeavors. As his widow, Anna, put it in 1977, referring back to their early commercial struggles and later prosperity, "What do you think fed all this over the years?"⁹

With commercial success in hand, Rodale was free to

indulge his other passions. In the early 1930s, he began to fulfil a life-long desire to write; his early rabbinical education had made him idolize the 'literary' man. And, as it turned out, in order to write, Rodale became a publisher. We have no record of Rodale's first writings, nor do we know whether or to whom he might have sent his early manuscripts, but we do know that as early as 1931, he began to publish on his own. The Humorous Scrapbook, his first journal, was inspired by a suggestion left hanging by Mark Twain, for a small magazine of collected 'funny' anecdotes.¹⁰ His next publishing venture, The Clown, was also humorous but also failed miserably. Nevertheless, Rodale, undeterred, had hit on the formula for almost all of his later successful publications: the Digest. As he later hyperbolized:

In the cradle I was always compiling, arranging, digesting. This is something you can't learn; it must be inherited along with narrow arteries (and) a supercharged thyroid. 11

Determined to break onto the literary scene, Rodale now turned his next digest to a serious topic, and one that fulfilled a life-long interest: health. The Health Digest, first published in 1935, tried to inform, not to entertain, the public. Rodale searched tirelessly through the health magazines for material to compile his new digest, and it was in the course of this search that he discovered his mentor, Sir Albert Howard. From The Health Digest it was only a small step to the composting crusade.

Rodale's conversion came when he read an article by Sir

Albert Howard in Health for All, a British health journal. Myopic, rotund if not actually obese, and with a history of heart attack in his family, Rodale was highly susceptible to the promise of better health. As he later marvelled of Howard's work:

...his idea hit me like a ton of bricks. Up to this time, in reading many books, no one had ever questioned how a vegetable was raised so far as the nutritional quality was concerned...

What really got me excited...was a description of a feeding experiment...where the students ate foods raised with compost made by Howard's method, a method that had taken him thirty years to perfect.¹²

Yet, as much as a revelation as Howard's writings seemed in 1940, its first seed may have germinated in Rodale's mind at least twenty years earlier. Health was clearly a life-long interest; sometime in the 1920s in Pittsburgh, he had listened approvingly to Sir Robert McCarrison report his experiences with the Hunzas; McCarrison detailed their superlative health, their diet, and their agricultural practices. Yet, as appealing as McCarrison's message was, it lacked Howard's electrifying impact; it was Howard who became Rodale's hero.

Then I found that Sir Albert had written a book called An Agricultural Testament, published by Oxford University Press. I obtained a copy and read it with great enthusiasm. It fanned the fires! It changed my whole way of life! ¹³

Whatever the seminal moment for Rodale's conversion, what was crucial was his ripeness for this rebirth, and his sense of urgency in publicizing this new cause.

After discovering Howard, Rodale initiated a correspondence

with his hero. He also bought a farm near the family business in Emmaus, Pennsylvania.

I decided that we must get a farm at once and raise as much of our family's food by the organic method as possible. 14

Yet it was predictable, given Rodale's ambition, that he never settled down to farming. From Howard he gleaned the idea of a movement, and he quickly began to see himself as its American exponent. Just two years after first encountering Howard's ideas, Rodale collapsed all his other publishing ventures to begin The Organic Farmer. Rodale coined the term "organic" for the new movement; Howard adopted it willingly, and he adopted Rodale as his American mouthpiece.

Typically, Rodale began his new venture in grand style. In 1942, the first issue of The Organic Farmer, a small volume, went out to 10,000 potential subscribers. The returns from this free trial run were, however, dismally low. Only eleven subscriptions were fielded.¹⁵ Rodale's enthusiasm was, however, undaunted. From his failure, Rodale taught himself an important lesson, devising a second strategy to gather readers.

Rodale now took aim at a new potential audience. With renewed zeal, he changed the name of his new journal to Organic Gardening. In 1943 and the middle of American involvement in World War Two, the organic method directly appealed to victory gardeners in their backyards and spare lots.

We threw out the poisons we had been using in our Victory gardens, sent for earthworms, praying mantises and ladybugs to kill our aphids, all to choruses of laughter, and some irritation from our families and assistants... It was all an appalling nuisance, but we knew in our hearts that Mr. Rodale was right. 16

More Americans were gardening than ever before, and the recent pesticide scares made them sensitive to the dangers of farm chemicals. Rodale capitalized on their alarm.

Rodale brought something of the model of muckraking reformers to his organic gardening crusade. He, like progressives before him, hoped to purify the American diet. He quoted liberally from Kallet and Schlink's diatribe on arsenic levels and the use of consumers as 100,000,000 Guinea Pigs.¹⁷ And, in Rodale's hands, the concerns multiplied; not only food additives and pesticides, but chemical fertilizers became potential poisons. In 1948, Rodale asked Upton Sinclair, who had shaken the nation with The Jungle, an exposé novel of meat-packing in Chicago, to unmask the dangers of chemical agriculture. Later, in 1954, he would approach Kenneth Roberts with the same appeal. Although Rodale never realized his dream of the organic novel, he kept up his eager vigilance for food reform, and in this form he expanded his crusade to include consumers, as well as gardeners and farmers.

Although Rodale visualized his first book, Pay Dirt in 1945, as a manifesto for an American 'organic' movement,

The back-to-the-land movement is one of the healthiest signs of a progressive people. Civilizations that get too far from the land are bound to decay. Nations, like Antaeus of

old, need to renew their strength by contact with the earth. 18

he was in essence a reformer, not a radical. In the first blush of his enthusiasm for organic farming, Rodale travelled in the eastern United States to discover sympathetic farmers. In time he came upon Ralph Borsodi's homestead in New York, and made contact with the Nearings in Vermont. Rodale, however, never took up their political sentiments as his own.

In Pay Dirt, Rodale the popularizer blended together "Federal and State government agencies, 4-H clubs, Farm Bureau, the Grange", the National Catholic Rural Life Conference, as well as Friends of the Land and the School of Living - all as equal proponents of the move back to the land.¹⁹ More subtly flavored political connotations were irrevocably lost in this melange. Of Nearing he made no mention; nor of Borsodi's decentralism, but only of the School of Living as having "developed many valuable techniques for making rural life and home industry and arts exciting and profitable".²⁰ Rodale ignored any mention of plans for a communal or collective rural life. He saw self-sufficient homesteads as steps toward healthy soil and healthy men, and a healthy society, but he wanted no confrontation with capitalism. In his one brief flirtation with the notion of a "rural proletariat", he envisioned the "hopeless share-cropper, hill-billy, shiftless renter, or migratory worker"²¹ - not as a class to be encouraged, but as a personal desolation to be avoided. The change Rodale hoped to preface was an agricultural one; and, if he

was sometimes tempted to write of a farming 'revolution', he avoided any discussion that might brand him or his movement as radical. Rodale embraced social causes but never clearly styled himself a socialist.

In the pages of Organic Gardening and Farming, the organic farmer was politically no different from any other farmer. Neither pacifist nor militarist, neither collectivist nor anarchist, Rodale's audience primarily aimed to avoid poisons in their produce. These gardeners were scarcely concerned with an agricultural, much less a social, revolution.

Even the most traditional political causes barely existed for Rodale. In later years, he at times threw his support behind a particular politician, such as James Delaney, the sympathetic proponent of the 1950 Congressional Committee on Chemicals in Food,²² but the overwhelming message was organic farming as nonpartisan, and certainly nondisruptive. In Rodale's mind, the popular success of his movement depended on its appeal to all political constituencies. He occasionally toyed with the idea of using politics for organic purposes. In 1960, for instance, he proposed a Health Party, which wouldn't be particularly Republican or Democrat or whatever but would give support to organic sympathizers. Nevertheless he wasn't prepared to create political controversy by putting the organic cause behind any single political platform.²³

To Rodale, the issues were organic food and organic farming, free of political motives, and untied to political

consequences. Politics to Rodale was not revolution, it was the choice made by an electorate, party over party. While he hoped that a revival of common sense concern for the land would rejuvenate rural skills and rural life, these goals were beyond petty political aspirations. Rodale, of course, addressed not depression America, but first a nation at war, and later a nation shy of the Communist 'menace'. He wrote chiefly for the gardener, whose concern was health, a luxury of relative abundance, not hunger, the crisis of scarcity. As a popularizer, Rodale never tied the spirit of the organic movement to any political commitments that might shake his already slender chances of support. For these reasons, the organic farming movement may have survived and even grown when any hint of radicalism might have spelled its death. Rodale's non-conformity probably remained safe because it was kooky and not political, but it created a mainstream organic movement devoid of any political enthusiasm. He aimed his crusade at middle America.

In creating a popular movement, Rodale distanced himself not only from political radicals, but from the spiritual echoes of his predecessors. Rodale, in Americanizing Howard and Steiner, secularized their religious concerns and spiritual metaphors. "Nature" and "Nature's Laws" were still standard phrases in the movement, appearing regularly in the pages of Organic Gardening and in Pay Dirt, but the sense of mission had subtly shifted. Nature now created physical, not spiritual

necessity. Rodale, in his collaboration with Howard, made much of the scientific basis and research work of his mentor, but he never borrowed from his eastern spiritual metaphor. In his gleanings from the Bio-dynamists, Rodale gave no clues that he was aware of the occult dictums which underlaid their work. He never treated Steiner directly, and, although he quoted from Pfeiffer's Bio-Dynamic Gardening and Farming, that in itself was a popular treatment. He may, of course, have had private spiritual sensibilities. In a 1977 interview, Anna, his wife, recalled Rodale's comment on urinating on the compost: "It is," he said, "like saying a prayer."²⁴ Whatever his spiritual orientation, however, it never became an explicit element of his public crusade. His appeal to the natural ideal was as secular as he could make it.

Pay Dirt, like Organic Gardening and Farming, was also intended as a technical treatise. Rodale took conventional research seriously in a way that Howard or Steiner never did. He mined the agricultural literature for whatever gems he could find to support the organic cause, turning peripheral or isolated facts around his own axis. He filled his digests with citations from university extension bulletins, agricultural journals, USDA sources, and the classic texts in soil science and agronomy. In this he was a born digester, modeling extraordinarily disparate data to his private vision.

If one takes the trouble, however, it's easy to see that Rodale made some changes when he borrowed from the conventional

literature. In the argument for humus, for instance, Rodale goes to the standard literature to drive home his point.

Sir E. John Russell, in Soil Conditions and Plant Growth describes a bacterial count at the Rothamsted Agricultural Station in England. In a field treated with farmyard manure, 28,860,000 bacteria were counted per gram of soil. Where complete minerals plus ammonium sulfate were used, only 15,100,000 were present. Lyon and Buckman in The Nature and Properties of Soils note that all the ordinary types of algae are greatly stimulated by the application of farm manure. Practically all investigators agree that the application of organic manures stimulate and increases the biologic life of the soil to a much greater extent than chemical or mineral fertilizers. 25

However neither Russell, nor Lyon and Buckman had actually condemned chemicals. Rodale took their comments about the benefits of organic matter and wove them into his own conclusions.

Rodale's commitment to a popular organic movement led him deeply into the question of possible organic research. Whatever the limits of his leadership, scientists were one group that he did try to mobilize. Yet over the years his concern for scientific support turned into a dramatic struggle with the scientific community.

In its first years, Rodale's scientific crusade was characterized by a call for organic research by and for enthusiasts. Here Rodale echoed Howard. He called for a new investigator - he treated his own farm as an experimental model, and he decided to equip a laboratory for organic research. Rodale also encouraged research by other enthusiasts. Ehrenfried Pfeiffer became a central collaborator with Rodale

in the crusade for a new science of non-chemical farming. Pfeiffer wrote regularly for Organic Gardening and completed the nutritional tests on produce which Rodale sent him. To Rodale, this collaboration seemed to promise substantial benefit for his organic cause.

Although confronted by increasing divisiveness between Howard and the Biodynamists, Rodale refused to be party to this conflict. Howard, in the guise of the scientific expert, attacked the claims made by Steiner and his disciples as "unfounded", based in "muck and magic".²⁶ Despite the superficial similarity of the spiritual metaphors employed by Howard, in "the Wheel of Life as one great subject", and by Steiner, in "Nature as one great totality", Steiner's appeal to "astral-ethereal forces" was foreign to Howard's purpose. As much as they shared in a resistance to conventional science, and in a respect for "Nature", these schools of non-chemical agriculture founded by Howard and Steiner remained worlds apart. Yet J.I. Rodale staunchly ignored these differences. In Pay Dirt (1945), he quoted from both sources, acknowledging Howard as his mentor, and Pfeiffer as a great impetus for research.²⁷ Initially he took the 'science' offered by Howard and the 'research' counsel offered by Pfeiffer to be part of one great 'scientific' organic cause.

This same encompassing eclecticism drove Rodale's campaign to recruit straight researchers to organic questions. Rodale knew that Howard had given up in despair on the research

establishment, but he had had none of this kind of experience first hand. He approached the question of scientific help with surprising goodwill; he seemed to expect American scientists to be a different breed than those encountered by Howard. In writing Pay Dirt, Rodale acknowledged the help of a number of sympathetic scientists. He clearly hoped to expand this circle. In 1949 he made the decision to help and encourage scientists to begin the exploration of questions raised by Howard. Rodale began to solicit money from his readers for research support under the guise of a Soil and Health Foundation, designed to support researchers sympathetic to a new agriculture.²⁸

There were, however, few applicants for the money that Rodale collected; only scattered bits of research were ever funded. Interested researchers may have been discouraged from taking Soil and Health funds; in at least one rumored case a scientist accepted a grant only to find out later that the money was contaminated in the eyes of his university administration. The striking exception to this trend was a grant accepted by Drs. William Albrecht and Keller at the University of Missouri.²⁹ Keller seems to have been the post-doctoral student enthusiastic about the organic message. Albrecht, more cautious, advocated building humus without condemning all chemicals. William Albrecht, however, was the famous name, and J.I. Rodale made much of his apparent sympathy. Yet the Soil and Health Foundation appeared to have too many strings

for most researchers. After 1952 the foundation was a granting agency in name only, and by 1955 it had been unofficially dissolved.

Over the years Rodale's optimism about collaboration with the scientific community began to crumble. "When I began to publish Organic Gardening in 1942, I imagined that the agricultural scientists would be waiting for me with open arms, but I certainly did not expect that they would have brickbats in them."³⁰ As his crusade came under attack by the medical and agricultural establishments, Rodale's equanimity waned. Despite his efforts to create a legitimate scientific basis for the organic farming movement, he found himself branded as a crank and a fraud. The professional opposition, unsympathetic particularly to the nutritional theories of organic advocates, catalogued Rodale alongside its traditional quacks. The brickbats were openly in hand.

The first public confrontation between Rodale and his scientific opponents took place at the 1950 Congressional hearings on Chemicals in Food. Rodale, as the sole contestant for the organic position, got a thorough trouncing. The questions posed turned his testimony into a quasi-prosecution, a sarcastic cross-examination of his credentials and professional credibility.³¹ Rodale's evident lack of farming experience, and the obvious dearth of his scientific training, became substantial issues at the hearing.

The conventional scientists seemed particularly incensed

by the way that Rodale used published results to support his argument. Discrepancies between his written statement and the stands taken by the researchers he quoted were used against him.

Mr. Abernathy: Do you know Dr. Emil Truog, of the University of Wisconsin?

Mr. Rodale: Yes. In my statement there is a statement by him which says that only through the use of organic matter will you get trace minerals in the soil.

Mr. Abernathy: He testified before the committee and states: Absolutely no authentic evidence exists to the effect that the application of chemical fertilizers to soils in accordance with approved practices, such as are recommended by the various state agricultural experiment stations and the United States Department of Agriculture, causes injury to these soils with respect to their physical, chemical, or biological condition.

Mr. Rodale: I would call that a lie.

Mr. Abernathy: Well, talk to Mr. Truog; not to me.³²

Thus, although Rodale's inclusive digesting technique subsumed a wide range of studies under the organic umbrella, he met continual rebuffs from conventional researchers.

At the 1950 hearings his enthusiastic adaptation of a study by J.K. Wilson of Cornell was directly challenged. Wilson was dead, but the case against Rodale was presented by Richard Bradfield, self-appointed adjudicator. Bradfield charged that Rodale "was reading into this article ideas of his own which were completely foreign to those of Dr. Wilson".³³ Earlier, Bradfield had protested privately to Rodale, but to

no avail. Rodale not only continued to refer to Wilson's work, he used the reference in Organic Gardening advertisements. Now Bradfield finally got the chance to chastise Rodale publicly.

I cite this experience to show the way one prominent leader of the organic school has given his readers an entirely false impression of the work of a competent, but unfortunately deceased scientific worker who was not in a position to defend his own views. 34

The final report of the Committee on Chemicals in Food gave Rodale's "opinions" only a passing nod. It dealt for the most part with other questions, declaring that "No reliable evidence was presented that the use of chemical fertilizers has had a harmful or deleterious effect on the health of man or animal".³⁵

The Committee's report was the signal for the scientific establishment to declare open season on the organic idea. The American Medical Association now tuned its position to accord with that of the agriculturalists; its Council on Food and Nutrition solicited a paper from Leonard Maynard, Professor of Nutrition and Biochemistry at Cornell. In his article Maynard strove to be both thoughtful and judicious; he played a waiting game in which "significant final results" must wait "until all the facts are learned".³⁶ Nevertheless, Maynard's anti-organic sentiments surfaced. He never mentioned Rodale by name, but he hinted at "articles...readily recognized as being based on faddism, emotion or propaganda rather than facts".³⁷ When he called for the "curtailment of enthusiasm based on

inadequate data or on speculations"³⁸ the browbeating taken by Rodale at the hearings came readily to mind.

R.I. Throckmorton, writing on "The Organic Farming Myth" for Country Gentleman, was less cautious about pulling his punches.³⁹ Again Rodale was not named, but Throckmorton did not share Maynard's concern for attaining a tone of scientific reason. He portrayed the organic enthusiast as a gimcrack snake medicine showman, and the movement as a "cult of misguided people" preaching a "strange two-pronged doctrine compounded mainly of pure superstition and myth, with just enough half-truth, pseudo-science and emotion thrown in to make their statements sound plausible to the uninformed".⁴⁰ A precis of this article, widely circulated in The Reader's Digest in October 1951, under the title "Organic Farming - Bunk!", downgraded organic claims to an even larger audience.⁴¹

At this point Rodale began to respond in kind; he had no doubt that he was the intended target of these attacks. Soon his disillusionment with scientists turned into outright animosity. In replying to Throckmorton, he blasted the intellectual pretensions of agricultural scientists. "The whole question of the relation of our soils to our health is in the wrong hands".⁴² Paradoxically, his faith in science itself was not yet at stake. "This kind of work should be placed with the kinds of brains that created the atomic bomb. Such genius exists, but it is not in agricultural science".⁴³ Rodale still cherished the dream of organic research, but as

his anger grew he turned against organized science.

In the early 1950s, Rodale began a tentative series of attacks on patronage in agricultural colleges and universities. As early as 1950 he condemned chemical company participation on the boards of governors of agricultural schools. He spoke of his suspicions of a conflict of interest which might ensue when corporations donated research funds to agricultural scientists.

In my opinion it would be better if a law were enacted that concerns manufacturing chemical fertilizers and poison sprays not be permitted to donate funds to institutions for agricultural research. That money should come from the Government. Then, I believe, the Universities would not operate under any implied obligations.⁴⁴

In these sporadic attacks, Rodale anticipated something of the environmentalists' political critique of science, but only in a brief and undocumented way.

Despite this newly embittered attitude, Rodale's original faith in science as a helpmate to the organic cause had not entirely dissipated. He renewed his own research efforts at this time; what agricultural scientists would not do Rodale determined to do for himself. Now some of the money from the Soil and Health Foundation was used to set up the Sir Albert Howard Plots on Rodale's farm. These were a set of 16 cement cylinders, in which both conventional and organic crops were grown. Rodale hoped to compare the nutritional values of crops grown under each method. The results obtained, however, were far from encouraging. When samples were sent out for

analysis, the chemically grown vegetables sometimes came out higher in vitamin content. Understandably, only the positive results ever appeared in the pages of Organic Gardening; the unpublished and damaging figures beautified Rodale's personal files.⁴⁵ Science was not yet the helpmate Rodale hoped it might be.

In his new efforts, Rodale deviated sharply from some of Howard's central maxims. To Howard, organic and conventional techniques could be compared only on the farm as a whole. Rodale, while retaining the emphasis on the quality of the produce, created plot studies. Howard had specifically condemned these as unsuitable. Rodale was also drawn into the conventional debate about the efficiency of the organic method, arguing for the quantitative as well as qualitative superiority of his techniques.

In any case, Rodale was no longer strictly adhering to Howard's Indore Method. Speaking to American farmers, some on farms of several hundred or thousand acres, he plumed for ways of placing manures and burned wastes directly on the land. He also opted for rock phosphate, no longer relying, as Howard had done, on the promise that compost-treated soils would break down and make available deeper rock deposits. Here, however, he made only a guarded concession, carefully distinguishing between natural phosphate rock and commercially available phosphate. While the chemical analysis might point up no difference, Rodale suspected unmeasured and undiscerned

differences between the two. Yet none of these compromises won Rodale the favor of his conventional critics. In fact they may have worked against him; unmeasurables were not beloved by his foes, and there were limits to the modifications he would make.

Faced by increasing frustration in this scientific crusade, Rodale took refuge in a new rhetoric of lay understanding. Occasionally a sympathetic physician or agriculturalist was applauded as one of a rare breed of maverick scientists,⁴⁶ but for the most part the organic farmer was advised to rely on "common sense", on his own "unscientific gumption".⁴⁷ Now Rodale acknowledged the offensive label "crank" as a potential honor; he gladly pointed out that "cranks turn things around". He congratulated himself as a man of "general intelligence" and urged his readers to do the same. Now, having shared the same ostracism, Rodale's sentiments came in tune with Howard's disdain for the "laboratory hermit" and his regard for the "peasant".

Turning away from scientists, Rodale turned not only toward "common sense", but also to what he visualized as the common man. His style had always been down-to-earth and blatantly folksy, if not actually patronizing. Now, however, he gave full vent to a peculiar brand of anti-intellectualism that he assumed his readers shared. His prose, already corny, became ingratiatingly saccharine. Where once he had called for scientific cooperation, he now played up his lack of

credentials, comparing professional 'facts' to his own practical intuitions.

One more thing: if I am going to save my life by following unscientific methods, then to heck with scientific science. 48

When physicians marshaled the attack on organic nutritional claims, he lumped them together with the agricultural establishment.

And there are the people who have in their hands my nutrition and yours, although in my case I am practically out of their hands, and I did it with my own unscientific gumption. 49

Now he loved to retell the story of one of his first encounters with an academic scientist who insistently and repeatedly tried to find out Rodale's credentials.

Well, I got his goat by telling him that I was a scientific nobody who didn't give a hoot who people were, and that I was more concerned with what they were. 50

Just as Howard wanted the scientist to be a farmer on the land, and Steiner applauded peasant wit over scientific stupidity, Rodale now insisted on lay understanding. In his efforts, however, he opposed the notion of common sense to that of scientific evidence, rejecting any intellectual argument as academic pretension. Howard and Steiner had wanted to reform science, not curtail it. Rodale, however, was a man of extremes. Common sense, the common man, and intuition became the only guiding lights of his organic crusade.

The changed temper of Rodale's scientific crusade disappointed some of his followers. With his critics, these

enthusiasts doubted some of Rodale's fringe interests, including his growing advocacy of vitamins and health food supplements, his polemics against water fluoridation and aluminum pans.⁵¹ Now, as he denigrated scientists, these doubts intensified.

Louis Bromfield, a rival agricultural reformer, challenged Rodale's supremacy in the organic movement. Bromfield had little time for Rodale's uncritical enthusiasm. He returned to the land at the end of World War Two, and intended to make his Malabar Farm a unique 'scientific' experiment, combining the best of the chemical and organic traditions. Bromfield, unlike Rodale, explicitly disavowed the mysticism of Bio-Dynamicists like Pfeiffer. He laid claim, however, to Howard's mantle. On Malabar Farm he hoped to revive the spirit of independent scientific investigation that Howard had espoused.

In contrast to Rodale's ostracized position, Bromfield managed to recruit help and support from the conventional agricultural community. He ran experimental trials on plowing and composting techniques, all reported in his newsletter, Friends of the Land, and in a series of books on his rural experiences.⁵² Yet Bromfield made no serious inroads into the complacency of the agricultural establishment; his efforts remained a mere ripple against the growing chemical tide.

Within the organic community, however, Bromfield's following grew respectably. Although Rodale confidently reckoned

him as one among many revivalists, Bromfield became a hero to those farmers who wanted to 'scientifically' refine the organic method. But like Rodale, Bromfield was no organizer - he provided inspiration but not leadership.

A second Rodale rival, Joe Nichols, tried to fill this bill. In 1954, Nichols, a Texas country doctor, founded The Natural Foods and Farming Associates. In the tradition of other advocates, Nichols published a small journal - unlike them, however, he organized meetings, first at the national and later at the state level.⁵³ Here again was an appeal to the small family farmer, gardener, and consumer. Nichols was concerned for health claims and for a scientific basis for natural nutrition. Nichols did not exactly challenge Rodale's leadership - he ignored it.

The Bio-Dynamist claims fitted neatly into Nichol's vision; Pfeiffer became a respected colleague at the meetings of The Natural Foods and Farming Associates. Pfeiffer's "sensitive crystallization" technique seemed to provide experimental evidence of differences between organic and chemical produce. Of course no one claimed to know exactly what this difference might be, but it was there for all to see in the chromatographs. The Bio-Dynamic composting techniques gained a ready, if secular, audience among the Associates.

Conclusion

The dream on a single organic crusade dimmed somewhat under the influence of these rival newcomers, but Rodale's

vision of a middlestream movement remained substantially unchallenged. Nothing emerged in the writings or activities of either Bromfield or Nichols to tarnish the ideals established by J.I. Rodale. The "myth of the garden" still shaped the non-chemical farming movement; enthusiasts continued to see themselves as independent entrepreneurs and the farm as a family enterprise. Thus the movement kept to the secular, apolitical path that Rodale had set it on, and, despite the successes of his rivals, Rodale continued to lead the organic crusade he had initiated.

In 1960, when Robert Rodale took over the editorship of Organic Gardening from his father, organic enthusiasts, scarred by their confrontations with scientific opponents, had turned to common sense and the common man. Advocates not only came to ignore their spiritual and political forebearers, they abandoned their scientific hopes for the movement. Yet the sentiments of organic crusaders, characterized by high oppositional fervor, would shift again with the popular environmental movement. In the 1960s, new ecological writings would renew the dreams of scientific support for enthusiasts.

Footnotes - Chapter Four

1. The first popular articles to catalogue the overall impacts of chemical discoveries on the farm, including the use of artificial fertilizers, appeared in the mid-1930s. In 1935 Harper's published a lament on how "Chemistry wrecks the farm". As the debate became more specific, the popular press picked up on claims for the nutritional superiority of naturally fertilized crops, and on calls for a renewed 'biological' balance on the farm. The first popular American accounts of the results of Steiner's esoteric dictums were probably J. Easton's homage to biodynamic methods in the May 1939 issue of the Forum and S. Bensusan's article on "Fertilizers, natural and artificial", in The Fortnightly in March 1940.

In the same years, the medical and scientific communities began to entertain this same question; their chief concern, however, was not the benefits of humus, but the mineral or trace elements of soils as nutritional components of crops. Hygia, the popular arm of the AMA press, looked into the claims for "Supervegetables" in 1937, praising the soil scientist's efforts to coordinate his research with that of the nutritionist. In 1939 Science presented E.C. Auchter's position on "The Interrelations of soils and plants, animal and human nutrition". Auchter, without acknowledging Howard, prefaced his argument by a reference to the overall "Wheel of Life" and the necessity to expand agricultural research into the nutritional questions. The challenge to conventional agriculture was clearly in the wind.

2. Evelyn Speiden Gregg, "The Early Days of Bio-Dynamics in America", Bio-Dynamics, 119, (Summer, 1976), p. 26.
3. Ibid.
4. Ibid., p. 28.
5. Ibid., p. 32.
6. Ibid., p. 33.
7. Gregg, "The Early Days of Bio-Dynamics in America (Part II)", Bio-Dynamics, 120, (Fall, 1976), p. 12.
8. His biographer, Carleton Jackson, presents a highly sympathetic account of Rodale's ambition and achievements. Although Jackson deals with much of the same material that

I present here, we come to different conclusions about Rodale's impact on the movement, see Carleton Jackson, J.I. Rodale: Apostle of Non-Conformity, (New York, Pyramid Books, 1974).

9. Interview with Anna Rodale, Emmaus, Pa., June 7 & 8, 1977.
10. Rodale kept throughout his life an amazing file of thousands of jokes, each catalogued separately under its own key word. In later years, largely retired from the organic cause, he began to write humorous plays, and to attend plays with the object of compiling a list of "what makes an audience laugh". Later, typically, he bought and renovated a playhouse for his own productions.
11. J.I. Rodale, unpublished ms., Emmaus, Pa., no date, no page.
12. J.I. Rodale, "Why I Started Organic Gardening", Organic Gardening and Farming, 14, (May 1967), p. 31.
13. Ibid., p. 32.
14. Ibid.
15. Interview with Robert Rodale, Emmaus, Pa., June 7, 1977. This story is legend among members of the Rodale staff. J.I. himself told it as 14,000 mailings and 12 returns: Ibid., p. 34.
16. Eleanor Pereyni, "Apostle of Non-Conformity", Saturday Evening Post, reprint (1966), n.p.
17. Arthur Kallet and F.J. Schlink, 100,000,000 Guinea Pigs, (New York: Vanguard, 1933).
18. J.I. Rodale, Pay Dirt, (Emmaus, Pa.: Rodale Press, 1945), p. 236-237.
19. Ibid.
20. Ibid.
21. Ibid., p. 240.

22. J.I. Rodale, "editorial", Organic Gardening, 19, (June 1952), p. 23.
23. J.I. Rodale, unpublished ms., Emmaus, Pa., n.d., n.p.
24. Interview with Anna Rodale, Emmaus, Pa., June 7, 1977.
25. Rodale, Pay Dirt, p. 5.
26. Sir Albert Howard, The Soil and Health: A Study of Organic Agriculture, published as Farming and Gardening for Health or Disease, Devin-Adair, 1947, (New York, Schocken Books, 1972).
27. J.I. Rodale, Pay Dirt.
28. Interview with Robert Rodale, Rodale Press, Emmaus, Pa., June 7, 1977.
29. J.I. Rodale, "Grants to Research Institutions", Organic Gardening, 18, (May 1951), p. 16.
30. J.I. Rodale, unpublished ms., n.d., n.p.
31. U.S. Congress, House, Report of the Select Committee to Investigate the Use of Chemicals in Food, 81st Congress, 1950, p. 864.
32. Ibid.
33. Dr. Richard Bradfield, Prepared Statement, U.S. Congress, House, Select Committee to Investigate the use of Chemicals in Food, November 29, 1950, p. 7.
34. Ibid.
35. U.S. Congress, House, Report of the Select Committee to Investigate the Use of Chemicals in Food, p. 864.
36. Leonard Maynard, "Soils and Health", Journal of the A.M.A., (July 1, 1950), p. 812.
37. Ibid., p. 807
38. Ibid.

39. R.I. Throckmorton, "The Organic Farming Myth", The Country Gentleman, (Sept. 1951), p. 21.
40. Ibid.
41. R.I. Throckmorton, "Organic Farming - Bunk", Reader's Digest, (Oct. 1951).
42. J.I. Rodale, unpublished ms., Emmaus, Pa., n.d., n.p.
43. Ibid.
44. J.I. Rodale, Editorial, "Agricultural Research", The Organic Farmer, 1, (January, 1950), p. 34.
45. The soil analysis referred to here was done by Edwin Harrington, Agricultural Chemist, Carversville, Pa., April 21, 1953. Rodale kept the report in his home files.
46. J.I. Rodale, "Whither Science?", The Organic Farmer, 4, (March 1953), p. 10.
47. J.I. Rodale, unpublished ms., Emmaus, Pa., n.d., n.p.
48. Ibid.
49. Ibid.
50. J.I. Rodale, "In Memoriam", Organic Gardening & Farming, 18, (September, 1971), p. 42.
51. During this period, Rodale began publication of a second health magazine, Prevention. In many ways Prevention would begin to absorb the ridicule of the medical establishment, while OGF continued to raise the ire of agricultural scientists.
52. Louis Bromfield, Pleasant Valley, (New York: Harper, 1945); Malabar Farm, (New York: Harper, 1948); From My Experience: the pleasures and miseries of life on a farm, (New York: Harper, 1955).
53. Joe M. Nichols, with James Presley, Please Doctor, Do Something: A Modern Physician Looks at Health and Nutrition, Dallas, Texas: Universal Media Inc., 1972).

Chapter Five

Environmental Merger

Launched by the publication of Rachel Carson's Silent Spring in 1962, environmental concerns seemed to promise a new lease on life to organic enthusiasts like the Rodales. Ecology was adopted as a new set of principles for organic farming, and ecologists were welcomed as new allies. As much as it seemed to offer, however, the transition to this new ecological vision was far from smooth. In most respects, the early ecological crusade and the organic movement operated as two distinct parallel communities. Ecologists and environmentalists approached the organic idea with grave reservations. Enthusiasts, on the other hand, mixed their hopes for scientific legitimacy with doubts about the integrity and built-in prejudices of any members of the scientific community. Only with the development of popular environmental concerns would scientists and organic farmers begin to share more than a common ecological language, and hesitantly begin to make common cause.

Ecology: Subversive Science

The discipline of ecology underwent a dramatic transformation in the minds of scientists and in the popular

imagination during the 1960s. What was the preserve of a relatively closed and inwardly looking community in 1962, became a banner for activism by the time of the declaration of Earth Day in 1970. In the process, scientists debated their social responsibilities and activists called them to a new public accountability.

In 1962 Rachel Carson, one of a rare breed of scientists unafraid of popular writing, published Silent Spring, a call for public discussion of the use of pesticides.¹ Carson opened the chemical agricultural debate to a national audience. In 1963, directly as a result of her writing, a President's Science Advisory Committee was constituted to investigate the use of pesticides.² Carson's book was the first step toward a public reevaluation of scientific priorities -- not only of the use of pesticides, but of the purpose and direction of the scientific community. Carson authored what we recognize today as the environmental movement.

Carson had widespread public support even before she wrote Silent Spring. Her first books, The Sea Around Us, and The Edge of the Sea, had established her as a best-selling author able to convey scientific detail with beauty and compassion.³

Carson succeeded where other champions of pesticide reform had failed. Not since Kallet and Schlinck's 100,000,000 Guinea Pigs had chemical use been widely discussed by anyone outside the industry or regulatory agencies. Two

earlier popular book on pesticides, published in the intervening years, had failed miserably. Our Daily Poison (1955) by Leonard Wickenden and The Poisons in Our Food (1950) by William Longgood received not only critical reviews but public indifference.⁴ Wickenden's and Longgood's efforts merely left them branded as cranks, out on a limb against official scientific opinion. Carson too faced a querulous opposition, but her message prevailed.

Although Silent Spring undisputably set the cornerstone to the environmental movement, Rachel Carson herself remains widely misunderstood. Certainly no standard muckraker, Carson was a reticent crusader, initially unwilling to campaign publicly. Yet Silent Spring marked a new intensity and purposefulness in her work. In reviewing the damaging evidence against pesticides, she became adamant about the need for public involvement in science policy decisions. Her biographers, however, Frank Graham Jr. who chronicled the repercussions of her work, and Paul Brooks who created an otherwise glowing biography, underestimate her tactical strengths.⁵ Graham and Brooks seem almost to apologize for Carson's "gentleness". Writing in 1970 and 1972, they failed to understand just how radical her 1962 position was. For them, Carson's early political acumen seemed pale in contrast to the hard line of scientific opposition in the 1970s. In 1958, when Carson began her four and a half year project, the climate was very different. Looking at her decision to write Silent

Spring in that constrained context, one obtains a very deep appreciation of her courage and commitment.

Carson first expressed her horror at the damaging effects of pesticides as early as 1945. Then, still a government biologist in the Fish and Wildlife service, and with her popular writing only a part time venture, she approached Reader's Digest about the possibility of an article on the dangers of DDT.⁶ Although similar articles appeared around that time in Harper's and the Atlantic, Carson's offer was turned down. As the evidence against pesticides accumulated, however, Carson's national reputation as a popular science writer led her into the front lines of the controversy.

In 1956 she was approached by the complainants of a DDT spray trial on Long Island to testify on their behalf. Although she declined to appear at that time, she actively helped to document the merits of the protest case.⁷ In 1957 Carson once again had her agent approach magazines about a DDT article, again to no avail. Then, in January 1958, Carson received a letter from a friend, Olga Huckins, asking for help in finding allies and evidence in a crusade against mass spraying in Massachusetts. This work became the turning point in her decision to write Silent Spring.

I began to ask around for the information she wanted and the more I learned about the use of pesticides the more appalled I became. I realized that here was the material for a book. What I discovered was that everything which meant most to me as a naturalist was being threatened, and that nothing I could do would be more important. 8

By 1958, with the new information she collected, Carson realized that "There would be no peace for me if I kept silent."

Once under way, Carson revealed a tough-minded pragmatism in her pesticide crusade. She understood all too well the barriers and opposition that would be raised to the kind of book she envisioned. During all the years of research and writing she preferred to keep the details of her project a secret among a few friends. In declining an invitation from her friend Dr. Clarence Cottam to participate in a National Audubon Society pesticide panel, she gave tactical reasons: "But, as you know, the whole thing is so explosive, and the pressures on the other side so powerful and enormous, that I feel it far wiser to keep my own counsel insofar as I can until I am ready to launch my attack as a whole".⁹ Carson, aware that her work would be seen as a potential attack, prepared herself to play a waiting game in order to maximize her advantage. Paul Knight, who reported on the aftermath of Silent Spring to Stuart Udall, then Secretary of the Interior, contrasted Carson's public moderation to her private angers: "She regarded many of her critics in agriculture and industry as prostitutes and kept scientists, regardless of what her attitude was publicly".¹⁰ In testifying before the Senate Committee in Congress on June 6, 1963, Carson openly expressed doubts about the limits imposed on much scientific work. Again, however, her tone remained moderate.

In the course of the more than five years I have spent in intensive study of the pesticide problem,

I have arrived at the conclusion that the conflicts inherent in this problem can be resolved only by an independent board of commission to be set up at the level of the Executive Offices. 11

Carson came to see public discussion as the sole means of redress to the closed activities and attitudes surrounding the use of pesticides.

Carson repeated this theme again and again in Silent Spring, calling explicitly for the end of an "era of specialists"... "dominated by industry", and lamenting the placating attitude of scientists and policy makers to the public.

When the public protests, confronted with some obvious evidence of damaging results of pesticide applications, it is fed little tranquilizing pills of half truth. 12

She saw her own work as a step toward dispelling these false assurances.

It is the public that is being asked to assume the risks that the insect controllers calculate. The public must decide whether it wishes to continue on the present road, and it can do so only when in full possession of the facts. 13

Carson made it her personal crusade to supply "the facts", taking the chemical debate to a popular arena.

The reputed "gentleness" of Rachel Carson was nevertheless well-founded. She combined her pragmatism with an acknowledged spiritual quest and a quiet and reticent nature. Dedicating Silent Spring to Albert Schweitzer, Carson echoed his same sense of "reverence for life". Her warnings about the unrestrained use of chemical pesticides was an alarm against the long term consequences of the abuse of the "law of balance",

of "nature's laws".

As crude a weapon as the cave man's club, the chemical barrage has been hurled against the fabric of life -- a fabric on the one hand delicate and destructible, on the other miraculously tough and resilient, and capable of striking back in unexpected ways. 14

The balance of nature, in Carson's eyes, was the appropriate metaphor to express a needed ecological perspective. She wanted not only to restrain the unrestricted use of pesticides, but to call for a reassessment of basic priorities, to re-examine man's place in Nature's laws.

The success of Silent Spring exceeded Carson's boldest expectations. All through the process of research and writing, Carson, counselled by friends, anticipated only modest success. Silent Spring, however, immediately captured the popular imagination. Serialized during May and June 1962 in The New Yorker, its September publication was breathlessly awaited. Reviewers in the Atlantic, Harper's and The New York Times all hailed Silent Spring as an extraordinary achievement.¹⁵ Even the negative reviews bowed to Carson's literary genius.¹⁶

At the same time, however, the opposition quickly mounted the counter-attack Carson had predicted. Although Carson never suggested a complete abandonment of pesticides, only a restrained and conscientious application of chemicals proved essential, her opponents in the chemical industry chose to misunderstand her intentions. They caricatured her position unmercifully. The Monsanto Corporation put together a "public information" leaflet, The Desolate Land, which satirized a

world of hunger and disease left in the wake of insects gone wild.¹⁷ Popular cartoons, portraying Carson sometimes as heroine, more often as culprit, began to appear.

The supposedly 'objective' scientific press joined in reprimanding Carson's unrestrained enthusiasm. Science, the journal of the American Association for the Advancement of Science, published a review by I.L. Baldwin, professor of agricultural bacteriology at the University of Wisconsin, which praised Carson's poetic talents while damning her biases.¹⁸ The alarm raised by Carson rang all too stridently in Baldwin's ears. He pointed up the contrast between her "perspective" and that of "most scientists" who "feel that the danger of damage is slight".

To place this in the proper perspective, consider that almost twice as many deaths are known to be caused by aspirin and that almost one-half as many deaths are known to be caused by bee stings.¹⁹

Baldwin saw Silent Spring not as

a judicial review or a balancing of the gains and losses; rather it is the prosecuting attorney's impassioned plea for action against the use of these new materials which have received such widespread acceptance, acceptance accorded because of the obvious benefits that their use had conferred.²⁰

But in charging that Carson built an undocumented case, Baldwin ignored her numerous disclaimers of attempting to offer a definitive statement. Many times in Silent Spring she made it clear that she was extrapolating and raising questions from limited evidence. Her tone was cautious. Again and again she lamented the absence of good evidence, and the element of

conjecture which necessarily limited the grounds of her argument. "The whole situation", she wrote, "is beset with questions for which at present there are no satisfactory answers."²¹ Where Carson called for a review of evidence and for new research, her critics heard only an attack on all pesticides.

What Carson's critics feared most was an unsophisticated popular response to the pesticide controversy. Here they revealed their lack of confidence in the public's ability to appreciate the complexities of Carson's position. William Darby, reviewing Silent Spring in The Chemical and Engineering News, made these fears explicit.

It does so confuse the information and mix it with her opinions that the uninitiated reader is unable to sort fact from fancy. It is doubtful that many readers can bear to wade through its high-pitched sequences of anxieties. It is likely to be perused uncritically, to be regarded by the layman as authoritative (which it is not), and to arouse in him manifestations of anxieties and psychoneuroses... The obvious effect of all this on the reader will be to aggravate unjustifiably his own neurotic anxiety.²²

For someone concerned with lack of expertise, Darby made free use of psychoanalytic jargon in trying to protect what he imagined were Carson's "neurotic" readers.²³ Carson, on the other hand, put her trust in the intelligence of her readers, stating subtleties where subtleties existed, posing puzzles where puzzles persisted. In choosing this tone and this tactic, in her faith in public discussion, Carson broke with the tradition dictating exclusive scientific expertise on

questions of public policy. In the eyes of her critics, she became a troublemaker equal to earlier food muckrakers, a mystic, a crank, a birdlover, a quack. She had challenged preserves exclusively claimed by the scientific community.

Yet even more fundamental assumptions divided Carson and her scientific critics. Baldwin and Darby, for instance, took exception to Carson's statement of concern for the "balance of nature". Defending the benefits of chemical use, Baldwin saw the "true balance of Nature" as a frightful prospect. Nature's balance, in his eyes, was something man must fight against in order to maintain agricultural production.²⁴ Similarly Darby took Carson to task for her "passive" and "pessimistic" outlook, warning against "the end of all human progress, reversion to a passive social state devoid of technology, scientific medicine, agriculture, sanitation, or education".²⁵ Chemical control, in the view of Baldwin and Darby, was a merely sensible protection against the menace of man's insect enemies. Unrestrained, Nature would destroy civilization.

These initial attacks aimed at Carson were redirected and extended in critiques of a second work on pesticides that appeared two years later. Robert Rudd, who wrote his Pesticides and the Living Landscape concurrently with Carson's Silent Spring, found himself embroiled in a controversy more vehement than any he had anticipated.²⁶ Rudd's bitterness over his treatment endured years after the debate subsided.

During a 1976 interview he recalled problems not unlike those Carson had encountered, and judged that "my spleen is almost back to normal size".²⁷

Rudd's conflict with the agricultural establishment came to a head during the reviewing process prior to publication. Trained as a biologist, he, like Carson, found himself subject to the charge of discipline jumping. Despite the fact that he taught at an agricultural campus and worked at the experiment station, his credentials were questioned. As he put it, "In those days if you didn't have cow manure on your boots, then you couldn't be an agriculturalist".²⁸ Sent to the University of Wisconsin Press, Pesticides and the Living Landscape was given to 18 faculty members for review, including the entire entomology department. "And", as Rudd saw it, "because they are part of the establishment, well, they just sat on it".²⁹ Although Rudd finished his book in 1962, it was two years before it was published. One reviewer, as Rudd told it, claimed to have stopped reading on the first page: "You know, one reviewer said that he hadn't read past the first paragraph of my book, because in it I had mentioned religion. Now I was aghast. Let me show you here, I talk about the Judeo-Christian ethic. And that is mentioning religion? Well, it is a bunch of horse hockey".³⁰

Rudd, turning to a political analysis of the pesticide question, began to see these entomologists as "nozzleheads" which "comes from the nozzle of the pesticides they use...

[and] ends up being a simple way of saying that they are part of the chemical orientation".³¹ Like Carson, Rudd concluded that "The scientists inside are incapable of correcting their own house".³² He illustrated this with the story of an early confrontation with the American Chemical Association - when he "was part of the establishment".

...you know they are really a business lobby. Well I said I was coming back to Washington and I wanted to make a visit, so they went all out. They brought people in from Dow, from Cyanimid. They had a whole one day symposium, it was a meeting all day and they wanted to give representations on the kinds of work they were doing. Well, finally, about two o'clock, my moment of truth came, and I had to tell them. They asked me what I thought was going on, and I said, "Well, it's a bunch of shit". Excuse my language, but they are just a bunch of congressional lobbyists...

I told them that they were manipulating farmers... and they knew that is what they were doing. And that they were a bunch of hucksters, and that is really the case. The guy who organized it, and he is nothing more than a congressional lobbyist, he ended up calling me a goddamn communist. I mean that is pretty bad. I was genuinely angry then, I felt really sympathetic with the growers. 33

The call for public discussion on pesticides voiced by Carson and Rudd did not, however, go unheard. Despite these attacks, the popular outcry first aroused by Silent Spring, and echoed in Pesticides and the Living Landscape, was not easily silenced. In fact by 1964, when Rudd published, signs of a new attitude to the use of chemicals had already begun to appear.

The first indication of new government responsiveness to the pesticide issue came within months of publication of Silent Spring. In 1963, the President's Science Advisory

Council, goaded to action, published a report which put Rachel Carson in a highly favorable light.

Public literature and the experiences of Panel members indicate that, until the publication of Silent Spring by Rachel Carson, people were generally unaware of the toxicity of pesticides. The Government should present this information to the public in a way that will make it aware of the dangers while recognizing the value of pesticides. ³⁴

Many of Carson's specific claims were replicated in the report. More importantly, the report suggested that the entire pesticide control system was in need of massive overhaul: "the existing Federal advisory and coordinating mechanisms (should) be critically assessed and revised as necessary to provide clear assignments of responsibility for control of pesticide use". ³⁵

Carson's admirers saw the PSAC report as a complete vindication of her claims. The response of the scientific community, however, remained equivocal. While Carson's biographers, Brooks and Graham, gleefully pointed to the change of heart demonstrated in a second review published in Science, their optimism was unwarranted. Daniel Greenberg, the Science reviewer in October 1963, still had Carson up on the charge of "stretching of scientific points". ³⁶ Greenburg willingly applauded the public spirit of Carson's campaign, but he still doubted the substance of many of her claims. Echoing Baldwin's earlier review, Greenburg hoped that "an author with a similar gift would sit down to write so compellingly of the advantages of the chemicals [Carson] scorned". ³⁷

Now, however, the bridge Carson tried to build between scientific and public concerns began to be appreciated. Greenburg, following the PSAC homage, acknowledged Carson's important public role. Similarly, the honors bestowed as a result of Carson's publication of Silent Spring praised precisely her conscientiousness and integrity. As well as many awards from conservation groups, Carson received an election to the National Academy of Sciences. The Academy cited her "moral feeling" as a crucial element of its decision.

A scientist in the grand literary style of Galileo and Buffon, she has used her scientific knowledge and moral feeling to deepen our consciousness of living nature and to alert us to the calamitous possibility that our shortsighted technological conquests might destroy the very sources of our being. 38

The very campaign of public involvement denigrated by conventional agriculturalists now became the source of greatest acclaim for Carson and a source of renewed determination among her sympathizers.

A new identity, outside the limits of strict academic specialization, began to emerge among ecologists. The concern for the "balance of nature" became a symbol of the humility of ecologists in contrast to the pretensions of other scientists. Ecologists pledged themselves to an appreciation of man's role, not as a master of nature, but as a part of natural balance. Rudd, for instance, found new purpose in this crusade: "Overall, I think that one has to say that a biologist is a really humble person. He knows how much he doesn't

understand."³⁹ He came to define ecology as the unique discipline capable of salvaging the mistakes of its predecessors. "It is the only field of biology which does not boil down to applied physics and chemistry".⁴⁰ "Nozzleheads" and other physical scientists were now portrayed with "channelled minds."

They just can't see the humanistic side of these questions. They put everything into a little box. They can't see biological processes are more complex...They don't know how to ask biological questions. They can't do environmental ecological science because they have to deal with very simple systems. They have to end up with a very predictable scheme. ⁴¹

Ecologists like Rudd came to see themselves as crusaders for a new "wholistic" outlook. Anti-specialization began to mark out the new environmental identity.

This new self-consciousness on the part of ecologists also took an activist turn. Frank Egler, a plant ecologist who was a key resource for Carson, formalized this debate. Egler had written despairingly of academic science for a number of years, but in 1964, with the pesticide problem on the tip of every tongue, his recriminations took on new weight. In March 1964, the American Scientist published a lengthy attack on "communications" among academics by Egler.⁴² Here he explicitly called for scientists to accept new social responsibilities. Egler argued against the "remarkable" arrogance of scientists who ignored ecosystem effects, "the whole nature of which we are a part".

Whether future generations of mankind will be able to survive and thrive in the changed environment which his so-called ingenuity is

producing is -- to put it honestly -- an open question. Man-plus-that-environment forms a new "whole" never before in existence. 43

Academics, in his view, were "failing the world", and ecologists in particular were guilty of dire "social immaturity". Although much of Egler's attack on these failures was deleted by the American Scientist editors, few had said more than him against their colleagues in a professional journal. His arguments touched off a storm of self-defence and self-evaluation among ecologists.

Social responsibility for scientists became the implicit agenda of a July 1964 special "Ecology" issue of BioScience, the journal of the American Institute of Biological Sciences. Paul Sears, a respected ecologist, set out a new identity for the discipline in his lead article. Sears, with a single word, shook the complacency of his fellow ecologists. In a stroke of master rhetoric, he titled his article "Ecology -- A Subversive Subject".⁴⁴ While Sears rejected Egler's stern admonishments, he spoke hopefully of the ecologist's inherent critical perspective.

My choice of title is not facetious. I wish to explore a question of growing concern. Is ecology a phase of science of limited interest and utility? Or if taken seriously as an instrument for the long-run welfare of man-kind, would it endanger the assumptions and practices accepted by modern societies, whatever their doctrinal commitments? 45

Sears combined a faith in ecological wisdom with a new activism. The purposefulness of the discipline had been a recurrent internal debate.⁴⁶ Now, however, with the clear

call for "subversive" science, this concern moved from inside the discipline to a wider movement.

The theme of social responsibility raised by Sears was restated by his co-contributors to the BioScience issue. Bucking each other up against Egler's sustained criticisms, these ecologists seemed out to prove their social maturity. W. Frank Blair saw ecology as "very much alive and even...on the verge of movement to a dominant position among the biological sciences".⁴⁷ Lamont Cole saw signs that "indicate that ecologists are at last going to lend their specialized fund of knowledge to the attack on important public problems".⁴⁸

My little discourse here has been intended to suggest that some of these problems will change in appearance when seen from the viewpoint of the ecologist. It is safe to predict that such viewpoints are about to emerge in increasing numbers from their sheltered retreats. ⁴⁹

Despite these expressions of optimism, however, ecology was not transformed overnight.⁵⁰ The social responsibility of ecologists was easy to postulate, more difficult to put into action. The special character of ecological science, and the political character of ecological activism, had yet to be tested. The claim to "subversive" status was a first step. While this notion was remarkable in a world just recovering from the extremes of McCarthyism, a world in which Robert Rudd's critics damned him as a "lousy communist", ecologists still had a long way to go before their crusades had any public impact.

Barry Commoner, outspoken critic of nuclear testing, became Rachel Carson's successor in this popular crusade, developing his Center for the Biology of Natural Systems in St. Louis, Missouri into a major axis of environmentally "relevant" science. A plant physiologist at Washington University, Commoner made his crusading debut as a member of the St. Louis Committee for Nuclear Information in 1958. By 1970, in a selection he viewed with some irony, Commoner would be portrayed on the cover of Time magazine as the representative ecologist of the environmental movement.⁵¹ Despite the scarcity of his credentials, in contrast to authoritative and trained ecologists, Commoner's colorful and vociferous campaigns captured the public spotlight.

First in a series of articles and later in a popular book published in 1966, Science and Survival, Commoner portrayed science as a "sorcerer's apprentice" out of control.⁵² He brought together evidence on detergents, pesticides, and nuclear damage. The St. Louis Committee became his prototype for a new brand of scientific activism. Questioning the "no effects" reassurances on nuclear testing, Commoner's group compiled evidence of radioactive wastes in the midwest. A baby tooth survey, conducted from 1958 to 1966, found Strontium 90 in the teeth of St. Louis children. The superficial assurances that testing had no deleterious effects, Commoner asserted, were, if not malicious, at least misguided.

Commoner concluded that the ecological crisis went

"beyond the realm of science". "No scientific principles, he insisted, "can tell us how to make the choice".⁵³

Once the scientific evidence has been stated, or its absence made clear, the establishment of a level of tolerance for a modern pollutant is a social problem and must be resolved by social process. Thus the logic of the scientific problems which are raised by environmental pollution forces the resolution of these issues into the arena of public policy. 54

Commoner, along with many of his colleagues, gave the scientist a special, if limited, responsibility. The expert must make the facts available, create an "informed citizenry", but never claim any special moral expertise. Scientists might have private opinions, he reiterated, and these opinions might be expressed, but the final judgement was a choice to be made by the public.

Despite his resistance of a notion of scientific "oughts", however, Commoner nevertheless subscribed to a doctrine of biological complexity. This underlying agenda inevitably shaped his portrayal of the dangers of technology and of the choices available to citizens. Like Carson, Commoner bowed to the laws of the "balance of nature" as absolutes which man must respect.

Sooner or later, wittingly or unwittingly, we must pay for every intrusion on the natural environment. 55

"Wholistic" natural criteria, he suggested, must form the basis of fundamental scientific laws and public decisions. Thus Commoner equated complexity in the natural system with stability, and suggested that the ecological crisis was a

result of over-simplification. "We are in effect conducting a huge experiment on ourselves".⁵⁶ With only minimal information, scientists proceeded to compound the crisis. "A generation hence -- to late to help -- public health statistics may reveal what hazards are associated with these pollutants."⁵⁷

The crux of this simplification was scientific specialization. "The separation of the laws of nature among the different sciences", Commoner suggested, "is a human conceit, nature itself is an integrated whole".⁵⁸ Ecology, he seemed to say, offered a different set of scientific criteria, and the ecologist had the unique opportunity to assert and re-examine the direction of the entire scientific community.

In 1967, at Washington University, Commoner founded the Center for the Biology of Natural Systems, dedicated to studying the "whole" system. He recruited a team of researchers and students, not necessarily ecologists, committed to addressing the ecological crisis. The first important study to emerge from the Center was a study of nitrogen pollution run-offs on farms in the St. Louis watershed.⁵⁹

In publicizing this work, and continuing his popular crusade, Commoner published a new book in 1971, The Closing Circle.⁶⁰ Once again he affirmed the conflict of mismanaged "social actions" with the "biological capabilities" of the ecosystem.

Human beings have broken out of the circle of life, driven not by biological need, but by the

social organization which they have devised to "conquer nature": means of gaining wealth that are governed by requirements conflicting with those which govern nature. The end result is the environmental crisis, a crisis of survival. Once more, to survive, we must close the circle. We must learn how to restore to nature the wealth that we borrow. 61

Commoner exemplified the crisis mentality of the popular environmental crusade. He now put the blame not only on the heads of scientists, but on their service to a social system which put economic and political considerations over "ecological wisdom".

By the early 1970s, the environmental movement was no longer a crusade dominated by scientists. The wholistic analysis had provided Carson and Commoner the leverage to critique the limits of conventional science. In lay circles, however, the questions they raised became part of an anti-technological stance these scientists had never envisioned. The environmental movement began to see itself as a political crusade. With the celebration of Earth Day, April 1970, the environmental mission took shape as a coalition of movements, political, legal, economic statements about a new society based on "subversive science" and "ecological conscience".

However, most scientists remained ambivalent about the popular dimensions of environmental activism. Even those committed to ecological reevaluation of conventional science resisted what they saw as the "bandwagon" element of much of the environmental crusade.

You get strong personalities who jump on any

bandwagon to make a name for themselves basically. I've no doubt that there are perfectly good ecologists making statements everyday to the public, but I think there is a certain reluctance by the better ecologists to stick their necks out. 62

Enthusiasm, these critics charged, disrupted indispensable standards of scientific care and caution.

Once you start making public statements on public issues, you stop being as critical of the evidence as you should be. A research worker needs to be cut off a little from the public limelight. 63

Commoner, who unlike Carson had no reputation for gentleness, received the brunt of many of these attacks. His critics found him at times a "thick-skinned toad"; they also saw his work as biased.

But I think you lose your ability to do good work. You end up looking for the results that you expect in the beginning, so that everything you do reflects that bias you started out with. I don't think you can do good work in an area after that. And you lose your credibility to the people who are reading your work. That's what's happened to Commoner. He has no credibility left, because everyone knows where he started from. 64

Ecologists and environmental sympathizers wanted to do relevant work, but they still put limits on the degree of activism appropriate for members of the scientific community.

Nevertheless, even conservative scientists slowly opened their eyes to the possibilities of environmental research. And certainly some of this interest stemmed from the apparent availability of research funds for environmentally-relevant projects. Many scientists found reason to sell their work under the environmental mandate. By 1969, researchers openly acknowledged the pay-off of defining their work as

environmentally relevant.

At that time, the flush area was environmental protection -- and waste heat pollution -- this was kind of tied to environmental protection. So a halfway decent proposal had a good chance of being funded. 65

For many researchers ecology was simply good for scientific business. They tagged an environmental label on otherwise conventional work and found themselves able to get grants. In the end, however, the results for the environmental movement were much the same. Although sympathies were secondary, relevant research, institutionalized within the scientific community, strengthened the claims made by activists.

In many ways, the initial inspirations offered by Carson and Commoner were refined and contained into programs that offered little in the way of 'subversion'. After Earth Day 1970, much of the scientific community breathed a collective sigh of relief that the intense pressures of the popular environmental movement seemed to be diminishing. Phillip Abelson, in a Science editorial, comforted himself and other scientists with the assurance that the "emotional peak" of Earth Day was "leveling off". "In future", he hoped, "emotional appeals based on inaccurate information are not so likely to be effective" and "more realistic economic considerations" would shape research priorities.⁶⁶ Despite all the enthusiasm of the environmental movement, a strong strain of resistance to public involvement and moral feeling persisted within the scientific community. Given this ambivalence,

environmentalists and ecologists still largely kept their distance from what were portrayed as the "doomsayers" of the popular movement. The dividing line between enthusiasm and expertise had subtly shifted, but advocate scientists remained a minority.

From "Scientific Tricks" to "Ecological Wisdom"

Organic enthusaists responded to the work of environmental activists by adopting ecology as the scientific basis of their crusade. Between 1960, before Carson's book, and 1970, these advocates moved from a suspicion of "scientific tricks" toward a tentative trust in the potential support of their apparent scientific sympathizers in the environmental movement. This transformation is strikingly illustrated by the statements of Robert and J.I. Rodale over the course of these ten years.

In 1960, when Robert Rodale inherited the editorship of Organic Gardening and Farming magazine and the nominal leadership of the organic movement from his father, the younger Rodale also inherited many of J.I. Rodale's basic sentiments. Bob Rodale's early tenure as organic crusader differed very little from the elder Rodale's. Although lower-key in style and temperament, he shared in his father's animosity towards scientists and his faith in common sense. In his first editorials, scientific credibility seemed to him very remote; he lambasted scientists as "cultists" who "believed in the superiority of man over nature".⁶⁷

In any case, J.I. Rodale had far from left the organic scene. Although he retired from the active editorship of the magazine, the energetic man who knew that "if I live to be 200 years old, I'll never do all the things I want to do", continued an intense involvement with the organic crusade. Despite his official retirement, J.I. stayed on as an executive editor and contributor of a monthly column. More important, he began to crusade in new directions. At the age of 60, restirring early literary ambitions, J.I. Rodale became a playwright.

Rodale wrote morality plays, unabashedly didactic, designed to promote the organic cause. A preface to one of his first plays prepared the audience for his message:

What you are going to witness now is a combination of lecture and play, but essentially it is a lecture -- nothing more or less, although it will be dressed up in the trappings of the theatre, with its comedy and drama. In judging it therefore please bear in mind that basically The Girl and the Teenager is actually a lecture -- a sugar-coated one -- easy to take we hope. In that spirit let the curtain rise. 68

Rodale now took the opportunity to deal fancifully with all his digests had treated in earnest. Loosening his joy in humor and the arsenal of jokes he had spent a lifetime collecting, he styled himself a satirist. He dealt with the dangers of sugar, the hazards of fluoridation, the vicissitudes of his opponents.⁶⁹

Yet Rodale failed as a playwright as he had never done as a serious crusader. The review by Donald Malcolm of the

rewritten version of The Girl and the Teenager, The Goose, reflected the farcical tone that followed Rodale's farces.

In this rough world, there are few things indeed that oblige one to speak of perfection. To any current list we now may add J.I. Rodale's The Goose, a drama of nutrition that opened last week at the Sullivan Street Playhouse.

It is perfectly awful. It is sublimely, heroically, breathtakingly dreadful. It inspires a sacred terror. It is beyond criticism. So much for civilities. 70

Malcolm and other reviewers missed being scathing only because they never took Rodale seriously enough to warrant that degree of scorn.

Characteristically undeterred by criticism, Rodale fronted a counter-attack. Treating his literary critics much as he had his scientific opponents, he published a rebuttal to their critics of his latest play, Toinette, in The New York Times, subtitled "The Playwright versus the Critics".⁷¹ Ultimately, just as he originally published to become a writer, Rodale became a producer in order to put on his plays. In 1962 he bought and converted an old Manhattan warehouse into "Theatre 62". Soon after, due to the lack of paying customers, Rodale was bringing an audience into the city by bus from Pennsylvania. He wrote and rewrote many of his plays, constantly seeking the formula of dramatic success. Only at the end of his playwriting period, in his version of Red Riding Hood, The Hairy Falsetto, did he give up on dramatizing the organic crusade, conceding to merely amuse his audience. And The Hairy Falsetto rewarded his efforts; it was produced

by a number of small college and community drama groups.

In most of his dramatic endeavors, however, science and his scientific foes played a part. One of his first plays, The Streets of Confusion, showed his continuing suspicion of "scientific tricks". Here he dealt with the dilemma of the public when faced by the expert claims of the scientific community. Rodale burlesqued an entomologist, "Professor Socially Dexterous", "based on some of the scientists I had met at universities and scientific meetings".⁷² His entomologist failed to identify a cricket.

My friend, it isn't as easy as you think. When one is a scientist one has to be scientific, which means one must first hypothesize, then investigate and elucidate and finally correlate, after which one scoffs at, acts superior to and suppresses. Then and only then can one correctly say that such an insect is such and such an insect. 73

His plays gave Rodale the perfect opportunity to unleash angers built up over the course of his crusade.

This same farcical sarcasm, less vehement but just as damning, came out in Organic Gardening and Farming editorials by both father and son during this period. In 1960, Robert Rodale took a poke at scientific "double-talk", paraphrasing what he saw as the "Scientist's 5th Amendment": "I refuse to answer on the grounds that I know what's good for you ordinary people and you don't".⁷⁴ For the most part, however, the younger Rodale strove for a more serious and reflective tone than his father. In his editorials he grappled with explanations of the differences between the scientific and

organic communities. In looking at the distinction between applied and basic research, for instance, he came up with some surprising new conclusions. After years of praise for practical research in the movement, Robert Rodale now damned the applied research process.⁷⁵ He came to identify "applied" work with the product orientation of the chemical industry. "Basic research", in contrast, he envisioned as the new, purer knowledge that truly underwrote the organic enterprise. The entomologist, purveyor of pesticides and applied scientist par excellence, had become the chief villain for both Rodales, whatever the tone and whatever the language.

Developments in the environmental movement, however, began to reshape these antagonisms. The publication of Silent Spring in 1962 profoundly shook the organic community; Rachel Carson's alarm about pesticides and her doubts about entomologists seemed to echo their own sentiments. Yet the reactions of advocates had a double edge. This 'late day' discovery of questions of longstanding concern both perturbed and pleased organic enthusiasts. J.I. Rodale, sparing of his praise, begrudged Carson her instant successs. He acknowledged the impact of her work, but insisted querulously on his own claim to priority, and the greater scope of his own work.

On the cover of the second issue, June 1942, there was a statement in large type: "Why is so much spraying against the insect menace necessary? From this point on, 20 years before Rachel Carson and her Silent Spring appeared, I began lashing out continuously against the danger to plants, animals and people of these poisonous insecticides.

But I went a step further than Miss Carson. I proved from existing scientific data, and from observations on our farm, that the use of chemical fertilizers produced harmful conditions in the soil and in the plant that grew out of it, and that many species of insects are drawn to attack the tissues of plants that are not in perfect shape from a health point of view. 76

His son, Robert, on the other hand, applauded Carson as a heroine to the movement with no reservations. Her "masterpiece", in his eyes, documented many organic claims, presenting "so much information and ... so persuasively that it is difficult for any intelligent person to read it and remain unmoved by it". [sic]⁷⁷

The saleability of the new pesticide alarm, not lost on the Rodales, sharpened their efforts. Already wary of entomologists, they now turned to the anti-chemical campaign with renewed fervor. Robert Rodale saw Carson's comments on human health as "a knockout punch to the idea that pesticides are safe when used as directed".⁷⁸ Jerome Olds, a Rodale editor, spoke explicitly of his hopes for a new level of public response.

Never before has the American public been made so aware of the dangers in the tremendous use of pesticides. It's as if a lid that kept down criticisms and resentment against poison sprays had been suddenly blown off. 79

When Carson appeared on a national CBS special, Organic Gardening and Farming magazine celebrated the occasion as her "television conquest" and as a triumph of "the organic point of view". Although Robert Rodale had previously admitted that Carson was not wholeheartedly within the

organic fold,

She does not take the organic gardener's view that our agriculture should try to operate without the use of any toxic pesticides. 80

the new Organic Gardening and Farming headline, in a burst of enthusiasm, blurred this distinction.

Millions of viewers see and hear her present the organic point of view in a coast to coast telecast. 81

For most enthusiasts, Carson's data on pesticide hazards seemed to bear out arguments they had addressed for twenty years.

Moreover, organic enthusiasts embraced Carson's work not only because she criticized pesticide use, but because her assumptions seemed to match their own. Her sensitivity to the "balance of nature", to the "fabric of life" seemed to echo Sir Albert Howard's early concern for the "Wheel of Life". Although she never acknowledged a debt to Howard, she titled one of her chapters with his image, "The Earth's Green Mantle". Steiner's disciples, the Biodynamicists, likewise paid special tribute to Carson. Anthroposophists Marjorie Spock and Mary Richards, organizers of the Long Island spray trial in 1956, had become Carson's close friends.⁸² The three women seemed to share the same deep commitment to nature's balance and to the search for evidence to back their claims. Unlike many of Rodale's followers, however, Biodynamic farmers and gardeners had never seen themselves as split apart from the scientific community. If

anything, with "Dr." Ehrenfried Pfieffer as their continuing "scientist"-mentor, they saw themselves as keepers of the "best" scientific tradition. Pfieffer had presented "expert" testimony against the dangers of DDT during the trial on Long Island.⁸³ Now the biodynamic movement was retrenching after Pfieffer's death, and the publication of Silent Spring marked the end of their mourning. Biodynamists, like the Rodale organic enthusiasts, saw Carson as an apostle of their vision.

However, Rachel Carson felt herself a reluctant heroine to organic crusaders. Whatever her friendships and her sympathies, she was thoroughly uneasy with attempts to identify her with the organic community. She saw her statements about the "balance of nature" as statements of scientific fact, not as emotional appeals. Her passion may have echoed Howard's respect for "Mother Earth", but in no way would Carson jeopardize her credibility by espousing the organic mission. She was quick to repeat that Silent Spring attacked only the indiscriminate use of pesticides, not all farm chemicals. In her threatened and tenuous position, Carson resented being classified as a bird-lover or mystic, and refused to speak before organic groups. Once, booked on a panel with J.I. Rodale without her prior approval, she cancelled the appearance at the last minute.⁸⁴ She wanted to give no additional ammunition to those who charged her as a pseudo-scientist or faddist. Even the charge of guilt by

association was too dangerous a risk.

In fact the Rodales, in the mist of the celebration of Silent Spring, found themselves facing trouble on a different front. In 1963, the Federal Trade Commission ruled against J.I. Rodale's 1954 book, The Health Finder.⁸⁵ The Federal Trade Commission charged Rodale Press with false and misleading advertising on the basis of J.I.'s health claims. Deciding to fight these allegations, the Rodales embarked on a lengthy legal battle. Over the next six years they appealed, with the help of several lawyers and the American Civil Liberties Union, on the grounds of the First and Fifth Amendments. Eventually the Rodales won their case on the basis that they had been denied due process of law. The Federal Trade Commission, declining to pursue the matter, dropped their case. However, the publicity surrounding this lawsuit did little to further the credibility of the organic crusade.

Nevertheless, organic advocates remained undaunted. The call for public discussion of chemical use broached by Carson seemed to confirm their suspicions of conventional scientists. Her insistence on lay as well as expert involvement seemed to them to affirm the role of the common man and the need for common sense. The vision of a better agricultural science, created by a joint effort of farmers and experts, had gained new support in their eyes. What J.I. Rodale had protested as a form of anti-organic conspiracy in the scientific community seemed to be borne out in Carson's attacks on the "era of

specialists". Those Robert Rudd condemned as "nozzleheads" seemed to fit Rodale's early portrait of that short-sighted entomologist, "Professor Socially Dexterous". Enthusiasts felt that Carson had put these opponents on the run.

Those who are partisans of the use of chemical poisons to kill man's enemies find that they are on the defensive to justify their methods.⁸⁶

Now, with their hopes set on the possibilities of 'basic' science, the Rodales anticipated a change of heart within the scientific community. They eagerly awaited new allies and new research in the aftermath of Silent Spring.

The first glimmerings of what would later be a full-blown scientific salesmanship appeared in the organic movement between 1967 and 1970. More and more "research notes", acknowledging the contributions of environmental scientists, began to appear in the pages of Organic Gardening and Farming. In his turn, Barry Commoner became a hero to the movement; enthusiasts applauded his results on excessive nitrogen run-offs as evidence of the dangers of chemical fertilizers.⁸⁷ But once again advocates extrapolated beyond the actual claims of the researchers they praised. Like Rachel Carson, Commoner called for moderation in the use of agricultural chemicals, not for the total abolition of synthetic fertilizers. Much more outspoken than Carson, however, he granted the organic idea its share of credit as part and parcel of larger "Movement" concerns. Although he did not endorse any of the specific claims made by enthusiasts, he suggested that their

overall position had potential scientific merit.

The people like the organic gardeners and the bird watchers and so on have for human reasons sensed what often turns out on hard examination to be fundamentally correct... Instinctively, without knowing the scientific side of it, they frequently have been right. 88

Commoner's endorsement did not, however, imply quite the level of scientific collaboration which enthusiasts expected. His own credibility was under attack; his "bandwagon" tactics were coolly received. Most scientists were willing to review the use of agricultural chemicals only under the relatively neutral banner of the environmental movement. Despite the growing sense of social responsibility in the scientific community, few researchers linked themselves directly with the organic crusade.

Enthusiasts received a less discriminating and far warmer reception from lay environmental activists. In the spirit of Earth Day, environmentalists acknowledged organic claims as part of the popular mandate for a cleaner, safer environment. In the two paperbacks prepared for Earth Day festivities and as guides to environmental activism, The Environmental Handbook (1970) and Ecotactics (1970), organic farming and gardening was taken for granted as part of the environmental mandate; the Handbook recommended J.I. Rodale's "how to" books on the organic method.⁸⁹

With this success, the organic crusade moved into the 1970s with unparalleled optimism. Advocates quickly broadened their concerns to incorporate questions outside the direct

farming issue, but most important they saw themselves as the core of agricultural reform in the environmental arena, as the ecologically-responsible farming community.⁹⁰

Conclusion

The natural ideal espoused by organic enthusiasts underwent a dramatic transformation in the eight years after the 1962 publication of *Silent Spring*. Carson and other ecologists provided a metaphor with which enthusiasts could restate their concerns. What had been a natural ideal became an ecological mandate. What advocates originally identified as the mysterious and subtle ways of nature became essential elements of "ecosystem complexity", what they promoted as the "balance of nature" became "ecosystem stability", and what they called "the workings of nature in all its domains" became "wholistic understanding".

Inherent in this adoption of the ecologist's language was the belief that the organic mission could now be stated with scientific authority. Enthusiasts identified their "laws of nature" with the possibility of verified principles of ecological science. They kept many of their longstanding suspicions of the scientific community intact, but began to hope for a new set of sympathetic scientists.

At the same time, enthusiasts began to respond to the popular front of their new ecological ideal. And, with this collaboration, advocates found themselves embroiled with a set of concerns which went far beyond the boundaries of preliminary

scientific salesmanship. The ecological metaphor had been adopted not only by old-guard organic enthusiasts, but by a new generation moving back-to-the-land with attention directed to spiritual, political, and self-sufficient discoveries.

Footnotes - Chapter Five

1. Rachel Carson, Silent Spring, (Boston : Houghton-Mifflin, 1962).
2. Presidential Science Advisory Committee, The Use of Pesticides, U.S. Government Publication microprint #11210-11216 (June 1963).
3. Carson, The Edge of the Sea, (Boston:Houghton-Mifflin,1955); The Sea Around Us, (New York,Oxford University Press,1961).
4. Leonard Wickenden, Our Daily Poison, first published Devair-Adair, 1955, (New York: Hillman Books, 1961); William Longgood, The Poisons in Your Food, first published Simon Schuster, 1960, (New York: Pyramid Books, 1975).
5. Paul Brooks, The House of Life: Rachel Carson at Work, (Boston: Houghton-Mifflin, 1972); Frank Graham, Since Silent Spring, originally published, Greenwich, Conn., Fawcett-Crest, 1970.
6. Brooks, Life, p. 206.
7. Ibid., p. 232.
8. Ibid., p. 233.
9. Ibid., p. 249.
10. Ibid., p. 311.
11. Ibid., p. 260.
12. Carson, Silent Spring, p. 23.
13. Ibid.
14. Ibid., p. 261.
15. Graham, Since, p. 77-88.

16. William Darby, "Silence, Miss Carson", The Chemical and Engineering News, (Oct. 1, 1962), p. 60-63;
J.L. Baldwin, "Chemicals and Pests", Science, 137, (28 September, 1962), p. 1042-1043.
17. Graham, Since, p. 73.
18. Baldwin, "Pests", p. 1042.
19. Ibid.
20. Ibid.
21. Carson, Silent Spring, p. 139.
22. Darby, "Silence", p. 62.
23. Ibid.
24. Baldwin, "Pests", p. 1043.
25. Darby, "Silence", p. 63.
26. Robert L. Rudd, Pesticides and the Living Landscape, (Madison: University of Wisconsin Press, 1964).
27. Interview with Robert Rudd, Davis, California, May 20, 1976.
28. Ibid.
29. Ibid.
30. Ibid.
31. Ibid.
32. Ibid.
33. Ibid.

34. Presidential Science Advisory Committee, Pesticides, p. 23.
35. Ibid.
36. Daniel S. Greenberg, "Pesticides: White House Advisory Body Report Recommending Steps to Reduce Hazards to Public", Science, 140, (24 May 1963), p. 878.
37. Ibid., p. 878.
38. Quoted in Brooks, Life, p. 323.
39. Interview with Rudd, May 20, 1976.
40. Ibid.
41. Ibid.
42. Frank Egler, "Pesticides in Our Environment", American Scientist, 52, (March 1964), p. 110-136.
43. Ibid., p. 112.
44. Paul B. Sears, "Ecology - A Subversive Subject", Bio-Science, 14, (July 11, 1964), p. 33-35.
45. Ibid., p. 33.
46. W.P. Taylor, "What is ecology and what good is it?", Ecology, 17, (1936), p. 333-346; see, for a discussion of the history of the discipline, F.N.Egerton, History of American Ecology, (New York, Arno, 1977).
47. W. Frank Blair, "The Case for Ecology", Bio-Science, 14, (July 11, 1964), p. 17.
48. Lamont C. Cole, "The Impending Emergence of Ecological Thought", Bio-Science, 14, (July 11, 1964), p. 32.
49. Ibid.

50. Entomologists, for instance, still split over their defensive against Silent Spring, were not happy with Egler's charges of irresponsibility. The storm aroused by Egler's initial article held no candle to its sequel, published in Bio Science in November 1964. Here Egler expanded on the controversial attack on academics deleted by his original editors. He laid the main burden of blame of his second charge on the doorstep of entomologists. The barrage of criticism awakened new debate in the Entomological Society of America. In keeping with their conservative line, some members passed a motion in censure against the irresponsible policy of the Bio Science editors in publishing Egler's inflammatory work. A few entomologists rejected the motion of censure, but their motives remain obscure. Most defended themselves against outside attacks. The role of ecology as a new umbrella discipline, guarding against specialization abuses, would be only slowly accepted.

51. Paul Revere of Ecology, Time, 95, (February 2, 1970).

52. Barry Commoner, Science and Survival, (New York: Viking, 1966).

53. Ibid., p. 101.

54. Ibid., p. 102.

55. Ibid., p. 27.

56. Ibid.

57. Ibid.

58. Ibid., p. 25.

59. Barry Commoner, "Nature Unbalanced", Science and Citizen, 10; (January, 1968), p. 9-19.

60. Barry Commoner, The Closing Circle: Nature, Man and Technology, (New York: Bantam Books, 1971).

61. Ibid., p. 298.

62. Interview with Dr. J. Dempster, in Anne Chisholm, ed., Philosophy of the Earth: Conversations With Ecologists, (New York, E.P. Dutton and Co., Ltd., 1972), p. 70.
63. Ibid.
64. Interview with Bill Jewell, Ithaca, New York, April 27, 1976.
65. Interview with Don Price, Ithaca, New York, April 27, 1976.
66. Phillip Abelson, "Changing Attitudes Towards Environmental Problems", Science, 172, (1971), p. 517.
67. Robert Rodale, "Have We Reached the Point of No Return", Organic Gardening and Farming, 7, (June 1960), p. 16.
68. J.I. Rodale, The Girl and the Teenager, (Emmaus, Pa.: Rodale Press, 1961), p. 5-6.
69. Rodale wrote approximately 36 plays in his later life; some in several versions. Among the titles were; The Malade who was Imaginary, Can a Hen Lay an Egg without a Rooster?, and The Yugoslav Medical Mystery.
70. Quoted in Carleton Jackson, J.I. Rodale: Apostle of Non-Conformity, (New York: Pyramid Books, 1974), p. 194-195.
71. Ibid., p. 197.
72. J.I. Rodale, editorial, Prevention, 22, (June 1970), p. 104.
73. Ibid., p. 105.
74. Robert Rodale, "No Return?", p. 18.
75. Robert Rodale, "Is it Good to be Scientific?", Organic Gardening and Farming, 7, (October, 1970), p. 18.
76. J.I. Rodale, "Why I Started Organic Gardening", Organic Gardening and Farming, 14, (May 1967), p. 33.

77. Robert Rodale, "Rachel Carson's Masterpiece",
Organic Gardening and Farming, 9, (September 1962) p.17.
78. Ibid., p. 18.
79. Jerome Olds, re Jerome Goldstein, "The New Year and
Silent Spring", Organic Gardening and Farming, 9,
(December 1962). p. 14.
80. Robert Rodale, "Masterpiece", p. 19.
81. Robert Rodale, "Rachel Carson Makes a Television
Conquest", Organic Gardening and Farming, 10, (June 1963),
p. 36.
82. Brooks, Life, p. 236.
83. Evelyn Speiden Gregg, "The Early Days of Bio-Dynamics
in America (Part III)", Bio-Dynamics, 121, (Winter 1977),
p. 16-23.
84. Brooks, Life, p. 311.
85. Carleton Jackson, Apostle, p. 148-190.
86. Robert Rodale, editorial, "1963 - A Year for Action",
Organic Gardening and Farming, 10, (September 1963), p. 15.
87. "Scientist Warns: Chemical Fertilizers Imperil Life",
Organic Gardening and Farming, 15, (December 1968), p. 80.
88. Quoted in Wade Green, "Guru of the Organic Food Cult",
The New York Times Magazine, (June 6, 1971), p. 65.
89. Garret de Bell, ed., The Environmental Handbook, (New
York, Ballantine Books, 1970), p. 346.
90. In 1967, Rodale Press began to publish an Environmental
Action Bulletin which dealt with all sides of the pollution
crisis.

Chapter Six

The New Age of the Garden

Tis a gift to be simple
Tis a gift to be free
Tis a gift to come down where you ought to be
And when you come to the place just right
Then you'll be in the valley of love and delight.

Seventeenth century Shaker hymn
revived by organic enthusiasts.

In the late 1960s, a new popularity emerged for organic farming not only as a result of growing environmental consciousness, but as an epiphenomenon of what was a broad and eclectic millinerian spirit. Returning to the land under the guise of spiritual, political, and personal renewal, a new generation now revived the quest for the American garden. For these young advocates, the return to the land seemed to offer a path free from the clutter and confusion of urban struggles, from the "hassles" of "the system" they hoped to escape. Organic farming, in turn, seemed to offer an agricultural method compatible with this vision -- free from excessive technology, from contamination both moral and chemical. Just as natural childbirth and folk medicine became unquestioned components of their new lifestyle, organic farming, largely unexamined, became the agricultural doctrine of these back-to-the-land enthusiasts.

Although most of these new advocates had only a vague and unsettled sense of their future on the land, a number of adamant and articulate publicists emerged to create popular postures for the new movement. In the writings and statements of these publicists, we find a conscious exploration of the organic vision. For some, the return to the land involved spiritual discovery, for some, a political mission, and for yet others, a quest for personal identity, but all of these advocates attempted to make sense of the organic message by their own lights. They acclaimed different heroes, sustained different myths. Thus the new age of the garden had many facets -- its diverse millinerian spirit marked out contrasts not only to the traditional movement, but among spiritual, political, and self-sufficiency ideals.

Spiritual Discovery and Practical Magic

Spiritual concerns, openly expressed, characterized many new back-to-the-land enthusiasts. Ranging from a simple sense of one's own belongingness and discovery of harmony in a vaguely ecological pantheism, to a belief in the individual spirits of plants and elements, these spiritual expressions varied widely. With or without explicit religious substance, however, these enthusiasts endowed the ideal of the garden with spiritual significance -- they sought justification and meaning beyond themselves. The spiritual visions shaped the organic crusade in two ways - first, by giving legitimacy to spiritual statements in the movement, and second, by revealing

specific doctrines of organic practice.

The spiritual search of new back-to-the-land advocates was largely a communitarian effort. Many members saw their rural spiritual communities as warm havens from the cold and impersonal, urban and bureaucratic world. Like the Shakers, Perfectionists and Owenites before them, these new utopians hoped to create in community and brotherhood a viable alternative society. They saw themselves as the leaders of a vast and inevitable return to the land, to an integrated and newly 'natural' life.

This new spiritual search could also be an individual quest. A phenomenon of 'born again' spirituality inspired many back-to-the-land farmers, as well as urban contemporaries sympathizing with the need for moral rearmament. The act of "giving over" to a higher spiritual force, in a moment of anguish or despair, guided the return to the land for many enthusiasts.¹ Like many American farmers before them, both chemical and organic, these enthusiasts saw their work on the land as an inspired activity, and as an affirmation of fundamental moral values. In the new movement, this "born again" inspiration became an explicit and unembarrassed pledge to a new way of life and of farming.

The religious sensibilities of the new back-to-the-land movement included then faiths old and new, eastern and western. Often enthusiasts embraced a mixture of Christian, Zen, Hindu and other esoteric concerns. At Morningstar Ranch, and

later Wheeler Ranch, in California, members paid reverence through a mantra derived from the gospel of St. John 14:6.

Jesus saith unto him, I am the way, the truth and the life: no man cometh unto the Father, but by me.²

At Morningstar East, in New Mexico, a member of the Native American Church acted as spiritual leader. Here, as well as at other New Mexican communes, peyote -- ritual sacrament of prayer and renewal -- guided the spiritual quest. Sufis in New York State, Hare Krishna in West Virginia, and The Brotherhood of the Spirit in Massachusetts were all among the diverse expressions in the spiritual back-to-the-land movement. Not surprisingly, the most esoteric expressions often seemed to offer the most appeal to the new enthusiasts. In breaking with their pasts, they sought radically different visions.

Despite their diversity, all these spiritual concerns shared a kind of ecological consciousness. Ecology, in some sense, became for spiritually oriented enthusiasts the basis of a kind of planetary faith. Ecological thinking seemed both to take man away from the center of the cosmology and to join diverse faiths into one. Lou Gottlieb, for instance, who deeded the land at Wheeler Ranch "over to God", combined Zen philosophy with a religious interpretation of ecology. He maintained that "shitting in the garden" was protected under the First Amendment of the Constitution which bars governmental interference with the 'free exercise' of religion.³ For other enthusiasts, this ecological pantheism meant a return to primitivism - most, after all, had yet to learn the basics of

life on the land. If early Indian traditions or others seemed to provide the clues, they were open to them. Reports include those of birth celebrations where parents fertilized with the placenta of their new born, and at least one case where they ritualistically ate the afterbirth. Anything 'natural', at one, or in harmony with physical rhythm would be endowed with spiritual significance, given a place in the new ecological rituals.

It was precisely as practical concerns took on spiritual meaning that specific doctrines of the organic method emerged among these enthusiasts. Spiritual overtones were tied to instructions about diet and cookery, planting and harvesting. Like many other enthusiasts, spiritual advocates were often scrupulously vegetarian. This choice, however, like that of the first vegetarians and Grahamites, was dictated by moral as well as health considerations. Similarly, as members of a new counterculture, drugs were often part of the repertoire of spiritual enthusiasts. They chose, however, 'natural' or 'organic' alternatives - sometimes seen as 'psychedelic sacraments' - marijuana, mushrooms, and peyote. And, as part of the new back-to-the-land constituency, in search of both natural practice and spiritual intention, these enthusiasts sought out farming methods of mystical promise.

Many discovered the Bio-dynamic principles, Rudolf Steiner's brief agricultural lectures and the elaborations of his followers. For the first time Bio-dynamics were sought

out not because of the scientific secularization offered by Pfeiffer, but for the intuitive promise of Steiner's vision. Enthusiasts embraced the "practical magic" Steiner's instructions seemed to offer.⁴

In contrast to the reticence and restraint exercised by Steiner's early disciples, new advocates acknowledged even their most esoteric sensibilities. They also took Steiner's teachings as guidance in larger problems - few became anthroposophists, but many were sympathetic to the Bio-dynamic vision. They were inclined to incorporate Steiner's instructions into whatever organic system they had already achieved - not to labor singleminded under the regime Bio-dynamists imposed. The purity of Steiner's instructions was further diluted, but popularity gained. In New Buffalo, Steiner was followed only haphazardly. In California, Alan Chadwick, sometimes hailed himself as mystic, evolved a 'French - intensive' technique based on modification of the Bio-dynamic method.⁵ On farms across the country, new enthusiasts experimented with components of the Bio-dynamic technique.

As a result of this new interest, traditional Bio-dynamists came reluctantly out in the open about their own mystical guidance. The Bio-dynamic community and the newcomers were very different kinds of people, separated vastly by age and by demeanor. Most of the initial keepers of Steiner's tradition in America were now in their eighties, properly religious and respectably middle-class. Helen

Philbrick recalled the encounter in the pages of Bio-Dynamics.

At first there were only rumors of beards and long hair. At one summer conference, two young men appeared in white tee shirts with full beards and flowing hair. They were the first to come to see what Bio-dynamics was all about. The following year, a truckload of young farmers arrived, drenched by pouring rain. In jeans and patches and bandanas they raced about observing everyone, inspecting everything, asking questions, seeking and challenging.⁶

Despite these differences, traditionalists came to recognize a common bond with the new generation.

Those who react this way are searching for a reality that speaks humanly to them... The quest is on for what gives meaning in one's work, what one can relate to meaningfully -

Questions of this kind have been asked before. Also there have always been individuals who have found answers during their lives. This happened especially among those who did not travel the common road. Those who are familiar with the history of the Bio-Dynamic movement know about such personalities. They did their work out of genuine interest.⁷

In their turn, the newcomers tried to overlook the superficial contrasts with the Bio-dynamic community.

Their comment, when asked if they were getting something from the conference, was, "Oh yes, these are beautiful people... We think they are beautiful people even if they do own automobiles and wear good clothes."⁸

Yet at the first conference in Spring Valley attended by the younger generation, few older Bio-Dynamists spoke openly about the spiritual basis of Bio-Dynamic Technique. Only when new enthusiasts insisted did traditionalists finally begin to break with their secretive tradition.

That summer was a turning point. Bio-dynamics had been discovered by the next generation. The

auditorium was filled with strangers, new, eager, restless, questioning, demanding, not always respectful, ready to explode at any moment.

'You aren't telling us everything. We want to know.' ⁹ was the compelling cry that unlocked the floodgates.

The result was a confrontation between the generations.

Reluctantly older Bio-dynamicists began to feel they "had to talk about Rudolf Steiner's Anthroposophy and its relationship to Bio-Dynamics".

The results of this revelation were not, however, all that the traditionalists might have hoped for. Few of their new acquaintances would come to embrace Anthroposophy seriously, and just as few would practice Bio-dynamics wholeheartedly. While the initial response was hopeful, Anthroposophy remained largely inaccessible to the new generation. In turning to Bio-dynamics, these newcomers hoped for a mysticism comprehensible in their own terms -- one compatible with their own eclectic visions, less exclusive in its claims, and without the intellectual pretensions of Steiner's teachings. If perhaps among the Anthroposophists there had been a charismatic personality capable of reaching out to the younger generation as Pfeiffer had to the old, the denouement might have been different. As it was, Anthroposophy seemed a cold, impersonal, intellectualized tradition to the newcomers, removed from their desire for direct spiritual experience.

Despite the eagerness of the new back-to-the-landers to try out Bio-dynamic technique, they hoped to incorporate these methods with other farming practices. Without strict

adherence to the mystical tradition, the rationale for an exclusive Bio-Dynamic method was lost. In addition, the old guard had little in the way of instruction or introduction to offer newcomers. The absence of schools or apprentice farms, or of practical instructions in English, impeded the transmission of the complete Bio-dynamic vision to the younger generation. Some newcomers would find these obscurities and difficulties challenging, but most would end up acknowledging Anthroposophy as one among many spiritual visions, using Bio-dynamic techniques as part of an overall 'natural' farming method.¹⁰

Yet even this qualified acknowledgement changed the character of the Bio-Dynamic tradition, triggering further integration with the mainstream organic movement. Texts by Steiner, Pfeiffer and Knoepf were translated and published for general distribution, and hints of "B-D experiments" appeared in the wider organic and back-to-the-land literature.¹¹ Slowly the notions of planting to the phases of the moon, the comparisons of "chromatographs" of organic and inorganic produce, and refinements of the preparations became part of the procedures used even by farmers not drawn to a spiritual quest. Bio-dynamists came to anticipate the presence of outsiders at their conferences, and to appear at forums other than their own. Within a few years this popularity, although initially based on a spiritual renaissance among back-to-the-land advocates, would precipitate further

secularization in the Bio-dynamic tradition. Once again the "experiments" would be presented briefly on the grounds of their "scientific" credibility. This secularized vision, however, would differ from that initiated under Pfeiffer -- it came much closer to coexisting with, but not eclipsing, the promised spiritual quest. Bio-Dynamic farmers and gardeners would now openly acknowledge their once secret mission.

In any event the "practical magic" embraced by new back-to-the-land enthusiasts was not exclusively Bio-Dynamic. A vaguer ecological mysticism still appealed to most enthusiasts, who remained unwilling to commit themselves to any established tradition, no matter how esoteric. And, at precisely the time that new enthusiasts were opening to spiritually-guided practice on the land, news of spectacular claims from the Findhorn Garden in Scotland began to arrive on this continent.

The rumors of Findhorn seemed to promise a living tradition more in keeping with the eclectic mystical leanings of the new generation of advocates. Although few American enthusiasts would ever visit Findhorn, many cherished reports of 40-pound cabbages and a new "planetary consciousness".

You are to cooperate in the garden by thinking about the Nature Spirits, the higher Nature Spirits, the Spirits of different physical forms, such as the spirits of the clouds, of rain, of the separate vegetables. In the new world their realm will be quite open to humans - or, should I say, humans will be open to them. Be open and seek into the glorious realms of Nature with sympathy and understanding, knowing these beings

are of the Light, willing to help but suspicious of human beings. 12

The basic Findhorn message echoed the ecological pantheism that first attracted many spiritually-oriented back-to-the-landers.

Findhorn had been founded in 1963 with a concern for secrecy reminiscent of the early Bio-Dynamic tradition. Peter and Eileen Caddy, the 'cornerstones' of the Garden, knew that most organic farmers would find their contacts with the 'Nature Spirits' absurd.

We didn't say anything about Devas, elves, or Pan for years. We just kept it to ourselves because we knew people couldn't understand it until it had been demonstrated. Only after years of results, and after experts from around the world confirmed the results could we say to the world: this is how we did it! 13

By their own admission, the Caddys and their friend Dorothy McLean created the garden and their understanding of its spiritual significance only after a laborious process of trial-and-error. With time it became almost impossible to separate their current vision of the garden from their initial accounts, to determine when those at Findhorn began to see themselves as founders of a "New Age".

When they arrived at Findhorn, the Caddys were stranded and unemployed. They gardened to moderate a harsh existence. Yet long before they came to Findhorn, the Caddys had accepted a life guided by Eileen's meditations. The voice Eileen heard, and the instructions Dorothy received from plant "devas" became the basis of the Findhorn experiment. A

classic division of labor generated their idea of the 'New Age'. Eileen, the mystic, unschooled and uncertain of her own spiritual gift, gave instructions; Peter, the practical worker and undoubting follower, long a believer and reader in the occult, including the Bio-Dynamic tradition, obeyed unhesitatingly.

From their inexperience and shaky visionary beginnings, however, the Caddys fashioned not only an enviable garden but an elaborate cosmology. The new "planetary consciousness" called for by the Nature Spirits promised a rapprochement with spiritual worlds man had unwittingly closed.

As the rain falls on the just or the unjust, we help to produce food for the good and the evil; the moral side of things is not our concern. We merely follow our destinies. We are man's friend or enemy depending on man himself. Our life is for the good; but man is making mincemeat of all life forces. On this level we are stable and man does not affect us, but further down where he is, he can, and he has, and we cannot answer for the consequences. Shall we not cooperate and build a new relationship? 14

This was an ecological vision which many enthusiasts found irresistible -- benign Nature contaminated only by man-made thoughtlessness.

Even those skeptical of the spiritual claims at Findhorn were intrigued by the dramatic results of the garden. Members of the conservative Soil Association, and others who would be inclined to disavow ecstatic experience, visited Findhorn only to be taken by surprise. They could not accept the mystical claims, but had no other account to offer for the Caddys'

phenomenal success against major obstacles. 'How was this garden possible?' remained an open question in their minds.

Certainly the Findhorn example was not one most enthusiasts could hope to emulate. Few claimed to be mystics themselves, and the principles of Findhorn practice remained loosely defined. Unlike the Bio-Dynamic tradition, no concrete instructions were available to provide a secular bridge to the mainstream organic movement.

Yet the legend of Findhorn dramatically reopened the discussion of spiritual forces in the movement. Peter and Eileen Caddy began to lecture and travel, bringing word of the new "planetary consciousness" to enthusiasts. With David Spengler, a young American mystic who had first joined them in Scotland and later returned to California, they visited spiritual centers and college campuses across the United States. This international campaign brought more visitors, and more money, to Findhorn. The garden loomed both as a kind of puzzle and a kind of symbol to organic enthusiasts. Unwilling to embrace or to discount the Caddys' claims, advocates pointed to Findhorn as one of the 'unknowns' of the organic crusade. And, in this light, the rumors of the garden not only served to strengthen the appeal of other spiritual orientations in the movement, they gave general legitimacy to the sense of mystical possibility.

The Politics of Practical Life

Many new enthusiasts gave political accounts of their

move back-to-the-land. In its first tentative form, this political orientation vaguely tied the return to the land to other "Movement" concerns. After 1968, and the Chicago convention, many early activists washed their hands of overt "dirty" politics. For them, the rural revival seemed to promise a refined critical vision -- one self-righteously applied to resisting the temptations and evils of "the system", but not engaged in dialogue. Yet these advocates did not entirely abandon their political analysis. Rather they embraced the notion that all action, including gardening and farming, could contribute to a revolution. Just as mysticism offered a renewed spiritual analysis of the "myth of the garden" and of the organic movement, this "new politics" offered a revolutionary consciousness to organic advocates.

The early sense of community among different segments of the "Movement" led back-to-the-land enthusiasts to see themselves as co-authors of a more general revolution. They, like other "revolutionaries", responded to the expectations and inspirations of their fellows -- to the demands for student protest, for civil rights, for an end to the Vietnam war. In sharing these "correct" sympathies, the back-to-the-land advocates affirmed their revolutionary role: they saw themselves as living the "good life" of the future, free of racism, hierarchy, sexism, and ecological damage.¹⁵ From this perspective, new farms and communes could be seen as models of a post-revolutionary society.

Murray Bookchin, a New York radical anarchist, became one of the chief ideologists of this revolutionary ideal. Bookchin hoped to weave together old and new anarchist traditions. In 1968 he outlined a program of "post-scarcity anarchism" which portrayed every choice as a political decision.

In the very act of refusing to live by bourgeois structures, the first seeds of the utopian life-style are planted. Negation passes into affirmation: the rejection of the present becomes the assertion of the future within the rotting guts of capitalism itself. "Dropping out" becomes a mode of dropping in -- into the tentative, experimental, and as yet highly ambiguous social relations of utopia. 16

Bookchin helped to popularize the idea of "decentralism" as a political agenda of the new movement. Until the late 1960s, however, Bookchin had never been overtly tied to the back-to-the-land movement. His first followers were educated, urban, and self-consciously bohemian.

Bookchin, like other anarchists, based his decentralism on the requisites of an ecological consciousness. In 1962, soon after Rachel Carson published Silent Spring, he hailed the revolutionary potential of her message.¹⁷ Bookchin had been concerned with food adulteration for many years. In the 1930s, he read the late muckraking writings, especially Kallet and Schlink's exposé, 100,000,000 Guinea Pigs, and in the early 1950s he followed the Delaney Commission Hearings on chemicals in food.¹⁸ Now, in the 1960s, ecology seemed to provide him with the idea of "a technology for utopia".

Bookchin tried life on a Vermont farm, but quickly

returned to his native urban habitat. His new followers, somewhat more enduring in their enthusiasm, hung on for months or years in a variety of communal settings. The longer they stayed on the land, however, the less critical were Bookchin's decentralist principles to their purpose.¹⁹

On the failure of the first decentralist anarchist commune, Cold Mountain Farm in 1967, many members moved the next summer to a second Vermont location, Bryn Athyn. From there, the same year, most moved together to New Mexico, first to a commune near Placitus, and finally, in a smaller contingent, to the Rockridge community. These political wanderers continually left behind their physical and emotional failures. Discouraged by ill-health and poor water, the unfriendliness of their neighbors, police harassment, and the poverty of their own communal ties, they kept searching for a way to actualize Bookchin's utopian vision. From an open-gate policy that embraced all and any, they switched to a relatively constrained policy that welcomed only utopians of more or less homogeneous inclinations. From a crowd of over fifty, they dwindled to a core of four couples holding together passing transients.²⁰ They truly found themselves part of "the tentative, experimental, and as yet highly ambiguous social relations of utopia". The experiment meant for them a rough and unsettled life.

At Total Loss Farm, on the other hand, a second group of New York radical exiles and Vermont newcomers met with a

better measure of success. Here too, members would come and go, but the physical hardships were less strenuous and the ties to community and place stronger. But Total Loss Farm also faced problems about the completion of tasks, about the limits of "doing your own thing". Here too, the anarchist struggle was transformed into a less articulate, more generalized sense of millinerian righteousness.²¹

Ultimately most of the adherents of the new communal vision lost sight of Bookchin's rhetoric. More and more they used the language of "decentralism" and the notion of "revolution" while remaining innocent of any anarchistic heritage. In adopting the right to "do your own thing" anarchists left behind exclusive political boundaries, developing a loosely structured and inclusive sense of radicalism. Often anti-intellectualism became an essential component of a folksy, down-home image. The fold of political sympathizers opened - almost any commune could be interpreted as part of the "revolutionary" effort, and a new sense of cooperation among the "experimenters" of the "utopian lifestyle" emerged. Strategies and political affiliations no longer concerned these enthusiasts - they were busy on the land, and that in itself was seen as an affirmation of the political ideal of the garden.

In the meantime, as well, a second strain of "Movement" rhetoric emerged to help reinforce the political claims of these back-to-the-land advocates. As the environmental crisis

grew in popular attention, ecological issues came to have "revolutionary" potential outside of radical circles. The concerns stated by Carson and Commoner became the basis of a new sensibility, open to many who would never have joined in other "Movement" ventures. Like Bookchin, before them, these advocates endowed ecology with revolutionary potential. As Gary Synder, the poet of the generation put it:

Because you can't be serious about the environment without being a revolutionary. You have to be willing to restructure society. 22

But "revolution" and "restructuring society" now had a different meaning than Bookchin had intended. For the new activists, revolutionary action included almost any form of ecological or conservational thoughtfulness. Here the distinctions among technical, personal, and political solutions disappeared. Environmentalists still had demonstrations and legislative ploys, but the "politics of ecology" came to include much more -- a court battle against pesticide spraying, a small town bottle drive, and even a homemaker's purchase of a bio-degradable detergent. Older conservation groups, including the Sierra Club and the Audubon Society, began to follow this new political lead, embracing "ecotactics" as the basis of a new mandate. Curiously, this "radical" revolution for the environment quickly lost most of its radical flavor. For new activists, as the total environmental crisis became a way of expressing the total political crisis, the political content was obscured. Ecological problems became political

problems, but at the same time ecological solutions became political answers. As environmentalists moved away from traditional political tactics and to the new ecotactics, politics came to include anything that provided something of a solution.²³

In time, as new political enthusiasts turned to the old organic movement for inspiration, they read a curious and most often misplaced radicalism into the organic message. They sought out vague "political implications", and laid claim to a radical heritage for the new movement. From the point of view of new enthusiasts, "movement" automatically implied "revolution". By virtue of the organic label, diverse and even antipathetical proponents became part of one "revolutionary" cause.

Knowing very little of their predecessors, these new advocates embraced any shred of political concern as evidence of radicalism. Enthusiasts retained the language of the left, but used it unthinkingly. They were able to ignore contradictions and anomalies among the programs of these early advocates only because they accepted watered-down, idealized versions of their new heroes. The politics of early advocates were never taken seriously or examined critically - very little was known of their philosophies. Their heroism consisted largely of their practical example, not their actual counsel for the movement.

When reviving Sir Albert Howard, as a 'new' organic

hero in this tradition, enthusiasts ignored his work in the the plantation industries.

J.I. Rodale, who had worked diligently to create a mainstream movement untainted by radical affiliations, became a new "radical" hero. His vaguely anti-corporate stand fit with the anti - big technological arguments of new enthusiasts. Jim Hightower, director of the Agribusiness Accountability Project, a Washington based research and advocacy group for the small farmer, acknowledged a debt to Rodale's early efforts.²⁴ Gurney Norman, California back-to-the-land advocate and an editor for one of the first popular environmental journals, applauded Rodale's work and the organic movement as "exquisitely subversive".

It has occurred to me that if I were a dictator determined to control the national press, Organic Gardening would be the first publication I'd squash, because it is the most subversive. ²⁵

Rodale's opponent, Louis Bromfield, received the same indiscriminate treatment. Bromfield's books, despite his apparent conservatism, were wed to the new organic "revolution".²⁶

In the same vein, more explicitly political figures, like Scott Nearing and Ralph Borsodi, once veiled behind the Rodale apolitical facade, became public heroes to new enthusiasts. In 1970, enthusiasts heralded the first commercial publication of Living the Good Life. In 1955, J.I. Rodale had hesitated to publish a review of Nearing's 'socialist' line. Now, twenty-five years later, the book was presented by Schocken, a major publishing house, and reviewed enthusiastically not only in

the movement literature, but in Newsweek, Time, Harper's, and the Nation. In part, the temper of American political tolerance had changed since the Nearings' private printing in 1954. More important, however, the Nearings had become practical heroes, and the Nearing experience had become a hot property for the back-to-the-land market.

What the Nearings took as a life of relative plenty against the tide of depression, however, more recent followers took up as a pledge of relative austerity in a land of overabundance and suffocating affluence. Many of the current crop of back-to-the-land enthusiasts idealized the Nearings without understanding their political position. Most knew Nearing only through his farming books - they had no inkling that he wrote a regular column for the socialist theoretical journal, Monthly Review. The mood of political eclecticism in the new movement meant that precise politics didn't matter. What counted instead was the willingness to experiment with one's life - to try out the newly ambiguous "social relations of utopia". The fact that the Nearings had a definite vision of social commitment and collective action went unacknowledged.²⁷

The media reports of the Nearings' rediscovery both echoed and reinforced this confusion. Newsweek profiled the Nearings as "Prophets of the Good Life", potential models for "the hippie communards of recent years".²⁸ Scott Nearing's political trials, presented almost as early personal eccentricity, were only the background to his choice of a Spartan

lifestyle. The fact that Nearing was dumped from the Communist party was put forward in his favor. The lesson for today's dissidents, Newsweek seemed to say, was one of hard work and "puritan discipline", not radical politics or 'escapist indulgence'. In the same breath, the editors condoned the Nearings and yet confirmed their skepticism of current back-to-the-land enthusiasts. It was unlikely, they implied, that "hippie communards" could live up to the Nearings' example of grit and endurance.

Charles Elliot in Time magazine was equally ambivalent about the new movement. On the one hand, he found in the "hundreds of little subsistence farms and rural communes" a "heartening quest". On the other, he was dubious of the ability of the new back-to-the-land enthusiasts to follow the Nearing model.

These new seekers are hungry not for parsley roots and multiplier onions, but for meaning, personal identity and love -- the sort of things the Nearings could take for granted in 1932. 29

Here we have a different paradox of praise and put-down. Elliot managed to applaud the Nearings for their practical work, but he minimized the personal dimensions of their struggle. At the same time he denigrated the possibility that recent followers could match their efforts. Why he chose to confine the search for "meaning, personal identity and love" to the recent movement, and, even as he did so, why he found the Nearings' supposedly practical efforts more worthy of emulation, revealed a deep prejudice against the

inspirations embraced by both old and new enthusiasts.

Nevertheless these media treatments of the Nearings and their admirers contained some curious half-truths. In fact, many of the new enthusiasts would fail -- but so did many of the Nearings' contemporaries. The survivors of both eras would be workers of much the same grain of the Nearings. As the media commentators intuited, new enthusiasts took away only a vague inspiration from the Nearing recipe for a "good life".

This charge from the establishment skeptics echoed that laid by purist left strategists - both camps attacked new back-to-the-land and organic enthusiasts as romantics. This attack, however, held increasingly little threat for new advocates. Their critics might equate their romanticism with impracticality, unrealism, and naive optimism, but in their own eyes their commitment to a better farming system renewed the basic political idealism that inspired the first American revolution. Marty Jezer, an initial member of Total Loss Farm and an editor of the pacifist journal WIN, rediscovered his early idealism in the context of the new farming movement.

I admit to being a romantic, to having spent much of my adult life in futile search for the American myth, some essence of the American experience worthy of my dreams. 30

Politically-inspired enthusiasts like Jezer hoped to embrace and create the possibilities of a true practical life, to encourage the essential virtues of decency and common-sense they idealized in the farmer. Unlike advocates of a spiritual

bent, they were not inclined to the 'ecstatic' or 'mystical' experiences of farming - they were, however, drawn to the question of 'authentic' experience. The farmer, idealized as the true worker happy with his land, became their ideal of a new renaissance man; his life became their model for what has been called the 'politics of authenticity':

My experience with farmers is a limited one, hardly enough to make a generalization about anything, much less construct a vision of a better world. But in a society as deadening as this, even the slightest glimmer of decency must be encouraged. I know maybe five or six farmers, but together they share characteristics that are rare in society and that I would want to preserve, emulate, and tell others about.³¹

This celebration of the farmer also connected to a vision of the new movement as a populist enterprise.³² The basis of this populist label, or its connection to earlier populist tradition were, however, never spelled out. The notion of 'Populism' evoked images, not policies. These new "populists" identified with the possibility of concerted action by farmers, with a sense of struggle between the small farmer and agribusiness, and with the promise of grass roots appeals. These images, not political analysis, engaged the imagination of new advocates.

By whatever name it went under -- whether "anarchism", "decentralism", "the politics of ecology", "of authenticity", or "populism" -- this political inspiration remained ambiguous and largely inaccessible to outsiders. These advocates shared an undefined longing to politicize the "myth of the garden",

but few had any sense of the realities of farming life. They were outsiders looking in.

The very ideology of decentralized commitment that inspired the search for local, specific solutions also undercut the possibility of a clear statement or a concerted impact. No matter how intensely enthusiasts worked on separate elements of the agricultural dilemma, they scarcely knew what their fellows were up to. No steps had been taken toward political organization because these enthusiasts had disavowed "dirty politics". Advocates of this vision of the movement never formulated a systematic base. They remained not only essentially leaderless, but never created a regular publication to keep their point of view fresh in the minds of enthusiasts. Beyond the notion of "political implications", these advocates had little concrete to offer to the organic crusade.

What then was the impact of the "new politics" on the mainstream movement? The initial impressions made by politically-oriented advocates left much to be desired. Dis-
mayed by the long hair and beards of new recruits, traditional organic disciples thought of the new communes as havens of war resisters, drugs, and promiscuous sex. When Organic Gardening carried a positive article on a couple of organic "hippies", many readers wrote to complain, asserting that they certainly wouldn't be willing to accept them as neighbors.³³ A mobilized, highly organized political base probably would have met widespread resistance from traditional advocates. However,

one can recognize implicit continuities between the "political" sensibilities of new advocates and the traditional organic vision. Although unwilling to identify themselves as "radicals", Rodale and other long term enthusiasts promoted "the myth of the garden" against tremendous odds. Their re-discovery as "political" heroes was less anomalous than it first seemed. Rodale's vision of an agrarian nation may not have been articulated as a political program, but it essentially rejected the direction of current agricultural policies and called for rural revival.

In explicit terms, however, the organic mainstream still steered clear of radicalism, accepting the "new politics" only as a broad kind of environmental consciousness. Robert Rodale adopted the new political imagery only in so far as it fit the confines of a popular, middle-road movement. Certification and marketing of organic foods, for instance, were now labelled "political" issues. When Robert Rodale editorialized on how "Compost and Politics Do Mix", he, like his father, disavowed any taint of radicalism or favoritism.

Keep in mind that the kind of government involvement and lobbying that I am suggesting is seldom political in the partisan sense. You can be a Republican, Democrat or whatever and do an effective job of waking up the politicians to the problems of organic growers, and the opportunities that natural methods represent.³⁴

For the Rodales, politics would always be identified with common sense.

What we are advocating after all, is just ecological common sense. ³⁵

The idea of an organic "revolution" became part of the movement lingo, but enthusiasts provided no challenge to the existing political structure. The communal and radical sentiments of new advocates remained at a step removed from the mainstream organic movement.

Personal Discovery and Practical Heroism

In their return to the land, many new enthusiasts affirmed the basic values of perseverance, independence, and hard work. In success in practical tasks, these advocates saw an opportunity to measure and discover themselves and their personal resources. Communally or individually, new farmers attempted to test their commitment, their sense of adventure, their competence. They might, in building a log cabin, see themselves as "pioneers" -- in constructing a tipi, feel as kin to the Indian -- or in restoring an ill-cared for or abandoned farm, imagine themselves "homesteaders". Despite these frequent variations, the essence remained the same -- a classical "myth of the garden" -- a cherished ideal of making it on the fruits of one's own labor. And, in promoting this vision, new crusaders echoed many elements of the early organic movement, rivaling Rodale's anti-intellectual and anti-political sentiments.

New enthusiasts, in this view, needed not politics, but experience; not academic discussions, but tools. The editor of The Whole Earth Catalog, Stewart Brand, made his journal one of the central documents of the practical orientation by

providing suggestions and advice for the inexperienced enthusiast. Brand's California-based catalog and store strongly resembled a countercultural Sears and Roebuck, where technical advice -- what to plant, how to compost, and when to harvest -- far outweighed movement propaganda. Brand hoped to provide the tools, but wanted enthusiasts to discover their own visions.

Brand indulged in very little movement rhetoric. Although he thought of ecology as a vaguely religious movement, he chose to leave the justifications unspoken, the inspiration unstated.

... a realm of intimate, personal power is developing -- power of the individual to conduct his own education, find his own inspiration, shape his own environment, and share his adventure with whoever is interested. Tools that aid this process are sought and promoted by the Whole Earth Catalog. 36

In this spirit, Brand denigrated onlookers to the 'real' experience, particularly the "voyeurism" of social scientists. He also rejected the suggestion that the Whole Earth Catalog serve as a clearing house for communes or back-to-the-land enthusiasts.

The Whole Earth Catalog is staying out of lateral communication among communes, yearning communers, social scientist reporters, etc. for two reasons.
1) the job is massive; we can't handle it.
2) the communities are beleaguered enough without us adding to the load.37

Brand took the trouble to recommend conventional commune bulletins, but was not himself in the business of creating a movement.

Brand wanted enthusiasts to become their own experts.

With studied anti-intellectualism, he made experience, not credentials, the fashion of the period. In the pages of The Whole Earth Catalog, practioneers of the organic method, experts by virtue of their trial-and-error common sense experience, became the heros of the new movement. Brand's editors acclaimed Ruth Stout, elderly author of How to Have a Green Thumb Without an Aching Back, as a "master gardener", "like an elderly Zen priest".³⁸ Jeanne Darlington, young unassuming Berkely gardener of Grow Your Own fame, became a "kind of hero".³⁹ Given these exemplars, new enthusiasts were encouraged to strike out on their own, to explore rather than analyze.

Yet Brand and his co-editors could not sustain the effort required to publish the massive Catalog regularly. They quickly covered most of the ground of the ecology movement, and found themselves repeating early articles without adding much new material. In 1971, the Catalog began to publish shorter supplements, and the last comprehensive issue appeared in 1972. When a smaller publication, The Co-Evolutionary Quarterly, took the place of the original Catalog, the focus changed accordingly. The Quarterly became a kind of theoretical journal for the movement in which tools appeared almost as an afterthought.

Brand's audience turned en masse to a second "practical" magazine, The Mother Earth News. John Shuttleworth, the editor of the News, took Brand's initial message seriously.

I'm saying we need fewer politicians and more Stewart Brands. Fewer drones and more productive (in the most basic sense) members of society. 40

Like Brand, Shuttleworth stressed "access to tools" as the subtitle of his new journal.

Shuttleworth's Mother Earth News first hit the newsstands in 1970, at the peak in popularity and publicity of the back-to-the-land and environmental movements. Five years earlier, Shuttleworth had considered his first plan of how to bring alternative lifestyles to the public. In 1967 he wrote half of a manual on his own roaming life, The Beachcomber, Rambler, and Wayfarer's Handbook. He had, however, burned his original manual in a despairing moment.⁴¹ Now, with Brand's model before him, Shuttleworth revived his early optimism.

Well, over the years I've gathered whole filing cabinets of material on people who have successfully walked away from the system and started living on their own terms. I wanted to share that information. A publication that paralleled and supported the work of Brand's Whole Earth Catalog seemed like a good idea. 42

He also set out to explore agricultural alternatives, and this eventually led him to the organic crusade.

John Shuttleworth, like J.I. Rodale thirty years earlier, was a curious mixture of publicist and prophet. Fired with messianic fervor, both men thought themselves "fated" to carry forth the organic message. Both were self-made successes plagued by physical ills and schooled in hard knocks. Rodale had looked to organic food to cure his physical weaknesses; Shuttleworth cherished a private theory that DDT had caused

his bout with polio in childhood. And both men had tried their hands at numerous endeavors before taking up the agricultural crusade. They both believed in hard work, both cultivated an aura of entrepreneurial independence, and both longed for success.

Most important, both J.I. Rodale and John Shuttleworth idealized the classical "myth of the garden". They created movements with a secular and apolitical stamp, based on the independent farmer engaged in toil and democratic struggle.

Shuttleworth, however, lacked Rodale's audacity. Although many of the intense battles of the organic crusade had been fought long before Shuttleworth came on the scene, he remained a cautious soul. Unlike Rodale, he was reluctant to take unpopular stands, preferring to stay in the shadows of 'Mother's skirts'. Shuttleworth hedged his bets in the News, taking the editorially 'objective' stance that he was not accountable for the accuracy of his contributors, or for his own suggestions. He was inclined to shrug off debates, to answer by providing both sides of a question, and to suggest that readers must find out the truth for themselves. This caution made it easy for him to sidestep direct attacks. He could deflect blows to his mission, rather than confront them. This was an option that J.I. Rodale had never chosen.

Shuttleworth's commitment to journalistic success seemed to overshadow the back-to-the-land mission at times. Very little in his first issue of the News gave any hint of single-

minded commitment. The most extensive article in this issue, under a section titled "Being Your Own Boss", covered the unlikely prospect of freelance cartooning. As he revealed in a 1975 interview, Shuttleworth had drawn cartoons since the age of 14 when recovering from polio. This first issue bore much of his stamp, if not his signature. The second article in this same section portrayed another of Shuttleworth's early jobs, work in an ad agency - "Independence by any means" might have been a better title than "How to work in marketing". Certainly these articles had little to do with the back-to-the-land movement. At this point, Shuttleworth offered nothing specifically on farming or on organic methods. He did include, however, a potpourri of advice on "how to build a tipi", how a family of four survived on \$6500 a year, and the success of the Twin Oaks commune. Shuttleworth seemed willing to print anything that might fill space, even those articles with only the most obscure connections to his crusading vision.

Shuttleworth, however, rode a crest of a popular wave with his new magazine. Despite its limitations, he quickly attained the success to which he aspired. After publication of this single issue run of 10,000 copies, Shuttleworth received two offers of overnight national distribution. Yet Shuttleworth really did fancy himself a prophet. Determined to "live on his own terms", he turned down both offers. He could not, however, resist the temptation to pat himself on the back for his independence and perseverance.

"Mother" will remain a people publication. She won't be playing the big-money distribution advertising games. Which means she can concentrate on more 'meat' and less on deadlines. 43

However, Shuttleworth would have trouble living up to this promise and to his vision. His determination to keep the News for himself and for the movement would dissipate and finally collapse after several years. The story of Shuttleworth's News reflected changes in the kind of movement he envisioned. Despite its problems and weaknesses, however, the Mother Earth News succeeded in a way no other back-to-the-land publication did.

The second issue of the News, although it came a bit closer to Shuttleworth's stated objectives, set off a fervor among his readers. This special issue, billed as "How to get out of the city and back to the land", was torn by inconsistencies. Once again Shuttleworth had revived a childhood dream; he reprinted a 1943 book, The Have More Plan, by Ed and Evelyn Robinson. The Have More Plan, while it provided many clues for the new or aspiring farmer, fell short of the organic tradition. Rodale and other purists had ignored it. The Robinsons, whatever their good intentions, had used DDT on their land. The first run of this issue of the News reprinted the plan as it was. Only after readers came up in arms did "Mother" apologize for "omitting" the disclaimer supposedly intended to accompany the plan. The second run included a carefully worded qualification in Shuttleworth's placating style.

For all his eagerness, Shuttleworth was still learning the ropes of the back-to-the-land business. The mission he embarked on, shaped by his early reading of the Robinson plan, by his hard life on his parents farm, and by his strong drive for self-sufficiency, differed radically from that espoused by many of his readers. His basic vision for the new movement invoked a renewal of the traditional form of the American "myth of the garden" -- of many individual farmers staking a place for themselves on the land. The communal fervor of many enthusiasts failed to strike any deeply sympathetic chord in Shuttleworth's makeup. His first thoughts went to the family farm. Shuttleworth never schooled himself in the early back-to-the-land or organic traditions. His eclecticism may have come almost by default, by virtue of his ignorance of any real controversies underlying the movement. He intended his magazine to be a folksy technical digest -- and he succeeded in this goal by ignoring broader agricultural issues.

Nevertheless, The Mother Earth News heralded a greater movement self-consciousness -- and Shuttleworth's vision would be slowly transformed in the process. The News was the first major publication to offer itself as a meeting ground and clearing house for sympathizers of the back-to-the-land movement. First under the guise of a column called "Contacts", and later under "Positions and Situations", The Mother Earth News offered "to help would-be back-to-the-landers get in touch with folks who are already out there". A phenomenal

range of ads showed up in these columns, including land sales, job offers, matrimonial (or not?) offers, and a cluttered assortment of personal needs. The "folks" described themselves as "friendly", "hardy", "healthy", and "interested in good clean living". Elaine A. of Texas asked:

Where can I find a natural commune...no dope...
and with a few morals...like the Indians had.
Maybe even someplace where they're developing
all those finer human things like Love and
Peace. No snow and not too hot in summer would
make it perfect (Heaven?) for me.

I want to dig my roots in somewhere so I can
stop looking and being so restless. 44

In later years of publication the "positions and situations" would come to run 20 to 30 pages, but the tone of many of the ads would echo this one. A kind of searching desperation characterized many aspiring back-to-the-landers, who saw the new movement as an answer to all their problems.

I'm very broken -- inwardly -- after putting up
with city life. I wasn't meant to live in such
an insane society. But I feel unsure about
making the break to the country. I need reaffir-
mation, strokes. I need to hear voices saying
directly to me, "It's real. You are right.
Alternative lifestyles are genuine situations.
You're OK." Will respond to all letters with
gratitude. 45

The same kind of outpouring of sentiment had probably shaped earlier periods in the movement to the land as well. Curiously, in the early 1970s, this public searching became a legitimate expression of needs and a convincing expression of interest in the return to the land. The stiff-upper lip determinism of the Nearings and Borsodis gave way to whining

appeals.

I'm a person looking for herself. Help! I want so much to live on and with the land... but I don't know where to start. I want to milk cows...to plant seeds...to breathe and smell fresh air...and to live. I have no money, just myself and my dreams. Can you help them come true? I have a feeling that there are many who share them. Write and share yours with me. 46

Yet this kind of hungry quest was only one element of the new movement. Along with it went a number of specific openings for communal tie-ups,

Our commune scene here in eastern Ontario is strong with 50 winterized freaks on five different places and several in nearby towns ready to start in the spring... 47

and these offers explicitly rejected "free riders". A similar set of ads offered land for sale and specified requirements for land purchase. But here too some notion of a new lifestyle was often included:

We're selling out five country acres in New Jersey in May to hunt for remoter land. About 50 acres (some tillable) with a year-round stream for power and water needs, an old house and barn and neighbors interested in sharing resources and skills would be great. Our talents include guitar building, beekeeping, home construction and food raising. Help us find our place, please. 48

Whether the 'would-be' farmers, the lost souls of the new movement, ever connected with those able to provide some answers was never confirmed in the News. What we can know is that all the advertisers shared at the least a sense of escape, of the search for a remoter place, and of the chance of self-discovery.

Shuttleworth, however, was still trying to promote the independent and entrepreneurial vision of the farmer to the broadest possible constituency. As new farming guides appeared, echoing the 1943 Have More plan of the Robinsons, Shuttleworth reprinted them in turn. In 1972, he 'discovered' the Grow It plan of Richard W. Langer, and in 1973 its British equivalent, Farming for Self-Sufficiency by John and Sally Seymour. Each plan was touted in its turn as the indispensable tool for the aspiring farmer.

As part of this effort Shuttleworth decided in 1972 to devote more time to these farming questions, and less to the motives of the movement. He felt burdened by the extensive demands of his readers for information on coops and communes, on urban alternatives. A new publication from Mother Earth News, Lifestyle, was the chosen vehicle of this purge; in issue 16, Shuttleworth announced that "Mother has a sister", and included an 84-page sample issue of his new magazine. Lifestyle, however, survived less than a year. After only eight issues "Mother" presented an extensive apology to 'her' readers, admitting that 'she' had taken on too big a job, and blaming the Post Office in a whining tone for holding up Lifestyle's second class mailing subsidy.⁴⁹ Most of the material was reincorporated into the Mother Earth News, and urban readers once again became respectable.

In the meantime, Shuttleworth went breezily on to other ventures, his confidence unshaken. Even in the demise of

Lifestyle he found a silver lining, one revolving around an earlier proposal. Now, he assured his readers, The Mother Earth News would be able to devote its energies to the promised research center.

The story of the Mother Earth News research center reflected a set of curious compromises between Shuttleworth's drive for self-sufficiency and the communal aspirations of many of his readers. While he still had only the vaguest dream for the center, Shuttleworth began to solicit funds from readers as lifetime subscribers and to print mock-up models and posters of the proposed center. In his eyes, the center would be his home and private think-tank, as well as his central contribution to developing the needed technology of the back-to-the-land movement. Yet the actual center would be a long time between conception and birth. First visualized in November of 1972, little had come of the idea of a center two years later. Without any land and with the few funds available, Shuttleworth developed plans for 'mini' electric and butyl alcohol cars and for a methane generator. Then, in 1974, a subscriber made a proposal which Shuttleworth threw back to readers in an off-hand manner. What, he said, if Mother offered parcels of land on the Research Center, say "\$10,000 for a 2 - 5 acre corner of a 1,000+ acre Research Center/Mountain Community"?⁵⁰ Who would be interested, if the details could be worked out?

In the same issue, The Mother Earth News initiated what

was seen as a much more serious proposition -- a "How to be Food Self-Sufficient Competition", offering a \$5000 first prize.⁵¹ These two offers, initially unrelated in Shuttleworth's mind, became inextricably linked in shaping his vision of the movement and its possibilities.

The response to the two offers was radically different than the one Shuttleworth anticipated. He received 40 letters on the idea of a land purchase at the research center, many with offers of the necessary \$10,000. Only one entry appeared for the self-sufficiency contest. These results shook Shuttleworth's vision of a hard-working, enterprising constituency for the movement. "Ideas," he came to say, "are scarcer than dollars in our society."⁵²

Both the 'eco-village', as the research community came to be known, and the 'self-sufficiency' contest, became bones of contention between the Mother Earth News and enthusiasts. Entries to the contest continued to be scarce. The rules were changed and the deadline extended twice. The Eco-Village, on the other hand, continued to be a popular notion among readers. It was, however, an even greater source of disillusionment for Shuttleworth. Although he had already compromised to the notion of community, none of the offers he received really filled the bill. Few readers, he noted with discouragement, combined the necessary dedication and dollars.

The human element, however, still has us stumped. In short - and over-simplified to a painful degree - the people that have the dollars don't see why they can't have cars and flush toilets...

...freaks who do understand the need for keeping cars out usually become unbearable asses during any discussion of money - or honest toil - we'll need to construct the eco-town. 53

Slowly even the notion of an eco-village disappeared; the research center became once again a private purview.

Yet by then the realities of his readership had been driven home to Shuttleworth. A new commercial tone, in which enthusiasts were not just an audience, but a market, began to emerge. The Rodale magazines, as we have seen, always carried ads for gardening supplies and equipment. The News now expanded this consumer consciousness, carrying, in addition to the ads for natural foods, roto-tilling and vitamin supplements; those for all the paraphernalia of a middle-class lifestyle for the young, including stereo equipment, 'natural' cosmetics, and mod posters and T-shirts.

In the eyes of many enthusiasts, Shuttleworth had "sold out".⁵⁴ Ultimately he would sell the rights to The Mother Earth News to Dell Publishing Company, putting him on solid financial footing, but abdicating his pledge to maintain a "people publication". The motto of the News, changed from "access to tools", became "more than a magazine...a way of life". The "way of life" itself came to have less and less to do with self-sufficiency, and more and more to do with a popular vision of alternative lifestyles for the young.

Nevertheless, Shuttleworth's vision of independence and self-sufficiency did influence the 'new' organic movement. For those who wanted to discover their talents and inclinations,

the ideal of the garden as a testing ground of personal worth had broad appeal. For the many enthusiasts who turned to farming without much else on their minds, Shuttleworth's vision helped to transform their activities and give them substance and meaning.

At the same time, this vision helped to integrate the old and the 'new' organic movements. The values espoused by Shuttleworth echoed those traditionalists had embraced with Rodale. Although the young readers of the News often seemed naive and unthinking to older enthusiasts, each generation showed good grace in trying to understand the other. Shuttleworth, of course, did as little as possible to alienate any section of his potential readership.⁵⁵ In this he was largely successful - little in his journal could cause the older generation to take offense. And, by making a virtue of hard work, he gave added legitimacy to new enthusiasts in the eyes of the old guard. His vision, and not the spiritual or political quests of communalists, helped to build a bridge between the new movement and the old.

Shuttleworth's original vision, of the independent family farmer, was extended and consolidated through the efforts of a second publicist, Chuck Walters, Jr. A midwest enthusiast, Walters founded his publication, Acres U.S.A., with inspiration gleaned from the writings of William Albrecht, soil scientist at the University of Missouri. Albrecht had combined his academic training and his sympathy to the organic

cause to come up with the notion of "ecological agriculture". Walters decided to popularize Albrecht's work directly as it applied to the midwest farmer.⁵⁶

Walters, in his vision of the down-to-earth and hard-working farmer, never remotely compromised with the communal vision as Shuttleworth had. In some ways, Walters had a clear sense of the farmer as a practical businessman and of the financial constraints that compelled his operation. On the other hand, he sensed that many farmers were discouraged by what they saw as the chemical treadmill. In his journal, he set out to combine an appeal to the efficiency of the non-chemical methods with the new ecological conscience.

His own compromises, however, bemused many organic advocates. Walters, tuned to the typical large midwest farm, encouraged a new branch of commercialization in the movement. At his Acres U.S.A. conferences, enthusiasts of the organic method found themselves confronted with huge demonstration displays of large-scale farm machinery, new commercial 'organic' fertilizers, and suggestions for applying their methods to farms beyond the scale many had ever seen. While Walters managed to appeal to the midwest farmer, many traditional enthusiasts came away more than a little uneasy about these commercial developments. Here, it seemed, was another possible "sell-out" to the forces of agribusiness. Walters might have his heart in the right place, but his vision left advocates of spiritual, political and self-sufficient

discovery uncertain about the direction that the organic movement would be taking.

The New Age

Of all the heroes, old and new, embraced by these new organic enthusiasts, J.I. Rodale attained the greatest notoriety. His new-won fame, however, was to be brief. Rodale died in 1971, at the peak of his popularity. Before his death, the seeds of a Rodale legend were sown, but it was left to the younger generation to deal with the problems of coalescing and sustaining the organic crusade.

Evidence of Rodale's new support could be found in the growing circulation figures for his magazine. 1970 and 1971 were boom years for Rodale Press. The subscription list for Organic Gardening and Farming leaped by 30% each of these years, in contrast to relatively small rises of 17% and 2% for 1968 and 1969. In just four years, the circulation rose from 382,208 to 757,229; Organic Gardening and Farming had become the most popular gardening magazine in the country.⁵⁷

"Catching Up to Rodale Press", the title of a March 22, 1971 article in Time, captured something of the new mood.⁵⁸ Rodale, a national curiosity, had become a prophet to be explained.

Up to this point the scant attention paid to Rodale had characterized him chiefly as a freak. In 1966 Eleanor Perenyi, although she identified herself as an enthusiast in a Saturday Evening Post article, nevertheless profiled Rodale apologetically. He was not a quack, she insisted, but she

could not deny that he was a bit of a crackpot. Even in Perenyi's generous view Rodale became a misfit-

...the Don Quixote of the compost heap, tilting his lance against the dangers and curses of the technological world. 59

His constituency, she admitted, was tiny. With only the old recruits of the victory gardens to point to, "the resources of the health groups (one-man stores and modes mail-order businesses operating out of small towns or marginal organic farms) [which] command little influence", there was little Perenyi could offer in hope of confirming Rodale's importance.

By 1971, however, the overwhelming shadow of environmental enthusiasm cast Rodale in a different light. Not only was he broadly recognized, but the tone of appraisal had changed dramatically. Now, despite the fact that Rodale remained a peculiar brand of an American eccentric, his influence was undeniable. However, the compliments handed out, as for the Nearings, were backhanded. Much was made of Rodale's perseverance in the organic cause against heavy odds -- as the media sized him up he was part cagey businessman, part quack, and part prophet.

This recognition meant a great deal to Rodale. Fame to him meant not merely new recruits to the movement, but the recognition he began to receive from Time, Penthouse, and The New York Times Magazine.⁶⁰ After years of struggling for survival, and of hoping for fame as a writer, he now made headlines. Within a few short months in 1971, Rodale,

featured prominently in these magazines, became an invited guest on Dick Cavett's national talk show. Rodale blossomed under all this attention -- an almost childlike glee began to replace his earlier bitterness.⁶¹

J.I. Rodale chose to take his new fame at face value. Generally delighted by what he saw as the 'age of recognition' for organic farming, he basked in the glow of his new popularity. His son, Robert, the brains behind-the-scenes responsible for the rising success of Organic Gardening and Farming, went largely unapplauded.

J.I. Rodale enjoyed the role of prophet immensely. Although eager to welcome the participation of new enthusiasts, he felt this to be a late day discovery, a just vindication after the years of challenge and abuse he had endured. And, whatever his delight, Rodale never overlooked an opening to put in a plug for his theories.

It's made me so much happier. In the old days, I used to get such clobbering and insulting, you know, and if I wasn't so well nourished, it would have affected me, but I stood up under it, because I had plenty of vitamin B, which is the nerve vitamin. 62

With success, Rodale became almost a caricature of himself, of the organic crank his critics had envisioned. Rodale the crank, the prophet, saw himself as an institution; he was obsessed with his own contribution to the movement.

Before the young came to us, my magazines were being listened to by a very limited audience. Suddenly these hippies and dropouts who had been making a lot of noise read my writings and found something real. 63

He preferred to see his new readers precisely as 'hippies' and dropouts', not as an informed environmental constituency.

There is so much truth in what we say that if you are not prejudiced, you must become convinced. They are buying land and growing food organically. Of course, when they taste the difference in products, they never want to go back. 64

In the last published interview he gave, for Penthouse magazine in June 1971, Rodale blazed with new ideas. His latest crusade included an attack on the deleterious effects of eating wheat products.

Bread is the most obesity-causing food of all. I am running a series of articles showing that diseases like rheumatic arthritis are caused by bread. I am also working on a theory that the warmongering nations are those eating wheat -- Russians, English, French, Germans, Polish, Americans. The rice-eating nations are much more placid and not inclined to go to war. Even in China the real warmongers were the wheat-eating mandarins in the north. 65

To the last, Rodale remained a showman making sensational claims, surrounded with controversy. That same month he died putting forth his claim during an appearance on the Cavett show, at the height of his public recognition.

Yet the contemporary movement had, in many ways, passed Rodale by. While the tributes paid to him before and after his death accurately acknowledged him as the father of the American organic crusade, he failed to grasp the temper of the new movement. At the end, his leadership and new-won popularity were symbolic, not substantive.

For all the enthusiasm and ideas of new organic advocates, no real movement had yet been organized. No national

organization existed, and only the consolidation of a few local groups gave credence to the claims of statewide organizations. The new movement - by no means an overnight success - actually came out of a set of confusions and compromises. Although sharing the same emotional response to a return-to-the-land, new advocates still had dramatically different visions in mind. These differences confounded the gap between inspiration and organization - no common mandate directed enthusiasts.

At the very peak of environmental enthusiasm, however, a process of reevaluation began. In almost the same breath that they declared the success of Earth Day and the "revolutionary" strength of the environmental movement, advocates began to discuss the possibility of a distinct and organized organic movement. Not that these organic farming enthusiasts intended to abandon environmental concerns, or to split from the accepted ecological doctrines -- rather they saw the promise of an agricultural revolution as a continuation of the environmental movement's vision within a more concrete and immediate sphere.

The process of creating a distinct organic movement also contrasted to failure of earlier movements in the eyes of enthusiasts.

You know, there's an intensity to this that hasn't been examined. I'd say it's intense but not central. It's a whole larger aspect of the environmental movement which has not died out. Now this has been the most effective part of the environmental movement, and this part is going to grow, because it has the potential. 66

In this light, many advocates wanted to secure a definite course of action unshakeable against the tides of merely "fashionable politics" or temporary faddism. Wendell Berry, for one, had voiced this concern in his Earth Day address, confessing a "justifiable skepticism" toward the future of new movements. Berry echoed the experience of many organizers from the sixties -- the fading of movement consciousness at its peak, and the "considerable danger that the Environmental Movement will have the same nature".

For it seems to me that the Civil Rights Movement and the Peace Movement, as popular causes in the electronic age, have partaken far too much of the nature of fads. Not for all, but certainly for too many they have been the fashionable politics of the movement. As causes they have been undertaken too much in ignorance; they have been too much simplified; they have been powered too much by impatience and guilt of conscience and short-term enthusiasm, and too little by conviction and deliberation. 67

Murray Bookchin, who had earlier advocated all acts "outside bourgeois structures", now began to call for refinements of "crude environmentalism". And, by 1971, when the last Whole Earth Catalog was published, Gurney Norman echoed this same concern for the failure of the environmental movement.

Most of the current talk about 'ecology' in America is simply the noise that accompanies all fads. It's obviously doomed to go the way of hula-hoops and the fifty-mile hike. 68

Consolidation now dominated the mood of the day. As confidence in the "Movement" drained away, enthusiasts began to see the organic cause as a single stable force. Yet here too, they faced problems. In their self-conscious striving

for a strong surviving tradition, enthusiasts hoped to turn to the Rodale heritage. Norman, among others, spoke of "a national energy that since its beginnings early in the 1940s has grown to a force so potent by now that it contains serious political implications".⁶⁹ Robert Rodale tried to do his part by reinstituting the farming section of Organic Gardening magazine, by inviting farmers to meet in Emmaus for the first Rodale conference, and by publishing a "directory" of organic health food stores, clubs, and associations. Yet these efforts failed to unify the now diverse sentiments of enthusiasts, or to create a national organization.

As enthusiasts began to address the problems of organizing the movement, they also began to recognize the deep splits among advocates. Not only were many communes disbanding, and many back-to-the-land advocates returning to the city, but many of the original readers were in fact urban sympathizers drawn to natural lifestyles. The glaring absence of real farmers in the organic ranks troubled enthusiasts. How could they present the organic method as a practical agricultural alternative when they had so few practicing farmers among their members?

Faced with these problems, many enthusiasts turned to research, to a notion of "new science" as a unifying solution for the movement. Under the guise of scientific support, advocates hoped to promote the credibility of the organic method and to find ways of organizing their diverse efforts.

Footnotes - Chapter Six

1. Frank Ford, New Harvest, (Fort Worth, Texas: Harvest Publishing, 1974), also interview with Ford, Mother Earth News, 29, (September 1974).
2. Robert Houriet, Getting Back Together, (New York: Coward, McCann and Geoghegan, 1971), p. 121.
3. Ibid.
4. Interview with Joe Smiley, farmer of Eastern Townships, Quebec, April 23, 1977. Smiley said that the organic idea was the best "practical magic" he had found within the whole 1960s "revolution".
5. Interview with Steve Kaffa, University of Santa Cruz Farm and Garden Project, Santa Cruz, California, May 1976.
6. Helen Philbrick, "Bio-Dynamics in Recent Years", Bio-Dynamics, 122, (Spring 1977), p. 22.
7. H.H. Koepf, "Bio-Dynamic Farming and Gardening in Our Time - Agriculture as a Social Task III", Bio-Dynamics, 103, (Summer 1972), p.1.
8. Philbrick, "Recent Years", p. 22.
9. Ibid.
10. Interviews with Ben Ladd, Eliot Coleman, Sam Smith, European farm tour, October 1976.
11. Carsten Pank, "A Farmer's Dialogue", Acres U.S.A., (March 1977).
12. Paul Hawken, The Magic of Findhorn: An Eyewitness Account, (New York: Bantam Books, 1976), p. 178-179.
13. Ibid., p. 57.
14. Ibid., p. 192.

15. Yet these enthusiasts, like others, were concerned with survival and prone to compromise. One of the first leftist commentaries, a WIN issue on ecology, is understood today by its editor, Marty Jezer, as 'totally opportunistic'.

I said to myself - "ecology" - I'd never heard of it - but I thought, "this is radical, let's go with it".

Ecology seemed to promise radicalism because it promoted action both on the broadest possible scale and on the most immediate personal level. The new left embraced the "politics of ecology" because it made all action virtuous, and defined all problems of the environment as revolutionary crises. Ecology seemed an answer to the threat of loss of "The Movement".

The role of women in the back-to-the-land and organic movements has been, if not always a point of outright contention, certainly varied. Some enthusiasts see women as traditional homemakers and helpmates; others insist on women's equal status as organizers and farmers.

16. Murray Bookchin, Post-Scarcity Anarchism, (Montreal: Black Rose Books, 1971), p.16.
17. Murray Bookchin, Our Synthetic Environment, first published 1967, 2nd edition, (New York: Harper Colophon Books, 1974).
18. Interview with Murray Bookchin in Mother Earth News, 10, (July 1971), p.6.
19. Interview with Marty Jezer, Montreal, Quebec, March 8, 1977. Lawrence Veysey also makes this point in his excellent treatment of the American anarchistic and spiritual experience, The Communal Experience: Anarchist and Mystical Counter Cultures in America, (New York: Harper and Row, 1973), p. 201.
20. Ibid., p. 194.
21. Interview with Marty Jezer, Montreal, Quebec, March 8, 1977, see Hugh Beame, et al., Home Comfort: Stories and Scenes of Life on Total Loss Farm, (New York: Saturday Review Press, 1973); Raymond Mungo, Total Loss Farm, A Year in the Life, (New York: Bantam Books, 1971).

22. Quoted by Peter Janssen, "The Age of Ecology", in Ecotactics, ed. John G. Mitchell and Constance L. Stallings, New York: Trident Press, 1970, p. 55.

23. Yet the need for political justification, while transformed, never entirely disappeared. Although some old time anarchists, like Bookchin, and like Paul Goodman, applauded modern anarchism as "the increased practice of anarchist living", other new and old radicals doubted this vision. The appropriation of the move back to the land as political activity was continually debated. A coterie of new leftists who saw themselves as tough-minded strategists voiced the major doubts. David Kolodney, in Ramparts, called for stronger political analysis, and a reaffirmation of serious political work. In certain moods, older radicals expressed resentment at the political dilution of the movement and the way in which new enthusiasts seemed to congratulate themselves for even minor success. Jim Fowler, the head of the Colorado organic growers, a long-time anarchist/marxist who had fought in the Spanish Civil War, commented on the naivety of the current political celebrations.

You know, they act as if they were the first to go back to the land, much less the first to worry about why. (interview, European Farm Tour, 1976).

Yet, for the most part, these older radicals were more forgiving of the apolitics of the movement than hard-core new leftists. Elaine Davenport, socialist, pacifist, sometimes farmer and always a gardener, wants to pick up on the continuities in the movement, to cherish the possibility of new political vitality. In her 30 years of involvement with the organic movement, Elaine has seen "people and groups come and go", yet she writes of Pragtree Farm near Seattle as a "kind of center of things here".

They're related to the Worker's Brigade who sell produce at our public market. I helped start the coop that started the group that started the brigade 17 years ago! So we're all related-the whole classical Marxist (political)-radical science movement-and back to the earth people are interrelating. (personal letter May 11, 1977. For those on the land, however, these debates held little interest. They had risked so much and were unlikely to give up their view of themselves as part of a larger, more critical movement.

24. Jim Hightower, "Who Pays for Agricultural Research?", Environmental Action Bulletin, (January 9, 1971), p. 4.

25. Gurney Norman, "Organic Gardening and Farming Books", The Whole Earth Catalog, (Spring, 1970), p. 33.

26. Marty Jezer, unpublished ms., Packers Corners, Vermont, p. 46.
27. Interview with Marty Jezer, Packers Corners, Vermont, in Montreal, Quebec, March 7, 1977. Jezer suggests that the least political back-to-the-land farmers have been the ones to "discover" Nearing's message.
28. "Prophets of the Good Life", Newsweek, September 14, 1970, p. 102-103.
29. Charles Elliot, "Up/on the Farm", Time, (January 18, 1971), p. 78.
30. Marty Jezer, "The Death of the American Farmer", Eat It: Agribusiness, Farming, Food and You, reprint from WIN, 1972, p. 3; Jezer wrote me that

It was one of the best selling issues ever - much to everyone's surprise. We didn't know that anyone was interested in farming at that time. And for a while it served as a resource guide to radical agriculture, at least on the left. My feeling is that this kind of propaganda is the most valuable thing that people like myself have grown. [sic]
31. Ibid.
32. But even this sweeping inspiration failed to live up to the expectation of some enthusiasts. Jeff Cox faulted populism as a mere "concern for people". In his view, "The organic movement is more than a populist movement, for it includes the whole web of life, not just people".
 Ibid., p.29.
33. Wade Green, "Guru of the Organic Food Cult", The New York Times Magazine, (June 6, 1971), p. 70.
34. Robert Rodale, "Compost and Politics DO Mix", Organic Gardening and Farming, 21, (Nov. 1972), p. 30.
35. Ibid.
36. Stewart Brand, "Purpose", The Whole Earth Catalog, (July 1970), p. 3.

37. Brand, "Communes", The Whole Earth Catalog, 3, (1971), p. 54.
38. Gurney Norman, "Books", p. 33.
39. Ibid., p. 32.
40. John Shuttleworth, "Editorial", The Mother Earth News, 1, (January 1970), p. 1.
41. Interview with John Shuttleworth, The Mother Earth News, 31,32, (Febr.-March 1975), p. 47.
42. Ibid.
43. John Shuttleworth, "Editorial", The Mother Earth News, 2, (March 1970), p. 3.
44. "Contacts", The Mother Earth News, 2, March 1970, p. 62.
45. "Positions and Situations", The Mother Earth News, 28, July 1974, p. 84.
46. Ibid., p. 83.
47. Ibid., p. 84.
48. Ibid.
49. "Editorial", The Mother Earth News, 25,, January 1973, p. 18.
50. "Editorial", The Mother Earth News, 29, September 1974, p. 90.
51. Ibid., p. 48.
52. "Mother Reports", The Mother Earth News, 30, November, 1974, p. 18.
53. "Mother Reports", The Mother Earth News, 36, (July 1975), p. 20.

54. Interview with Marty Jezer, Packers Corners, Vermont, in Montreal, Quebec, March 7, 1977. Jezer had contributed an article on the agribusiness crisis, "How Many Harvests Do We Have Left?", to the fourth issue of the News. He quickly lost heart, however, as Shuttleworth seemed to him to turn to lifestyle concerns. Through him, I obtained a copy of the current brochure for NEWS advertisers, which details their purchasing inclinations for photographic equipment, tv's, stereos, tape recorders, cars, books, and musical instruments. See "The Principle Readers of The Mother Earth News", conducted by Don Bowdren Associates, 1977. The median income reported by readers was \$18,000. 25.8% reported an income of \$25,000 and over. So much for self-sufficient struggle.
55. However, Shuttleworth is rumored to have turned down a "Positions and Situations" ad from a gay commune.
56. Chuck Walters, Jr., The Case for Eco-Agriculture, (Raytown, Missouri: Acres, U.S.A., 1971); William A. Albrecht, The Albrecht Papers, ed. Chuck Walters, Jr., (Raytown, Missouri: Acres, U.S.A., 1975).
57. Records of Circulation Dept., Rodale Press, Emmaus, Pa.
58. "Catching up to Rodale Press", Time, March 22, 1971, p. 51.
59. Eleanor Perenyi, "Apostle of Non-Conformity", Saturday Evening Post, reprint, (1966), n.p.
60. "Catching Up", p. 51; Gay Bryant, "J.I. Rodale - Pollution Prophet", Penthouse, 2, June 1971, p. 39-42; Wade Green, "Guru of the Organic Food Cult", The New York Times Magazine, June 6, 1971, p. 30-31, 54-60, 65-70.
61. Carleton Jackson, "Non-Conformity", 1974, p. 219. Jackson quotes a letter from Rodale to Betty Franklin, May 25, 1971: "The climate sure has changed. Imagine, 30 years of clobbering and now I have become respectable".
62. Green, "Guru", p. 30.
63. Bryant, "Pollution Prophet", p. 42.
64. Ibid.

65. Ibid.
66. Interview with Paul Relis of the El Mirasol Garden Project, Santa Barbara, California, in Montreal, Quebec, May 7, 1976.
67. Wendell Berry, "Think Little", The Whole Earth Catalog, (September 1970), p. 3.
68. Gurney Norman, "Books", 1971, p. 33.
69. Ibid.

Chapter Seven

The Promise of "New Science"

In the early 1970s, as problems of institutionalization and organization came to the fore, the promises held out by enthusiasts of a "revolution in consciousness" and of a "renaissance man", faced their first concrete test. Elaborating on ecological rhetoric, many enthusiasts now advanced the notion of "new science" as a means of realizing their visions of agricultural and social reform. These advocates fell back on a deep but recurrent mood in the organic movement. Despite the failure of early collaborations with the scientific establishment, and the anti-intellectualism expressed by many enthusiasts, the hope that the organic method would ultimately be vindicated as the "most scientific" agriculture had never been totally forsaken. Now ecology, with its promise of "wholistic" and "relevant" research, renewed their hopes; enthusiasts fully expected that their "new science" would be more sophisticated and complex than anything the conventional agricultural community had yet offered.

It is going to take a lot more knowledge to develop a sane, stable agriculture than it did to develop our present conventional system, just as it took a lot longer to develop the science of ecology than it did mathematics or chemistry. 1

And, as the "myth of the garden" took on its new scientific guise, three areas of research interest engaged the attention of enthusiasts: 1) the salesmanship of conventional results, 2) the results of alternative technology institutes, and 3) the promise of vindication through energy research.

Scientific Salesmanship

Just as J.I. Rodale had once adopted conventional results to argue for the viability of the organic method, enthusiasts now turned to ecological research as a new scientific basis for the movement. And, like Rodale before them, they embraced some projects that barely fit the organic message, and some that scarcely deserved the label 'research'.

Curiously, the first hopes held out for a "new science" of organic farming, grounded in an institutionalized framework of 'relevant' research, bore little resemblance to the self-consciousness of early environmental activists. Yet the motives of scientists, crusading or pecuniary, did not trouble organic advocates. What they hailed in this first excitement was a sense of new possibilities; they seldom made fine distinctions among the new ecological research results.

And, in a second curious turn, the organization of the "new science" came to mirror elements of the scientific establishment. Organic enthusiasts not only celebrated the promise of "new science" as a rallying point of their crusade, but borrowed many of the rituals of the traditional scientific ideal. They organized meetings and conferences with the

participation of 'new' experts, and began to compile a literature of organic research.

In their first overtures of scientific salesmanship, organic enthusiasts played up the student movement as a new academic interest in the organic method, capitalizing on environmental interest and activism. In 1970, M.C. Goldman, an editor of Organic Gardening and Farming, headlined his overview of "the nation's campus scene" with the claim that "The Organic Revolution Goes to College".² Goldman found new research potential in a wide range of university and college projects. At Santa Cruz, California, for instance, Goldman highlighted a university garden project as part of the new academic concern for organic methods. The garden project, proposed by Peter Lee, a philosophy professor, and carried out under the direction of Alan Chadwick, an ex-English landscape gardener and self-proclaimed mystic, recruited students as gardening volunteers and apprentices. These students, however, hardly qualified as researchers. Santa Cruz, a liberal arts college built on an atmosphere reflecting the early California student movement, was worlds away from the world of regimented research at Davis, the agricultural campus of the California system. In fact, the Santa Cruz gardeners themselves had no research pretensions, but saw their project as a loose meeting ground for the back-to-the-land counter-culture, environmental activism, and student protest.³ Yet Santa Cruz, publicized widely, became legendary both within

and without the organic movement. Not only Rodale Press, but The New York Times, Newsweek, and the Washington Post ran articles on its new 'experiment'.

The other projects heralded by Goldman similarly made up in publicity what they lacked in research. At Ambassador College in Texas, the organic agricultural course, practical and elementary, had spiritual rather than scientific underpinnings. Goldman, however, stressed its "well-equipped ag laboratory". At Berkeley, California, the conservation gardening course involved essential practical instruction. The Berkeley instructor, Bargyla Rateaver, had a botany doctorate, but she was better known as "Mrs. Organic Agriculture in California", a life-long advocate and local television and radio personality.⁴

These projects celebrated by Goldman as examples of a new academic interest had little to do with the question of new research. Yet Rodale Press had been sold on its own scientific salesmanship. In 1973, the Rodale staff extended this compiling effort to a full length monograph, The Organic Guide to Colleges and Universities.⁵ Here they listed over a hundred environmentally related course offerings, most of which had nothing to do with the organic message. They relied on a vague melding of environmental and student activism to sell their "new science".

This same salesmanship extended to the assessment of conventional research results. Enthusiasts used the

encompassing notion of "new science" to refer to a variety of studies seen as ecologically relevant. The boundaries of this research included much specialized research; enthusiasts labelled a result 'organic' so long as its results could be made to tally with their own expectations. As Nick Veeder, a New York teacher and organic farmer suggested, "...about 95% of our technology is common, only about 5% is different".⁶ Yet the notion of "new science" incorporated much that came from that shared 95%; many enthusiasts continued to rely on traditional texts for their basic understanding of soils, crops, and livestock, and many of their 'new' results came from the conventional agricultural literature. The rhetoric of "new science" transformed the work of conventional researchers. Taking organic and conventional farming systems to be strikingly different entities, these enthusiasts discovered hidden significance in conventional results.

More and more reports of research results appeared in the pages of Organic Gardening and Farming. Nutritional studies, sewage reclamation, nitrogen fertilizer contamination, and biological insect control all figured in the "new science" hailed by Rodale publicists.

A second kind of publicist, the scientist as enthusiast, also appeared in the movement. These researchers, both academics and advocates, led double lives, travelling to conferences, and building an organic research literature by compiling bibliographies of related research. Stuart Hill,

of MacDonald College near Montreal, became one such key publicist. Hill, a soil ecologist, encouraged students to take up organic questions; he hoped to create a Centre for Ecological Agriculture at MacDonald which might become a blueprint for the new scientific organization. As a popularizer, Hill drew from the conventional literature to document organic claims.⁷ He travelled to organic conferences throughout the United States and Canada with this message. Maria Linder, a second publicist, followed much the same route. Linder, a cancer researcher at M.I.T., came from a family of Anthroposophists.⁸ She worked during her college summers as Ehrenfried Pfeiffer's research assistant, and became a popularizer of his work. Although Linder's evidence was borrowed from Pfeiffer, she became an invaluable scientific ally in the eyes of the movement, travelling to general conferences and to the meetings of bio-dynamic and organic gardeners. The publicity offered by these scientific advocates helped to strengthen the notion of "new science" in the movement.

Bargyla Rateaver, "Mrs. Organic Agriculture in California", took this scientific salesmanship a step further by organizing what she called the "First International Conference on the Organic Method for Farm and Garden" in January 1973. At this San Francisco conference, Rateavar recruited scientists alongside practitioners as experts on the organic method. She convinced twelve faculty members within the University of California system to give short presentations on their

Rodale, J.I., "Grants to Research Institutes", Organic Farmer, vol. 1, no. 6, January 1950.

Rodale, J.I., Pay Dirt, Rodale Press, Emmaus, Pa., 1945.

Rodale, J.I., Why I Started Organic Gardening, Organic Gardening and Farming, vol. 14, no. 5, May 1967.

Rodale, Robert, "Compost and Politics DO Mix", Organic Gardening and Farming, 21, November 1962, p. 26-30.

Rodale, Robert, (editorial), "1963- A Year for Action", Organic Gardening and Farming, 10, September 1963, p. 15-17.

Rodale, Robert, "Rachel Carson Makes a Television Conquest", Organic Gardening and Farming, 10, June 1963, p. 36-37.

Rodale, Robert, "Rachel Carson's Masterpiece", Organic Gardening and Farming, 9. September 1962, p. 17-19.

Rodale, Robert, Sane Living in a Mad World, New American Library, 1972.

Rodale, Robert, "Who Pays for Agricultural Research", Organic Gardening and Farming, January 1954.

Roos, Leslie L. Jr., The Politics of Ecosuicide, New York: Holt, Rinehart and Winston, 1971.

Rorty, James,; Rorty, Norman,; and Phillips, N.,MD, Bio-Organics: Your Food and Your Health, (orig. titled Tomorrow's Food), Prentice-Hall, Inc., 1947: Lancer Books, 1956.

Rossiter, Margaret W., The Emergence of Agricultural Science Justus Liebig and the Americans, 1840-1880, New Haven and London: Yale University Press, 1975.

Rudd, Robert L., "Pesticides: The REAL Peril", The Nation, vol. 189, 1959, p. 401.

Rudd, Robert L., Pesticides and the Living Landscape, Madison, Wis., University of Wisconsin Press, 1964.

- Russell, Howard S., A Long, Deep Furrow: Three Centuries of Farming in New England, Hanover, N.H.: University Press of New England, 1976.
- Schumacher, E.F., Small is Beautiful: A Study of Economics as if People Mattered, London: Blond and Briggs, 1973.
- Sears, Paul B., "Ecology - A Subversive Subject," Bio Science, 14(7), July 11, 1964.
- Shepard, Paul, and McKinley, Daniel (eds.), The Subversive Science: Essays Toward an Ecology of Man, New York: Houghton-Mifflin Co., 1969.
- Shepherd, Arthur Pearce, Scientist of the Invisible: An Introduction to the Life and Work of Rudolf Steiner, British Book Centre, 1959.
- Sinclair, Upton, The Jungle, London: T.W.Laurie, 1906.
- Smith, Henry Nash, Virgin Land: The American West and Symbol and Myth, Cambridge, Mass.; Harvard University Press, 1950: New York, Vintage, 1957.
- Staff (The) of Rodale Press, The Organic Guide to Colleges and Universities, Emmaus, Pa.; Rodale Press, 1973.
- Steiner, Rudolf, Agriculture: A Course of Eight Lectures, London: Bio-Dynamic Agricultural Association, Rudolf Steiner House, 1974.
- Steiner, Rudolf, An Autobiography (transl. from German by Rita Stebbings), Blauvelt, New York; Rudolf Steiner Publications, 1977.
- Steinhart, J.S., and Steinhart, C.E., "Energy Use in the U.S. Food System," Science, 184; p. 307-316.
- Stone, Alan B., (interview with Stuart Hill), "Stuart Hill Calls It Ecological Agriculture", Harrowsmith, 1976.
- Stout, Ruth, "The Scientists Are Getting Nervous", Organic Gardening and Farming, 9, October 1962, p. 25-27.

Swados, Harvey, Years of Conscience: The Muckrakers,
Cleveland, Ohio: The World Publishing Co., 1962.

Taylor, W.P., "What is Ecology and What Good is it?", Ecology,
17, 1936, p. 333-346.

Thomas, Robert David, The Man Who Would be Perfect, John
Humphrey Noyes and the Utopian Impulse, University of
Pennsylvania Press, 1977.

Throckmorton, R.I., (Dean, Kansas State College), "The
Organic Farming Myth," Country Gentleman, September 1951,
p. 21.

Throckmorton, R.I., "Organic Farming - Bunk," Reader's Digest,
October 1952.

Todd, John H., "Shaping an Organic America: The Organic
Gardener and Farmer as a Scientist", Organic Gardening and
Farming, vol. 18, no. 11, November 1971.

Todd, John H., "Tomorrow is Our Permanent Address", The New
Alchemy Institute Journal, 4, 1977, p. 85-106.

U.S. Congress, House, Hearings Before the Select Committee
to Investigate the Use of Chemicals in Food Products,
Prepared Statement of Richard Bradfield, 81st Cong.,
November 29, 1950.

U.S. Executive Office of the President, Office of Science and
Technology, The Use of Pesticides, A Report of the Pres-
ident's Science Advisory Committee, Washington, D.C.,
May 1963.

von Hoffman, Nicholas, "Conventional Farming Inefficient,
Self-destructive?", Montreal Gazette, August 12, 1975.

Vandenbosch, Robert, "A Better Way to Battle the Bugs",
Organic Gardening and Farming, 24, April 1975, p. 60-72.

Vandenbosch, Robert, "Bouquets from the Spray Tank", Organic
Gardening and Farming, 22, October 1973, p. 66-71.

Vandenbosch, Robert, "Pesticides: They're Turning on the Bugs",
Organic Gardening and Farming, 22, April 1973, p. 70-73.

Vandenbosch, Robert, "The Rape of EPA," Organic Gardening and Farming, 25, January 1976, p. 92-96.

Veysey, Lawrence, The Communal Experience: Anarchist and Mystical Counter-Cultures in America, New York: Harper and Row, 1973.

Wacksmith, Guenther, The Life and Work of Rudolf Steiner, Whittier Books, 1951.

Walters, Charles Jr., The Case of Eco-Agriculture, Raytown, Missouri, Acres, U.S.A., 1969.

Walters, Charles Jr., (editorial), Acres, U.S.A., November 1975.

Whitfield, Stephen J., Scott Nearing: Apostle of American Radicalism, New York: Columbia University Press, 1974.

Whorten, James, Before Silent Spring: Pesticides in Pre-DDT America and Public Health, Princeton, N.J., Princeton University Press, 1974.

Wickenden, Leonard, Our Daily Poison, Devin-Adair, 1955: New York: Hillman Books, 1961.

Wiley, Harvey Washington, An Autobiography, 1930.

Wiley, Harvey Washington, The History of a Crime Against the Food Law, Washington, D.C., 1929: Rodale Press, 1957.

Winters, S.R., "Supervegetables for Health: Research into the Relation of Soil Content to Food Values of Plants," Hygeia, vol. 19, January 1941, p. 46-48.

Young, J.H., American Self-Dosage Medicines: A Historical Perspective, Lawrence, Kansas: Coronado Press, 1974.

Youngberg, Garth, "The Alternative Agriculture Movement", Policy Studies Journal, 6, Summer, 1978, p. 524-531.

Youngberg, Garth, "The Alternative Agriculture Movement: Its Ideology, Its Politics, Its Prospects". Paper prepared for delivery at the 1977 Annual Meeting of the S.W. Poli. Sci. Association, Statler Hilton Hotel, Dallas Tex., Mar 30/Apr 2, 1977.

Zwerdling, Daniel, "Can U.S. Farmers Kick the Petrochemical Habit?", New Times, vol 10, no. 11, May 29 1978.

Interviews

The individuals listed here are those that I contacted in advance requesting an "interview", or who spent time to outline their activities to me at conferences and meetings. I informally approached many other organic enthusiasts during the course of fieldwork - some who were not clear about my role "in" the movement, some whose names I never learned. This list of interviews is then incomplete - it represents only the most overtly structural discussions in my research.

Interviews

Chuck Alexander, Department of Agricultural Economics, University of Missouri, Columbia, Missouri; interviewed in St. Louis, Missouri, June 16, 1977.

Jerry Azevedo, Department of Radiobiology, University of California, Davis, California, May 19, 1976.

Joseph Alpen, Department of Chemistry, University of Massachusetts, Boston, February 24, 1976.

Gigi Berardi, Department of Natural Resources, Cornell University, Ithaca, New York, April 28, 1976.

Kostia Bergman, Department of Biology, Northeastern University, Boston, Massachusetts, February 25, 1976.

Roger Blobaum, independent agricultural consultant, Creston, Iowa; interviewed in St. Louis, Missouri, June 16, 1976.

Clement Boulanger, coordinator, Mouvement de l'Agriculture biologique de Québec, Montreal, Quebec, February 19, 1976.

Denis Bourgeois, Nature et Progrès, Paris, France; interviewed in Seegen Switzerland, October 18, 1976.

Paul Buck, High Vista Farm and Department of Food Science, Cornell University, Ithaca, New York; interviewed in Palo Alto, California, May 30, 1976.

George Casler, Department of Agricultural Economics, Cornell University, Ithaca, New York, April 28, 1976.

Vashek Cervinka, Department of Food and Agriculture, State of California, Sacramento, California, April 23, 1976.

Eliot Coleman, Small Farm Research Association, Harborside, Maine; interviewed during European Farm Tour, October 1976.

Barry Commoner, Center for the Biology of Natural Systems, St. Louis, Missouri, June 16, 1976.

Jean Collombon, Centre de Formation des Coopérants Culturels et Techniques Internationaux, Paris, France; interviewed in Seegen, Switzerland, October 18, 1976.

Dave Dahlston, Center for Rural Affairs, Walthill, Nebraska,
June 8, 1976.

Elaine Davenport, organic gardener, Seattle, Oregon,
interviewed during European Farm Tour, October, 1976.

Dennis Demmel, Center for Rural Affairs, Walthill, Nebraska,
interviewed in St. Louis, Missouri, June 18, 1976.

Otto Doering, Agricultural Economics Department, Purdue
University, Lafayette, Illinois; interviewed in St. Louis,
Missouri, June 18, 1976.

Ann Drescher, Rodale Experimental Farm, Emmaus, Pa.;
interviewed during European Farm Tour, October 1976.

Henry Ebensshade, organic enthusiast, Davis, California,
April 27, 1976.

Frank Eggert, Department of Small and Part-Time Farming,
University of Maine, Orono, Maine, interviewed during
European Farm Tour, October 1976.

Colin Fisher, Pye Research Association, Haughley, England;
interviewed in Seegen, Switzerland, October 19, 1976.

Jim Fowler, Colorado Organic Producer's Association, Denver,
Colorado; interviewed during European Farm Tour, October
1976.

Isao Fujimoto, Department of Applied Behavioral Sciences,
University of California at Davis, Davis, California,
May 18, 1976.

Richard Garcia, Division of Biological Control, University
of California at Berkeley, Berkeley, California, May 27,
1976.

Michael Gertler, Center for the Biology of Natural Systems,
St. Louis, Missouri; interviewed in Montreal, Quebec,
March 16, 1976; in St. Louis, Missouri, June 17, 1976; in
Montreal, as a student at MacDonald College during 1977
and 1978.

Jerome Goldstein, Executive Editor, Rodale Press, Emmaus, Pa.; interviewed in Seegen, Switzerland, October 16, 1976; in Emmaus, Pa., May 8, 1977.

Clarence Goluecke, Richmond Field Station, University of California at Berkeley, Berkeley, California, May 28, 1978.

John Haberen, Director of Research and Development, Rodale Press, Emmaus, Pa., June 8, 1977.

Ross Hume Hall, Department of Biochemistry, McMaster University, Hamilton, Ontario, May 1, 1976.

Miriam Harris, Jordan River Farm, Huntley, Virginia; interviewed during European Farm Tour, October 1976.

John B. Harrison, Mylora Farm, Richmond, B.C.; interviewed in Montreal, Quebec, May 26, 1975.

Joan Hodsman, Center for Ecological Agriculture, MacDonald College, Montreal, Quebec, May 21, 1975.

Bill Jewell, Department of Agricultural Engineering, Cornell University, Ithaca, New York, April 27, 1976.

Marty Jezer, Total Loss Farm, Packers Corners, Vermont; discussion in Montreal, Quebec, 1978.

Jean Johnson, Research Applied to National Needs, National Science Foundation, Washington, D.C.; interviewed in St. Louis, Missouri, June 19, 1976.

Michael Jost, Department of Plant Physiology, Michigan State University, East Lansing, Michigan, June 24, 1976.

Steve Kaffka, Farm and Garden Project, University of California, Santa Cruz, California, June 1, 1976.

Thomas Lang, Greenpeace Experimental Farm, Denman Island, B.C.; interviewed in North Hatley, Quebec, March 28, 1976.

Mary Langdon, British Soil Association, London, England, October 28, 1976.

Maria Linder, Department of Nutrition and Food Science,
M.I.T., Cambridge, Mass., February 26, 1976.

William Lockeretz, Center for the Biology of Natural
Systems, St. Louis, Missouri; interviewed in Boston,
Mass., February 22, 1976; in St. Louis, June 18, 1976.

David Ludewig, Illinois organic farmer, student at MacDonald
College, Montreal, Quebec during 1976-1977.

John Madison, Department of Environmental Horticulture,
University of California at Davis, Davis, California,
May 20, 1976.

A.D. McLaren, Department of Soils and Plant Nutrition, Univ-
ersity of California at Berkeley, Berkeley, California,
May 24, 1976.

Richard Merrill, New Alchemy West, Scotts Valley, California,
June 3, 1976.

Virginia and Lowell Naeve, organic farmers, North Hatley,
Quebec, March 28, 1976.

Tym Nason, The Maine Organic Farmer and Gardener,
Kennebunkport, Maine; interviewed during European Farm
Tour, October, 1976.

Scott Nearing, Harborside, Maine; interviewed in Boston,
Mass., February 21, 1976.

Jim Nolfi, Social Ecology Program, Goddard College, Plain-
field, Vermont, April 22, 1976.

William Olkowski, Division of Biological Control, University
of California at Berkeley, Berkeley, California, May 28, 1976.

Michael Perelman, Department of Economics, California State
University, Chico, California, May 21, 1976.

David Pimentel, Department of Entomology, Cornell University,
Ithaca, New York; interviewed in Boston, Mass., February
20, 1976.

Tony Pinchot, 1975 Secretariat, International Federation of Organic Agricultural Movements; interviewed in Seegen, Switzerland, October 16, 1976.

Don Price, Department of Agricultural Engineering, Cornell University, Ithaca, New York, April 27, 1976.

Paul Relis, El Mirasol Garden Block, Santa Barbara, California, May 11, 1976.

Charles Reinhart, Physics Department, Southwest State College, Marshall, Minnesota; by 'phone, March 20, 1977.

Anna Rodale, director, Rodale Press, Emmaus, Pa., June 8, 1977.

Robert Rodale, president, Rodale Press, Emmaus, Pa., June 7, 1977.

Walter Rosen, Department of Biology, University of Massachusetts, Boston, Mass., February 26, 1976.

Robert Rudd, Department of Biology, University of California at Davis, Davis, California, May 20, 1976.

Richard Root, Department of Entomology, Cornell University, Ithaca, New York, April 28, 1976.

Warren Sahs, Laboratory Superintendent, University Field Laboratory, Mead, Nebraska, June 7, 1976.

George Salzman, Physics Department, University of Massachusetts, Boston, Mass., February 26, 1976.

Michael Schuster, Bio-Dynamic Farming and Gardening Association, Toronto, Ontario, April 30, 1976.

Mark Schwartz, Soil and Health Foundation, Rodale Press, Emmaus, Pa., June 9, 1977.

Donald Scobey, Biology Department, North Dakota State Fargo, North Dakota, June 9, 1976.

Mary Shields, Stony Acres Farm, Canterbury, New Hampshire, interviewed during European Farm Tour, October 1976.

George E. Siebeneicher, Editor, Organischen Landbau, Munich, Germany; interviewed in Seegen Switzerland, October 18, 1976.

Curt R. Sorteberg, National Farmers Union, Denver, Colorado, interviewed in St. Louis, Missouri, June 16, 1976.

Joe Smiley, Eastern Townships Organic Farmers, Lennoxville, Quebec, April 24, 1977.

Sam Smith, Caretaker Farm, Williamsburg, Mass.; interviewed during European Farm Tour, October, 1976; in Montreal, Quebec, February 20, 1977.

Bob Steffen, Baystown Organic Farm, Baystown, Nebraska, June 8, 1976.

John Steinhart, Department of Geophysics, University of Wisconsin, Madison, Wisconsin, June 22, 1976.

Bill Stout, Department of Agricultural Engineering, Michigan State University, East Lansing, Michigan, June 23, 1976.

Marty Strange, Center for Rural Affairs, Walthill, Nebraska, June 8, 1976.

Richard Strong, California Farm Bureau, Berkeley, California, May 23, 1976.

Heather Tishbein, Countryside Journal, Waterloo, Wisconsin; interviewed during European Farm Tour, October 1976.

John Todd, New Alchemy Institute, Falmouth, Massachusetts, October 15, 1977.

Robert Vandebosch, Division of Biological Control, University of California at Berkeley, Berkeley, California, May 26, 1976.

Nick Veeder, organic farmer, Cooperstown, New York; interviewed during European Farm Tour, October 1976.

Hardy Vogtmann, Secretariat 1976-International Federation of Organic Agricultural Movements, Obervil, Switzerland; interviewed in Seegen, Switzerland, October 18, 1976; in Montreal, Quebec, May 22, 1977.

Dick Warder, Research Applied to National Needs, National Science Foundation, Washington, D.C.; interviewed in St. Louis, Missouri, June 20, 1976.

Ken Watt, Department of Biology, University of California at Davis, Davis, California

Chaitanya York, Maine Organic Farmers and Gardeners Association, Hallowell, Maine; interviewed during European Farm Tour, October 1976.

work at the conference. Ratevar gave these sessions the same kind of extravagant billing she used for enthusiasts. She subtitled Dr. C. Simeck's talk on "Rejuvenating Soil" as "Miracles by a scientist who loves the living things in the earth he enriches"; and Dr. Walter Gardiner's presentation on "How water moves in the soil" as "Unexpected, strange, exciting".⁹ Although the scientists appeared in a field of sixty presentations, the range of research experts was impressive, including a Davis horticulturalist, a Berkeley plant physiologist, and a Riverside soil scientist. Although not the sole experts in Ratevar's view, these researchers gave an extra stamp of legitimacy to this "first" conference.

There would be many other "first conferences" organized in these early years of scientific salesmanship. Just as the university course system had become a potential haven of organic claims, conferences became a cornerstone of new scientific support in the eyes of enthusiasts. Advocates not only idealized the goal of a "new science", they emulated the rituals of the scientific system.

Who were the new scientific heroes of the movement? Some researchers accepted the possibility of organic claims on the same good faith they had adopted environmental activism. Although not directly part of the movement, they sympathized with the idea that "there's a lot of good science in organics".¹⁰ On the other hand, the research promotions of the movement abraded the sensitivities of more conservative

researchers. Extending their fears of the "bandwagon" element of environmentalism, these researchers condemned the popular organic salesmanship more vehemently than they had damned Carson and Commoner. Echoes of this suspicion of publicity and fear of the contamination of "interested" science would reverberate throughout the crusade for "new science".

However the salesmanship of the "new science" ignored the ambivalence of its new heroes. J.D. McLaren, plant physiologist at the University of California at Berkeley, found himself lionized despite his reservations.¹¹ McLaren had appeared at the San Francisco conference organized by Bargleva Ratevar chiefly out of curiosity, not commitment. In short order, however, he became known as the researcher, contrary to conventional wisdom, who had proved that whole molecules could be absorbed by the plant root. Enthusiasts used McLaren's work to argue that chemical agriculture introduced dangerous pesticide molecules into the plant structure. Recalling his experience in a 1976 interview, McLaren marvelled at the reception of his data.

I began to realize that they had their own frame of reference, their own self-consistent way of looking at nature... I realized we wouldn't be talking the same language. I think much of it is nonsense -- I don't think it's relevant. They were just having a ball, like a meeting of some missionary society. A few of them were science-oriented, most of them had these artful notions of nature, and you don't make friends by shattering someone else's perspective. So I just kept my mouth shut and told my story. People were interested. They felt somehow or other that supported their viewpoint -- and I came away with mixed feelings. 12

By keeping his own counsel, McLaren wound up an organic hero. Although he later balked at enthusiasts' interpretations, carefully stating the problems of extending very specific laboratory work on the hemoglobin molecule to observations in the field or to other molecules, the popular accounts persisted. The "new science" continued to build on his research despite his own ambivalence.

James Madison, a second conference participant, also shared little with enthusiasts. Although Madison had been introduced to the Bio-dynamic movement and to Bromfield's writings many years earlier, he remained unaware of the new movement until the San Francisco conference.¹³ Madison, a horticulturalist at Davis, accepted Ratevar's invitation but not her beliefs, admired her energy but not her conclusions.

Well, it's all right on a personal level, but I'm not sure that one man's mysticism justifies another man following the same path. Let me put it that way. Which is the difference between that and science. If you know for instance that hydrogen and oxygen combine in a certain proportion, you can count on it, you don't have to deal with it thereafter. Now mysticism may have to be fairly individual,...I don't know. ¹⁴

Madison, recommended by organic enthusiasts at Davis in 1976 as a concerned scientist, had in fact only tangential interest. He was a dilettante, not a committed advocate; he was thinking about starting plot trials using compost as one test condition, but with no conviction that his work would vindicate organic methods.

Even researchers committed to non-chemical research have

not necessarily seen themselves as organic advocates. William and Helga Olkowski, proponents of biological insect control at Berkeley, stopped short of a whole-hearted espousal of organic methods. The Olkowskis published The City People's Book of Raising Food with Rodale Press, but they hesitated at what they saw as over-zealous and over-simple solutions. Although Bill Olkowski saw organic enthusiasm as "the closest thing in this society that I can relate to that's got any kind of answer", he insisted it was not the "last answer".¹⁵ When Stuart Hill wrote to Bill Olkowski, the latter replied warning about the problem of enthusiastic errors.

I wrote him back and I cautioned him to be cautious about organic farming -- how their hearts are in the right place, but their technology needs work. Now I will give you an example -- garlic for insecticide. It's an effective insecticide, Okay? But if you used it like they used DDT all these years, you'd have the same problems from garlic as you will from DDT. Let's say it's like whether you get -- whether you have a sledge hammer or a hammer, you still have got the wrong tool in your hand. 16

The Olkowskis also had serious reservations about the commercialism of the movement. The first draft of their book was rejected by Rodale Press as "too educational"; they continued to write it only because they needed the money for their projects and they wanted "to get the message out". However, they came to see Rodale Press as "really a business".

It's a business -- it's not utopian -- or anything like that -- they are trying to sell literature. They run a nice easy operation but they are still in the business of selling something. 17

And, like McLaren and Madison, the Olkowskis distanced themselves from the "mysticism" they associated with enthusiasts. These three-fold reservations made them only reluctant heroes to the organic movement.

Closer scrutiny might have shaken the movement's faith in its new scientific heroes; few enthusiasts, however, made any distinction between sympathy and advocacy on the part of researchers. The movement's vision of "new science" remained a popular and vaguely transmitted image. Just as relevant science seemed to provide the basis of an organic research literature, the new scientific sympathizers seemed to form a new constituency of like-minded advocates. Enthusiasts felt themselves to be at last breaking down the ranks of the anti-organic conspiracy.

Now too, organic enthusiasts developed a systematic interpretation of pressure and prejudice inside the agricultural establishment. They not only celebrated the fact that some researchers had joined their crusade, but felt newly righteous about the failures of the research establishment to respond to their demands. The driving force behind this analysis was a book published by Jim Hightower, director of the agribusiness accountability project in Washington, Hard Tomatoes, Hard Times.¹⁸ Hightower, although not specifically an organic advocate, documented the ties between the chemical industry and the land grant college system. Agribusiness, he charged, dictated agricultural research priorities and policies.

Hightower instilled his analysis with a special sense of injury by comparing the historical ideals of the land grant system with its current operation. Despite earlier promises of service and support for the farmer, he argued, the government had sold out to "no nobler objective than profits".

Incredibly, this concentration and integration receives the full blessing and support of the Department of Agriculture, which has abandoned the farmer, the farm worker and the majority of rural Americans and has made its bed with the processors, marketeers, and other business interests surrounding agriculture. 19

Hightower acknowledged J.I. Rodale's early attacks on patronage in the agricultural system; his detailed analysis re-inflamed the antagonisms enthusiasts directed against the research establishment. This righteousness at the abuses of the conventional research community reinforced the commitment of organic advocates toward "new science".

Sympathetic researchers also responded to what they saw as agribusiness harassment. Robert Vandenberg, chief entomologist at the Division of Biological Control in Berkeley, frankly attacked the chemical industry as a "pesticide mafia".²⁰ Vandenberg was not an organic purist; he still saw the need for some pesticides, but felt their present use out of all proportion to necessity. Unlike Carson and Rudd, he played up his notoriety to the hilt, deciding to nominally join ranks with organic enthusiasts. Between 1973 and 1976, Vandenberg published a series of articles in Organic Gardening and Farming, outlining the abuses of the "pesticides-as-usual

establishment" and their "savage rape of the EPA".²¹

Eventually Vandenburg's own work came under attack; a study he conducted on the cosmetic use of pesticides faced fierce opposition from the agricultural establishment.

Vandenburg: In other words, what we have got is a nest of snakes. We knew it from the start. It was just a matter of trying to get at it. And probably the most damning thing is the deceit and coercion and blackmail and threats and all that sort of thing that were directed at us. We tried to get at this thing.

Peters: Did you get anywhere?

Vandenburg: Oh yes. In a sense I have never been through such an experience in my life from the standpoint of ethics all up and down the line to abort this thing. Even before I knew I had gotten it [the grant] I was threatened by an executive of one of the fruit-processing companies. They didn't like it and they were going to do something when the report came out and complain about it to the university vice-president. And they did. 22

Under review by the Council on Agricultural Science and Technology (CAST), in his view a "corrupt outfit", Vandenburg's report became target of what he saw as a "hatchet job".²³ Through his friendship with Isao Fujimoto, rural sociologist and organic sympathizer at Davis, Vandenburg got advance warning of the CAST handling of his results. Fujimoto, one of 17 reviewers, charged that his positive comments had been distorted in the final CAST review; he refused to let edited versions of his statement stand.²⁴ The CAST committee, forced to use Fujimoto's original statement, added a proviso, "Further Comments on the Four Assumptions", which appeared as a rebuttal of his comments. Vandenburg, let in on Fujimoto's difficulties, agreed with the view that the CAST committee was

out to "sink the study". He was reassured, however, by other comments he received from the EPA.

But I am not going to worry about it. The important thing about the report is not what emerges from EPA, but the fact that EPA has sent it out to a huge number of people, and most of the vibes I get are good. 25

CAST, it seemed, could damage the report but not repress it.

In any case, by 1976 Vandebosch planned a wider publicity campaign against the "pesticide mafia" in his decision to write a popular account as "a guy in the trenches telling his story".

I call it "Bug Bomb". It is sort of the ecological, sociological, economical, political history and evolution of the current mess in pesticides. It is sort of autobiographical. That's a great aid because it is much easier to do that way. I am not an investigative reporter -- I do have about 25 years of experience. 26

This book promised to be exactly the kind of "horror story" that organic advocates would applaud. Vandebosch represented a sort of 'good guy' scientist to enthusiasts -- publicly demonstrating his sympathy, matching their own outrage. While he still operated within the conventional scientific system, his cooperation extended their attack on establishment abuses and confirmed their expectations of "new science".

Organic enthusiasts had hoped for a rapprochement with scientists on their own terms; what they achieved was something different. In their scientific salesmanship they adopted quite conventional research as organic results and conventional researchers as organic heroes. Yet we mistake the character

of enthusiasts' efforts if we simply equate them with 'failed science'. In borrowing from the language and forms of the scientific establishment, these celebrations of "new science" led organic advocates to publicize on presentable credentials, to recruit new sympathizers, and to confront establishment abuses. These celebrations also coalesced crusaders in a new way, joining some of the diverse sentiments of the movement. And, through their new 'research literature' and new conferences, enthusiasts began to organize their movement around the notion of "new science".

The Alternative Institute: Garden of the Scientific Age

Expressed in its most dramatic millinerian form, the vision of a "new science" went beyond scientific salesmanship, directly challenging the sanctity of the traditional research establishment. Aspiring to much more than a reevaluation of conventional results by movement publicists, many scientific advocates wanted to break away from what they saw as the limits of academic science.

Science hadn't trained us to be able to answer the most fundamental questions: How do you make that piece of earth sing, and how do you make it support those that live there? Degrees in agriculture, disease ethology, ecology... nothing! 27

In the eyes of these enthusiasts, neither the cursory institutionalization of relevant science nor the superficial efforts at compromise could provide more than a cover-up of deeper flaws. Like the political, spiritual, and self-sufficiency

visionaries, these enthusiasts saw ecology as a broadly 'revolutionary' doctrine, dictating a new scientific ethic -- wholism -- and promising a new cooperative scientific enterprise -- research for and by enthusiasts.

In 1970 a group of scientists, led by marine biologist John Todd, set up the first prototype for the scientific garden, The New Alchemy Institute. Todd, like many of the new researchers, responded to an ecological mandate broader than any previously outlined by organic advocates. At the New Alchemy, agricultural questions were to be incorporated into a larger scientific design, one which included the search for alternative technologies of wind, sun, and water, as well as land.

Know the sun, know the plants, know the soil,
know the people, know the shelter...have them
all interlaced. 28

This scientific design encompassed disciplines beyond the range of standard ecological thinking.

Fields as disparate as anthropology, psychology, the origins of consciousness and myth, physics, biology including agriculture, medicine and the study of natural systems, climatology, material and structural sciences, electronics, aerodynamics, light and optics, architecture, landscape architecture, and modes and transport and communication will be seen increasingly as elemental entities in a larger organic whole. 29

The New Alchemy Institute truly set out to "alchemize" traditional science.

Todd, a Canadian, began his scientific career in agriculture, but moved to marine biology for his graduate degree. Teaching in the United States and pulled toward environmental

activism in the early 1960s, he stood out as a bright young man on his way to big things. Soon, however, he began to rethink his "mega" scientific training. In the course of teaching a graduate seminar at San Diego, he tried out the elements of a new "micro" science while living on the land with his students. Todd had already read the arguments for a radical ecological vision proposed by Bookchin, but now, with his students, he faced the limits of his university training for the problems of actually understanding and surviving on the land.

It occurred to me that here I'd been in university since 1957, thirteen or fourteen years in academia -- and many of these students had been in almost as long as I had -- and we simply weren't trained in sensitive stewardship.³⁰

Todd decided to begin again "in a very tiny way", asking each student "to study one component of this place...and teach somebody else what you'd learned". The success of this experiment shaped Todd's future course.

And all of a sudden we were talking for the first time like we knew what we were talking about, even though we had just barely got the doors open! And here was this piece of land which was no longer an inhospitable enemy. Everywhere we were finding allies. Without knowing what was there, we never would have gotten the doors open far enough to see what was inside. It was very heavy for me.³¹

In 1969 Todd, his wife Nancy, and their good friend Bill McLarney left the academic life to set up The New Alchemy Institute. One year later, in June 1970, the institute, incorporated as a non-profit organization, moved to its permanent home on Cape Cod.

The New Alchemists, sharing deeply in the utopian spirit of the 1960s, wanted to create a technology on which to base a new society. His friendship with Murray Bookchin influenced Todd dramatically.³² The New Alchemy Institute became a center devoted to actualizing Bookchin's dream of ecology as a "technology for utopia". The New Alchemists initially set up their center as a communal venture, one tied to a vague anarchistic lifestyle and purposefully open to the appeals made by spiritual and self-sufficiency advocates. These scientists hoped not only to avoid cutting themselves off from social concerns, but to actively seek a new consciousness "in human terms".. Ecology, the "rebirth of a more wholistic vision", included all elements of the new life,

And a lot of this sort of thinking...wholism, a kind of sacredness of doing, you know, and of being. It enables anyone to get into politics without experience or knowledge because you're really working with your neighbor or in your own backyard. 33

promising a sensibility that "will alter our sense of ourselves and our relationship to nature and to the planet". Now the scientific and social revolutions could be viewed as one. In creating the basis for this new age, Todd and his fellow New Alchemists used appreciative as well as technical language. They spoke of themselves as "stewards" of the earth, of "husbandry" rather than "agriculture", and of the opportunity to create a "humble" science.³⁴ They called their design for an ecologically sound home and institute the New Alchemy "ark", and visualized it as "an early exploration in weaving together

the sun, wind, biology and architecture on behalf of humanity".³⁵ Utopian sentiments shaped both their scientific and social goals.

In this quest, the New Alchemists felt a special kinship with early organic crusaders. Todd read Bookchin, but he also explored the writings of Louis Bromfield and Sir Albert Howard.³⁶ Over fifty years earlier, Howard had damned the specialization of the research establishment in tones just as scathing as Todd's own. Howard, too, had called for a new research institute. Bromfield had set an example by using the farm as a research forum. These new researchers hoped to build on this critical heritage, and on the support of the organic movement. After years of attack and counterattack, of challenge and ridicule, these scientists began to make the first overtures toward organic enthusiasts.

John Todd and William McLarney first wrote to Robert Rodale in 1970, inviting him to visit and requesting financial support for the New Alchemy Institute. Rodale, already receptive to Carson and other ecological researchers, was singularly impressed by Todd's letter. In a 1977 interview, he still recalled its favorable impact.

I get lots of letters, but this was exceptional -- it was articulate and informed. So I went up to see what they were doing. 37

Rodale's first impression was reinforced by his visit. He decided to give the New Alchemists \$24,000 to develop a reader research program in conjunction with Organic Gardening and

Farming magazine, and to develop their own agricultural programs.

The idea behind the reader research program involved "teaching people to be scientists". Its antecedents lay in Howard's notion of the "lay investigator" and in the emulation of a newly politicized notion of Chinese science.³⁸ Howard had asked scientists to adopt the peasant as a "brother cultivator"; Chinese research, billed as "science that walks on two legs", offered the notion of a lay agricultural researcher akin to the idea of the "barefoot doctor". The peasant with a sophisticated knowledge of plant breeding became a prototype for the new scientist. The character of expertise underwent a transformation in this vision of lay science. Credentials were neither denigrated nor enshrined. Scientists and educated laymen were to become mutual heroes in the attempt to evolve "reader research". The New Alchemists tried to organize subscribers to Organic Gardening and Farming to conduct systematic trials in their home gardens and fish ponds. They hoped to collate these results as part of a comparative research design.

However, the vision of cooperative lay and expert research faded unexpectedly when the New Alchemists attempted to put it into practice. The new scientists confronted unanticipated difficulties in coordinating the work of their lay counterparts. In one early Organic Gardening and Farming article, Bill McLarney chastised readers for their brand of

overenthusiasm.

Enthusiasm is a fine thing, but unrestrained it can lead to jumping the gun and all manner of attendant difficulties. Since I began writing for OGF I have been impressed and pleased by the readers' enthusiasm for the notion of aquaculture. But my pleasure has been tempered by the fairly frequent need to compose a letter to some unfortunate aquaculture enthusiast informing him that his brand new pond is poorly designed and constructed. For every such person, there are five other aquaculture neophytes I manage to head off at the pass before they build the wrong kind of pond. 39

By making their own individual modifications to the master plan devised by the New Alchemists, many readers disrupted the entire basis of comparison that the scientists had hoped to establish. Robert Rodale recalled the difficulties of applying Todd and McLarney's ideas to the needs of the average farmer.

They are doing some relatively esoteric things. Our hallmark is to try to be very practical. We want to talk to our reader who is going out to dig a 9 foot by 12 foot hole in his backyard. 40

Rodale seemed to sense a real gap between the sophisticated ecological pronouncements of the New Alchemists and the practical demands of his readers.

Now there's a whole rhetoric of lifestyle change as John Todd sees it. This rhetoric precludes you from saying "dig a hole". 41

Despite then a common desire for "new science", cooperation between Rodale Press and the New Alchemy Institute was shortlived.

Yet even these difficulties might have been overcome if other expectations had been met on both sides. Neither

Rodale nor Todd wanted to go deeply into the story of their split in later interviews, but their differences involved more than semantic or technical programs for the "new science". Rodale, in funding the institute, seemed to expect to be the exclusive publicizer of New Alchemy results. Todd, although sympathetic and grateful to Rodale for his support, had no sense of any implicit contract of publication. He pushed the New Alchemy concept both in the popular press like Saturday Review and in his own institute publication. Direct collaboration between the two ended on this note.

Todd, in any case, was already looking for money to implement the broad ecological mandate he envisioned. One of The New Alchemy's chief sources of support was its own publication, The New Alchemy Institute Journal. Subscribers to the journal were viewed as members of the Institute, and potential practitioners of its research designs. Few subscribers reenrolled, however, and Todd found himself balancing on a "fiscal razor's edge".⁴² Soon the New Alchemists found themselves relying on private donations and a few lucky windfalls from small foundations. Eventually, they found it necessary to apply to traditional granting agencies like the National Science Foundation, but with little success. Financial problems continued to plague these visionaries of a "new science".⁴³

Nevertheless, the New Alchemy remained an important model for the movement and a powerful metaphor for the scientific hopes of enthused enthusiasts. The promise of

"do-it-yourself" participant research transformed projects initiated under other banners in the movement. Enthusiasts inspired principally by the political, spiritual, and self-sufficiency visions of the return to the land began to incorporate research into their farming plans. What the New Alchemy offered was a kind of implicit biological determinism which captured the imagination of enthusiasts without any prior research ambitions. Alternative technology, in this view, promised the new age. A utopian scientific optimism began to permeate the movement. Richard Merrill, California New Alchemist, saw research as the fundamental revolutionary act.

To me, food and energy alternatives provide a paradigm for a whole cultural revolution. I think that you can expect changes in the culture if you get people to look seriously at these alternatives. Ipso facto, if you change the ways we use energy and the food we use, you can create cultural change. It has got to change as people see these alternatives as alternative means of producing.⁴⁴

Few of their followers were as articulate as Todd and his colleagues, but they shared the same vision. In the five years following the founding of the institute in 1970, over a hundred different alternative technology centers started up across the United States and Canada. In Oregon, in California, in British Columbia, in the New England States, and elsewhere enthusiasts saw themselves as creating "a new alchemy-type thing". Many of them hoped to build some kind of cooperative bond between experts and laymen, most insisted on the necessity of trial and error experience in knowing

their land and designing their research plans. By 1975, the RAIN catalog from Oregon was publishing monthly lists of new centers and their projects. The new alternative research institute was becoming as ubiquitous in its own right as the original back-to-the-land commune had been seven years earlier.

Somewhat ironically, in view of the anti-establishment thrust behind the original notion of the New Alchemy Institute, many projects emerged in conjunction with academic programs. However, these were generally tied to the whole complex of environmental alternatives now offered in the mainstream university system. Antioch College, a liberal arts college well known for its experimental emphasis, developed not one but two projects espousing alternative technology. Its Farallones farm project in Occidental California offered an apprentice farming program, and its counterpart Urban Integral House in Berkeley developed skills for the city dweller. Neither project claimed to be exclusively organic; both borrowed heavily on the philosophy of the New Alchemists. Antioch offered a Masters of Ecology from these centers, but broke explicitly with the conventional system of academic prerequisites. Applicants from all fields of experience were invited to apply to the program; interest and desire displayed by applicants overrode past training or credentials.

Previous academic and other specialty studies are not required, but it is expected that enrolling students will be prepared to devote a minimum of one academic year of intensive studies to their field of concentration. 45

Here, although borrowing from the academic system, the vision of "new science" dictated lay participation and wholistic criteria.

The Social Ecology Program developed at Goddard College in Vermont reflected the same kind of academic compromises. This program, coordinated by Murray Bookchin, relied on student enthusiasm to carry out projects based on the New Alchemy model. The Goddard program involved a plot of land for a research institute and training ground, catering to students during the school year and paying apprentices in the summer. Jim Nolfi, coordinator in residence, came to the program with a degree in marine biology and the desire to do "less abstract" things.⁴⁶ The practical emphasis at Goddard seemed to encourage students and apprentices to design and carry out concrete innovations. However, Nolfi admitted to several disadvantages to this plan.

We have spent almost this whole year finishing up projects that got started with the students last year. The question is, how do you contain that energy? How can you give directions to the students, and still let them do things that interest them? 47

Most of the student projects fell short of the New Alchemy ideal.

We use some short circuits they don't use. One constraint is that they devise ways to do things by scratch. Because we have students, and we want to get things done, we use short circuits. They never plug it in. We may decide to plug it in, get it working, and then unplug it. 48

The summer apprenticeship program was, as Nolfi put it, "when things really started popping". In some respects, the student academic program functioned as an excuse for a summer festival of movement stars. Over the course of six weeks, Bookchin, Todd and others appeared to instruct at the widely-advertised course for enthusiasts. Again, however, technical results were not paramount. Goddard provided a meeting ground on which researchers and lay advocates could generate new contacts and redefine their common goals.

The vision of a new research center also permeated at least one conventional agricultural school. Unlike the efforts at Antioch and Goddard, however, the plans for a degree program in "ecological agriculture" at MacDonald College in Montreal met serious difficulties. First proposed by Stuart Hill, the plans for a center for Ecological Agriculture have not yet been confirmed. Students still regularly arrive by word of mouth, hoping to study with Hill, but they are forced to do their degrees within the conventional academic program.⁴⁹ Nevertheless, the Center continues to operate with the optimistic assumption that the "new science" will ultimately prevail. It is widely hailed within the organic community as a landmark of

growing sympathy from the academic agricultural establishment.

In the meanwhile, the New Alchemy metaphor drew strength not only among academic sympathizers, but among lay advocates. Alan Chadwick left the Santa Cruz project to start a new farming commune in the hills of northern California near Covelo in 1973, and even this spiritual advocate made an attempt to field "research" support for his projects.⁵⁰ In Santa Barbara, California, the El Mirasol community gardening project was expanded to include apprentice and lay research programs.⁵¹ At The Farm in Tennessee enthusiasts began to consider the research applications of their communal agricultural venture.⁵² A sensitivity to potential research, as we have seen, fired John Shuttleworth's effort to mobilize the self-sufficiency advocates. The possibilities of lay research raised themselves in every branch of the movement.

Individual farmers also began to see their farms as potential research centers. Eliot Coleman, for instance, bought his five acre Greenwood Farm in 1968, and transformed it into the Small Farm Research Association in 1971. Coleman, who came to organic farming from a career in Spanish literature, seemed to see himself as a modern-day Louis Bromfield, carrying out the research vision on the family farm. Although he denied following anyone back-to-the-land, Coleman bought his plot next door to Scott Nearing's farm, and followed much of Nearing's example. He also borrowed heavily from the writings of Sir Albert Howard. These influences, with the

New Alchemy model, shaped his research enterprise. By 1976, Coleman had put his Small Farm Research Association on the organic map -- he published a series of research bulletins, took on summer apprentices, won first prize in the under five acre category of the Mother Earth News self-sufficiency context, and became a self-appointed delegate to the International Federation of Organic Agricultural Movements.

For Coleman, 'wholistic' research became the *raison d'être* of the farmer as scientist. A natural bibliophile, he prided himself on knowing the conventional agricultural literature and the movement literature. Following Howard's argument, he rejected the notion of comparative research, but nonetheless tried to incorporate what the conventional agriculturalists could teach him. In his research, admittedly limited by the necessity to make a living on his land, he focused on knowing his land and making it work to its best advantage.⁵³ His was an appreciative stance reminiscent of Todd's effort to "Know the sun, know the plants, know the soil, know the people, know the shelter... have them all interlaced."

Coleman had the knack of turning personal experiences into movement opportunities. When he took on apprentices, they worked the farm in return for board, living in tents. He drilled these disciples in the necessity of an austere lifestyle and in lay research.⁵⁴ In 1975 Coleman went to Europe, visiting organic farms and attending the organizational

meeting of a new International Federation of Organic Agricultural Movements. Initially he wanted to make his trip a joint venture, so "... I asked them at Rodale to see if anyone else wanted to go".⁵⁵ Failing to get any response, Coleman set off on his own with two of his apprentices in tow, using the trip both as a vacation and a chance to make contacts with the European organic community. He came back with the message that Europe was the place where the organic movement and organic research were really under way, a message that had a new ring to it after years of J.I. Rodale's efforts to create a singularly American movement. A year later, Coleman made much the same trip, but this time he shepherded twenty-five organic enthusiasts and one sociologist in three Volkswagen buses.⁵⁶ He brought this group as a prideful American delegation to the international meeting. In the same spirit, Coleman became the driving force behind the "College of the Atlantic", an expanded three-week apprentice program not unlike Goddard's summer seminar, starred in his own organic radio show, and spoke at many conferences. The notion of "new science" and his new research center brought him from obscurity to international recognition in the emerging movement.

Although Coleman's unparalleled success left many other enthusiasts almost speechless in his wake, they nevertheless aspired to their own research visions. Farmers began to take on summer apprentices.⁵⁷ They also toyed with the idea of lay research, re-exploring Howard's early message and its elaborations by the New Alchemists. They hoped to create a practical, comprehensible, accessible farming system that the

conventional establishment could only envy.

The New Alchemy vision had also been assimilated into the traditional organic mainstream. In 1972 Rodale Press bought 300 acres near Emmaus for its own experimental 'New Farm'. Despite his earlier disappointment with Todd, Robert Rodale sensed that the New Alchemists were on to a good thing. In fact, Rodale wanted his new research center to surpass Todd's Institute.

I'm happy to see him succeed, but I'm a competitive person in a mild way. We have 25 people and are spending \$45,000 a year on research. I want this place to be the best organic research place in the world.⁵⁸

As part of this effort, Rodale recruited trained scientists as his research directors, first Alex Cunard from 1972 to 1976, and then Richard Harwood, who he billed as "without a doubt the best organic researcher" even before Harwood arrived to take over his new position.⁵⁹ But when Rodale envisioned his new research center, he sought distinctly practical solutions.

I have sympathy to John Todd, but there's a very established scientific background to the New Alchemy idea. I'm almost the opposite of that. Now that I'm older I'm willing to support all kinds of things practical. 60

Practical participant reader-research, not "esoteric" solutions, made up the New Farm mandate. Rodale remained ambivalent about scientific efforts, but he hoped to guide them into accessible and concrete solutions for his average reader.

I'm not really anti-science. J.I. used to attack scientists and on the other hand use scientific results. When I was younger I didn't like scientists, I was suspicious of them. But now that I'm older I see we have to use, to work out the scientific effort here... come up with answers on a simple level. 61

In this spirit, Organic Gardening and Farming readers were asked to grow Amarath seeds, a wheat alternative, supplied by Rodale in a 'simple' research program. Other research included companion-planting trials and a small windmill operation. As Rodale adopted the idea of a new research center, he revised it to suit his vision and what he saw as the practical needs of his readers. Like his father, he was drawn towards the possible practical benefits that science might offer.

Whatever their differences with the traditional movement, the New Alchemists inspired a renewed research effort among mainstream organicists. The new institute or research farm became a kind of scientific version of "the myth of the garden". Lay research, by and for enthusiasts, became a way of life among both new and old back-to-the-land advocates.

Most critically, the new scientific vision offered enthusiasts independence from the conventional establishment. Enthusiasts looked back to the research reforms offered by Howard and Steiner, and forward to the anticipated success of their own efforts. Although advocates still differed on the scope, practicality, and accessibility of their proposed projects, they agreed that the scientific garden, whether "Ark"

or "New Farm", provided an essential model of the new age.

Energy

In 1973, the declaration of the first "energy crisis" opened up a new realm of scientific debate in conventional and organic agricultural circles. Conventional scientists, often with the implicit mandate of justifying consumption levels, set out to state the energy requirements for agricultural production. Organic enthusiasts, in the spirit of scientific salesmanship, thought that these same studies provided a rationale for their own less intensive methods. This controversy came to a head over the publication, in 1975 by the Center for the Biology of Natural Systems, of the first comparative study of organic and conventional farms.

Two parallel studies, dramatically different in orientation, opened the discussion of energy and agriculture. Within months of each other, Michael Perelman, a radical agricultural economist, and David Pimentel, an establishment ecologist, published assessments of the national energy requirements for agricultural production. Perelman's article appeared in Environment, the current version of Commoner's original Science and Citizen, in June 1972.⁶² Pimentel's study came out in Science, the journal of the American Association for the Advancement of Science, in September 1973.⁶³ Together the two studies touched off a controversy neither researcher had quite expected; they had published with uncanny timeliness -- the "energy crisis" was in full swing.⁶⁴ However,

looking deeper behind the scenes, Perelman and Pimentel had very different conceptions of the purpose of their work, and of its ties to the organic movement.

Michael Perelman, an initiate of Berkeley Ecology Action, came to agricultural questions with a prepared Marxist analysis. Perelman arrived to spend his graduate years at Berkeley in 1966, just after the height of radical student consciousness, and faced the disillusionment of "bickering and infighting" in the Students for a Democratic Society.⁶⁵ The emerging ecology movement seemed to offer him a niche for his brand of activism.

So when I got involved with the ecology movement, I saw it as an effective critique of capitalism. You see, it fits in. All my life I have hated consumerism, the whole buying things business. Even though my father was a businessman, and I worked in the family store ever since I was a little kid, I never wanted to keep on buying things. So I was open to that kind of critique, I'd say that I have a deep-seated rejection of mercantilism. So I was open to this anti-consumption argument, since I was a little kid.⁶⁶

The environmental movement in Berkeley also offered a flamboyance resonant to Perelman's chosen style. Speaking of Cliff Humphrey, founder of Ecology Action, Perelman admired his "real ability to do things with the media".

He did things like emptying the basin. The big thing was that they were filling the San Francisco Basin. So what he did, at the time of a big conference, he got money bags and he went down and filled them up with sludge, and he brought them back and put them on the desks of the people who were filling up the basin.⁶⁷

In his own protests, Perelman thrilled to this same sense of

horseplay. In 1969, with Richard Merrill who later became a New Alchemist, Perelman exploded the equanimity of an Environmental Protection Agency student conference with some gentle "guerilla theatre".

We had a 'businessman' throwing garbage onto this river -- the river was a piece of blue cloth we were waving around -- and the 'businessman' was there, and throwing all these buckets of crap onto it, and 'the people' were screaming and yelling. So we had 'the people' clean it up, and then the 'businessman' would come back and throw some more on it. So finally we had 'the people' yelling. The audience couldn't understand it. They came to give their serious proposals, and we were doing this theatre thing. And at the end, when it was a mess, the 'businessman' saying, "Well, we can't do anything about it. Let's call a conference". 68

The environmental movement provided Perelman the opportunity to present his Marxist analysis with wit and slapstick.

In a more serious vein, Perelman chose agricultural economics because "it looked like it dealt with these important things". Although suspicious of much of the academic system, he hoped to make it work to his own advantage.

You know, what I wanted to do was take Marx and put him on a mathematical footing. So what I would do, I thought, was take their own tools, and show them how they were wrong, that it had different conclusions. So really I thought I could destroy the monster in its own balliwick. 69

Along the way, however, Perelman began to doubt the feasibility of his mission. Economics, which once promised a "half-way point, between the intellectual and the active", began to seem simply "form without content". Unwilling to abandon his Marxism, he came up against the problems of operating within the discipline along radical lines.

These problems crystallized during the course of Perelman's work on "Farming With Petroleum". In 1968, Perelman started his research without any encouragement from his colleagues; they failed to see the value of studying what was accepted as a cheap source of energy for agriculture. "But at that time I had very, very negative comments on the kind of work I was doing".⁷⁰ After 1973, other economists began to comment positively; Perelman, however, felt that they misunderstood the implications of his study.

They still read it as a technical argument about scarcity...I was hoping to use that scarcity argument as a jumping-off point for a discussion of the use of resources as a social decision. I was not trying to say that petroleum was sacred or incontrovertible but wanted to get into the question of social needs, and of decisions, of the question of what society wants.⁷¹

Perelman wanted his academic work to illuminate political questions. He felt that research at its best should be "suggestive", that economic data should be understood as "a parable" offering people a "different frame to organize their understanding". In this spirit, he questioned the almost fetishistic attachment to numbers and statistics in his own discipline.

I have begun to question the data base that I used. Although for me it is not really a question of what measurements you arrive at. I view my data as an allegory. You know, if my figures were 5% or 50% off, it would make very little difference to me. In my mind it is an allegory of the type of agricultural system that we operate, not the specific numbers that you arrive at.⁷²

Nevertheless, when other scientists began to address energy

questions, Perelman suddenly found himself in the mainstream of this academic debate, invited to prepare papers and attend conferences. He felt, however, that his colleagues entirely missed the radical "parable" he had intended.

But everyone said, "Oh gee, we use lots of it. We're wasteful". That was not where I was rooted. It is not just a question of restructuring our energy uses. So I have been received positively for the wrong reason. I wanted to question the way we use our resources in general.⁷³

As a result, Perelman intensified his effort to develop a serious radical critique, planning a book on the "political economy of food", Farming for Profit in A Hungry World.

Perelman identified much more closely with the efforts of environmental and organic enthusiasts to address the problems of the agricultural system. When he visited the Center for the Biology of Natural Systems, he came away impressed by Commoner's ability to do "suggestive" work, to "pull people together". "And", he said, "I think the whole group is doing magnificent research".⁷⁴ He sympathized with the New Alchemists as well, although he felt that they should put their work "into a social context". And, pleased at the opportunity to strengthen their position, Perelman spoke willingly to organic enthusiasts. In these forums, and not in academic circles, he felt that the real intentions of his research would be understood.

David Pimentel, on the other hand, Perelman's more conventional counterpart, found himself embroiled as a reluctant participant in the new popular energy debate. Perelman sought

public discussion; Pimentel captured the spotlight unwittingly and unwillingly. Although a few enthusiasts resented Pimentel's fame in view of Perelman's prior publication, most acclaimed him as an establishment scientist newly sympathetic to the organic crusade.⁷⁵

Pimentel, an ecologist and a member of the entomology department at Cornell University, in fact exercised his concern for wholistic and relevant science largely within the confines of the scientific establishment. He had first worked on environmental problems in 1963, soon after Carson published, as a member of the committee to prepare a Presidential Report on the Quality of the Environment. Since then he had served as chairman of the Board of the National Academy of Sciences and of the National Council on Environmental Education, and as a member of the board of the Science and Technology for International Development and of the Pesticide Advisory Council of the Environmental Protection Agency. Pimentel consistently steered a moderate course in both his committee work and his environmental research. He worried about the potential problems when scientists uncritically jumped on the environmental bandwagon, and couched his own critiques of the agricultural establishment in very cautious language.

But if I had one criticism. Well, let me put it in a positive light. Before we can, I think, make the greatest breakthrough in agriculture today, is to look at agriculture and manage it as a system. In the past, we've had too much of this ad hoc approach, an agronomist doing his thing, a plant pathologist doing his

or her thing, and an entomologist and so forth.
And no one tending to put it together. 76

Whatever his commitment to environmental problem-solving, and to wholistic research, Pimentel rejected radical or anti-establishment rhetoric.

As part of his conservative approach to research reform, Pimentel designed a multi-disciplinary course at Cornell in which a group of students attacked a joint year-long research project. He proposed ideas to students from what he thought were "hot issues -- from my reading, my contacts in Washington". Students then agreed on a common project, and each one accepted one aspect of it as his assignment.

And then they are asked to really become the expert on that particular dimension. So any time a question comes up on that dimension, they are asked to go out and dig it. 77

In the end, Pimentel expected his students to produce a publishable paper that included the wholistic dimensions of the research problem.

Pimentel's Energy and Agriculture paper, a product of his course in 1972, followed this design. Here Pimentel and his students pulled together the diverse threads of agricultural production, listing the energy production costs of a single crop, corn, across the spectrum from germination to transportation. The farming system, in Pimentel's eyes, was a "very complex operation" that "few people really appreciate".

...too many people have tried to provide a simplified answer or solution to these problems. And there are no simplified solutions to any of these problems. 78

Pimentel wanted his students to tackle this problem in all its complexities.

I mean, if you take the number of insect pests, and their natural enemies, the pathogens, and the climatic and environmental conditions that influence those pathogens, the genetics of crop type, and the impact of weather and weather factors, and soil types...you know, it's very, very complex. 79

Complexity, in Pimentel's eyes, was no excuse for generalities. Wholism never excused sloppiness, never contradicted the need to quantify the factors involved. In order to understand the "correct decision", he wanted to "attach numbers" to agricultural questions. Far from seeing his data operating as a suggestive "parable", he felt the need to "deal with quantities" in a precise way.

We do that in all these papers, we attach numbers. We don't like people talking generalities. Because I think you have to get down to those actual quantities, and the trade-offs.80

The commitment to wholistic research, in Pimentel's view, must be achieved within the demands of a rigorous scientific method.

To his surprise and discomfort, Pimentel found himself hailed as a scientist willing to take on the agricultural establishment, as an organic hero.

Pimentel: But people read a lot of their own thoughts in what you're saying. That's why, you see, the organic gardeners think that I'm on their side! (Laughs) Apropos, when we talked about the use of manures, and green manure, this is all down their alley, you see, and they like that...

Peters: So you're in the position of seeing how

people have picked up on your arguments?

Pimentel: Right, and some of them use them in all kinds of ways that I never even dreamed of. 81

In fact, Pimentel remained "very dubious of that system".

He offered standard criticisms of the organic method.

I want to see the facts. And the very careful measurements of the data. I mean, I know you can produce corn by hand, no question about it, but it will take you 500 hours. What's your standard of living if it takes you 500 hours to produce an acre of corn? 82

While he agreed that some of the movement's comments on conventional agriculture were "justifiably critical", he insisted that "they carry the thing a little too far, to the extreme, frankly".

This type of feeling that nitrogen that you put in fertilizer is different from the nitrogen you get from decomposing plants...I don't know if you've had any chemistry, but it's the same nitrogen molecule. 83

Pimentel avoided extremes on every side. Personally he seemed willing to take a live-and-let-live attitude to the organic lifestyle: "I think we ought to do what we are interested in, what makes us happy", and he sympathized with some of the movement's criticisms of nutritional wastes; but he resented the way that his study was used as ammunition for an agribusiness critique. For him, the questions raised were precisely technical ones, problems in the wasteful application of fertilizer and other energy inputs.

As the energy debate heated up, however, Pimentel

found himself subject to complaints from the conventional community. Few saw him as an organic enthusiast, but they nevertheless found the popular reception of his research alarming.

I thought it was a timely piece of work, but the publicity that went out made it look like agriculture was a gobbler of energy, which was not his purpose. It's not his fault it gets picked up that way.⁸⁴

And, in order to belie his results, conventional scientists began to attack his procedures; Pimentel's attempt to quantify energy consumption came up short of their standards.

It's hard not to be critical when someone is using the wrong numbers and you know it. ⁸⁵

Even more subtle sanctions were applied by Pimentel's own department. Despite his effort to create a multi-disciplinary course, these entomologists brought him up on the charge of breaking from the mandate of the discipline. Richard Root, a sympathetic colleague, railed at the department's treatment of his fellow ecologist.

Look at Pimentel. He got involved in the work on energy and agriculture. That's a substantial piece of work. But here, at the last departmental meeting, the chairman passed a motion that he should return that part of his salary for the time he spent on that research. I mean the whole point of view is that it doesn't have anything to do with insects. ⁸⁶

Despite his efforts to eschew controversy, Pimentel found himself not only a reluctant organic hero but also an academic pariah.

By 1973, energy became the single most critical issue in agricultural research. Researchers in almost every state

set out to discover the real energy requirements if cut-backs became necessary. However, these scientists adopted an implicit mandate as well, the attempt to show that agriculture was not the energy bandit it had been made out to be. In a California study initiated by the Farm Bureau, the need to assure energy for farming was raised openly. As the chief investigator, Vashek Cervinka, recalled the Bureau's motives...

...they were concerned basically with one question --how to secure more fuel for agriculture, for the farm. That was really the original basic reason why they requested the study. 87

Far from presenting an allegory of resource decisions, or a moralistic statement on wastefulness, this study downplayed agricultural consumption. Cervinka and his fellow researchers showed that California farming, despite speciality crops and irrigation systems, represented only 5% of the state's energy budget.⁸⁸ The Farm Bureau, in view of the high export levels of California's produce and thus the major contribution to national agricultural needs, argued that this figure demonstrated the remarkable efficiency and economy of the agricultural system. The California study became the prototype for other state-level energy studies. In Florida, New Mexico, New York, and other states, researchers underscored the justifiable energy requirements for agricultural production.

Nevertheless, these researchers still worried about the fact that organic enthusiasts saw their studies in a different light. Vashek Cervinka, for instance, could not quite dispel

his concern for the way "some people take our study and use it to argue something different".⁸⁹ Although he had no specific examples to point to, Cervinka felt the pull of an undercurrent of enthusiasm which used his research as part of an agribusiness critique. And, of course, a kernel of truth underlay his anxiety. Organic enthusiasts continued to see conventional agriculture as a plundering and pernicious thief of energy reserves. After all, they reasoned, if conventional methods consumed up to 5% of the energy budget, consumption levels for organic methods probably could be tagged at a much lower figure. And, with conservation as the new agricultural priority, the superiority of the organic system would finally receive due recognition.

Then, in 1975, with the rumor that Barry Commoner's Center for the Biology of Natural Systems was about to publish a comparison of conventional and organic farms, enthusiasts began to rejoice in earnest. By this time Commoner's association with a study operated as a red flag of alarm for conventional agriculturalists, a beacon of light for organic advocates. The news that the study reported a mere 8% profit differential for the organic farms aroused incredulity and opposition among conventional scientists, confidence and plaudits among enthusiasts.

As Commoner put it himself, he "went right to the top" to get funding for this controversial study.⁹⁰ Initially, however, the study was not intended to include organic farms.

On many governmental boards by 1973, Commoner knew from the grapevine that energy was becoming a controversial area. In keeping with his desire to do "relevant" research, he approached the National Science Foundation, under the aegis of their program of Research Applied to National Needs, for energy money. The CBNS researchers decided to do something on energy in agriculture, but they weren't sure exactly what.

The decision to undertake a comparison of organic and conventional farms was made with the encouragement of an Iowa organic enthusiast, Roger Blobaum. A self-employed agricultural consultant, Blobaum saw himself "basically as an advocacy person". He first came to environmental and conservation problems from a political background; he had worked for Gaylord Nelson, for Hubert Humphrey, and finally ran for Congress himself in 1970. Blobaum first met organic farmers and listened to their problems during his unsuccessful congressional campaign. After his defeat, he decided to look into the question more thoroughly.

So I took 8 or 10 days, in the fall of '71, and I just drove around, looking at different organic farms and talking to farmers. I said to myself that this was absolutely tremendous that people were doing this. And it was terrible that no one recognized what they were doing. And they said that they were considered oddballs. So I convinced myself by looking, and could see the purpose of it. So I decided to draw attention to it. 91

As a result, Blobaum involved himself with the Catholic Rural Life Conference, the National Coalition for Land Reform, and organized a trip for farmers to China. He also

contracted with Rodale Press to write a book on mid-west organic efforts. From his political background, he addressed himself as a catalyst, asking how he could "pull all these interests together". Advocacy dominated his thinking when he met with CBNS researchers for the first time. Blobaum knew Michael Gertler, a junior member at the Center, as a fellow member of the National Farmer's Organization. Over dinner with Gertler and William Lockeretz, the chief investigator of the proposed energy study, he raised the question of organic farming.

I was down here in St. Louis for a regional council meeting, and I was talking to Mike over dinner -- and Willie was along. We spent all evening talking about energy and agriculture. It was not too long before we got down to the topic of organic farming. Mike had heard of it, but I didn't think that Willie had. He was pretty interested. Anyway, it was not too long before I got a letter from Willie, saying they were thinking of doing some kind of research project on organic farming. 92

Blobaum, as a consultant to the energy study, contracted to find 24 organic farmers both suitable and willing to participate in the study. His advocacy had paid off; he anticipated results that would clearly demonstrate the viability of organic methods.

The decision to study organic as well as conventional farms was made, however, with certain reservations. Lockeretz, as chief investigator, felt uneasy about the possibility of intense controversy. In many ways, Lockeretz remained committed to stringent scientific standards. Originally a high energy physicist, he had joined Commoner's staff in 1971 in

response to questions about the role of the scientific establishment in the war in Vietnam.

I went to St. Louis because of the groups I wrote to, only Commoner replied positively. He said, "It doesn't matter that you are a physicist, of course you can study environmental issues". 93

Yet in his research Lockeretz had no intention of abandoning his scientific training. For the energy study, regardless of the inclusion of organic farms, he wanted to maintain the standards of "conventional agricultural economics".

As far as our methods and our ideology, we are very solidly within mainstream academic research -- as far as our methods, our style, and our philosophy. The only thing that is unconventional is the particular system that we are studying. 94

Initially he questioned the wisdom of revealing the actual comparison being made in the study. He feared being identified with organic farmers and "the mysticism they practice", and suggested that the study should refer to "experimental and control groups". By the time that the research was ready for the first year's publication, however, Lockeretz realized that the fact that it dealt with organic farmers would be an open secret.

Then I said, "Look, someone's going to read this, and they are not going to know what we are talking about for a while, but as they read, suddenly a light bulb is going to go on, and they're going to say-- 'These guys are talking about organic farms. Why don't they say so?' So I decided, let's just say so. 95

While he remained leery of the organic label, "It's not my fault that the proponents of that kind of farming choose that name", he resigned himself to the idea of controversy. "We

have to live with that name".

As it became increasingly apparent over the course of the study, the cat was already out of the bag. Even before the results were published, an attempt was made to sabotage the funding for the study. Word of under-the-table dealings by the National Fertilizer Institute eventually leaked back to CBNS researchers.⁹⁶ Ed Wheeler, president of the multi-million dollar lobby of chemical companies, had apparently protested directly to the head of the National Science Foundation about the decision to fund the study. Wheeler was far from enchanted by federal support for a study that he suspected would be construed as anti-chemical. Although his appeal probably never stood much chance of success, he seemed to see it as his duty to protest.

However, the real problems of the CBNS study erupted after publication. Conventional agriculturalists not only felt called upon to comment, some saw it as their duty to "get" the study.⁹⁷ Samuel Aldrich, professor of agronomy at the University of Illinois, became the chief self-appointed critic. Like Wheeler, Aldrich went directly to the National Science Foundation, raising objections to the CBNS research procedure. NSF administrators, however, viewed his interventions as "clipping".

So he'd make his criticisms, but he'd never come out and make them in a public way. What I had to say to that was, "If you're going to play around, you can't remain a virgin". Finally we had to tell him this. You see, legally, any correspondence he sends to us is available to Barry. So we just had to suggest that they come out with their objections in public. Or be quiet about it. 98

Eventually Aldrich wrote to the CBNS; Lockeretz found himself engaged in a lengthy and unwelcome correspondence with him, responding to seemingly endless criticism.⁹⁹

Although these attacks never seriously threatened the funding of the study, they had an impact on the strategies chosen by CBNS researchers and the NSF staff. In establishing an overview committee for the project, the CBNS group took a precautionary step against anticipated criticism. They carefully invited established agricultural scientists, as well as advocates like Blobaum, to sit in review of the study's procedures and findings.¹⁰⁰ Among others, they recruited Earl Gavetz of the USDA and Toby Curtz, an agronomist at Illinois, Aldrich's home campus. This overview committee supposedly operated in a watchdog capacity, examining the assumptions made by the researchers. When protests arose over the study, the CBNS then had the implicit backing of its overview members. The NSF also solicited 'external' reviews of the research which were available to the CBNS. Vashek Cervinka and other state level researchers were asked for their comments. Eventually Aldrich was included among the external reviewers. By taking these comments into account, the CBNS researcher had the opportunity to ward off potential attacks. Much of this process, however, had political rather than substantive consequences. If the researchers had taken all the available criticisms to heart, they would have ended up abandoning the study altogether. As it was, they were able to put on an appearance of accountability and responsiveness for the NSF administrators without

acceding to all criticisms.¹⁰¹

At the day-long meeting with the overview committee in August 1976, for instance, Commoner, Lockeretz, and their assistants balanced a fine line between answering objections and retaining the integrity of the original project. Critics like Aldrich indeed had their say. Major questions arose about the sampling procedures of the study, the number of years the study should continue, the need to create a larger survey of organic farmers, and the possibility of disaggregating data on different organic procedures and different crops.¹⁰² Few of the final decisions on these problems were taken in the overview committee, but the researchers faced the need to consider these questions. Nor was their responsiveness solely conditioned by the presence of Dick Warder, their NSF project administrator, for whom their attitude might spell a difference in dollars for the study. The CBNS researchers did not simply defend themselves; they accepted many of the reservations expressed as legitimate. Commoner and Lockeretz both recognized that the overall credibility of the study could make a difference to its ultimate impact.

However, the potential utility of the energy project also played an important role in the minds of CBNS researchers, their overview committee, and the NSF staff. Credibility, in Commoner's view, was fine, but none of his projects was designed "to serve the discipline". In this respect, he wanted to play an educational role -- "We want to hit and run, do

something that will irritate other work, not just what we did".¹⁰³ Just as important, in his mind, was the need to develop real answers to real questions. In fact, many of his consultants concerned themselves exclusively with questions of utility. Curt Soderberg, an overview member from the National Farmers Organization, put this priority to the committee.

In my job, I spend a lot of time on farms. I've seen farmers with wells poisoned by nitrites. If you could give them an alternative, show them what they should do, they'd grasp it. That's what I'm asking for, working with farmers. They say, "I want off the treadmill, but I barely make it as it is".¹⁰⁴

Marty Strange, director of the Center for Rural Affairs, a Nebraska rural alternatives project, raised this same problem after the meeting. "What's the point", he said, "when what we need are practical alternatives?"¹⁰⁵ Strange, Roger Blobaum, and Bob Steffen, director of the Boystown Nebraska organic farm, represented the organic constituency at the overview meeting. These advocates had little patience for the rambling discussions of methodology; they wanted clear practical statements. Nor were NSF administrators immune to this mandate. The program for Research Applied to National Needs (RANN), which funded the CBNS study, had been designed precisely to fund projects that could not be undertaken by the traditional "mission" agencies like the USDA. RANN, designed not "just as a scholarly program", supposedly listened to "the potential users" of a project.¹⁰⁶ Dick Warder, the energy project

administrator, praised the Commoner group for responding to this mandate.

You've got to be able to say who's going to use the study. You've got to show that it's going to have some application. That's one thing about that committee yesterday, they had Curt Soderberg there. Now he represents the potential users. That's the kind of thing we are after.¹⁰⁷

Like Commoner, Warder saw RANN as a kind of "Green Beret" research elite, preparing the way for the slogging of the rank-and-file troops of conventional scientists once credibility and utility had been established.

However, despite the claims of a new practical research approach, a gap persisted between the expectations of researchers and government officials attuned to institutionalized "relevant research" and the demands of organic enthusiasts. The two groups defined the needs of "potential users" in different ways, they held different notions of practical and useful research, and they still parted on the issue of credibility. At the 1976 "Energy and Agriculture" conference organized by CBNS to coincide with the overview meeting, these conflicts were brought home to organic enthusiasts. Even some of the sympathetic CBNS researchers seemed embarrassed at the conventionality of the conference.¹⁰⁸ Commoner visualized this as "the first conference of its kind", designed "to bring people together, to get in touch, see what we can do to stimulate this process without generating hysteria."¹⁰⁹ To the disappointment of enthusiasts, the "people" were chiefly conventional scientists, the "process", standard research.

The CBNS, with funds from the outreach portion of their NSF energy budget, invited interested researchers to meet and present in St. Louis. These scientists took the opportunity to mark out the parameters of legitimate energy research. With few exceptions, they presented their 'objective' and 'tentative' findings on energy alternatives and energy requirements. Organic enthusiasts found themselves hard pressed to extend their scientific salesmanship to these energy projects. Whenever possible, they applauded a promising solution; they embraced, for example, the idea that it might be possible to mutate the nitrogen-fixing bacteria associated with soybeans to other crops -- despite the fact that this work remained in the test-tube stage.¹¹⁰ For the most part, enthusiasts gleaned scant encouragement from the tone of arbitrary exploration and conscientious methodology in these presentations. Organic advocates confirmed their earlier suspicions of the scientific establishment. They saw the energy researchers preening and jockeying for position among one another, not addressing questions relevant to their sense of agricultural crisis.

Nevertheless, most organic enthusiasts continued to include energy research in their broadly defined "new science". The vast majority of advocates had not yet been exposed to the inner workings of the energy debate. Others, like Roger Blobaum, still held out the hope that land grant universities would soon turn to serious research on organic alternatives.

Now too, the CBNS team began to collaborate in the scientific salesmanship of the movement. Lockeretz, Commoner and Warder had a vested interest in promoting a second wave of research that supposedly emanated from their own work. Like advocates, they began to point to new energy research pertinent to organic concerns.

Two studies in particular seemed to fill this bill, the first a plot study initiated by Warren Sahs at the Mead Experimental Station in Nebraska, and the second a survey of organic farmers to be conducted by Chuck Alexander, a graduate student under the direction of Phillip Warnken at the University of Missouri in Columbia. Both of these studies gained wide recognition before they ever got off the ground. In fact, these were very modest projects. Sahs had simply allocated an acre of ground at the thousand acre Mead Station to plots comparing organic, conventional, and mixed techniques. He hardly expected these tiny plots to provide conclusive results. Alexander had proposed a questionnaire on energy expenditures by organic farmers for his master's degree, but he planned a brief and undetailed survey of 60 farmers at most. Both of these researchers reacted with astonishment to the attention their work received. When interviewed, Alexander demurred that he could give only a cursory outline of work intended for the coming year.¹¹¹ Sahs, his first test crops less than 12 inches high, seemed to apologize as he walked the meager boundaries of this test plots.¹¹² However, the

optimism of the "new science" prevailed; the massive propaganda for these projects led enthusiasts to anticipate rewards far beyond the scope of these modest research proposals.

Following suit, enthusiasts began to plan their own energy studies. At the Center for Rural Affairs in Walthill, Nebraska, a vista volunteer, Dennis Demmel, began to make plans to a Nebraska Low Energy Agriculture Project (NLEAP). The Center, the brain-child of two ex-poverty workers, Marty Strange and Dave Dahlston, had been organized to promote farmers markets and seminars, and to push for tax breaks for the family farm.¹¹³ Strange and Dahlston, self-acclaimed "populists", settled in Nebraska in 1973, seeing it as one among many states desperately in need of a family-oriented rural revival. They combined their poverty experience with Vista with environmental activism and corporate farming critiques. In 1975, under Demmel, they broadened this mandate to include research into appropriate farm technology and organic methods. The Center, with the Midwest Organic Producers Association, helped to sponsor a Biological Agricultural Workshop at Boystown Nebraska. Under the guise of NLEAP, and with Demmel's initiative, they intended to gather data on low-energy technologies on Nebraska farms.¹¹⁴ The Center seemed to combine the spirit of the New Alchemy with the concern for comparative energy research.

More than any other group, mid-west organic enthusiasts welcomed the idea of comparative energy research. It was their

farms that were under study; vindication of the superiority of organic methods seemed to offer the chance to hold their heads up high in the agricultural community.¹¹⁵ And, for these farmers, the profit margins discussed by the CBNS study were critical. Unlike home and hobby gardeners, the success of organic production affected their source of livelihood.¹¹⁶ They knew only too well that most conventional farmers would consider a switch to organic techniques only if their methods compared favorably on the bottom line. Energy comparisons seemed to them an essential component of the "new science".

A New Scientific Leadership

In concrete terms, the "new science" of the organic movement turns out to be a curious mix of disparate elements, including conventional scientific research, the results and inspiration of alternative technology centers, and the promise of vindication of composting methods as less energy intensive techniques. Within these broad areas, organic enthusiasts hail new 'heroes' to the movement, emulate and participate in the conferences of the scientific establishment, and celebrate each new rumor of potential research as 'the' breakthrough substantiating organic claims. However, the "new science" is more than the sum of its parts, the tallying of successes and failures. The vision of the "new science" offers something less tangible. Enthusiasts turned to its promise not only to verify their methods, but because it seemed to unite diverse sentiments in the movement and to offer support from the

expert establishment. In some respects, the "new science" has fulfilled this promise. The scientific celebrations of the movement have recharged enthusiasts with a new, unanimous rhetoric, and have recruited a new set of leaders to the movement.

The rhetoric of the "new science" crystallized in the search for a new name for the movement. Many advocates want to switch from the emotionally-laden organic label devised by J.I. Rodale to some neutral, scientized term. In keeping with their vision of ecology as a wholistic, relevant enterprise, some enthusiasts use the phrase "ecological agriculture". Others, following the traditional name used in Europe, especially in France and Switzerland, translate from "l'agriculture biologique" to obtain the term "biological agriculture". And some prefer the name "alternative agriculture" because it seems to include the whole range of rural options they envision, embracing both technical means of production and rural land policy. All three of these new names may be used interchangeably, as long as the passé organic label can be avoided.

In fact, advocates of the "new science" may not only try to dispose of the organic label, but attempt to purge J.I. Rodale himself from the roll of movement heroes. These enthusiasts align themselves with the conventional establishment, condemning Rodale as a crank and a charlatan. They look back to Sir Albert Howard, but not to his American mouthpiece.

Following Louis Bromfield, for instance, Eliot Coleman denigrates Rodale's commercialism, his nutritional quackery, his anti-science campaigns, and his damaging impact on the movement.¹¹⁷ Even Bio-dynamicists, once Rodale's allies, now repudiate his "oversimplifications" in their campaign to reinstate Steiner's techniques as the "most scientific" non-chemical methods. Carston Pank, a New York Bio-dynamic farmer, makes a sharp distinction between the 'organic' and 'bio-dynamic' methods in his popular Dirt Farmer's Dialogue, a 1976 monograph based on articles written for Bio-Dynamics between 1970 and 1973.

The bio-dynamic movement in North America has always lingered in the shadows of Rodale's work and success. This would be nothing to lament if it were not for the fact that J.I. Rodale did not only simplify the natural truths but he had sometimes dilettantically oversimplified and thus produced nonsense, which often seems to have impressed his followers and successors the most.¹¹⁸

Although not identified with the outright spiritualism of the movement, Rodale represents a kind of secularized mysticism for which the advocates of "new science" feel little sympathy. Like their conventional counterparts, they fear being lumped with "little old ladies in tennis shoes". And often these advocates don't actively exorcise Rodale, they simply ignore his efforts. What, they reason, does Rodale's organic crusade really have to do with their new ecological agriculture?

In this spirit, scientists now accept positions of leadership in the movement. The newly elected Secretariat of

the International Federation of Organic Agricultural Movements (IFOAM) is Hardy Vogtmann, a nutritionist and director of the Obervil experimental farm in Basle, Switzerland.¹¹⁹ Vogtmann, like other advocates of the "new science", melds enthusiast claims to a deeply felt ecological rhetoric. He speaks of "husbandry", not agriculture -- an essential reminder that man acts within the natural system. In the European tradition, he promotes bio-dynamic techniques as the "most scientific" methods available to farmers.¹²⁰ In his travels to the United States, he promotes research both inside and outside the movement. And, in his capacity as Secretariat, Vogtmann represents the non-chemical farming mission to the U.S. Department of Agriculture, to land grant colleges, and to other conventional agricultural groups.

Other scientists act as leaders of the movement in less explicit ways, speaking at conferences organized by lay enthusiasts and to the conventional community. Stuart Hill, for instance, accepted a position on the agricultural committee of the Canadian Science Council, seeing it as an opportunity to promote the ecological agricultural message.¹²¹ The Center he has promoted at Macdonald College has become a focal point of movement efforts in Canada and the New England states.

These scientists measure their success on a dual standard. Where enthusiasts turned to the notion of "new science" to strengthen the organic cause and unify diverse sentiments, researchers seek external support for their scientific reforms.

They rejoice in signs of interest shown by the USDA and other members of the agricultural community. Thus the original intentions of the "new science" have been subtly transformed by their participation and leadership. Their "new science" often evokes the formal standards of the scientific community.

Footnotes - Chapter Seven

1. Dennis King, "Is Science Advanced Enough for Biological Agriculture", Farmstead Magazine, (Summer 1977), p. 18-19.
2. M.C. Goldman, "The Organic Revolution Goes to College", OGF, 19, (January 1970), p. 57.
3. Interview with Steve Kaffka, University of Santa Cruz, Farm and Garden Project, Santa Cruz, California, May 27, 1976.
4. Interview with James Madison, Horticulture Dept., University of California, Davis, May 20, 1976.
5. The Staff of Rodale Press, The Organic Guide to Colleges and Universities, (Emmaus, Pa., Rodale Press, 1973).
6. Interview with Nick Veeder, Cooperston, New York, on European Farm Tour, October 1976.
7. Hill has prepared several bibliographies on studies related to organic methods which he distributes by mail and at the many conferences he attends.
8. Interview with Maria Linden, Dept. of Nutrition and Food Science, Massachusetts Institute of Technology, Cambridge, Mass., February 26, 1976.
9. Conference Program, "First International Conference on the Organic Method for Farm and Garden", San Francisco, Calif., January, 1973, p. 1.
10. Interview with George Salzman, Dept. of Physics, University of Massachusetts, February 26, 1976.
11. Interview with J.O. McLaren, Dept. of Plant Physiology, University of California, Berkeley, May 24, 1976.
12. Ibid.
13. Interview with Madison, 1976.

14. Ibid.
15. Interview with William Olkowski, Division of Biological Control, University of California, Berkeley, May 28, 1976.
16. Ibid.
17. Ibid.
18. Jim Hightower, Hard Tomatoes, Hard Times, (New York; Viking Press, 1972).
19. Ibid., p. 8.
20. Interview with Robert Vandebosch, Division of Biological Control, University of California, Berkeley, May 26, 1976.
21. Robert Vandebosch, "Pesticides: They're Turning on the Bugs", OGF, 22, (April 19, 1973), p. 70-73; Bouquets from the Spray Tank", OGF, 22 (October 1973), p. 66-71; "The Rape of the EPA", OGF, 25 (January 1976), p. 92-96.
22. Interview with Vandebosch, 1976.
23. Ibid.
24. Interview with Isao Fujimoto, Dept. of Rural Sociology, University of California, Davis, May 18, 1976.
25. Interview with Vandebosch, 1976.
26. Ibid.
27. Interview with John Todd by "my", What Do We Use for Lifeboats?, (New York: Harper Colophon Books, 1976), p.77.
28. Ibid.
29. John Todd, "Tomorrow is Our Permanent Address", The New Alchemy Institute Journal, 4, (1977), p. 85.
30. "my", Lifeboats, p. 77.

31. Ibid.
32. Interview with John Todd, The New Alchemy Institute, Falmouth, Massachusetts, October 12, 1977.
33. "my", Lifeboats, p. 78.
34. Interview with Todd, 1977.
35. "The Ark", New Alchemy Institute Poster, Falmouth, Massachusetts, 1977.
36. Interview with Todd, 1977.
37. Interview with Robert Rodale, Rodale Press, Emmaus, Pa., June 7, 1977.
38. The idealization of Chinese research came up again and again in my interviews. Several advocates had, or hoped, to visit Chinese farms.
39. William O. McLarney, "Pond Construction: First Step in Successful Agriculture", OGF, (April 1972), p. 116.
40. Interview with Rodale, 1977.
41. Ibid.
42. "my", Lifeboats, p. 79.
43. This was a problem they shared with many other enthusiasts; over the course of my fieldwork, I received many queries about where researchers could look for money.
44. Interview with Richard Merrill, New Alchemy West, Scotts Valley, California, June 3, 1976.
45. RAIN, Environmental Education Center, Portland, Oregon, 1975.
46. Interview with Jim Nolfi, Social Ecology Program, Goddard College, Plainfield, Vermont, April 26, 1976.
47. Ibid.

48. Ibid.
49. Interview with David Ludewig, MacDonald College, Montreal, Quebec, February 4, 1976.
50. Interview with Elliott Coleman, Small Farm Research Association of Harborside, Maine, in Canterbury, New Hampshire, February 13, 1977.
51. Interview with Paul Relis, El Mirasol Block, of Santa Barbara, California, in Montreal, Quebec, May 11, 1976.
52. Interview with Mark Schwartz, director of Soil and Health Foundation, Rodale Press, Emmaus, Pa., June 8, 1977.
53. Interview with Coleman, 1976 & 1977.
54. Interview with Paul Boffa, European Farm Tour, October 1976.
55. Interview with Coleman, 1976.
56. Nothing I can write can capture the camaraderie among the members of the European Tour, who grew together as well as individually over the three week trip.
57. Interview with Veeder, 1976.
58. Interview with Rodale, 1977.
59. Ibid.
60. Ibid.
61. Ibid.
62. Michael Perelman, "Farming with Petroleum", Environment, 14, (1972), p. 8-13.
63. David Pimentel, "Energy Requirement of Agricultural Production", Science, 182, (1973), p. 443-449.

64. Although I interviewed a third early energy researcher, John Steinhart, he does not figure here because his work did not attract the same kind of attention from enthusiasts. See John S. Steinhart and Carol E. Steinhart, "Energy Use in the U.S. Food System", Science, 184, (1973), p. 307-316.
65. Interview with Michael Perelman, Dept. of Economics, California State University, Chico, California, May 21, 1976.
66. Ibid
67. Ibid.
68. Ibid.
69. Ibid.
70. Ibid.
71. Ibid.
72. Ibid.
73. Ibid.
74. Ibid.
75. Interview with Merrill, 1976. Merrill felt that Perelman had done the work, Pimentel "got all the salts".
76. Interview with David Pimentel, Dept. of Entomology, Cornell University, Ithaca, New York, in Boston, Massachusetts, February 22, 1976.
77. Ibid.
78. Ibid.
79. Ibid.
80. Ibid.

80. Ibid.
81. Ibid.
82. Ibid.
83. Ibid.
84. Interview with Don Price, Dept. of Agricultural Engineering, Cornell University, Ithaca, New York, April 27, 1976.
85. Ibid.
86. Interview with Richard Root, Dept. of Entomology, Cornell University, Ithaca, New York, April 27, 1976.
87. Interview with Vashek Cervinha, Management Analysis Section, Calif. Dept. of Food and Agriculture, Sacramento, California, May 17, 1976.
88. Vashek Cervinha, et al., Energy Requirement for Agriculture in California, California Dept. of Food and Agriculture and University of California, Davis, (January 1974).
89. Interview with Cervinha, 1976.
90. Interview with Barry Commoner, Center for the Biology of Natural Systems, Washington University, St. Louis, Missouri, June 15, 1976.
91. Interview with Roger Blobaum of Creston, Iowa, St. Louis, Missouri, June 6, 1976.
92. Ibid.
93. Interview with William Locherety, Center for Biology of Natural Systems, Washington University, St. Louis, Missouri, in Boston, Massachusetts, February 23, 1976.
94. Ibid.
95. Ibid.

96. Several respondents gave me this story and since one asked for anonymity, I have decided not to quote any of them.
97. Interview with Price, 1976.
98. Interview with Dick Warder, Research Applied to National Needs, National Science Foundation in St. Louis, Missouri, June 18, 1976.
99. Interview with Locherety, 1976.
100. Interview with Warder, 1976.
101. Meeting of the -CBNS Overview Committee, Washington University, St. Louis, Missouri, June 15, 1976.
102. Ibid.
103. Ibid.
104. Ibid.
105. Interview with Marty Strange, Center for Rural Affairs, Walthill, Nebraska, in St. Louis, Missouri, June 17, 1976
106. Interview with Warder, June 7, 1976.

However, a second NSF administrator, Jean Johnson, spoke frankly about the problems in implementing this mandate. She pointed to those NSF old-timers who often funded "alternative research" "under-the-table" through the basic science division. Even in RANN, as Johnson saw it, "There is almost a direct relation between how good something is and how hard it is to get it funded". Interview, St. Louis, Missouri, June 17, 1976.
107. Ibid.
108. Interview with Michael Gertler, Center for the Biology of Natural Systems, Washington University, St. Louis, Missouri, June 18, 1976.
109. Meeting of Overview Committee, 1976.

110. Interview with Bob Steffen, Boystown Organic Farm, Boystown, Nebraska, in St. Louis, Missouri, June 18, 1976.
111. Interview with Chuck Alexander, Student, Dept. of Agricultural Economics, University of Missouri, Columbia, Missouri, in St. Louis, Missouri, June 15, 1976.
112. Interview with Warren Seths, Mead Experimental Station, Mead, Nebraska, May 30, 1976.
113. Interview with Marty Strange and Dane Dahlston, Center for Rural Affairs, Walthill, Nebraska, June 7, 1976.
114. Interview with Dennis Demmel, Center for Rural Affairs, Walthill, Nebraska, in St. Louis, Missouri, June 18, 1976.
115. Midwest Organic Producers News, 1, (April 1976), n.p.
116. Here these advocates seem to resemble those nineteenth century farmers described by Margaret Rossiter, who made economic decisions about the switch to chemicals. For early farmers, the pressing problems were yields and economic success. It mattered little to them that the techniques they tried out were the results of competing theories in the academic marketplace; what did matter was proof in the profits they could attain. See Margaret W. Rossiter, The Emergence of Agricultural Science: Justin Liebig and the Americans 1840-1880, (New Haven and London: Yale University Press, 1975).
117. Interview with Coleman, 1977.
118. Carsten J. Park, Dirt Farmers Dialogue: 12 Discussions About Bio-Dynamic Farming, (Sprakers, New York: B-D Press, 1976), p. 6.
119. Meeting of the General Assembly of the International Federation of Organic Agricultural Movements, Seegen, Switzerland, October 16-19, 1976.

120. Interview with Hardy Vogtmann, IFOAM Secretariat, in Montreal, Quebec, June 2, 1977.
121. Interviews with Stuart Hill, Centre for Ecological Agriculture, MacDonald College, Montreal, Quebec, 1978

Chapter Eight

Conclusion -- Science and Experience

Longstanding ideals and assumptions held by organic enthusiasts have prevailed in the movement despite the claims of the "new science". Expressions of the natural ideal in the movement have helped to qualify and modify the inspiration offered by these 'scientific' celebrations. These compromises between popular and 'scientific' sentiments tell us much about the fundamental vision that enthusiasts continue to hold.

As in the past, contemporary advocates seek to meld their "new science" claims to the "laws of Nature". For some advocates this remains an arduous exercise; science still suggests a threat to the natural ideal.

Scientists make me sick. Wherever scientists are there is the want to do things, quickly, artificially, and synthetically. 1

For most advocates, however, the claims of science have a place alongside the experience of farmers -- so long as researchers do not "replace the real folks who dig in the dirt."²

The Creator made us able to view life through several windows. When the sun shines on any of them, let the shades be raised. 3

These compromises and reservations, as much as the resistance

of the conventional agricultural community, have shaped the overall development of the movement's "new science". While scientific celebrations continue to color the rhetoric and organization of the movement, the "new science" has not usurped spiritual or political beliefs, has not replaced the traditional organic ideal based on the individual family farmer armed with his "sacred plow". In the compromises which have emerged, organic enthusiasts, perhaps more clearly than ever before, have declared themselves not simply as non-chemical farmers, but as crusaders for rural revival and social responsibility. They have continued to hold the sacred natural covenant that inspired their predecessors.

Compromises -- Practicality and Accountability

Despite the promised vindication of energy comparisons, organic enthusiasts have not adopted strictly instrumental arguments for composting or against agricultural chemicals. Their initial optimism for energy research has been qualified by the realization that these studies implicitly commit the movement to a quantitative perspective. Few enthusiasts have been willing to adopt a model that would dictate the fate of organic claims solely in terms of energy advantages or financial viability.

Organic enthusiasts, as we have seen, have expressed long-standing reservations about the quantitative approach. Steiner had warned against the superficiality of "Arhamanic statistics". Howard had insisted that "Mother Earth does not

keep a pass-book", that economic studies "can hardly be worth the paper they are written on". J.I. Rodale, who had compromised by attempting to quantify some of the nutritional analyses of his plot research, had never gone so far as to adopt economic comparisons. For most advocates, the most important advantages of the organic method have been those as yet undiscerned and unmeasured with the standard tools of agricultural economics. Their arguments for the organic method have been predicated on assumptions about the quality of the crop and the soil.

Contemporary enthusiasts reassert this qualitative standard in their assessments of energy studies. In one of the first reviews of the comparative study by the Center for the Biology of Natural Systems, Chuck Walters Jr., editor of Acres U.S.A., rejected the use of isolated economic measures.⁴ Although Walters admitted his pleasure in reports of a mere 8% profit differential, he warned against the acceptance of this kind of comparative study as the sole standard of organic advantages. What, he asked, of the health of the soil, and of the people, issues not addressed by the discussion of profit margins?

In this same spirit, Robert Rodale voiced clear reservations about economic studies. Rodale granted that the CBNS study had had a significant impact in "raising new interest in scientists", but he saw most of this research as a "reflex" response. Conventional agriculturalists, in his view, now

unthinkingly designed plot studies.⁵ From Rodale's point of view, these comparisons had little to offer organic enthusiasts. They were designed to assert credibility to skeptics.

This is not interesting to me as research... farmers are just so different... My interest is not comparing. Of course there are situations where chemicals work out better. 6

For Rodale, the true promise of the "new science" lay in the development of practical solutions. He had already modified the vision of "new science" offered by Todd and other alternative technologists to fit his requirements for a practical research effort. Now he used much the same reasoning to qualify the comparative energy research.

I'm 100% devoted to improving methods. Because even if you prove it works there, [in an experiment] how are you going to know it's going to work on a farm? 7

Rodale decided that Organic Gardening and Farming research would ignore comparisons and concentrate on practical results. As we have seen, he asserted goals reminiscent of Howard's early research station at the "New Farm" outside Emmaus. In addition, he decided to revive the Soil and Health Foundation as a second mainstay of the "new science".

Like his father, Robert Rodale held a clear sense of himself not simply as a publisher and editor, but as a responsible leader of the organic crusade: just as he argued for practicality in terms of the "real needs" of his readers, he argued that the research undertaken under the guise of the Soil and Health Foundation must be accountable to the movement.

The revived Foundation funded only those comparative studies that avoided economics. Most of the money went to projects that seemed to promise practical benefits. And, in order to engage the participation and support of his readers, Rodale approved a plan for subscription funding of the Soil and Health Foundation. Organic Gardening and Farming offered "hair testing" and soil and water analysis services to its readers under this program. For a ten dollar fee, participants received an analysis of their hair, soil or drinking water, as well as the guarantee that their money would be used to fund future Soil and Health Foundation projects.⁸ In keeping with this sense of accountability, Rodale asked Soil and Health Foundation researchers to write up their results for a popular newsletter and to give presentations at an annual banquet. Rodale not only wanted this research to practically benefit organic enthusiasts, he wanted them to know what they were getting for their money. The "new science" of the organic movement, in his view, must look to its supporters rather than to its skeptics.

Enthusiasts themselves shared this same disdain for comparative research, this same insistence on practical work. At the meetings of the International Federation of Organic Agricultural Movements (IFOAM) in October 1976, advocates were far from reticent about putting forth their demands. While the new scientific leadership of IFOAM promoted the importance of external credibility, most lay advocates voiced serious

reservations about this goal; American enthusiasts were among the most vociferous in this debate. Eliot Coleman, director of the Small Farm Research Association, called the attempt to "prove" the organic method a "red herring". Coleman insisted on the need to "develop a better, more economic way to farm", but he felt that the comparative worth of new organic technology would follow spontaneously.⁹ Miriam Harris, a Virginian farmer and advocate, echoed Coleman's sentiments by asking for practical work: "Don't get into the area of science, as agriculture has traditionally done, an area we know nothing about".¹⁰ Harris, a spiritually oriented enthusiast, worried that the growing emphasis on science in the movement would destroy the basic inspirational message of the organic tradition.¹¹ Nick Veeder, a New York farmer and teacher, suggested that the comparative scientific emphasis could lead to a "superfluous load of highly technical material".¹² Like Coleman and Harris, Veeder wanted useable results. These enthusiasts, rather than deferring to the scientists' desire for comparative research inside the movement, wanted IFOAM to act first as a "friendly contact" among researchers, and second as a pressure group asserting "our right to get what comes out of the traditional institutes".¹³ Within the movement, however, they wanted practical results to be the main focus.

The scientific leadership could not directly deny these demands. The researchers could, however, attempt to side-step

the issue. A separate "agricultural technology" committee was set up to handle the demand for practical results. The scientists relegated the decision on comparative studies to a second "research" committee. In this way, they hoped to formulate their plans for credible comparative research without the disruption of lay enthusiasts.

However, enthusiasts continued to apply extra-scientific criteria within the research committee. Again, questions of practicality arose, and again researchers tried to outmaneuver lay advocates. And now new political considerations explicitly surfaced. Lay enthusiasts and scientists in the movement came into direct conflict over the definition of potential organic researchers.

The election of a standing research committee brought this debate to a head.¹⁴ Of the 96 participating IFOAM members, twelve participants chose to attend the first meeting of self-selected researchers. Only half of this number were scientists; the other six were lay advocates who had involved themselves in popular research projects. Participants in this initial committee ranged from scientists like Vogtmann to lay enthusiasts with little or no scientific training. Ostensibly, in keeping with the temper of the movement, all interested parties stood on equal footing in the committee. Over the course of the three day meeting, however, clear inequities surfaced. For the most part, accredited researchers dominated the discussions. Only when the time came to elect a smaller

three member operating committee, did lay advocates assert their influence.

Both Hardy Vogtmann and Colin Fisher, director of the Pye Research Center in England, were acclaimed as members of the standing committee by the larger group. Controversy erupted, however, over the selection of a third member of the committee. Fisher and Vogtmann nominated Pierre Ott, who had attended the IFOAM meeting as an observer under the auspices of Alasuisse, an international petro-chemical corporation. A friend, a known entity, and an apparent confederate in their research plans, Ott was their ideal choice of fellow scientist. However, lay advocates like Eliot Coleman opposed Ott's nomination. Coleman charged Ott, on the grounds of his industrial affiliation, with vested interests in clear conflict with organic goals. Ott's election, Coleman claimed, would coopt the organic cause; Alasuisse, he charged, both operated as a "known polluter of the North Sea" and "cashed in" on the organic crusade by distributing the bio-dynamic compost starter under the brand name "Pay-bac".¹⁵ In Ott's stead, Coleman nominated Winifred Felderer, a representative of a small Dutch soil testing lab.

By rejecting Ott and nominating Felderer, Coleman directly challenged the complacent authority assumed by Vogtmann and Fisher. Fisher explicitly objected to Coleman's charges on the grounds that "This is science, not politics". Nevertheless, Coleman's arguments carried the day. Lay enthusiasts

voted in a block against Ott's appointment. He was banished, if not from participation in the movement, from its leadership. Vogtmann and Fisher found themselves subject to criteria they viewed as inappropriate to the research enterprise. They seemed to expect a kind of deference from lay advocates that was not forthcoming. They were powerless, however, to veto Felderer's nomination.

As a result of this conflict, the scientific leaders did their best to further the distance between themselves and lay advocates. In their plans for the 1978 meetings, they proposed a separate time and place for the research committee meeting. They also tried to curtail participation to accredited scientists.

Clearly we must involve individual scientists and/or institutes active in areas of research that relate to the complexity of IFOAM's interest in alternative agriculture and improved human nutrition. It is, therefore, proposed that participation in the second Meeting be limited to scientists who could make a positive contribution to the meeting by either the presentation of a Paper or informal and constructive criticisms of the Papers to be presented. 16

These researchers also proposed to concentrate on the publication of all papers.

We regard it as essential that the quality of all papers to be presented should be such as to ensure their subsequent publication. 17

Again, this was a strategy designed to evoke traditional scientific standards and to discourage lay participation. The self-imposed estrangement of these researchers was tantamount

to a refusal to account to lay advocates. Arguments over scientific credibility, once engaged between enthusiasts and conventional skeptics, now moved into the movement. Unwilling to concede to demands for practicality or to political considerations, these researchers still adhered to much of the conventional scientific ethos.

However, in other ways scientists in the movement kept faith with their predecessors and lay counterparts. Like lay advocates, these researchers rejected conventional energy studies. Although they adhered to certain principles of the formal scientific ideal, they nevertheless saw themselves as a new breed of generalists. Their vision of the "new science" took its cue from the ecological metaphor; they hoped to create "wholistic" research.

When the results of Commoner's second year comparisons had appeared, widening the differential between conventional and organic farming profits to 12%, researchers in the movement had begun to voice their own doubts about energy comparisons. Stuart Hill, one of the major scientist-publicists of the organic crusade, had expressed his reservations in a paper titled "Limitations of the Energy Approach in Defining Priorities in Agriculture".¹⁸ Hill had initially welcomed the Pimentel and CBNS studies, but he had undergone a drastic change of heart after he realized that energy researchers were about to become another set of narrow-minded specialists.¹⁹ Hill, the single organic advocate to present a paper

at the CBNS Energy and Agriculture conference, made his opposition clear. Although he had the support of the small band of enthusiasts who attended the conference, he had little sympathy from most energy researchers. In his presentation, he challenged their assumptions and collective self-congratulations.

The apparent success of "specialist solutions", often based on the treatment of symptoms, has prevented us from viewing the incredibly complex system on which our survival depends, and in doing so, we are gambling with our future. If we are to deal with these problems, we must understand the laws by which life and the natural environment function and establish political and socio-economic systems that are consequential upon them. 20

Energy comparisons, by Hill's lights, had turned the organic debate away from the wholistic vision.

The IFOAM scientists echoed Hill's objections to energy comparisons. Although Hardy Vogtmann had designed his own comparative studies, he wanted to determine nutritional values of organic and chemical produce, not energy or profit margins. In his official capacity as IFOAM Secretariat, Vogtmann hoped to convert conventional researchers to "wholistic" methods. In May 1977, embarking on a tour of organic and conventional research centers in the United States and Canada, he proselytized for new kind of comparative research. Vogtmann wanted to coordinate a network of studies across North America and Europe which would use comparable base line procedures based on feeding trials with matched animal populations. In his visit to the Center for the Biology of Natural Systems, he

received a sympathetic hearing and obtained a tentative guarantee of cooperation from project director William Lock-
 erez.²¹ The CBNS seemed at least willing to consider the
 non-economic comparison that Vogtmann proposed. And, inside
 the movement, the response was overwhelmingly favorable. Both
 enthusiasts and researchers saw "wholistic" comparisons as an
 important step for the "new science", as a compromise with the
 conventional community.

Popular Science

In light of these compromises and negotiations between
 scientists and enthusiasts, the scientific antagonisms and
 celebrations of the organic movement can be understood in a
 new way. Enthusiasts are both deeply involved and deeply
 ambivalent about science. Their resistance is not simply
 anti-science sentiment, nor are their claims mere window-
 dressing on their beliefs. Throughout the history of the move-
 ment, we find a strong pull between attempts at rationality
 and messianic righteousness. Enthusiasts envision a 'popular
 science' whose claims can be tested by both scientists and
 lay advocates.

Enthusiasts have emulated the rituals of the scientific
 establishment. The 'research circle' at Dornach which evolved
 to promote Steiner's lectures quickly promoted Pfeiffer as its
 resident expert. Howard's followers attempted to set up
 experiments along the lines of his research reforms. In the
 United States, Rodale and Bromfield both envisioned widespread

research support for the new organic movement and took it upon themselves to raise scientific questions on their own farms. And, as we have seen, the current scientific salesmanship of the movement explicitly mimics the conferences and research literature of the conventional community.

Enthusiasts have also been popularizers of scientific results, remarkably adept translators of conventional research work. In each stage of the movement, enthusiasts have adopted and modified what the current conventional research offers. In both the ecology and energy debates, for instance, advocates have elaborated on discussions borrowed from the standard scientific literature.

Organic enthusiasts also present their own distinctive claims in scientific terms. J.I. Rodale, despite his continual diatribes against conventional scientists and "doddering Ph.Ds", retained a commitment to the ideals of evidence and proof. Towards the end of his life, he still spoke of the new "theories" on which he was working, of the need to gather evidence in a variety of areas. Yet advocates like Rodale have differed from conventional scientists on what constitutes scientific evidence. In some cases, a single example may suffice as "proof" of their theories. While the pull to rational explanation underlies the attempt to provide evidence, enthusiasts have generally been leery of the experimental model.

Instead, organic advocates offer real life experience as

the corroborating evidence of their claims. This crusade, for experience rather than experiments, can be found in every vision of the movement. Rudolf Steiner, for example, asserted the importance of practical experience within his anthroposophical teachings by embracing "so-called peasant stupidity". Steiner praised the peasant's real appreciation of the land in contrast to the scientist's narrow calculations. Sir Albert Howard also glorified the peasant and his practical talents. For Howard, the peasant and the "kitchen gardener" shared a real qualitative understanding that the scientific establishment had long since lost. J.I. Rodale likewise looked to the farmer for the "common sense" guidelines of his crusade. For these enthusiasts, experience, unlike evidence, included the emotional satisfactions of work on the land and of adherence to the natural ideal.

The contemporary organic movement continues this quest for experience. Robert Rodale, for instance, has not abandoned his father's "common sense" mission. The elder Rodale had revelled in portraying his enthusiasm as "unscientific gumption".

One more thing: if I am going to save my life
by following unscientific methods, then to heck
with scientific science. 22

While the younger Rodale has made many compromises with the new scientific vision of the movement, the echo of his father's voice can still be heard in his crusade.

I don't think that science is everything.
It's not a good thing to live scientifically.
I'm not trying to do everything scientifically. 23

The organic movement, in the view of both Rodales, has encompassed much more than science or scientific celebrations.

In this spirit, Robert Rodale has defended his father's 'organic' label as the best name for the non-chemical farming ideal. He has argued not only against the erosion of new terms inside the movement, but against proposed Federal Trade Commission legislation that would ban 'organic' and 'natural' as terms imprecise and potentially misleading. In his prepared statement to the Commission Food Advertising Committee, Rodale has built his defence partly on the basis of organic produce differences, but also on the argument that the meaning of the term 'organic' goes beyond the produce itself. Using an organically grown carrot to illustrate his point, he suggests that:

That organic portion of the carrot is tangible, even though it extends beyond the carrot itself - back to the soil in which it was grown, to the people who grew it, worked, took it to market, and sold it. In dozens of different agricultural, economic, social, environmental, ecological and even political ways, the organically grown carrot is different. 24

In replying to the testimony of Dr. Daniel Arnon, Rodale, like his father, has debated the appropriateness of established scientific evidence as the sole criterion on which to judge the organic method.

He says nothing about a person or agency following the dictates of common sense, if common sense happens to differ with his concept of scientific truth. What about morality, religion, cultural traditions, and the hundreds of other conditions which people choose to impose on their lives which don't happen to follow the dictates of scientific truth. 25

The organic label, in this view, cannot be reduced to mere scientific quibbling; for the consumer and farmer, the organic label represents a comprehensive crusade, expresses both personal satisfaction and social responsibility. As Rodale has argued;

That word crystallizes the totality of their effort, going beyond the non-use of chemicals to speak of their respect for ecological values, love for the land, and desire to spread those ideas. 26

Thus, common sense experience, not just scientific data, remains the hallmark of Rodale's organic vision.

Enthusiasts view both the efforts of their predecessors and their new scientific celebrations as elements of a much broader mission. Scientists, welcomed as confederates, must remain accountable to enthusiasts for the direction of their work. Researchers, in this view, will never supplant "the real folks who dig in the dirt". The ultimate proof of their "most scientific" agriculture and the possibility of new practical research will come not only from accredited researchers, but from real life experience. Thus Robert Oelaf, an enthusiast who wrote his doctoral dissertation on the potential benefits of the organic method, extends the notion of "new science" to include the efforts of the farmers

Good science is a matter of using your mind, your reason, it doesn't have to be objective. You need belief, you have to believe that the world is orderly to do organic research. Don't let us restrict ourselves to objective facts. This logical positivism is being more and more questioned. What an organic farmer is doing is research on his own farm - doing it all the time. He's breaking new ground, he can't get advice from anybody. He's personally involved. 27

Rodale, Oelaf, and others affirm a vision of new 'popular science', one undertaken for and by advocates, directed by the attempt at rationality, but inspired by the farmer's experience of "Natural" order and harmony on the land.

Common sense and the Natural Ideal

The quest for experience in the organic movement extends far beyond questions of scientific validity. In the demand for practicality, voiced by both the spiritually minded enthusiasts like Harris, and the politically-oriented advocates like Coleman, basic sentiments shared by diverse visions of the movement, by old and new enthusiasts, are restated. The long-standing concern for experience has united and animated an amazingly heterogeneous organic movement, has been a fundamental precept of the natural ideal. Much of the strength of the movement has been a result of the ability of enthusiasts to ignore differences and paradoxes by emphasizing the common quest for experience.

In the early American food reform movement, both Scott Nearing and Ralph Borsodi took the quest for experience to heart, embarking on farming as a way to combine practical skills with utopian enthusiasm. Borsodi, at his School of Living, hoped to "furnish a demonstration of how to live to which the whole world might listen". The Nearings saw their rural experience as "an affirmation -- a way of conducting ourselves, of looking at the world and taking part of its activities that would provide at least a minimum of those

values which we considered essential to the good life".

Regardless of political and spiritual formulations, most early advocates stressed direct experience as the real measure of their crusade.

For Rodale, the "common sense" crusade took the form of vehement anti-intellectualism. Yet his counterparts, who avowed a scientific vision, shared his concern for experience. Louis Bromfield, felt that life on the land must shape the feelings and activities of non-chemical farmers. He titled his most popular account of Malabar Farm, From My Experience. In this book he argued for the value of practical and fundamental experience on the land. Likewise Joe Nichols, the physician who founded the Natural Foods and Farming Association, heralded the farm as the real testing ground for organic methods. Despite their conflicts, these three rivals for the early organic leadership all acknowledged the basic value of practical experience.

Contemporary enthusiasts, despite their apparent differences, also share with one another and with the older advocates a belief in experience. Spiritual, political, and self-sufficiency advocates hold in common a disdain for authority and credentials. Most of their inspiration stems from a vaguely articulated anti-intellectualism and a kind of ecological righteousness. For these advocates, the farmer holds out wisdom and judgement in contrast to the sterile scholarship of the expert, the massive blunders of the technocrat.

Their own efforts are directed toward discovering this same wisdom, cultivating this same judgement from experience on the land.

This stress on experience in the movement has been accompanied by an emphasis on the personal and individual. Experience can take many forms, but it must be directly achieved, directly inspired. For political, self-sufficiency, and spiritual advocates, this directness takes different forms. For political enthusiasts, experience must be authentic, an affirmation of the value of real work and a confirmation of their personal development. For self-sufficiency advocates, experience involves the possibility of real self-discovery. And for spiritual enthusiasts, revelation can and should be direct; they claim access to the world of the spirit, and use empathy as a means of understanding the spiritual expressions of nature.

Among spiritual enthusiasts, for instance, Rudolf Steiner taught that the human race was slowly evolving to a state in which all men would eventually achieve direct revelation. Steiner himself claimed to give his Agriculture course through direct inspiration; farmers, on the other hand, could approximate this knowledge by attuning themselves to the land. Contemporary Bio-dynamic farmers and gardeners have expressed the awakening of this spiritual possibility in their own agricultural efforts. John Philbrick, minister and anthroposophical disciple, has written of walks in his own garden.

You see I am aware that God walked in the Garden in the cool of the day. Time and time again I find Him there. Often He opens my eyes to see things that I wouldn't otherwise see. From the outset I began to recognize that the most important things surrounding me in the garden are the Forces of Life. 28

Similarly, at Findhorn Garden in Scotland, inspiration is shared between oracles and disciples. Eileen Caddy's spiritual inspiration remains the guiding source of the garden, but followers and visitors are encouraged to seek personal grace and insight. The garden itself is a place where the individual can open himself to the voices of the Nature spirits. Findhorn is also located near a "power spot", an ancient site where it is believed the empathetic individual can experience the spirit world.

Many new spiritual advocates share this sense of the dual nature of inspiration. At The Farm in Tennessee, Stephen Gaskin is acknowledged as a spiritual pastor and preacher to his followers, but individuals can also achieve inspiration. "...if there's anything we do that looks like it's neat or together, it's because we are based in Spirit".²⁹ "Psychedelic sacraments", marijuana and peyote, hold out the promise of direct revelation.

If you're going to have anything to do with a material sacrament, which is what a psychedelic is, it should be in such a way that there is nobody interspersed between you and where you're going. That is: Don't take anything made in a laboratory. If you're going to take anything, there's grass and mushrooms and peyote...which are the classic organic psychedelics. 30

Midwives on The Farm are close to God because they participate

in "the sacrament of birth -- the passage of a new soul into this plane of existence". Birth is a spiritual experience in which mother and midwife attain grace.

The wisdom and compassion a woman can intuitively experience in childbirth can make her a source of healing and understanding for other women. 31

Many levels of experience then offer spiritual awakening at The Farm, as at other spiritual communes of the new age. This sense of revelation joins them to older spiritual advocates in the movement.

Not grace, but achievement and responsibility, have been the hallmarks of personal experience among secular middle-road organic advocates. For both J.I. Rodale and John Shuttleworth, toil on the land exemplified the basic integrity and self-respect achieved by the conscientious farmer. Their followers have echoed these sentiments; the organic movement has offered a continual proving ground of personal wisdom and an exploration into self-sufficiency.

Other advocates give this emphasis on individual experience and immediacy a political overtone. The 'radical' vision of the organic movement, from Nearing to Bookchin, embraced the political nature of personal experience. Nearing, in classical marxist terms, saw himself engaged in praxis, in the liberating activity of true labor. Bookchin endowed everyday practical action with the dignity of political participation in the "social relations of utopia". Contemporary radicals have lost much of the guiding rhetoric of these predecessors,

but have retained an emphasis on immediacy and directness. They thereby seek 'authentic' experience on the land, and emulate the virtues of the 'decent farmer'. Women farmers have recently appropriated this exploratory venture as their own; new communal women's farms have offered personal discovery and political consciousness to their members and individual women farmers have attempted to strike out on a journey of liberating self-inquiry and social exploration on the land.³²

These 'political' advocates explicitly intend their statements about individual experience as statements about society.³³ However, much of their 'politics' has been a phasing out of traditional political action. Many advocates refer to "political implications" as a salve to personal conscience developed in early radical activism. Nevertheless, the political identity they retain, and their understanding of the movement, offer an analysis of explicit social problems to other advocates.

What avowedly 'political' enthusiasts voice as radical and activist statements, mainstream apolitical enthusiasts express neutrally in terms of "progress" and "civilization". Throughout the movement, statements about individual experience have been implicitly intended as statements about society. In fact, apolitical advocates have articulated a millinerian extreme not equalled by overtly radical enthusiasts. Steiner, as a spiritualist, predicted the collapse of man and man's

civilization unless composting techniques were adopted and the false chemical system abolished. Likewise, Howard, who started with exclusively agricultural critiques, turned to political issues in his later campaign. He warned against the "disastrous failure" imminent with continued chemical use, and offered the Indore method as an opportunity "to found our civilization on a fresh basis".

In the American movement, J.I. Rodale, although leery of potential political attacks, addressed the recurrent "crisis of civilization". He compared the dangers threatening American society to those which had destroyed ancient cultures.

The back-to-the-land movement is one of the healthiest signs of a progressive people. Civilizations that get too far from the land are bound to decay. Nations, like Antaeus of old, need to renew their strength by contact with the earth. 34

In their turn, many contemporary American enthusiasts see themselves as revolutionaries, if not radicals. In their efforts to construct a "planetary consciousness", remake a society on rural foundations, they envision not a political, but a cultural revolution. They reject artificiality and plasticity, rejoice in simplicity and permanence. Their statements about society continue the poignant tradition of the "myth of the garden".

All these expressions of common sense, direct experience, and social change in the organic movement have been linked by the natural ideal enthusiasts hold in common. The vision of an integrated and benevolent Nature, both mystical and secular,

both radical and conservative, has united the movement. Grace, heroism, authenticity, progress and permanence have all been possible within the laws and rhythms of Nature. Organic farming enthusiasts, whatever their rhetoric, have tried to realize their vision through direct communion with Nature. The natural ideal has been adopted to many different metaphors in the movement -- "the Wheel of Life", "astral-ethereal forces", "the land's promise", "the respect for ecological balance" -- but all of these expressions have shared in common the view that chemical agriculture breaks the fundamental bond between man and the earth. Enthusiasts have tried to reforge that bond in their efforts on the land and in their public crusade.

All of us have agriculture in our blood. We may have to go back five generations, but it's there and that knowledge should also make you extra confident. 35

A fundamental sense of rightness, guided by the natural ideal, has underlaid this mission.

But I just can't enjoy working with chemicals that poison the soil. I never could. When I first heard about organic methods I was so happy to realize other people thought the same way I did. I think it's a matter of whether you really love the land or not. 36

For enthusiasts, the organic farmer holds a sacred natural covenant for this and all future generations. He holds the land in trust.

Footnotes - Chapter Eight

1. Sky Bullock, "Letter to the Editor", Organic Gardening and Farming, 21, (April 1972), p. 22.
2. T.A. Jennings, "Letter to the Editor", Organic Gardening and Farming, 22, (October 1973), p. 18.
3. Ibid.
4. Chuck Walters, Jr., "Editorial", Acres, U.S.A., 6, (November 1975), p. 2.
5. Interview with Robert Rodale, Rodale Press, Emmaus, Pa., June 7, 1977.
6. Ibid.
7. Ibid.
8. Interview with Mark Schwartz, Director of Soil and Health Foundation, Rodale Press, Emmaus, Pa., June 8, 1977.
9. Comments at meetings of the General Assembly of the International Federation of Organic Agricultural Movements (IFOAM), Seegen, Switzerland, October 16, 1976.
10. Ibid.
11. Interview with Miriam Harris, European Farm Tour, October 1976.
12. Comments at the General Assembly of the IFOAM, October 16, 1976.
13. Ibid.
14. Meeting of the Research Committee, IFOAM, Seegen Switzerland, October 17, 1976. The following discussion relies on my notes and observations at the committee meetings.
15. Coleman was not alone in his protest: politicized advocates shared his regrets at the commercialization of organic methods and, among Bio-Dynamic farmers, Carston Park expressed dismay on a seemingly apolitical level. Without

mentioning the industrial takeover, he suggested that the new name itself was highly objectionable.

The former name holds a promise of enhancing life forces without pointing to monetary rewards, and the new advertising name holds a promise of monetary rewards without indicating a promotion of life forces... In short, the Arahamanic grip appears to have grown quite tight on the remains of Dr. Pfeiffer's Bio-Dynamic Starter: Carston Park, "Letter to the Editor", Bio-Dynamics, 121, (Winter 1977), p. 30.

16. Colin Fisher, memo to Research Committee, IFOAM, February 28, 1977, p.2.
17. Ibid.
18. Stuart B. Hill and Jennifer A. Ramsay, "Limitations of the Energy Approach in Defining Priorities in Agriculture", paper presented at the CBNS "Energy and Agriculture" conference, St. Louis, Missouri, June 6-19, 1976.
19. Interviews with Stuart Hill, Centre for Ecological Studies, MacDonald College, 1976.
20. Hill and Ramsey, "Limitations", p. 2.
21. Interview with Hardy Vogtmann, IFOAM Secretariat in Montreal, Quebec, June 2, 1977.
22. J.I. Rodale, unpublished mss. Emmaus, Pa., n.d., n.p.
23. Interview with Robert Rodale, 1977.
24. Robert Rodale, Prepared Statement to the Federal Trade Commission, Committee on Food Advertising, 1977.
25. Ibid., p. 51.
26. Ibid., p. 64.

27. Robert Oelaf, seminar comments at the Centre for Ecological Agriculture, MacDonald College, March 8, 1978.
28. Helen Philbrick and John Philbrick, Gardening for Health and Nutrition, (Blauvelt, New York: Rudolf Steiner Publications, 1971), p.i.
29. Stephen Gaskin and the Farm, "Plowboy Papers", The Mother Earth News, 45, (May/June 1977), p. 10.
30. Ibid.
31. Quoted by Jill Johnson. "The Farm: the Friendliest Place in America", The Village Voice, (January 3, 1977), p. 17; see Ina May Gaskin, Spiritual Midwifery, ed. by Rachel Sythe, (New York: World Publishing Co., 1978).
32. Interview with Mary Shields, Story Acres, Canterbury, New Hampshire, February 12, 1977; Country Women Journal, (Albion, California: Country Women, 1970).
33. Some of the most interesting insights in this vision have appeared in the fiction of the new utopia. See Ernest Callenbach, Ecotopia, (New York: Bantam Books, 1977), and Marge Piercy, Woman On the Edge of Time, Greenwich, Conn.: Fawcett Publications, 1976.
34. J.I. Rodale, Pay Dirt, (Emmaus, Pa.: Rodale Press, 1945), p. 236-237.
35. Eliot Coleman, "A Small Farmer's Guidelines to Success", in Organic Farming: Tomorrow's Agriculture, the Staff of Rodale Press, ed., Emmaus, Pa.: Rodale Press, 1977, p. 46.
36. Johnny Adams, quoted in "Ten Years Ahead of His Time", Gene Logsdon, Ibid., p. 61-62.

Sources Consulted

Books and Articles

"Catching up to Rodale Press", Time, March 22, 1971, p. 51.

"Death of a Salesman", Newsweek, June 21, 1971, p. 69

Farm Report, The Year of the Soybean 1978, The Farm, Summertown, Tenn.

Program, "First International Conference on the Organic Method for Farm and Garden", San Francisco Hilton Hotel, January 3-6, 1973.

"Foundation Notes", The Soil and Health Foundation News, February 1977, vol. 6, no. 1.

-my, What Do We Use for Lifeboats?, conversation with Robert Reiners, John Todd, Ian McHarg, Paolo Soleri and Richard Saul Wurman, New York: Harper Colophon Books, 1976.

"A Noisy Reaction to Silent Spring", review of Rachel Carson, Sierra Club Bulletin, 48, January 1963.

"Paul Revere of Ecology", Time, 95: February 2, 1970.

"Prophets of the Good Life", Newsweek, September 14, 1970, 100-101.

"Results of Survey Shows: Nebraska Farmers Successfully Kick Chemical Habit", New Land Review, vol. 1, no. 2, Winter 1975.

"Silent Spring: An Appraisal", review of Rachel Carson, National Parks Magazine, 36 (182), p. 16-21.

Abelson, Philip, "Changing Attitudes Toward Environmental Problems", (editorial) Science, 172:517.

Albrecht, William A., The Albrecht Papers, ed. by Charles Walters Jr., Raytown, Missouri, Acres, USA, 1975.

Alcott, William A., A System of Vegetable Diet as Sanctioned by Medical Men and by Experience in All Ages, New York, Fowler and Wells, 1849.

Auchter, E.C., "The Interrelations of Soils and Plants, Animal and Human Nutrition", Science, vol. 89, May 12, 1937, p. 421-425.

Baldwin, I.L., "Chemicals and Pests", Science, vol. 137, 28 September, 1962, p. 1042-1043.

Barnes, P., ed., The People's Land, Rodale Press, Emmaus, Pa., 1975.

Berry, Wendell, "Think Little", The Whole Earth Catalog, September 1970, p. 3-5.

Berry, Wendell, The Unsettling of America: Culture and Agriculture, New York: Avon Books, 1977.

Blair, W. Frank, "The Case for Ecology", Bio Science, 14(7), July 11, 1964, p. 17-19.

Borsodi, Ralph, Education and Living, Suffern, New York, 1948.

Borsodi, Ralph, Flight from the City: An Experiment in Creative Living on the Land, Harper and Row Publishers Inc., New York, 1933; Harper Colophon, 1972.

Beame, Hugh, et al., Home Comfort: Stories and Scenes of Life on Total Loss Farm, Saturday Review Press, New York, 1973.

Bookchin, Murray, (pseud. Lewis Herber), Our Synthetic Environment, 2nd. ed., New York: Harper Colophon Books, 1974.

Bookchin, Murray, (pseud. Lewis Herber), Post-Scarcity Anarchism, Montreal: Black Rose Books, 1971.

Brand, Stewart, "Purpose", The Whole Earth Catalog, July 1970, p. 3.

Bromfield, Louis, From My Experience: the Pleasures and Miseries of Life On a Farm, New York: Harper, 1955.

Bromfield, Louis, Malabar Farm, New York: Harper, 1948.

Bromfield, Louis, Pleasant Valley, New York: Harper, 1945.

Brooks, Paul, The House of Life: Rachel Carson at Work, Boston: Houghton-Mifflin, 1972.

Bryant, Gay, "J.I. Rodale; Pollution Prophet", Penthouse Interview, Penthouse, Vol. 2, no. 10, June 1971, p. 39-42.

Bullock, Sky, "Letter to the Editor", Organic Gardening and Farming, 21, April 1972, p. 22.

Buttel, Frederick H., and Finn, William L., "The Structure of Support for the Environmental Movement, 1968-1970", Rural Sociology, 39, Spring 1974, p. 56-69.

Callenbach, Ernest, Ectopia, Berkeley, Calif., Banyan Tree Books: January 1975; New York, Bantam Books, October 1977.

Carson, Gerald, Cornflake Crusade, New York and Toronto; Rinehart and Company, 1957.

Carson, Rachel, The Edge of the Sea, Boston: Houghton-Mifflin, 1955.

Carson, Rachel, The Sea Around Us, New York: Oxford University Press, 1961.

Carson, Rachel, Silent Spring, Boston: Houghton-Mifflin, 1962.

Cervinka, Vashek, et al., Energy Requirements for Agriculture in California, California Department of Food and Agriculture, University of California, Davis, January 1974.

Chisholm, Anne, Philosophers of the Earth: Conversations with Ecologists, New York: E.P. Dutton and Co. Inc., 1972.

Cole, Lamont C., "The Impending Emergence of Ecological Thought", Bio Science, 14(7), July 11, 1964, p. 30-32.

Commoner, Barry, Science and Survival, New York: Viking, 1966.

Commoner, Barry, The Closing Circle: Nature, Men and Technology, New York: Bantam Books / Alfred A. Knopf Inc., 1971.

Cotgrove, Stephen, "Environmentalism and Utopia", Sociological Review, 24, February 1976, p. 23-42.

Darby, William, "Silence, Miss Carson", The Chemical and Engineering News, October 1, 1962, p. 60-63.

De Bell, Garrett, (ed.), The Environmental Handbook, New York: Ballantine Books, 1970.

Dunlap, Riley E., "The Socioeconomic Basis of the Environmental Movement", paper presented at the Annual Meeting of The American Sociological Association, San Francisco, August 1975.

Demmel, Dennis, "Center Launches Nebraska Low Energy Agricultural Project", mimeo., Center for Rural Affairs, Walthill, Nebraska, 1976.

Egerton, F.N., (ed.), History of American Ecology, New York: Arno, 1977.

Egler, Frank E., "Pesticides in Our Environment", American Scientist, 52(1), March 1964, p. 110-136.

Elliot, Charles, "Up on the Farm", Time, January 18, 1971, p. 78.

Fishbein, Morriss, "Bread and Some Dietary Fads" The New Medical Follies, New York: Boni and Liveright, 1927, p. 132-133.

Galston, Arthur W., "The Organic Gardener and Anti-Intellectualism", Natural History, 81, May 1972, p. 24,28.

Gaskin, Stephen and The Farm, "The Plowboy Papers", MENS, no. 45, May/June 1977.

Goldman, M.C., "The Organic Revolution Goes to College", Organic Gardening and Farming, 19, January 1970, p. 56-61.

Graham, Frank, Since Silent Spring, Boston: Houghton-Mifflin, 1970.

Graham, Sylvester, Lectures on the Science of Human Life, London: Horsell and Aldine Chambers, 1949.

Gregg, Evelyn Speiden, "The Early Days of Bio-Dynamics in America", Bio-Dynamics, I, 119: Summer 1976, p. 25-38:
 II, 120: Fall 1976, p. 7-22:
 III, 121: Winter 1977, p. 16-23.

Green, Wade, "Guru of the Organic Food Cult", New York Times Magazine, June 6, 1971, p. 30-31; 54-60; 65-70.

Greenburg, D.S., News and Comment - "Pesticides: White House Advisory Body Report Recommending Steps to Reduce Hazard to Public", Science, vol. 140, March 24, 1963, p. 878-879.

Hall, Ross Hume, Food for Nought: The Decline in Nutrition, New York; Vintage Books, 1976 : Random House, 1974.

Hawken, Paul, The Magic of Findhorn: An Eyewitness Account, New York: Harper and Row, 1975; Bantam Books, 1976.

Hemleben, Jean, Rudolf Steiner: A Documentary Bibliography, London: Henry Gouldner Ltd., 1975.

Hightower, Jim, Hard Tomatoes, Hard Times, A Report of the Agribusiness Accountability Project on the Failure of America's Land Grant College Complex, Schenkman Publishing Co., Cambridge, Mass., 1973.

Hill, Christopher, The World Turned Upside Down: Radical Ideas the English Revolution, New York: Viking Press, 1972.

Hill, Stuart B., and Ramsay, Jennifer A., "Limitations of the Energy Approach in Defining Priorities in Agriculture", Paper presented at Center for the Biology of Natural Systems "Energy and Agriculture" conference, St. Louis, Missouri, 16-19 June, 1976.

Howard, Sir Albert, An Agricultural Testament, London: Oxford University Press, 1940.

Howard, Sir Albert, The Soil and Health: A Study of Organic Agriculture, (originally 1947), paperback New York: Schocken Books, 1972.

Howard, Louise E., Sir Albert Howard in India, London: Faber and Faber, 1953.

Hofstadter, Richard, The Age of Reform: From Bryan to F.D.R., New York: Vintage, 1955.

Houriët, Robert, Getting Back Together, New York: Coward, McCann and Geoghegan, 1971.

Issel, William H., "Ralph Borsodi and the Agrarian Response to Modern America", Agricultural History, XLI, April 1967, p. 155-166.

Jackson, Carleton, J.I. Rodale, Apostle of Non-Conformity, New York: Pyramid, 1974.

Jennings, T.A., "Letter to the Editor", Organic Gardening and Farming, 22, October 1973, p. 18.

Jezer, Marty, "Death of the American Farmer", Eat It: Agribusiness, Farming, Food and You, Report from WIN, 1972, p. 1-5.

Johnston, Jill, "The Farm: The Friendliest Place in America", Village Voice, January 3, 1977, p. 17-19.

Kallet, Arthur, and Schlink, F.J., 100,000,000 Guinea Pigs: Dangers in Everyday Foods, Drugs and Cosmetics, New York: Vanguard, 1933.

Kanter, Rosabeth Moss, Commitment and Community: Communes and Utopias in Social Perspective, Cambridge, Mass.: Harvard University Press, 1972.

King, Dennis, "Is Science Advanced Enough for Biological Agriculture?", Farmstead Magazine, Summer 1977, p. 18-22.

Kolmer, Lee, "Conventional vs. Organic Farming", Ag World, November 1975, p. 17.

Koepf, H.H., "Bio-Dynamic Farming and Gardening in Our Time-Agriculture as a Social Task III", Bio-Dynamics, 103, Summer 1972, p. 1-6.

Kuhn, Thomas F., The Structure of Scientific Revolution, 2nd.ed., (enlarged), Chicago: University of Chicago Press, 1962, 1970.

Lacuer, Walter, Young Germany, A History of the German Youth Movement, London: Routledge and Kegan Paul, 1962.

Lamb, Ruth de Forest, The American Chamber of Horrors: The Truth About Food and Drugs, New York, Farrar, 1936.

Lockeretz, William, et al., A Comparison of the Production, Economic Return and Energy Intensiveness of Corn Belt Farms That Do and Do Not Use Inorganic Fertilizers and Pesticides, Centre for the Biology of Natural Systems, Washington University, St. Louis, Missouri, July 1975.

Lockeretz, William, Organic and Conventional Crop Production in the Corn Belt: A Comparison of Economic Performance and Energy Use for Selected Farms, Center for the Biology of Natural Systems, Washington University, St. Louis, Missouri, June 1976.

Longgood, William, The Poisons in Your Food, (first published Simon and Schuster, 1960), New York: Pyramid Books, 1975.

Loomis, Mildred, "Green Revolution - A Beginning," The Green Revolution - A Voice for Decentralization, vol. 34, no. 4, 1977.

Maddox, John, The Doomsday Syndrome, New York: McGraw-Hill Book Co., 1972.

Manchester, Harland, "The Great Organic Gardening Myth," Reader's Digest, 1962, p. 102-105.

McConnell, Grant, The Decline of Agrarian Democracy, Berkeley and Los Angeles: University of California Press, 1959.

McLarney, William O., "Pond Construction: First Step in Successful Agriculture", Organic Gardening and Farming, 21, April 1972, p. 116.

Marx, Leo, The Machine in the Garden: Technology and the Pastoral Ideal in America, New York: Oxford University Press, 1964.

Mayer, Andre, and Mayer, Jean, "Agriculture, the Island Empire", Daedalus, 103(3), Summer 1974, p. 83-96.

Maynard, Leonard, "Soils and Health", Journal of the American Medical Association, July 1950, p. 806-812.

Maynard, Leonard, "Organic Gardening - Bunk", Reader's Digest, October 1951.

Mendel, Dr. Lafayette B., "Some Historical Aspects of Vegetarianism", Popular Science Monthly, LXIV, March 1904, p. 457-465.

Mitchell, John G., and Stallings, Constance L., Ecotactics, New York: Trident Press, 1970.

Merrill, Richard, ed., Radical Agriculture, New York: Harper Colophon, 1976.

Mosse, George S., The Crisis of German Ideology, New York: Grosset and Dunlap, 1964.

Mosse, George S., The Nationalization of the Masses, New York: Howard Fertig, 1975.

Mosse, George S., Nazism : An Interview with Michael Ledeen, New Brunswick, New Jersey: Transaction Books, 1978.

Mungo, Raymond, Total Loss Farm: A Year in the Life, New York: E.P. Dutton Co. Inc., 1970 : Bantam Books, 1971.

Nearing, Helen, and Nearing, Scott, Living the Good Life, New York: Schocken Books, 1970.

Nearing, Scott, The Making of a Radical: A Political Autobiography, New York: Harper and Row, 1972.

Nearing, Scott, and Nearing, Helen, Our Right to Travel, Harborside, Maine, Social Science Institute, 1959.

Norman, Gurney, "The Organic Gardening Book", The Whole Earth Catalogue, Spring 1970, p. 32-33.

Olds, Jerome, (pseud. Goldstein), "The New Year and Silent Spring", Organic Gardening and Farming, 9, December 1962, p. 14-15.

Olkowski, Helga and Olkowski, William, The City People's Book of Raising Food, Rodale Press, Emmaus, Pa., 1975.

Pank, Carston J., "Letter to the Editor", Bio-Dynamics, 121, Winter 1977, p. 29-30.

Pank, Carston J., Dirt Farmer's Dialogue, Bio-Dynamic Press, Sprakers, New York: 1976.

Parrish, W.W., and Clark, H.F., "Chemistry Wrecks the Farm," Harper's, August 1935, p. 272-282.

Perelman, Michael, "Farming With Petroleum," Environment, 14, p. 8-13, 1972.

Perenyi, Eleanor, "Apostle of Non-Conformity", Saturday Evening Post, Philadelphia: Curtis Publishing Co., n.d., 1966.

Philbrick, Helen, "Bio-Dynamics in Recent Years", Bio-Dynamics, 122, Spring 1977, p. 20-24.

Philbrick, John and Philbrick, Helen, Gardening for Health and Nutrition: The Organic Method, Blauvelt, N.Y., Rudolf Steiner Publications, 1971.

Piercy, Marge, Woman On the Edge of Time, Greenwich, Conn.: Fawcett Publications, 1976.

Pimentel, David, "Energy Requirements of Agricultural Production", Science, 182, 1973, p. 443-449.

Reed, Roy, "Organic Farms Found Efficient," New York Times, July 20, 1975.

Rodale, J.I., "with the editor", "Organically Treated Plots Superior", Organic Gardening, 19, December 1951, p. 16-18.

Rodale, J.I., "editorial", Organic Gardening and Farming, vol. 22, no. 6, June 1970.

Rodale, J.I., The Girl and the Teenager, Rodale Press, 1962.