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Ecology and Revolutionary Thought

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we cannot be extravagant enough in releasing the imagination of man.

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from the burden of tradition, acquired uncanny powers of generalization and imagination. Roaming freely and spontaneously over the entire realm of experience, it produced astonishing visions, often far transcending the material limitations of the time. Entire sciences and schools of philosophy were founded in the sweep of an essay or a pamphlet. It was a time when new potentialities had replaced the old actualities, when the general, latent with new possibilities, had replaced the burdensome particulars of feudal society, when man, stripped of traditional fetters, had turned from a transfixed creature into a vital, searching being. The established feudal classes were breaking down, and with them nearly all the values of the mediaeval world. A new social mobility, a restless, almost gipsy-like yearning for change, pervaded the Western world. In time, bourgeois society crystallized out of this flux, bringing with it an entirely new body of institutions, classes, values — and chains — to replace feudal civilization. But for a time the world was loosening its shackles, and it still sought a destiny that was far less defined than we suppose today, with our retrospective “historical” attitudes. This world haunts us like an unforgettable dawn, richly tinted, ineffably beautiful, laden with the promise of birth.

Today, in the last half of the twentieth century, we too are living in a period of social disintegration. The old classes are breaking down, the old values are in disintegration, and the established institutions — so carefully developed by two centuries of capitalist development — are decaying before our eyes. Like our Renaissance forebears, we live in an epoch of potentialities, of generalities, and we too are searching, seeking a direction from the first lights on the horizon. It will no longer do, I think, to ask of anarchism that it merely free itself from nineteenth-century fetters and update its theories to the twentieth century. In a time of such instability, every decade telescopes a generation of change under stable conditions. We must look even further, to the century that lies ahead;

of a computerized and automated technology — for it is virtually impossible to predict the vocational or professional future of most people in the Western world.

By the same token, this very technology is ripe with promise of a truly liberated society. The anarchist movement, more than any other, must explore this promise in depth. It must thoroughly assimilate this technology — master its development, possibilities, and applications and reveal its promise in humanistic terms. The world is already beset with mechanical “utopias” that more closely resemble Huxley’s brave new world and Orwell’s 1984 than the organic utopias of Thomas More and William Morris — the humanistic trend in utopian thinking. Only anarchism can infuse the promise of modern technology with an organic perspective, with a man-oriented direction. Ecology provides a superb approach to the fulfillment of this historic responsibility. It is more than likely that if the anarchist movement does not take this responsibility seriously and apply itself fully to the job of translating the promise of technology into an envisionable body of guidelines, a technocratic, mechanistic approach will tend to dominate modern thinking on the future. Men will be asked to resign themselves to “improved” and gimmick-ridden version of existing urban monstrosities, of a mass society, of a centralized, bureaucratic state. I do not believe that these monstrosities have permanence or stability; quite to the contrary, they will seethe with unrest, regress toward a new barbarism, and eventually fall before the revenge of the natural world. But social conflict will be reduced to its most elemental, brutish terms, and it is questionable indeed if mankind will be able to regain its vision of a libertarian society.

There is a fascinating dialectic in the historic process. Our age closely resembles the Renaissance, some four centuries ago. From the time of Thomas More to that of Valentin Andreae, the breakdown of feudal society produced a strange, intermediate social zone, and indefinable epoch, when old institutions were clearly in decline and new ones had not yet arisen. The human mind, freed

In almost every period since the Renaissance, the development of revolutionary thought has been heavily influenced by a branch of science, often in conjunction with a school of philosophy.

Astronomy in the time of Copernicus and Galileo helped to guide a sweeping movement of ideas from the medieval world, riddled by superstition, into one pervaded by a critical rationalism, openly naturalistic and humanistic in outlook. During the Enlightenment — the era that culminated in the Great French Revolution — this liberatory movement of ideas was reinforced by advances in mechanics and mathematics. The Victorian Era was shaken to its very foundations by evolutionary theories in biology and anthropology, by Marx’s reworking of Ricardian economics, and toward its end, by Freudian psychology.

In our own time we have seen the assimilation of these once liberatory sciences by the established social order. Indeed, we have begun to regard science itself as an instrument of control over the thought processes and physical being of man. This distrust of science and of the scientific method is not without justification. “Many sensitive people, especially artists,” observes Abraham Maslow, “are afraid that science besmirches and depresses, that it tears things apart rather than integrating them, thereby killing rather than creating.” What is perhaps equally important, modern science has lost its critical edge. Largely functional or instrumental in intent, the branches of science that once tore at the chains of man are now used to perpetuate and gild them. Even philosophy has yielded to instrumentalism and tends to be little more than a body of logical contrivances, the handmaiden of the computer rather than the revolutionary.

There is one science, however, that may yet restore and even transcend the liberatory estate of the traditional sciences and philosophies. It passes rather loosely under the name of “ecology” — a term coined by Haeckel a century ago to denote “the investigation of the total relations of the animal both to its inorganic and to its organic environment.” At first glance Haeckel’s definition

sounds innocuous enough; and ecology, narrowly conceived as one of the biological sciences, is often reduced to a variety of biometrics in which field workers focus on food chains and statistical studies of animal populations. There is an ecology of health that would hardly offend the sensibilities of the American Medical Association and a concept of social ecology that would conform to the most well-engineered notions of the New York City Planning Commission.

Broadly conceived, however, ecology deals with the balance of nature. Inasmuch as nature includes man, the science basically deals with the harmonization of nature and man. This focus has explosive implications. The explosive implications of an ecological approach arise not only from the fact that ecology is intrinsically a critical science — in fact, critical on a scale that the most radical systems of political economy failed to attain — but it is also an integrative and reconstructive science. This integrative, reconstructive aspect of ecology, carried through to all its implications, leads directly into anarchic areas of social thought. For in the final analysis, it is impossible to achieve a harmonization of man and nature without creating a human community that lives in a lasting balance with its natural environment.

The Critical Nature of Ecology

Let us examine the critical edge of ecology — a unique feature of the science in a period of general scientific docility.

Basically, this critical edge derives from the subject-matter of ecology — from its very domain. The issues with which ecology deals are imperishable in the sense that they cannot be ignored without bringing into question the viability of the planet, indeed the survival of man himself. The critical edge of ecology is due not so much to the power of human reason — a power that science hal- lowed during its most revolutionary periods — but to a still higher

men whose social position is being undermined by modern technology; and there are still millions of industrial workers for whom the class struggle is a brute, immediate fact of life. Many aspects of the older anarchist programs, sophisticated by historical experience and matured by later thinkers, doubtless still apply to many parts of the world.

But the fact remains that in the United States and in many countries of Europe, a new historical context is emerging for anarchist principles. The distinguishing feature of this new context is the development of gigantic urban belts, the increasing centralization of social life into state capitalism, the extension of automated machinery to all areas of production, the breakdown of the traditional bourgeois class structure (I refer here to the decline of the working class, not merely to the disappearance of the old robber barons), the use of “welfare” techniques to stifle material discontent, the ability of the bourgeoisie — more precisely, the state — to deal with economic dislocations and crises, the development of a war economy, and the realignment of imperialist nations around the United States — what is crudely called the Pax Americana. This new era of state capitalism, which has supplanted the older era of industrial laissez-faire capitalism, must be dealt with earnestly and without regard to earlier precepts by the anarchist movement. To fail to meet this theoretical challenge will doom all existing movements to a lingering, burdensome stagnation.

New problems have arisen to which an ecological approach offers a more meaningful arena of discussion than the older syndicalist approach. Life itself compels the anarchist to concern himself increasingly with the quality of urban life, with the reorganization of society along humanistic lines, with the subcultures created by new, often indefinable strata — students, unemployables, an immense bohemia of intellectuals, and above all a youth that began to gain social awareness with the peace movement and civil rights struggles of the early 1960s. What keeps all strata and classes in a state of astonishing social mobility and insecurity is the advent

my exile,” he wrote from Paris, “I detest Parisian civilization ... I shall never be able to write except on the banks of the Doubs, the Ognon and the Loue”), the fact yet remains that the very Parisians who were to “storm the heavens” in 1830, in 1848, and again in the Commune of 1871 were mainly artisans, not factory workers, and it was these men who were to adhere to Proudhon’s doctrines. Again, my point is that the Proudhonian anarchists were men of their times and dealt with the problems from which stemmed most of the social unrest in France — the painful, agonizing destruction of the handicraft workers.

In the latter half of the nineteenth century, anarchist thought finds itself in a new historical context — a period marked by the rise of the industrial proletariat. Its most effective expression for the time is to be found less in the works of Bakunin and Kropotkin than in the less permanent articles and speeches of Christian Cornelissen, Pierre Monatte, “Big Bill” Haywood, Armando Borghi, and Fernand Pelloutier — in short, in the anarcho-syndicalists. That many anarcho-syndicalist leaders should have drifted from anarchist notions to a reformist trade-union outlook should not surprise us; in this respect they often followed the changing mentality of the industrial working class and its growing stake in bourgeois society.

If we look back, then, we find that anarchist principles, insofar as they have been more than that personal idea of a few isolated intellectuals, have always been clothed in a historical context. Before the Great French Revolution, anarchist doctrines rose on the full swell of peasant discontent. Between the French Revolution and the Paris Commune, the historical wave that carried these doctrines forward was artisan discontent. And between the Paris Commune of 1871 and the Spanish Revolution of 1936, anarchism — this time, together with Marxian socialism — flowed as movements with the fortunes of the industrial proletariat.

There is still widespread peasant discontent in the world today: indeed, the source of the most violent discontent will be found in the villages of Asia, Latin America, and Africa. There are still crafts-

power, the sovereignty of nature over man and all his activities. It may be that man is manipulable, as the owners of the mass media argue, or that elements of nature are manipulable, as the engineers demonstrate by their dazzling achievements, but ecology clearly shows that the totality of the natural world — nature taken in all its aspects, cycles, and interrelationships — cancels out all human pretensions to mastery over the planet. The great wastelands of North Africa and the eroded hills of Greece, once areas of a thriving agriculture or a rich natural flora, are historic evidence of nature’s revenge against human parasitism.

Yet none of these historical examples compare in weight and scope with the effects of man’s despoliation — and nature’s revenge — since the days of the Industrial Revolution, and especially since the end of the Second World War. Ancient examples of human parasitism were essentially local in scope; they were precisely examples of man’s potential for destruction and nothing more. Often they were compensated by remarkable improvement in the natural ecology of a region, as witness the European peasantry’s superb reworking of the soil during centuries of cultivation and the achievements of Inca agriculturists in terracing the Andes Mountains during pre-Columbian times.

Modern man’s despoliation of the environment is global in scope, like his imperialism. It is even extraterrestrial, as witness the disturbances of the Van Allen Belt a few years ago. Today human parasitism disrupts more than the atmosphere, climate, water resources, soil, flora, and fauna of a region; it upsets virtually all the basic cycles of nature and threatens to undermine the stability of the environment on a worldwide scale.

As an example of the scope of modern man’s disruptive role, it has been estimated that the burning of fossil fuels (coal and oil) adds 600 million tons of carbon dioxide to the air annually, about 0.03 percent of the total atmospheric mass — this, I may add, aside from an incalculable quantity of toxicants. Since the Industrial Revolution, the overall atmospheric mass of carbon dioxide has in-

creased by 13 percent over earlier, more stable, levels. It could be argued on very sound theoretical grounds that this growing blanket of carbon dioxide, by intercepting heat radiated from the earth into outer space, will lead to rising atmospheric temperatures, to a more violent circulation of air, to more destructive storm patterns, and eventually to a melting of the polar ice caps (possibly in two or three centuries), rising sea levels, and the inundation of vast land areas. Far removed as such a deluge may be, the changing proportion of carbon dioxide to other atmospheric gases is a warning of the impact man is having on the balance of nature.

A more immediate ecological issue is man's extensive pollution of the earth's waterways. What counts here is not the fact that man befouls a given stream, river, or lake — a thing he has done for ages — but rather the magnitude that water pollution has reached in the past two generations.

Nearly all the surface waters of the United States are polluted. Many American waterways are open cesspools that properly qualify as extensions of urban sewage systems. It would be a euphemism to describe them any longer as rivers or lakes. More significantly, large portions of groundwater are sufficiently polluted to be undrinkable, even medically hazardous, and a number of local hepatitis epidemics have been traced to polluted wells in suburban areas. In contrast to surface-water pollution, groundwater or subsurface water pollution is immensely difficult to eliminate and tends to linger on for decades after the sources of pollution have been removed.

An article in a mass circulation magazine appropriately describes the polluted waterways of the United States as "Our Dying Waters." This despairing apocalyptic description of the water pollution problem in the United States really applies to the world at large. The waters of the earth, conceived as factors in a large ecological system, are literally dying. Massive pollution is destroying the rivers and lakes of Africa, Asia, and Latin America as media of life, as well as the long-abused waterways of highly

In Germany its foremost spokesman during the Peasant Wars was Thomas Muenzer; in England, Gerrard Winstanley, a leading participant in the Digger movement. The concepts held by Muenzer and Winstanley were superbly attuned to the needs of their time — a historical period when the majority of the population lived in the countryside and when the most militant revolutionary forces came from an agrarian world. It would be painfully academic to argue whether Muenzer and Winstanley could have achieved their ideals. What is of real importance is that they spoke to their time; their anarchist concepts followed naturally from the rural society that furnished the bands of the peasant armies in Germany and the New Model in England.

With Jacques Roux, Jean Varlet, and the Enragés of the Great French Revolution, we find a reapplication of substantially the same concepts held by Muenzer and Winstanley to a new historical context: Paris in 1793 — a city of nearly 700,000 people, composed (as Rudé tells us) of "small shopkeepers, petty traders, craftsmen, journeymen, labourers, vagrants, and the city poor." Roux and Varlet address themselves to a basically classless people who might properly be compared with the sullen Negro masses in the Watts district of Los Angeles. Their anarchism is urbanized, so to speak; it is focused on the need to still the pangs of hunger, on the misery of the poor in the restless Gravilliers district. Their agitation tends to center more on the cost of living than on the redistribution of land, more on popular control over the administration of Paris than on the formation of communal brotherhoods in the countryside.

Proudhon, in his own way, probes the very vitals of this context. He speaks directly to the needs of the craftsman, whose world and values are being threatened by the Industrial Revolution. In the background of nearly all his works is the village economy of the Franche-Comte, the memories of Burgille-en-Marnay, and the *tour de France* he made as a journeyman in the printing trade. A benign paterfamilias, an artisan at heart who loathed Paris ("I suffer from

Observations on “Classical” Anarchism and Modern Ecology

The future of the anarchist movement will depend upon its ability to apply basic libertarian principles to new historical situations. These principles are not difficult to define — a stateless, decentralized society, based on the communal ownership of the means of production. There is also an anarchist ethic, if not methodology, which Bakunin basically summarized when he said: “We cannot admit, even as a revolutionary transition, a so-called revolutionary dictatorship, because when the revolution becomes concentrated in the hands of some individuals, it becomes inevitably and immediately reaction.” (There is also need, I fear, for a vigorous, uncompromising article on “Taking Anarchism Seriously.” There are far too many so-called anarchists, comfortably situated in the millenarian world of bourgeois reform — and its many official and material rewards — whose notions can be regarded as mere extensions of Adam Smith. But that is a separate matter.) What disquiets me, for the present, is the word *classical* as applied to anarchism, a word fortunately that is usually decorated by quotation marks. The word has strange connotations for a movement whose very life-blood is a fervent iconoclasm, not only with respect to authority in society at large, but in itself.

To my thinking, anarchism consists of a body of imperishable ideals that men have tried to approximate for thousands of years in all areas of the world. The context of these ideals has changed with time, but basic libertarian principles have altered very little through the course of history. It is vitally important that anarchists grasp the changing historical context in which these ideals have been applied, lest they needlessly stagnate because of the persistence of old formulas in new situations.

In the modern world, anarchism first appeared as a movement of the peasantry and yeomanry against declining feudal institutions.

industrialized continents. Even the open sea has not been spared from extensive pollution. I speak here not only of radioactive pollutants from nuclear bomb tests and power reactors, which apparently reach all the flora and fauna of the sea. It suffices to point out that the discharge of diesel oil wastes from ships in the Atlantic has become a massive pollution problem, claiming marine life in enormous numbers every year.

Accounts of this kind can be repeated for virtually every part of the biosphere. Pages can be written on the immense losses of productive soil that occur annually in almost every continent of the earth; on the extensive loss of tree cover in areas vulnerable to erosion; on lethal air pollution episodes in major urban areas; on the worldwide distribution of toxic agents, such as radioactive isotopes and lead; on the chemicalization of man’s immediate environment — one might say his very dinner table — with pesticide residues and food additives. Pieced together like bits of a jigsaw puzzle, these affronts to the environment form a pattern of destruction that has no precedent in man’s long history on the earth.

Obviously, man could be described as a highly destructive parasite, who threatens to destroy his host — the natural world — and eventually himself. In ecology, however, the word *parasite*, used in this oversimplified sense, is not an answer to a question but raises a question itself. Ecologists know that a destructive parasitism of this kind usually reflects a disruption of an ecological situation; indeed, many species, seemingly highly destructive under one set of conditions, are eminently useful under another set of conditions. What imparts a profoundly critical function to ecology is the question raised by man’s destructive activities: What is the disruption that has turned man into a destructive parasite? What produces a form of human parasitism that not only results in vast natural imbalances but also threatens the very existence of humanity itself?

The truth is that man has produced imbalances not only in nature but more fundamentally in his relations with his fellow man — in the very structure of his society. To state this thought more

precisely: the imbalances man has produced in the natural world are caused by the imbalances he has produced in the social world. A century ago it would have been possible to regard air pollution and water contamination as the result of greed, profit-seeking, and competition — in short, as the result of the activities of industrial barons and self-seeking bureaucrats. Today this explanation would be a gross oversimplification. It is doubtless true that most bourgeois enterprises are still guided by a public-be-damned attitude, as witness the reactions of power utilities, automobile concerns, and steel corporations to pollution problems. But a more deep-rooted problem than the attitude of the owners is the size of the firms themselves — their enormous physical proportions, their location in a particular region, their density with respect to a community or a waterway, their requirements for raw materials and water, and their role in the national division of labor.

What we are seeing today is a crisis not only in natural ecology but above all in social ecology. Modern society, especially as we know it in the United States and Europe, is being organized round immense urban belts at one extreme, a highly industrialized agriculture at the other extreme, and capping both a swollen, bureaucratized anonymous state apparatus. If we leave all moral considerations aside for the moment and examine the physical structure of this society, what must necessarily impress us is the incredible logistical problems it is obliged to solve — problems of transportation, of density, of supply (raw materials, manufactured commodities, and foodstuffs), of economic and political organization, of industrial location, and so forth. The burden this type of urbanized and centralized society places on any continental area is enormous. If the process of urbanizing man and industrializing agriculture were to continue unabated, it would make much of the earth inhospitable for viable, healthy human beings and render vast areas utterly uninhabitable.

Ecologists are often asked, rather tauntingly, to locate with scientific exactness the ecological breaking point of nature — presum-

all their shortcomings and limitations, were the first to give us a notion of this completeness. “The *polis* was made for the amateur,” Kitto tells us. “Its ideal was that every citizen (more or less, according as the *polis* was democratic or oligarchic) should play this part in all of its many activities — an ideal that is recognizably descended from the generous Homeric conception of *arête* as an all-round excellence and an all-round activity. It implies a respect for the wholeness or the oneness of life, and a consequent dislike of specialization. It implies a contempt for efficiency — or rather a much higher ideal of efficiency; an efficiency which exists not in one department of life, but in life itself.”⁶ An anarchist society, although it would surely aspire for more, could hardly hope to achieve less than this state of mind.

If the meshing of ecological and anarchist principles is ever achieved in practice, social life would yield a sensitive development of human and natural diversity, falling together into a well-balanced, harmonious unity. Ranging from community through region to entire continents, we would see a colorful differentiation of human groups and ecosystems, each developing its unique potentialities and exposing members of the community to a wide spectrum of economic, cultural, and behavioral stimuli. Falling within our purview would be an exciting, often dramatic, variety of communal forms — here marked by architectural and industrial adaptations to semiarid biomes, there to grasslands, elsewhere by adaptation to forested areas. We would witness a dynamic interplay between individual and group, community and environment, humanity and nature. Freed from an oppressive routine, from paralyzing repressions and insecurities, from the burdens of toil and false needs, from the trammels of authority and irrational compulsion, individuals would finally be in a position, for the first time in history, to fully realize their potentialities as members of the human community and the natural world.

⁶ H.D.F. Kitto, *The Greeks* (Chicago: Aldine, 1964), 161.

from the spade, and the farmer from the industrial plant may well promote a degree of vocational overspecialization that leads to a dangerous measure of social control by specialists. What is equally important, professional and vocational specialization would prevent society from achieving a vital goal: the humanization of nature by the technician and the naturalization of society by the biologist.

I submit that an anarchist community would approximate a clearly definable ecosystem — it would be diversified, balanced, and harmonious. It is arguable whether such an ecosystem would acquire the configuration of an urban entity with a distinct center, such as we find in the Greek *polis* or the medieval commune, or whether, as Gutkind proposes, society would consist of widely dispersed communities without a distinct center. In either case, the ecological scale for any of these communities would be the smallest biome capable of supporting a population of moderate size.

A relatively self-sufficient community, visibly dependent on its environment for the means of life, would gain a new respect for the organic interrelationships that sustain it. In the long run, the attempt to approximate self-sufficiency would, I think, prove more efficient than the prevailing system of a national division of labor that prevails today. Although there would doubtless be many duplications of small industrial facilities from community to community, the familiarity of each group with its local environment and its ecological roots would make for a more intelligent and more loving use of its environment. I submit that far from producing provincialism, relative self-sufficiency would create a new matrix for individual and communal development — a oneness with the surroundings that would vitalize the community.

The rotation of civic, vocational, and professional responsibilities would stimulate all the senses in the being of the individual, rounding out new dimensions in self-development. In a complete society we could hope again to create complete men; in a rounded society, rounded men. In the Western world the Athenians, for

ably the point at which the natural world will cave in on man. This is equivalent to asking a psychiatrist for the precise moment when a neurotic will become a nonfunctional psychotic. No such answer is every likely to be available. But the ecologist can supply a strategic insight into the directions man seems to be following as a result of his split with the natural world.

From the standpoint of ecology, man is dangerously simplifying his environment. The modern city represents a regressive encroachment of the synthetic on the natural, of the inorganic (concrete, metals, and glass) on the organic, and of crude, elemental stimuli on variegated, wide-ranging ones. The vast¹ urban belts now developing in industrialized areas of the world are not only grossly offensive to eye and ear but are becoming chronically smog-ridden, noisy, and virtually immobilized by congestion.

This process of simplifying man's environment and rendering it increasingly elemental and crude has a cultural as well as a physical dimension. The need to manipulate immense urban populations — to transport, feed, employ, educate, and somehow entertain millions of densely concentrated people daily — leads to a crucial decline in civic and social standards. A mass concept of human relations — totalitarian, centralistic, and regimented in orientation — tends to dominate the more individuated concepts of the past. Bureaucratic techniques of social management tend to replace humanistic approaches. All that is spontaneous, creative, and individuated is circumscribed by the standardized, the regulated, and the massified. The space of the individual is steadily narrowed by restrictions imposed upon him by a faceless, impersonal social apparatus. Any recognition of unique personal qualities is increasingly sur-

¹ For insight into this problem, the reader may consult Charles S. Elton, *The Ecology of Invasions* (New York: John Wiley & Sons, 1953); Edward Hyams, *Soil and Civilization* (London: Thames and Hudson, 1952); Lewis Herber, *Our Synthetic Environment* (New York: Knopf, 1962); and Rachel Carson, *Silent Spring* — this last to be read less as a diatribe against pesticides than as a plea for ecological diversification.

rendered to the needs — more precisely, the manipulation — of the group, indeed, of the lowest common denominator of the mass. A quantitative, statistical approach, a beehive manner of dealing with man, tends to triumph over the precious, individualized-qualities approach that places its strongest emphasis on personal uniqueness, free expression, and cultural complexity.

The same regressive simplification of the environment occurs in modern agriculture.² The manipulated people in modern cities must be fed, and feeding them involves an extension of industrial farming. Food plants must be cultivated in a manner that allows for a high degree of mechanization — not to reduce human toil but to increase productivity and efficiency, to maximize investments, and to exploit the biosphere. Accordingly, the terrain must be reduced to a flat plain — to a factory floor, if you will — and natural variations in topography must be diminished as much as possible. Plant growth must be closely regulated to meet the tight schedules of food-processing plants. Plowing, soil fertilization, sowing, and harvesting must be handled on a mass scale, often in total disregard of the natural ecology of an area. Large areas of land must be used to cultivate a single crop — a form of plantation agriculture that lends itself not only to mechanization but also to pest infestation. A single crop is the ideal environment for the proliferation of pest species. Finally, chemical agents must be used lavishly to deal with the problems created by insects, weeds, and plant diseases, to regulate crop production, and to maximize soil exploitation. The real symbol of agriculture is not the sickle (or for that matter the tractor) but the airplane. The modern food cultivator is represented not by the peasant, yeoman, or even the agronomist — men who

² For insight into this problem, the reader may consult Charles S. Elton, *The Ecology of Invasions* (New York: John Wiley & Sons, 1953); Edward Hyams, *Soil and Civilization* (London: Thames and Hudson, 1952); Lewis Herber, *Our Synthetic Environment* (New York: Knopf, 1962); and Rachel Carson, *Silent Spring* — this last to be read less as a diatribe against pesticides than as a plea for ecological diversification.

velopment of ecology. This is not the place to embark on “utopian” writing, but certain guidelines can be presented even in a general discussion. And in presenting these guidelines, I am eager to emphasize not only the more obvious ecological premises that support them but also the humanistic ones.

An anarchist society should be a decentralized society, not only to establish a lasting basis for the harmonization of man and nature, but also to add new dimensions to the harmonization of man and man. The ancient Greeks, we are often reminded, would have been horrified by a city whose size and population precluded a face-to-face, often familiar relationship between citizens. Today there is plainly a need to reduce the dimensions of the human community — partly to solve our pollution and transportation problems, partly also to create real communities. In a sense, we must humanize humanity. Electronic devices, such as telephones, telegraphs, radios, television receivers, and computers should be used as little as possible to mediate the relations between people. In making collective decisions — and the ancient Athenian *ecclesia* was, in some ways, a model for making social decisions during the classical period — all members of the community should have an opportunity to acquire in full the measure of anyone who addresses the assembly. They should be in a position to absorb his attitudes, study his expressions, and weigh his motives as well as his ideas in a direct personal encounter and through full debate and face-to-face discussion.

Our small communities should be economically balanced and well rounded, partly so that they can make full use of local raw materials and energy resources, partly also to enlarge the agricultural and industrial stimuli to which individuals are exposed. The member of a community who has a predilection for engineering, for instance, should be encouraged to steep his hands in humus; the man of ideas should be encouraged to employ his musculature; the “inborn” farmer should gain a familiarity with the workings of a rolling mill. To separate the engineer from the soil, the thinker

situation. Their object is not to rule a domain but to release it. They regard insight, reason, and knowledge as means for fulfilling the potentialities of a situation, as facilitating the working out of the logic of a situation, not of replacing its potentialities with preconceived notions or distorting their development into dogmas.

Returning now to Read's words, what strikes us next is that like the ecologist, the anarchist views differentiation as a measure of progress. The ecologist uses the term *biotic pyramid* in speaking of biological advances; the anarchist, the word *individuation* to denote social advances. If we go beyond Read, we will observe that, to both the ecologist and the anarchist, an ever-enlarging unity is achieved by growing differentiation. An expanding whole is created by the diversification and enrichment of the parts.

Just as the ecologist seeks to elaborate the range of an ecosystem and promote a free interplay among species, so the anarchist seeks to elaborate the range of social experience and remove all fetters to its development. Anarchism is not only a stateless society but also a harmonized society that exposes man to the stimuli provided by both agrarian and urban life, to physical activity and mental activity, to unrepressed sensuality and self-directed spirituality, to communal solidarity and individual development, to regional uniqueness and worldwide brotherhood, to spontaneity and self-discipline, to the elimination of toil and the promotion of craftsmanship. In our schizoid society, these goals are regarded as mutually exclusive dualities, sharply opposed. They appear as dualities because of the very logistics of present-day society — the separation of town and country, the specialization of labor, the atomization of man — and it would be preposterous to believe that these dualities could be resolved without a general idea of the physical structure of an anarchist society. We can gain some idea of what such a society would be like by reading William Morris's *News from Nowhere* and the writings of Peter Kropotkin. But these are mere glimpses. They do not take into account the post — World War II development of technology and the contributions made by the de-

could be expected to have an intimate relationship with the unique qualities of the land on which they grow crops — but the pilot and chemist, for whom soil is a mere resource, an inorganic raw material.

The simplification process is carried still further by an exaggerated regional (indeed national) division of labor. Immense areas of the planet are increasingly reserved for specific industrial tasks or reduced to depots of raw materials. Others are turned into centers of urban population, largely occupied with commerce and trade. Cities and regions (in fact, countries and continents) are specifically identified with special products — Pittsburgh, Cleveland, and Youngstown with steel, New York with finance, Bolivia with tin, Arabia with oil, Europe and America with industrial goods, and the rest of the world with raw material of one kind or another. The complex ecosystems which make up the regions of a continent are submerged by the organization of entire nations into economically rationalized entities, each a way-station in a vast industrial belt system, global in its dimensions. It is only a matter of time before the most attractive areas of the countryside succumb to the concrete mixer, just as most of the Eastern seashore areas of the United States have already succumbed to subdivisions and bungalows. What remains in the way of natural beauty will be debased by trailer lots, canvas slums, "scenic" highways, motels, food stalls, and the oil slicks of motor boats.

The point is that man is undoing the work of organic evolution. By creating vast urban agglomerations of concrete, metal, and glass, by overriding and undermining the complex, subtly organized ecosystems that constitute local differences in the natural world — in short, by replacing a highly complex organic environment with a simplified, inorganic one — man is disassembling the biotic pyramid that supported humanity for countless millennia. In the course of replacing the complex ecological relationships on which all advanced living things depend with more elementary relationships, man is steadily restoring the biosphere to a stage that

will be able to support only simpler forms of life. If this great reversal of the evolutionary process continues, it is by no means fanciful to suppose that the preconditions for higher forms of life will be irreparably destroyed and the earth will become incapable of supporting man himself.

Ecology derives its critical edge not only from the fact that it alone, among all the sciences presents this awesome message to humanity but because it also presents this message in a new social dimension. From an ecological viewpoint, the reversal of organic evolution is the result of appalling contradictions between town and country, state and community, industry and husbandry, mass manufacture and craftsmanship, centralism and regionalism, the bureaucratic scale and the human scale.

The Reconstructive Nature of Ecology

Until recently, attempts to resolve the contradictions created by urbanization, centralization, bureaucratic growth, and stratification were viewed as a vain counterdrift to “progress” — a counterdrift that could be dismissed as chimerical at best and reactionary at worst. The anarchist was regarded as a forlorn visionary, a social outcast, filled with nostalgia for the peasant village or the medieval commune. His yearnings for a decentralized society and for a humanistic community at one with nature and the needs of the individual — the spontaneous individual, unfettered by authority — were viewed as the reactions of a romantic, of a declassed craftsman or an intellectual “misfit.” His protest against centralization and stratification seemed all the less persuasive because it was supported primarily by ethical considerations — by utopian, ostensibly “unrealistic” notions of what man could be, not of what he was. To this protest, opponents of anarchist thought — liberals, rightists, and authoritarian “leftists” — argued that they were the voices of

it “expands the environment,” both for itself and for the species with which it enters into a balanced relationship.⁵

How do these concepts apply to social theory? To many readers I suppose, it should suffice to say that, inasmuch as man is part of nature, an expanding natural environment enlarges the basis for social development. But the answer to the question, I think, goes much deeper than many ecologists and libertarians suspect. Again, allow me to return to the ecological principle of wholeness and balance as a product of diversity. Keeping this principle in mind, the first step toward an answer is provided by a passage in Herbert Read’s *The Philosophy of Anarchism*. In presenting his “measure of progress,” Read observes: “Progress is measured by the degree of differentiation within a society. If the individual is a unit in a corporate mass, his life will be limited, dull, and mechanical. If the individual is a unit on his own, with space and potentiality for separate action, then he may be more subject to accident or chance, but at least he can expand and express himself. He can develop — develop in the only real meaning of the world — develop in consciousness of strength, vitality, and joy.”

Read’s thought, unfortunately, is not fully developed, but it provides an interesting point of departure. What first strikes us is that both the ecologist and the anarchist place a strong emphasis on spontaneity. The ecologist, insofar as he is more than a technician, tends to reject the notion of “power over nature.” He speaks instead of “steering” his way through an ecological situation, of managing rather than recreating an ecosystem. The anarchist, in turn, speaks in terms of social spontaneity, of releasing the potentialities of society and humanity, of giving free and unfettered rein to the creativity of people. Each in its own way regards authority as inhibitory, as a weight limiting the creative potential of a natural and social

⁵ I do not wish to saddle Gutkind with the notions I have advanced above, but I believe the reader would benefit enormously by reading Gutkind’s masterful discussion of communities, *The Expanding Environment* (Freedom Press).

els for domestic and industrial reasons; they must construct or tear down buildings (the aerial debris produced by those activities is a major source of urban air pollution); they must dispose of immense quantities of rubbish; they must travel on roads with rubber tires (the particles produced by the erosion of tires and roadway materials add significantly to air pollution. Whatever pollution control devices we add to automobiles and power plants, the improvement these devices will produce in the quality of urban air will be more than canceled out by future megalopolitan growth.

There is more to anarchism than decentralized communities. If I have examined these possibilities in some detail, it has been to demonstrate that an anarchist society, far from being a remote ideal, has become a precondition for the practice of ecological principles. To sum up the critical message of ecology: if we diminish variety in the natural world, we debase its unity and wholeness. We destroy the forces making for natural harmony and stability, for a lasting equilibrium, and what is even more significant, we introduce an absolute retrogression in the development of the natural world that may eventually render the environment unfit for advanced forms of life. To sum up the reconstructive message of ecology: if we wish to advance the unity and stability of the natural world, if we wish to harmonize it on ever higher levels of development, we must conserve and promote variety. To be sure, mere variety for its own sake is a vacuous goal. In nature, variety emerges spontaneously. The capacities of a new species are tested by the rigors of climate, by its ability to deal with predators, and by its capacity to establish and enlarge its niche. Yet the species that succeeds in enlarging its niche in the environment also enlarges the ecological situation as a whole. To borrow E. A. Gutkind's phrase,

historic reality, that their statist and centralist notions were rooted in the objective, practical world.

Time is not very kind to the conflict of ideas. Whatever may have been the validity of libertarian and nonlibertarian views a few years ago, historical development has rendered virtually all objections to anarchist thought meaningless today. The modern city and state, the massive coal-steel technology of the Industrial Revolution, the later, more rationalized systems of mass production and assembly-line systems of labor organization, the centralized nation, the state and its bureaucratic apparatus — all have reached their limits. Whatever progressive or liberatory role they may have possessed has clearly become entirely regressive and oppressive. They are regressive not only because they erode the human spirit and drain the community of all its cohesiveness, solidarity, and ethico-cultural standards; they are regressive from an objective standpoint, from an ecological standpoint. For they undermine not only the human spirit and the human community but also the viability of the planet and all living things on it.

It cannot be emphasized too strongly that the anarchist concepts of a balanced community, a face-to-face democracy, a humanistic technology, and a decentralized society — these rich libertarian concepts are not only desirable but necessary. Not only do they belong to the great visions of man's future; they now constitute the preconditions for human survival. The process of social development has carried them from an ethical, subjective dimension into a practical objective dimension. What was once regarded as impractical and visionary has become eminently practical. And what was once regarded as practical and objective has become eminently impractical and irrelevant in terms of man's development toward a fuller, unfettered existence. If community, face-to-face democracy, a humanistic, liberatory technology, and decentralization are conceived of merely as reactions to the prevailing state of affairs — a vigorous nay to the yea of what exists today — a compelling, ob-

jective case can now be made for the practicality of an anarchist society.

This rejection of the prevailing state of affairs accounts, I think, for the explosive growth of intuitive anarchism among young people today. Their love of nature is a reaction against the highly synthetic qualities of our urban environment and its shabby products. Their informality of dress and manners is a reaction against the formalized, standardized nature of modern institutionalized living. Their predisposition for direct action is a reaction against the bureaucratization and centralization of society. Their tendency to drop out, to avoid toil and the rat-race, reflects a growing anger toward the mindless industrial routine bred by modern mass manufacture in the factory, the office, or the university. Their intense individualism is, in its own elemental way, a de facto decentralization of social life — a personal abdication from mass society.

What is most significant about ecology is its ability to convert this often nihilistic rejection of the status quo into an emphatic affirmation of life — indeed, into a reconstructive credo for a humanistic society. The essence of ecology's reconstructive message can be summed up in the word *diversity*. From an ecological viewpoint, balance and harmony in nature, in society, and by inference in behavior, are achieved not by mechanical standardization but by its opposite, organic differentiation. This message can be understood clearly only by examining its practical meaning.

Let us consider the ecological principle of diversity — what Charles Elton calls the “conservation of variety” — as it applies to biology, specifically to agriculture. A number of studies — Lotka's and Volterra's mathematical models, Gause's experiments with protozoa and mites in controlled environments, and extensive field research — clearly demonstrate that fluctuations in animal and plant populations, ranging from mild to pestlike proportions, depend heavily upon the number of species in an ecosystem and the degree of variety in the environment. The greater the variety

lored to the characteristics and resources of a region, must replace the sprawling urban belts that are emerging today.⁴

An objective case for decentralization, to be sure, does not end with a discussion of agriculture and the problems created by combustible energy resources. The validity of the decentralist case can be demonstrated for nearly all the “logistical” problems of our time. Let me cite an example from the problematical area of transportation. A great deal has been written about the harmful effects of gasoline-driven motor vehicles — their wastefulness, their role in urban air pollution, the noise they contribute to the city environment, the enormous death toll they claim annually in the large cities of the world and on highways. In a highly urbanized civilization, it would be meaningless to replace these noxious vehicles with clean, efficient, virtually noiseless, and certainly safer battery-powered vehicles. The best electric cars must be recharged about every hundred miles — a feature that limits their usefulness for transportation in large cities. In a small, decentralized community, however, it would be feasible to use these electric vehicles for urban or regional transportation and establish monorail networks for long-distance transportation.

It is fairly well known that gasoline-powered vehicles contribute enormously to urban air pollution, and there is a strong sentiment to “engineer” the more noxious features of the automobile into oblivion. Our age characteristically tries to solve all its irrationalities with a gimmick — afterburners for toxic gasoline fumes, antibiotics for ill health, tranquilizers for psychic disturbances. But the problem of urban air pollution is too intractable for gimmicks, perhaps more intractable than we care to believe. Basically air pollution is caused by high population densities, by an excessive concentration of people in a small area. Millions of people, densely concentrated in a large city, necessarily produce serious local air pollution merely by their day-to-day activities. They must burn fu-

⁴ Lewis Herber, *Crisis in Our Cities* (New Jersey: Prentice-Hall, 1965), 194.

needs of a decentralized society. In sunny latitudes we could rely more heavily on solar energy than on combustible fuels. In areas marked by atmospheric turbulence, we could rely more heavily on wind devices, and in suitable coastal areas or inland regions with a good network of rivers, the greater part of our energy would come from hydroelectric installations. In all cases, we would use a mosaic of noncombustible, combustible, and nuclear fuels. The point I wish to make is that by diversifying our energy resources, by organizing them into an ecologically balanced pattern we could combine wind, solar, and water power in a given region to meet all the industrial and domestic needs of a community with only a minimal use of hazardous fuels. And eventually we might sophisticate all our noncombustion energy devices to a point where all harmful sources of energy could be eliminated.

As in the case of agriculture, however, the application of ecological principles to energy resources presupposes a far-reaching decentralization of society and a truly regional concept of social organization. To maintain a large city requires immense quantities of coal and petroleum. By contrast, solar, wind, and tidal energy can reach us mainly in small packets; except for spectacular tidal dams, the new devices seldom provide more than a few thousand kilowatt-hours of electricity. It is difficult to believe that we will ever be able to design solar collectors that can furnish us with immense blocks of electric power produced by a giant steam plant; it is equally difficult to conceive of a better of wind turbines that will provide us with enough electricity to illuminate Manhattan Island. If homes and factories are heavily concentrated, devices for using clean sources of energy will probably remain mere playthings, but if urban communities are reduced in size and widely dispersed over the land, there is no reason why these devices cannot be combined to provide us with all the amenities of an industrialized civilization. To use solar, wind, and tidal power effectively, the megalopolis must be decentralized. A new type of community, carefully tai-

of prey and predators, the more stable the population; the more diversified the environment in terms of flora and fauna, the less likely there is to be ecological instability. Stability is a function of complexity, variety, and diversity: if the environment is simplified and the variety of animal and plant species is reduced, fluctuations in population become marked and tend to get out of control. They tend to reach pest proportions.

In the case of pest control, many ecologists now conclude that we can avoid the repetitive use of toxic chemicals such as insecticides and herbicides by allowing for a greater interplay among living things. We must allow more room for natural spontaneity, for the diverse biological forces that make up an ecological situation. "European entomologists now speak of managing the entire plant-insect community," observes Robert L. Rudd. "It is called manipulation of the biocenose. The biocenetic environment is varies, complex and dynamic. Although numbers of individuals will constantly change, no one species will normally reach pest proportions. The special conditions which allow high populations of a single species in a complex ecosystem are rare events. Management of the biocenose or ecosystem should become our goal, challenging as it is."³

The "manipulation" of the biocenose in a meaningful way, however, presupposes a far-reaching decentralization of agriculture. Wherever feasible, industrial agriculture must give way to soil and agricultural husbandry; the factory floor must yield to gardening and horticulture. I do not wish to imply that we must surrender the gains acquired by large-scale agriculture and mechanization.

³ Rudd's use of the word *manipulation* is likely to create the erroneous impression that an ecological situation can be reduced to simple mechanical terms. Lest this impression arise, I would like to emphasize that our knowledge of an ecological situation and the practical use of this knowledge is a matter of insight and understanding rather than power. Elton, I think, states the case for the management of an ecological situation when he writes: "The world's future has to be managed, but this management would not be just like a game of chess — [but] more like steering a boat."

What I do contend, however, is that the land must be cultivated as though it were a garden; its flora must be diversified and carefully tended, balanced by a fauna and tree shelter appropriate to the region. Decentralization is important, moreover, for the development of the agriculturist as well as for the development of agriculture. Food cultivation, practiced in a truly ecological sense, presupposes that the agriculturist is familiar with all the features and subtleties of the terrain on which the crops are grown. He must have a thorough knowledge of the physiography of the land, its variegated soils' — crop land, forest land, pasture land — mineral and organic content, and its microclimate, and he must be engaged in a continuing study of the effects produced by new flora and fauna. He must develop his sensitivity to the land's possibilities and needs while becoming an organic part of the agricultural situation. We can hardly hope to achieve this high degree of sensitivity and integration in the food cultivator without reducing agriculture to a human scale, without bringing agriculture within the scope of the individual. To meet the demands of an ecological approach to food cultivation, agriculture must be rescaled from huge industrial farms to moderate-sized units.

The same reasoning applies to a rational development of energy resources. The Industrial Revolution increased the quantity of energy available to industry, but it diminished the variety of energy resources used by man. Although it is certainly true that preindustrial societies relied primarily on animal power and human muscles, complex energy patterns developed in many regions of Europe, involving a subtle integration of resources such as wind and water power, and a variety of fuels (wood, peat, coal, vegetable starches, and animal fats).

The Industrial Revolution overwhelmed and largely destroyed these regional energy patterns, replacing them first with a single energy system (coal) and later with a dual system (coal and petroleum). Regions disappeared as models of integrated energy patterns — indeed, the very concept of integration through diver-

sity was obliterated. As I indicated earlier, many regions became predominantly mining areas, often devoted to the production of a few commodities. We need not review the role this breakdown in true regionalism has played in producing air and water pollution, the damage it has inflicted on large areas of the countryside, and the depletion of our precious hydrocarbon fuels.

We can, of course, turn to nuclear fuels, but it is chilling to think of the lethal radioactive wastes that would require disposal if power reactors were our major energy source. Eventually an energy system based on radioactive materials would lead to the widespread contamination of the environment — at first in a subtle form, but later on a massive and palpably destructive scale.

Or we could apply ecological principles to the solution of our energy problems. We could try to reestablish earlier regional energy patterns, using a combined system of energy provided by wind, water, and solar power. We would be aided by more sophisticated devices than any known in the past. We have now designed wind turbines that could supply electricity in a number of mountainous areas to meet the electric power needs of a community of 50,000 people. We have perfected solar energy devices that yield temperatures high enough in warmer latitudes to deal with most metallurgical problems. Used in conjunction with heat pumps, many solar devices could provide as much as three quarters — if not all — of the heat required to comfortably maintain a small family house. And at this writing the French are completing a tidal dam at the mouth of the Rance River in Brittany that is expected to produce more than 500 million kilowatt-hours of electricity a year. In time the Rance River project will meet most of the electrical needs of northern France.

Solar devices, wind turbines, and hydroelectric resources taken singly do not provide a solution for our energy problems and the ecological disruption created by conventional fuels. Pieced together as a mosaic, as an organic energy pattern developed from the potentialities of a region, they could amply meet the