

Self-Reliance

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Staff

Editor

Richard Kazis

Finance

William Batko
Jeff Zinsmeyer

Urban Agriculture

Gil Friend
Miranda Smith

Energy

David Morris

Waste Utilization

Neil Seldman

Information Access

Laurel Silverman

Community Ownership

James Taylor

Self-Reliance

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Neighborhood Planning

Designing the Future

Decisions which affect our neighborhoods are, more often than not, made outside them, by people unfamiliar with or unsympathetic to their needs. Construction of a freeway, urban renewal programs, the onslaught of high rise development, the steady encroachment of commercial structures, the closing of the neighborhood school — these are the decisions over which, often enough, community residents have little or no influence.

In the past decades, some communities have fought successfully against these intrusions. Many others lost their battles. In the process of losing, however, communities came to realize that their survival depended upon two conditions: first, they needed access to information about potential changes in the neighborhood *before* the changes had already occurred; and, second, they needed enough organization, enough power, so that the control of community development would rest in the hands of community residents.

Who Should Have Control?

This growing awareness of the importance of winning decision-making power has opened up a new battleground where community groups square off against city officials and against strong interest groups for the right to shape a city and its neighborhoods. Zoning and land-use planning are becoming recognized as crucial neighborhood political issues. In many cities, both planning and zoning agencies stand aloof from neighborhood concerns. Zoning boards often reflect the interests of the downtown commercial sector. Planning agencies, because their central concern is generally the maximization of revenue for the city, are also usually more sympathetic to business interests than to residential communities. Zoning, although initially developed as a way of protecting neighborhood integrity, rapidly deteriorated into a tool for the furthering of wholesale redevelopment. The residential neighborhood which desires stability and orderly, evolutionary change must compete before the planning agencies with other influential interest groups. The suburban commuters want a new freeway into the city so that travel time to work can be reduced. The city administration needs an increase in revenues and argues that more high rise and commercial buildings will bring in greater property tax revenues. More often than not, the "aesthetic" and social concerns of community residents are ignored in favor of the economic arguments of other interests.

In fact, in most cities, neighborhood residents have little opportunity to plead their case. The neighborhood itself is not recognized as an established political, or even administrative, unit. Residents are provided little, if any, notice about upcoming zoning change, demolition permits, building permits or other developments which would affect the future of the neighborhood.

Slowly, though, this attitude is changing. In the 1960's, both the Urban Renewal and Model Cities programs sponsored by the federal government required citizen participation. In large part, this requirement was no more than an attempt to defuse the anger which accompanied widespread rioting in our central cities; but it did initiate a movement toward increased citizen participation which continues to grow. The Project Area Committees for Urban Renewal were ineffectual rubber stamps, usually dominated by business and real estate interests. The participatory committees in the Model Cities programs were somewhat more active, though not necessarily more effective, than their predecessors. The recent requirement that all federally funded projects supply environmental impact statements has had the effect of giving neighborhoods access to information which they traditionally lacked.

Now, several cities have even accorded recognition to neighborhoods as units which must be preserved and protected. In Dayton, Ohio, priority boards advise on zoning and planning matters. In Birmingham, Alabama and Simi Valley, California, citizens groups have won a role in formulating zoning decisions.

The Case of Oregon

These victories do not come easily, and the struggle by neighborhoods for more than advisory power in the planning process is a difficult one. The state of Oregon is a case in point. Oregon is perhaps the most advanced example of local participation in land use planning. It is in Oregon, too, that the struggle for power on the part of neighborhoods is currently being fought the hardest. In the three years since the state legislature adopted Senate Bill 100, the Land Use Act, and chose *not* to follow the American pattern of uncontrolled growth, the battlelines have been drawn, the struggle and the opposing sides clearly demarcated.

In 1974, the state legislature in Oregon expanded the Land Use Act to require Citizen Involvement as an administrative rule. This meant that local comprehensive planning had to be hammered out by local residents. To make sure that such participation actually occurred, the Land Conservation and Development Commission (LCDC) was directed to adopt statewide planning goals and to develop a mechanism by which neighborhoods could prepare and implement comprehensive plans. The Commission conducted fifty-six public workshops to discover citizen attitudes concerning land use and eighteen public hearings on statewide goals. As a result of these workshops and hearings, fourteen statewide goals were adopted. State agencies, cities, counties and special districts were directed to prepare comprehensive plans by January 1976 which would comply with the adopted goals. One goal was the establishment of a land use planning process which would "take into consideration social, economic, energy and environmental needs." The goal of Citizen Involvement read as follows: "To develop a citizen involvement program that insures the opportunity for citizens to be involved in all phases of the planning process."



Throughout Oregon, planning became a focus for attention and action. Citizen and neighborhood involvement were actively encouraged as cities and towns tried to develop their comprehensive plans by the end of 1975. It wasn't long after the process had begun before law suits, court cases and legislative battles involving land use were making front page news in Oregon. Neighborhood groups were fighting for power; real estate interests were fighting equally hard to maintain theirs. The radical implications of the new goals and process were becoming more and more clear to all: the battle was on.

The most important of the court cases was "Baker vs. the City of Milwaukie," in which the court ruled that an adopted comprehensive plan supersedes existing zoning regulations. A spunky, astute citizen named Jeanie Baker claimed that the adopted Milwaukie Comprehensive Plan would not permit construction of an apartment house which developers proposed to build next to her home. The court decision in her favor gave legal sanction to the dominance of a citizen planning process over the decisions of an administrative zoning board.

Throughout Oregon, conflicts rage between developers

and residents over whose interests should be represented in the comprehensive plans. In coastal Coos county, land developers established their own committee to develop a land use plan which permitted intensive development. A citizens' group calling itself One Thousand Friends of Oregon mounted a successful challenge to the plan, pointing out the lack of citizen participation in its development. In the city of Portland, at least five inner-city neighborhoods are moving toward "downzoning," the lowering of acceptable population density of their land, in an effort to retain the viability and livability of their neighborhoods. This move pits them against many landlords and developers who traditionally hold on to inner city land until its value begins to rise, then demolish the existing housing and construct high rise commercial or apartment buildings.

The relationship between the professional municipal planning offices and neighborhood residents in Oregon is still being worked out. One citizen's planning group in Eugene has complained that it was not consulted in the drafting of a crucial rezoning proposal, that it was allowed to speak only during the first part of the hearing, after which it had to be content with listening to well-prepared rebuttals from the city's planners.

Urban Renewal and Model Cities programs had the effect of initiating a movement toward increased citizen participation which continues to grow

In Portland, the planning bureau is recognized as supportive and helpful by neighborhood groups. Five neighborhood plans are currently being drawn up; three are ready for presentation to the City Council. But the heritage of well-founded suspicion of city agencies is not so easily replaced by trust. There is tension between one neighborhood and the Planning Bureau which began when the Bureau, before submitting the neighborhood's plan to the City Council, removed the title page which had read "comprehensive plan" and replaced it with another which reads "policy plan." The Planning Bureau sees no difference between the titles; the neighborhood, on the other hand, is afraid that the change will weaken the neighborhood's position and legal authority in any future court suit. In another neighborhood, Corbett-Terwilliger-Lair Hill, the Planning Bureau reduced a thirty page plan to a one page list of zoning ordinance changes for the City Council to approve. Partially as a result of these developments, a city-wide meeting of neighborhood associations was convened in mid-September to discuss neighborhood planning efforts and to develop unified strategies for neighborhood self-determination.

November will be an important month for the future of neighborhood planning in Oregon. The City Council will have to decide on the demand of Corbett-Terwilliger that its plan be adopted as a legally binding comprehensive plan. In addition, as a result of petitioning by large landowners and developers, the residents of the State of Oregon will be voting in a referendum on whether or not to continue the Land Conservation and Development Commission and the current model of decentralized planning. For more information on the future of neighborhood planning in Portland, contact: Penny Allen, Chairperson of the Corbett-Terwilliger-Lair Hill Planning Commission, 3627 SW Kelly, Portland OR 97201; or Ernie Bonner, Director, Planning Bureau, City Hall, Portland OR 97204.

—David Morris and Richard Kazis

Neighborhood Planning in Three Cities

In the past five years, many cities have developed neighborhood planning programs. These programs differ in a number of ways: the relationship between the neighborhood planning group and the city planning office, the relationship of the community plan to the city planning and budgeting processes, the comprehensiveness of the neighborhood planning process. The following brief descriptions of three neighborhood planning programs — two initiated by the city and one by the neighborhood — illustrate some of these variations. If your community is involved in an experiment in neighborhood planning, let us know. We'd like to hear from you.

Chicago, Illinois

The Northwest Community Organization has just completed a community plan for the East Humboldt Park area adjacent to Chicago's downtown central business district. The plan was done with professional help and guidance from the National Center for Urban Ethnic Affairs, but was developed without the initiative of the city's Planning Office.

The lower-income, ethnically diverse community was divided into eight neighborhoods for planning purposes. Information on existing conditions in these areas was gathered from a citizen questionnaire, from a block-by-block condition survey conducted by residents, and from numerous neighborhood meetings. This neighborhood information was also documented with census and other demographic and economic data. Based on the condition information, each of the eight neighborhoods was evaluated in terms of area, population, housing, income, traffic, open space, facilities, shopping and so on. The planning document describes specific solutions for the problems identified in each neighborhood and lays out a recommended 3-year comprehensive improvement program for each block. This short-range response is complemented by a "Concept for the Future" which recommends a long-range but equally specific program aimed at developing the kind of neighborhoods that residents want. Action on plan proposals is assured by an attached letter from the Mayor's office promising cooperation with the community in implementation.

For further information contact: Robert Corletta, Director of Planning and Redevelopment, The National Center for Urban Ethnic Affairs, 1521 16th Street NW, Washington DC 20036.

Atlanta, Georgia

Atlanta's new city charter took effect in 1974, giving the Department of Budget and Planning the responsibility of preparing each year both the city budget and the one, five, and fifteen year development plans. The charter also requires citizen participation in the preparation of all budgets and land-use plans.

Initially, 190 neighborhoods and 240 community organizations were identified by the Planning Department. These groups were given two brief explanatory booklets on neighborhood planning and were invited to develop plans for their

communities. No technical assistance was provided by the city, but some 75 groups submitted neighborhood plans. The plans varied widely in scope and sophistication but they were utilized in the preparation of the operating and capital budgets and the development plans. Two neighborhoods were downzoned to residential on the basis of plan proposals, because of a charter requirement that the city zoning ordinance be annually revised to conform to the development plan.

In April 1975, the Council approved boundaries for 24 Neighborhood Planning Units, each containing between seven and twenty neighborhoods. By the beginning of 1976, the city had established four neighborhood planning teams with a total of 18 full- and part-time professionals and interns. Each team is responsible for helping six neighborhood units prepare their plans. The process includes the inventory and analysis of existing conditions, setting of neighborhood goals, preparation of sketch plans, and incorporation of the approved plan into the comprehensive development plans and the city budget.

For further information contact: William F. Kennedy, Director, Division of Neighborhood Planning, City Hall, Atlanta GA 30304.

San Diego, California

In 1962, the San Diego City Council determined that "community planning on a cooperative basis between citizen organizations and City staff should be encouraged." In 1966, the Council approved both a formal Council Policy on Community Planning and an increase in the Planning Department's budget to support an expanded program of community planning.

The planning process is initiated when a neighborhood organization petitions the city council for recognition. There are now thirty officially recognized community planning committees working with city staff on either general community plans or detailed implementation plans. These plans deal with land use, traffic, open space and community facilities. City staff members give the committees materials which outline the steps of the planning and development process and spell out the staff and community responsibilities. The staff provides information, mapping and graphic assistance, and planning proposals for community consideration. The committees identify goals for the neighborhoods and select from among the staff's alternative sketch plan proposals. The staff prepares the final planning document for citizen review, amendment and adoption.

When the plan is adopted by the community, the committee presents it to the Planning Commission and the City Council for acceptance. Once accepted, the community plan officially becomes a part of the general plan. Since California law requires that a city's zoning conform to the provisions of its general plan, the Planning Department has initiated zoning changes to conform with all adopted community plans.

For further information contact: Paul D. Foxworthy, Assistant to the Planning Director, Office of Planning Department, City Administration Building, 202 C Street, San Diego CA 92101.

—James Taylor

Off the Shelf

Neighborhood Planning:

Atlanta Bureau of Planning,

How to do Neighborhood Planning

This short booklet is designed to serve as a technical guide to neighborhoods which are developing comprehensive plans. It begins with the basics, such as a general explanation of the planning process, introduces the concept and need for planning on the neighborhood level and then gives step-by-step suggestions as to how to go about preparing a comprehensive plan. It includes suggestions on physical, social and economic planning for the neighborhood. Written in a simple style with many explanatory graphics, this booklet tries to bring the concepts and the process of planning out of the offices of professionals and into the consciousness of community residents. Available from the Atlanta Bureau of Planning, 58 Mitchell Street SW, Atlanta GA 30303.

Joseph Newlin et al,

Organizing and Conducting Community Surveys

Colorado State University

A basic guide for planning and conducting community surveys. Briefly but usefully discusses such important survey design issues as scope, question criteria, costs, and pre-testing. Includes over sixty pages of sample survey instruments used for needs assessments, resource inventories and community attitude surveys. Some of the questions are too specific to be used by many communities, but that supports the booklet's thrust that a survey "should be developed and designed locally, never a copy of someone else's." Available for \$1.00 from: Community Resource Development, Cooperative Extension Service, Colorado State University, Fort Collins CO 80521.

John C. Platt et al,

Citizens Handbook on Neighborhood Land Planning

Lewis and Clark College, 1973.

This handbook was written for two groups of citizens in Portland, Oregon: "those leading the struggle to assure a local voice in City decisions affecting neighborhoods" and "those struggling with land planning problems next door or across the street." It is a good source of clear information on the value to neighborhoods of planning for land use, housing, transportation and open space. Though written specifically for Portland, the book's discussion of property taxation, eminent domain and zoning, emphasizing the legal rights and opportunities of neighborhoods, can be useful anywhere. Available from: the Bookstore, Lewis and Clark College, Portland OR.



Practical Guides to Neighborhood Conservation: Guides to Getting Things Done in the Visual Environment, Volume I

Center for the Visual Environment, 1976.

This guide consists of seven short pamphlets developed by the Center for "citizen organizations and city officials wishing to enhance ... the elements of their communities ... which make them unique." Each pamphlet explains, in a how-to-do-it way, tools, techniques, and resources which neighborhoods can use for their own betterment. The pamphlets suggest possible programs and provide names and addresses of useful contacts. The most relevant of the pamphlets for neighborhood planning are: *Legal Tools and the Visual Environment*, which is mostly about zoning; *Design for Good Neighborhoods*; *Funds for Neighborhood Conservation*; and *The Benefits of Recycling Buildings*, which deals with both energy and dollar savings.

All seven are available for \$5.00 (they can also be purchased separately) from the Center for the Visual Environment, 1785 Massachusetts Avenue NW, Washington DC 20036.

L Shipnuck, D. Keating, M. Morgan,

The People's Guide to Urban Renewal

Berkeley Tenants Organizing Committee, 1974.

This book, subtitled "A Community Defense Manual," is a primer on urban renewal, community development block grants and other federal programs. Written at a time when "urban renewal" of the sixties was being replaced by "community redevelopment" of the seventies, the book analyzes the lessons of the past and the outlook for the future in terms of how community groups can combat the destructive tendencies of federal redevelopment programs and begin to shape their neighborhoods as they would like. Topics include: where local pressure points are located; how to deal with relocation; community development corporations; revenue sharing; housing rehabilitation and codes. Available for \$3.00 from: Berkeley Tenants Organizing Committee, 2022 Blake Street, Berkeley CA 94704.

Roland L. Warren,

Studying Your Community

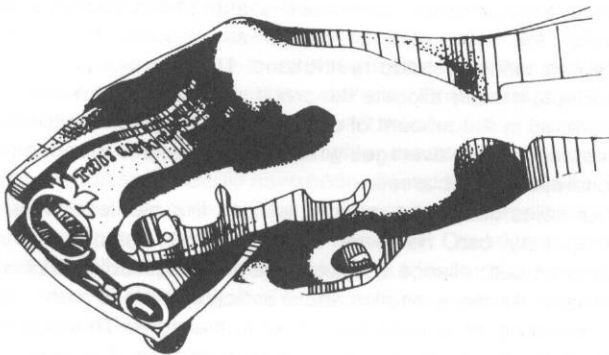
The Free Press, 1965.

Any successful planning process requires the compilation of factual data about one's neighborhood, about its geography, population, economic life, housing, education, recreation facilities, social services, civic associations and community organizations. Without such information, it would be impossible to draw up a plan that would reflect community needs and wants. This book, first published in 1955, remains as a classic guide to the conceptualization and carrying out of a community survey. The author goes into detail as to what general topics should be covered and what types of specific questions should be asked. Though it may suffer some from age, the work's extensive nature makes it a helpful resource for those trying to study their own community.

Plugging the Leaks

Early in 1975, Joseph Danzansky, the president of Giant Foods, a middle Atlantic regional supermarket chain, addressed the problem of the lack of convenient food stores in the city of Washington. Speaking before a food forum sponsored by the Metropolitan Washington Council of Governments, Mr. Danzansky stressed the need for tax incentives from the city to draw the chain stores back into the inner city. The tax incentive he specified would be a write down on acquired property, which would allow chains to pay lower property taxes. Danzansky emphasized that not only do chain supermarkets provide convenience and lower prices to consumers, but they also create jobs and increase the tax benefits (on property and income), which accrue to the city. It made good economic sense, he implied, for the city to provide a sweetener to the chains, since this sweetener would be paid back many times over in increased revenues and decreased service costs (welfare, unemployment, etc.) to the municipality.

Danzansky's argument is a standard one, heard in any area which is going through economic hard times. Corporations provide benefits to a jurisdiction; they should therefore be actively courted. The states of Pennsylvania and Ohio competed fiercely over the location of a proposed Volkswagen plant. Pennsylvania won the battle only after the legislature had passed a special package of benefits for Volkswagen which included a commitment of loan availability to the corporation and the payment of development costs of the site by the state. The state felt that it was worth it: corporations, after all, provide jobs and tax revenue, their workers spend in local shops and invest in local property. Economic vitality, it was argued, depends upon the location of plants and distribution centers.



Large corporations, however, play another, less beneficial role within cities: they serve as a conduit to drain capital out of the locality. Our staff, for the same hearings in which Mr. Danzansky stressed the importance of tax breaks for chains, prepared a report on the relative effects on a local economy of a chain supermarket branch as compared to a locally-owned, cooperative supermarket. The report concluded that a moderate sized chain store in the inner city, with annual sales of \$5.7 million, deprives the local economy of \$332,160 more than would the same store owned either locally or cooperatively. This money differential comes from payments of profits, debt service, and

management costs which are paid to corporate headquarters rather than locally. (See *Exporting Capital*)

This is not to argue that chains do not create jobs and additional tax revenues. They do; but so do all supermarkets. What is being argued is that chains affect the local economy far less favorably than similar operations which are locally and/or cooperatively owned.

A mistake is made when the social and economic contribution of a Giant supermarket — or any business firm — is evaluated solely on the basis of its corporate balance sheets. All other things being equal, Giant will provide jobs and taxes to the locality. All other things are not equal, though. State and local legislation and expenditures facilitate the start-ups, expansions and shut-downs of business firms. They can provide incentives for a Giant — the normal practice — or they can begin to encourage and support operations which more fully serve the local economy.

The Multiplier Effect

The conceptual background to this analysis is in viewing the local economy as autarkic, as one which does not need to rely upon the policies of corporations or the mysterious machinations of the capital markets in order to provide products, services, jobs, and tax revenues. If one examines the flow of funds through a given geographical community, that community will be found to have "trade deficits and surpluses," to import or export capital.

The key concept is the "multiplier" effect. Money entering a locality can be put to use in a number of ways. Assume it buys a loaf of bread. That sixty cents will then be taken from the store's tills and distributed: to workers, management, suppliers, the government (in taxes), etc. If management lives a thousand miles away, then management's share will leave the locality. If management lives nearby, the money will remain in the local economy, going through another round of savings and expenditures. The more transactions the money can be used for locally, before it leaks out, the higher the multiplier effect and the greater the return to the local, public treasury for sales and other taxes. One of the common definitions of money is that it is a store of wealth: a high usage of money translates into increased wealth in a locality.

Given this perspective on local economies, other ways of stopping leakages suggest themselves. Bread, peanut butter, cheeses, and other goods can easily be produced locally without paying a premium for decentralized operations, as is being proven in many cities around the country. Were these locally-produced goods bought by the supermarkets, rather than the regionally or nationally produced goods currently purchased (more correctly, supplied by a vertically integrated company), the local multiplier effect would increase.

Successful local stores produce a profit. Large corporations use the majority of their profits for internal investment, thereby removing that money from the community. Surplus generated by

local stores (including potential surplus generated by non-profit enterprises) can be invested in other community enterprises, further increasing the multiplier and further decreasing the dependence on outside investment.

A group of community food stores in Washington, known as the Washington Area Food Federation, asked the local government for financial assistance approximately equal to that requested by the chain stores, so that they could set up stores in poorly serviced areas of the city. These stores, locally owned and controlled, pay most management costs and debt service to local residents and institutions. The combined purchasing power of these and the proposed new stores would have greatly expanded the market for local producers and suppliers. Had the city honored their request (and had the new stores been viable operations), the multiplier effect in the city would have increased, not greatly, but enough to provide for a few additional jobs and some additional municipal service delivery. Not surprisingly, though, the group was turned down.

New Strategies

In other cities, the concept of local investment has met with more success. Chicago has recently ruled that municipal employees must maintain residence in the city. While this regulation has been on the books for decades, it is being strictly enforced for the first time. This has a direct impact on leakages within Chicago's economy. Wages paid to the employees will be, to a greater extent than before, saved and spent within the city. Other cities have a similar rule; even more cities want it. Clearly, economics were not the only reason for mandating local residence; but the resultant effect on local revenues and multipliers is a healthy one.

Many cities and states also either mandate or give preference to purchasing from or through local manufacturers or distributors. State and local governments provide a counter-cyclical stability to their area during economic hard times: their budgets rarely decline. They consistently purchase some types of goods (school lunches, pencils, paper, chairs) and services (printing, reproduction, data processing), providing a guaranteed market. Local governments, within this context, could be far more aggressive than they currently are in stopping leakages through local purchasing. Generally, they remain reluctant to actively encourage local businesses through capital investments and the like, relying on the marginal effects of tax law.

One of the most widespread grassroots campaigns to plug up a community's economic leakages is the campaign against redlining. In scores of cities, groups have decried the "business as usual" practices of the housing finance lenders in diverting capital away from older city neighborhoods. The arguments and reinvestment strategies have taken a number of forms, one of which is the demand that savings generated within a locality be returned to that area in housing loans. In many cities, these strategies have met with some success: in Washington, DC, one savings and loan which from 1972 to 1974 had made only 5% of its loans within the city, responded to public pressure in 1975 and made 24% of its loans within the city.

There are scores of other examples of how capital exportation can be reduced: urban greenhouses can produce some food otherwise imported; community credit unions, restricted to making loans within their neighborhood, can be an important and constructive force if given wider loaning powers; solid waste can be processed locally into a saleable product; energy conservation measures can reduce imported fuel costs. The local area can exert control over its economic destiny.

Exporting Capital

National fast food chains, like chain supermarkets, provide convenience, jobs, and tax revenues to their service areas. And, like the supermarkets, they also export capital.

Figures were obtained on the financial status of one chain outlet (a McDonalds), located in an inner-city area. Corporations cost out their expenses, allocating to each restaurant its proportional share; this breakout is illuminating. If the figures from this one store are representative (and there is good reason to expect that they are, given the industry's standardized operations), then we all deserve a break.

Fully 20.00% of this store's costs immediately leave the community: advertising; rent (paid to a corporate subsidiary); a service fee paid to the corporation; accounting and legal fees; insurance; depreciation and amortization; and debt service. This restaurant, like all other outlets, purchases its food and paper supplies from other centralized corporate subsidiaries. These costs are 41.81% of total expenses. Management costs go toward paying salaries outside of the area and equal 5.62% of expenses. Other expenses, a total of 9.07%, are unclear in their ultimate origin. Only "crew labor" (15.04%) and some portion of taxes (1.93%) clearly remain in the community.

This one restaurant does about \$750,000 in sales annually and earns about \$50,000 in profits before taxes. Over \$500,000 of this money leaves the community; as much as \$67,500 more may also be "exported." Were the buildings owned locally, management hired from local residents and supplies purchased locally, some of this leakage could be effectively plugged.

The model is, of course, simplistic. Many difficulties exist, not the least of which is the power of financial and corporate giants. There are difficulties in measurement: how should a community be defined, how can revenue flows be traced. There are also practical difficulties: many products cannot be produced locally without vast increases in population, land availability, resources, capital. Municipalities, communities and states cannot unduly restrict the movement of capital and goods; they cannot establish tariffs or trade restrictions. They cannot (as in many countries) directly allocate the credit of private institutions. They are limited in the amount of public capital they have available to invest, and in the leverages which can be used to attract private capital into specific areas.

Our cities cannot be autarkic entities like medieval walled-in towns; they can, however, move a great distance towards economic self-reliance and toward a more equitable distribution of wealth. As the examples above indicate, there is much which can be done on a local level to plug leakages. This becomes especially significant for poorer neighborhoods. The many redlining studies have indicated that leakages within poorer communities are consistently more extreme than elsewhere. Increasing the multiplier effect in these depressed communities, plugging the leaks, is essential to any plan to revive their local economies. In some cases poorer neighborhoods would expand their economic base at the expense of richer areas; but this would help our cities and our country begin to move toward a more even distribution of wealth. The mechanisms for moving in this direction are available to every city and state: what is lacking is governmental initiative.

— William Batko

Organic Hydroponics: A Simple Solution

To many, the idea of organic hydroponics seems like an impossible contradiction. Hydroponics, the growing of plants in a medium other than soil, usually utilizes a chemically derived nutrient solution. Organic gardeners, as a rule, do not like hydroponics: for those who love the soil, the prospect of plunging elbow-deep into a gritty mix of perlite and vermiculite is not very inspiring. Nor is brewing up a batch of Hy-pon-ex or Miracle-gro. However, as an enterprising group of urban gardeners in Montreal has discovered, hydroponic food production need not rely upon a chemical nutrient solution; and, under the unique conditions of rooftop farming in the city, soil-less vegetable cultivation has distinct advantages.

The Montreal Project

Two years ago, the Canadian government funded an eighteen month demonstration project in Montreal to investigate the feasibility of rooftop agriculture. The intent of the funding was the development of appropriate agricultural methods and technology so that people would be able to farm the flat wasteland above their city. The target community was the inner-city, ethnically mixed neighborhood, St. Louis Sud. Project workers taught courses in gardening and "roof maintenance" skills, so that community residents could take over the project when funding ran out.

The two gardeners who were hired to teach, research and supervise were experienced organic gardeners who preferred to work with soil. During the first summer, the rooftop gardens were planted in soil. Over 100 cubic yards of soil had to be carried by hand up two flights of stairs, each cubic yard weighing between 195 and 270 pounds. The soil then had to be loaded into carefully positioned containers, so that the stress on the roof would be minimized. Even though the roof was strong and could support 80 pounds per square foot, still much of the "wasteland" had to remain uncultivated. If a lighter medium had been used, more rooftop space could have been utilized for food production.

During that first summer, the differences between ground level and rooftop agriculture became apparent. Container soil dried rapidly and had to be watered daily. Nutrients leached out with every rain; so the plants had to be side-dressed with a variety of fertilizers at least every three weeks. Since the populations of soil microorganisms and animals are greatly reduced in rooftop containers relative to their concentration in soil, their role in soil regeneration in the rooftop project was less significant. Earthworms, though they lived well in the boxes, could not bring minerals back to the soil from the parent rock because there were no parent rocks. By July, the root systems had become potbound, filling the entire container. It was found that insect problems occurred more easily on the roofs than on the ground if strict care was not maintained. It began to look as if organic container gardening could never be more than a poor cousin to ground level organics.

The project workers, however, came up with a solution, a

method which could minimize the many logistical and ecological problems being encountered. That method was hydroponics; given their organic gardening background, the workers decided to experiment with organic hydroponics.

The Organic Hydroponic Procedure

Contrary to prevalent thought, it is extremely simple to mix a batch of organic nutrients adequate for the needs of any plant. One can either use a tea made from high quality compost, or one can mix a basic solution of one tablespoon fish emulsion, one tablespoon liquid seaweed, and a teaspoon of bloodmeal to each gallon of water. The mix varies, depending upon the type of plant being grown. Less bloodmeal should be used with flowering and fruiting produce than with leafy crops. Other nutrients can also be added; blended eggshells, for example, might be helpful when added to a cabbage crop. There is room for variation and for more experimentation: the basic mix is meant to be a starting point rather than a proven end-product.

The fish emulsion, seaweed and bloodmeal recipe was developed in trials on lettuce during the Montreal winter. By spring, two successful lettuce crops had been harvested, so the project workers decided to try the nutrient solution with a tomato crop. Two large five by seven foot coldframe boxes were prepared. One was fitted with hydroponic accessories and filled with a growing medium of half perlite (a lava product) and half vermiculite (made from mice) to which fifty pounds of sand were added. This was found, after much experimentation, to be the best medium. The other box was provided with the normal drainage holes, filled with the conventional soil mix, and fertilized on regular schedule.

For the first month of the summer, the thirty-six tomato plants being grown hydroponically lagged behind the thirty-six soil-grown tomatoes. This was because no seedling tomatoes had been started in a soil-less mix and it was necessary to take the plants from the soil, wash the soil off the roots, and then set them in the hydroponic box.

By July, the hydroponically grown tomatoes were larger, more sturdy, and had more fruit set than the soil-grown controls. They also had a much greater resistance to the aphids which infested downtown Montreal last summer. This increased resistance is a good indication that the plants were receiving excellent nutrition from the organic mix. Comparisons of the final yields are not yet available, but by mid-August the hydroponic tomato plants were producing about a third more tomatoes than the soil-grown controls. There is no doubt that this simple nutrient solution provides excellent nourishment.

Critics of hydroponics claim that the method is too expensive and too complex. They also claim that it takes the fun out of gardening and is unaesthetic. The latter claim has some validity. Some community residents in Montreal were put off by the boxes of sterile, almost feathery growing medium. Many stressed that they were gardening for more than the potential

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Progress Reports

Local Initiative

Local governments in Montana are in the midst of a promising experiment in local self-determination. It revolves around the turning on its head of the "Dillon rule," a judicial interpretation that essentially says that all powers not specifically granted to the local governments are the province of the state. In Montana, the 1972 Constitution made it so that all powers not specifically delegated to the state belonged to the local government. There are three main provisions in Montana's plan for making local government more responsive to local citizens: "1) providing readily available alternatives in terms of local government structures and powers; 2) extending the powers of initiative and referendum to the voters of every governmental unit and 3) mandating periodic voter review of local government to assure active consideration of available options." For further details contact Dale Harris, State Commission on Local Government, Capitol Station, Helena MT 59601; Jim Parker, Dept. of Community Affairs, Capitol Station, Helena MT 59601. *Community Planning Report* July 30, 1976.

At Lucas Aerospace in England, workers are still pushing for the adoption of an Alternative Corporate Plan, one that would give workers input as to the nature of what is produced as well as the process of production. The section of the union which covers draughtsmen and systems engineers throughout Lucas Industries has raised the issue as part of the current round of wage bargaining. The union has asked Lucas' management how much they are prepared to spend on the design and manufacture of socially useful products. The unions are arguing for a "social wage," demanding that money given up by socially responsible wage-restraint on the part of workers be used for socially useful production. Among other things, they have demanded a 45% increase in the production of kidney machines. Management's reaction is

unclear; but news of the imminent sacking of ten workers from the Neasden plant, which produces kidney machines, is not likely to improve relations between the two sides. *Undercurrents*, August-September 1976.

The Flatbush Development Corporation (FDC) a coalition of residents of Brooklyn's Flatbush section, has chalked up a string of successes in its short eighteen month existence. Housing code enforcement in the area has been stepped up. Five deteriorating buildings have shown marked improvement following the formation of tenant groups. Local residents are now working with the city's Planning Department and the Pratt Institute for Community and Environmental Development in an effort to develop a long-range proposal for the revitalization of Flatbush Avenue. Perhaps the most exciting single activity which FDC members are involved in is the rescue of an apartment building at 1212 Ocean Avenue. The building had been taken over by the city after the landlord had abandoned it. The FDC convinced the city to let the community group manage the building. The project has been so successful that the current resident/managers will soon be given the opportunity to buy their apartments as co-ops for \$1000 each and will be able to get an \$80,000 low interest loan to make necessary repairs. For more information, contact: Michael Weiss, FDC, 1418 Cortelyou Road, Brooklyn NY 11226.

Finance

On September 30, 1976 all depository institutions (banks, savings and loan associations, credit unions) with assets of over \$10 million were required to release a detailed accounting, by zip code, of where all their 1975 mortgages had been placed. This requirement was passed in 1975 as part of the Federal Mortgage Disclosure Act. Almost immediately, press and community groups began compiling and publicizing the information. The *Washington Post* (10/3/76) noted in a front page arti-

cle that while the total amount of conventional mortgages had increased for the District of Columbia in 1975, over half of those mortgages went to wealthy white neighborhoods in the Northwest. In Los Angeles, a citizen's group is preparing a series of county maps in order to illustrate the lending patterns of specific financial institutions. Several states, including Michigan, Pennsylvania, and New York are also preparing statewide analytical systems to compile, process and present the data from the first year. While zip coded material will not be easily cross-tabulated by socioeconomic data (which is recorded by census tracts), its proper presentation can still have a strong public impact. If your community is in the process of studying Federal Mortgage Disclosure data, please let us know. Write to Jeff Zinsmeyer, ILSR, 1717 18th St NW, Washington DC 20009.

In Seattle, Washington a citizen's group, with support from city officials and their congressional representatives, won a battle over a proposed bank branch within their neighborhood. The second largest bank in the state had applied to the Comptroller of the Currency to establish a branch within Seattle. This bank had defined its "service area" as a gerrymandered district, avoiding previously redlined areas. The community protested through a media campaign and through pressure on the comptroller; as a result, the bank withdrew its application.

A Washington DC community organization has petitioned the Federal Home Loan Bank Board to deny the application of a major Washington Savings and Loan Association for a branch in their neighborhood. The Adams Morgan Organization (AMO) argues that given the S&L's previous lending practices, its branching into the community will facilitate the displacement of low and moderate income residents from the ethnically and racially diverse neighborhood. A survey of the lending practices of the S&L revealed that, in the past, it has made very few rehabilitation loans to homeowners and no FHA- or VA-guaranteed mortgage loans. Those mortgages which have been given by the S&L have averaged over \$65,000, a cost well out of the reach of many neighborhood residents. (The esti-

CENTER FOR GROWTH ALTERNATIVES

1785 Massachusetts Avenue, N.W., Washington, D.C. 20036 / (202) 387-6700

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To the friends of the Center for Growth Alternatives:

The Center for Growth Alternatives has had to close its doors, together with its parent organization, the Equilibrium Fund. We have turned over our mailing list, print materials, and other remaining resources to the INSTITUTE FOR LOCAL SELF-RELIANCE.

The people at the Institute have long had our admiration, and we feel that our kinship of purpose will allow for continuity of the work in which the Center was engaged. We urge the Growth Alternatives Network to remain intact, informed, active, and in communication through ILSR and its periodical, SELF-RELIANCE. SELF-RELIANCE contains short reports and longer analytical articles, resource lists and bibliographies, all related to the nascent movement for decentralization and growth alternatives. SELF-RELIANCE is published bi-monthly; subscriptions are available for \$6/year for individuals, \$12/year for institutions.

The Institute for Local Self-Reliance will also carry the following CGA publications:

Nongrowth Planning Strategies: The Developing Power of Towns, Cities, and Regions by Earl Finkler and David L. Peterson. 116 pp. \$3.95.

Energy Growth Alternatives, a special issue of Equilibrium edited by Sam Love. 49 pp. \$1.00.

Recreation in the Cities: Who Gains from Federal Aid? A CGA study by John Burdick. 48 pp. \$2.00.

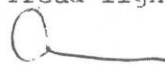
GROWTH ALTERNATIVES. Back issues of nos. 1 and 2 of the CGA newsletter. Free; or donation to ILSR.

These publications should be ordered from (with checks payable to):

The Institute for Local Self-Reliance
1717 18th Street, N.W.
Washington, D.C. 20009

Many thanks for your warm support and for the flood of enthusiastic response to the GROWTH ALTERNATIVES newsletter.

Tread lightly on the Earth.


Avrom Bendavid-Val
Director, CGA

mated median family income for the neighborhood is \$11,686; over 80% are renters.)

In its petition to deny, AMO demanded that the institution only be allowed to open a branch if it: 1) adopts a loan program designed to encourage home renovation and purchase by current residents and 2) nominates an AMO representative for election to the S&L's board of directors. In a recent community referendum 73% of those who voted (435 people), voted to oppose the institution's initial branch application. For a copy of the AMO Petition to Deny, contact: Public Interest Research Group, 1346 Connecticut Avenue NW, Suite 419A, Washington DC 20036.

Waste Utilization

Low technology collection/recycling solid waste systems are catching on around the country. The ORE plan for neighborhood-based collection/recycling, developed in Portland, Oregon, is now being adopted on a city-wide basis in Bellingham, Washington. Four ORE-styled enterprises began operation in Eugene, Oregon on October 1st. Another is being planned for Brooklyn NY. This year, EPA grants will provide start-up and support funds for collection/recycling projects in the following cities: Newton MA; Berkeley, Modesto, San Luis Obispo and Stanislaw County CA; Lewiston WA; Universal City MO; Tucson AZ; El Paso TX; Salt Lake City UT; and Duluth MN. For more information, contact Neil Seldman at ILSR.

Denver, Colorado, has recently joined the cities of Washington DC and Portland Oregon in rejecting a large-scale high technology resource recovery solution to the city's mounting garbage problem. A study conducted by the Resource Recovery Management Committee, formed by thirty-four participating local governments banded together by intergovernmental contract, concluded that resource recovery is economically infeasible at the present time without substantial subsidies to cover operating deficits. The study also

noted that should a mandatory beverage container deposit system be approved in November by Denver's voters, then an additional net revenue loss of \$977,000 a year could result, making the economics of high technology solutions that much more prohibitive.

Similar arguments were put forward by Robert Miller, the Director of the Hillsborough County (Florida) Solid Waste Control Department in his report to the Resource Recovery Council in Tampa last August. Mr. Miller spoke out against the high technology solution of burning garbage for energy, noting that source reduction and recycling of waste, coupled with the use of solar energy and more widespread energy conservation measures, were far more prudent solutions to both the waste and energy problems. He recommended the evaluation of the various resource recovery strategies on the basis of certain values: "such things as tax burden impact (reflecting capitalization and operating costs), environmental quality impact, positive economic impact (primary and secondary jobs produced), resource depletion impact, and system net energy yield." It is good to see municipal and county solid waste experts expressing their dissatisfaction with the implications of high technology resource recovery solutions. For more information, contact: Robert Miller, the Hillsborough County Solid Waste Control Department, County of Hillsborough, Tampa FL 33601.

Energy

In a new study entitled *Efficient Energy Use and Well-Being: The Swedish Example*, it has been shown that Sweden used about 60% as much energy as the U.S. in 1971 to produce each equivalent dollar of output. Among the reasons for Sweden's lower energy use are: 1) homes and buildings that are heated twice as efficiently, 2) automobiles that average 24/ mpg, 3) 25% less use of energy per ton of industrial output. The authors, Lee Schipper and AJ Lichtenberg of the Lawrence

Berkeley Laboratory in Berkeley CA propose that Americans could save as much as 30% of their present energy use with a number of changes in lifestyle. *Maine Energy* August 1976.

A cooperative apartment building in lower Manhattan, which had previously installed a solar hot water system, has recently received a grant from the Community Services Administration to install a reconditioned Jacobs wind generator. Contact: Travis Price, 519 East 11th Street, NY NY 10003.

The town of Wilton, Maine (pop. 4200) has become the first town in the state to utilize solar energy in a waste-water treatment plant. The uniquely designed facility uses solar energy for both space heating and water treatment. Methane produced by anaerobic digestion of organic compounds in the water is stored as backup for the solar energy systems. The entire facility is one of the most energy-conserving of its kind: it has a reduced northern exposure, utilizes energy saving screw pumps which permit the remainder of the process to feed by gravity, and will use heat pumps to regain 75% of the heat lost to exhaust. Details c/o City Hall, Wilton, ME. *People and Energy* September 1976.

The California Office of Appropriate Technology has established a solar technician training program. Using CETA training money, 15-20 people will manufacture, as well as install, solar collectors for hot water. The government had previously purchased many buildings in the state capital, Sacramento, for an aborted development project. The training program will retrofit forty apartment units and several residences in this area. For further information, write to Jonathan Katz, Office of Appropriate Technology, PO Box 1677, Sacramento CA 95808.

When writing to any of the contacts mentioned in SELF-RELIANCE, please send a self-addressed stamped envelope. It will speed the reply and will save these folks some money.

Resources

In this issue of SELF-RELIANCE, we present a list of organizations which are doing important work relevant to the struggle for urban decentralization. Some are involved in grassroots organizing, others are involved primarily in research, still others are experimenting with appropriate technology. These groups have much information and experience to share; but most are poor, overworked and understaffed. If you wish to find out more about any of these groups, send them a self-addressed, stamped envelope with your inquiry. It will speed their reply.

Alliance for Neighborhood Government

1901 Que Street NW
Washington DC 20009

The Alliance for Neighborhood Government (ANG) is a national association of over two hundred neighborhood organizations and city-wide coalitions. Their work currently focuses on three areas: 1) Neighborhood Information — to influence federal, state and local governments to become more responsive to the information needs of neighborhoods; 2) Citizenship and Community Education — to promote the skills of citizenship and neighborhood participation through high school and college curricula; and 3) Housing and Community Development Block Grants — to secure the amendment of the 1974 Housing and Community Development Act so as to strengthen the role of neighborhood organizations in the allocation of the block grant funds. The Alliance publishes the monthly *ANG Bulletin*; subscriptions are \$10/year.

Center for Local Self-Reliance

3302 Chicago Avenue
Minneapolis MN 55407

The Minneapolis Center for Local Self-Reliance (not formally related to ILSR), which incorporated as a non-profit tax-exempt organization just this past spring, seeks to advance self-reliance on the neighborhood level by encouraging greater local control of resources and of technologies which meet basic human needs. In its first year, the Center has

been focusing on energy conservation. The group has been providing assistance to neighborhood residents in home insulation, water conservation and cost-efficient weatherization.

Center for New Corporate Priorities

1516 Westwood Boulevard, Suite 202
Los Angeles CA 90024

The Center for New Corporate Priorities is a research group which focuses on the impact on consumers and communities of unfair lending and banking practices. They are currently involved in three major projects: a study on banking and the environment aimed at identifying the environmental impact of various lending practices; an evaluative study of the lending and employment practices of San Francisco banks; and the Coalition Against Redlining and its monthly newsletter, *The Redlining Reporter*. The Coalition keeps tabs on developments in Los Angeles County, pushing for strong anti-redlining regulations and publicizing blatant instances of discriminatory lending practices. Annual membership in the Coalition, which includes a subscription to *The Redlining Reporter*, is \$10.

Community Environmental Council

109 E De La Guerra Street
Santa Barbara CA 93101

Community Environmental Council (CEC) is a small, non-profit independent educational and research organization founded in 1970. Since its inception, it has initiated several planning and environmental education projects in the Santa Barbara area. Current projects include: a county-wide resource recovery program, market research for recycled material, Project Energy Conservation (a one-year program to reduce energy consumption in Santa Barbara by 5%), the Santa Barbara Public Garden Project, the Mesa Project (a demonstration project focusing on appropriate technologies for food production, waste utilization and energy conservation) and the CEC Ecology Center and lending library. Membership costs \$15 a year and entitles members to a monthly newsletter and the occasional periodical, *Survival Times*.

Earthmind

5246 Boyer Road
Mariposa CA 95338

Earthmind is a non-profit research and educational corporation; it is also a group of energetic, knowledgeable and hopeful people. They have been working to found an alternative energy-based community and, in the meantime, have put together some fine demonstration projects and some fine publications. They have installed and studied an aluminum S-Rotor wind generator, restored and installed an old 1500-watt Wincharger, devised a pedal-powered flour mill, experimented with solar energy, and rebuilt an electric vehicle. Their publications include *Wind and Wind-spinners*, a nuts and bolts approach to Wind/Electric Systems (\$8); *The Home-Built Wind-Generated Electricity Handbook* (also \$8); and two very informative newsletters on their experience and research (\$2 each). For a complete publications list and some general information on Earthmind, send them 50¢ and a long stamped, self-addressed envelope.

National People's Action

121 West Superior Street
Chicago IL 60610

Under the organizing banner of "Neighborhoods First," National People's Action (NPA) has launched a campaign to unite neighborhood groups to fight for commitments of federal support for pressing neighborhood needs. NPA has united groups from over sixty cities and towns to fight for: increased citizen participation in community development block grant allocation; investigation of the use of Law Enforcement Assistance Administration (LEAA) crime-fighting funds; legislation establishing Life Line utility rates; anti-redlining regulations and complete disclosure by financial institutions of residential mortgage data. NPA's strategy is to build a broad nationwide coalition of neighborhood groups into a vocal and powerful lobbying and pressure group. The group's monthly newsletter, *Disclosure*, is available for \$10 and provides good information on grassroots efforts, legislative developments and "pervasive governmental and private sector scandals that affect our neighborhoods."

● Linking Communities Through Space

When, in the 1800's, the advent of lithography made possible the publication of inexpensive illustrated newspapers, the effect was profound. Daily news became accessible to the common person: most people could then afford to keep up with current events. The history of communications technology has been a progression of similar technological breakthroughs which have made available increasingly vast amounts of information to increasingly large groups of people. Radio, film, television, telex — all these communications media have had profound effects on our lives and our consciousness.

Since the launch of Sputnik in 1957, communications technology has advanced significantly: what had once been just a dream — the global village with instantaneous wireless communication around the world — is now very much a reality. Like any advance in communications, space technology has the potential for further democratizing the media and radically changing the way individuals and communities generate and receive information; but, as has been the case with every previous breakthrough in communications, the future uses of the media will, in the end, be determined and designed by those interest groups which control the hardware.

The Potential

The possible public uses for communication satellite systems are varied and exciting. Many new broadcast channels could be introduced to the home. New regional and national networks could be created since the high cost of leasing AT&T long lines for distribution would be avoided. Existing low-budget broadcasters, such as college radio and television stations or the National Federation of Community Broadcasters, could afford to share programming costs with others and exchange material on a regular basis. Since there would be no shortage of broadcast frequencies, alternative networks tailored to the needs and interests of particular audiences would be possible; Spanish-language stations, stations for Indian reservations, women's stations, would all be feasible. Networks could be designed to deliver social and information services to people in congested urban areas or in remote rural regions: health-care training, education, information about food stamps, social security and other governmental programs could be available to anyone for the price of a television.

New breakthroughs in satellite technology are bringing down the price of these systems to the point where these alternatives will be economically feasible in the near future. A small company in California, using conventional technology, has developed a prototype two-way transmitting and receiving terminal which sells for \$50,000. This is far less than the FCC or any large company ever admitted was possible. By using a fifteen foot dish antenna (even though FCC regulations require a thirty foot minimum), they were able to cut costs considerably and still maintain broadcast quality. It is reasonable to assume that the \$50,000 price tag would drop significantly if the terminal were

produced in any quantity; the prototype price usually includes some of the research and development costs as well as the actual per unit cost.

Breakthroughs in receiver technology have been the most promising. Already the Japanese have manufactured a prototype receiver which costs only \$1500 to build. NASA and HEW have been experimenting with \$10,000-\$15,000 earth stations for remote area communications. When this price is compared to the current satellite ground technology, consisting of huge dish antennas and costing anywhere from \$100,000 to \$5,000,000, the implications of these breakthroughs for public access to communications media are clear and far-reaching.

What stands in the way is neither technology nor economics: the real barriers are political

The greatest cost associated with satellite communication is, of course, the satellite itself. At present, a commercial satellite costs \$5 million and the launch costs another \$5 million. When the space shuttle is launched, though, these costs will drop significantly. The satellite will be assembled and launched from space: there will be no need for costly booster rockets. By 1985, then, the cost of launching a communications satellite able to provide telephone, telex, telegraph and computer data will be within the reach of cities, perhaps of neighborhood coalitions. From both the economic and the technological standpoints, the utilization of space technology for public uses, for information and communication to communities which are in real need, is increasingly feasible and realistic. That is not the problem, though. What stands in the way is neither technology nor economics: the real barriers are political. By 1985, when costs will be within reason, it could already be too late to launch a non-profit public service satellite. That is a result of the way in which satellite communications systems have developed.

The Politics

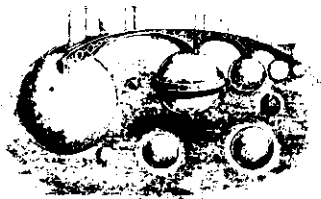
In 1962, a quiet and effective coup in the field of communications was engineered and executed, and the public never really knew about it. The Communications Satellite Act of 1962 created COMSAT, a profit-making investor-owned corporation established to provide fast, reliable and inexpensive long-distance communications via international satellite relay. Its ownership was divided evenly among the four American international common carriers (AT&T, ITT, RCA and Western Union) and the public (mostly represented by banks, insurance firms and investment holding companies). Oregon Senator Wayne Morse strongly recommended that the Act "be discussed and debated at the community level, in one discussion group after another, in meet-

ing after meeting." Backers of the bill, though, pushed it through quickly, arguing that if we didn't do it, the Russians would, that the need for new communications channels was urgent, that it was important to see just how profitable satellites could be.

In 1972, the Nixon Administration announced its policy on satellites which was, in effect, no policy: the skies were to be open on a first-come, first-served, "free competition" basis. Since then, commercial domestic satellite systems have come into being, and all the large corporations have jumped on the bandwagon. Western Union and RCA have launched their own satellites. COMSAT, IBM and Aetna Insurance have formed Satellite Business Systems, Fairchild Industries and Western Union have created AMSAT. The FCC has received over 200 applications for satellite earth station construction permits, from Exxon, GE, Westinghouse, Dow-Jones, even Home-Box Office. So, although there is presently enough room in the sky for many satellites, it is estimated that by 1985 there won't be enough "parking space" for domestic satellites. If 1985 rolls around and non-commercial, public uses have *not* been accommodated, there will be no chance of their being accommodated then.

PISA

For this reason, the Public Interest Satellite Association (PISA) was formed in the fall of 1975 to explore the public interest uses of satellite communications technology and to ensure that its future development serves the communications needs and interests of the American people. PISA's ultimate goal is the establishment of an independent non-profit satellite communications system tailored to meet the specific needs and requirements of the non-profit sector of society.



PISA would like to see an entire satellite launched for the purpose of serving the public interest, for the benefit of the non-profit sector of American society. To this end, the group is talking with NASA which has plans for launching a public service satellite by 1983. At the same time, PISA is pursuing a policy of trying to work with what is, of trying to guarantee a place for non-profit groups on existing satellite facilities. PISA argues that precedents have already been set for the special treatment of non-profit groups in the area of communications. The Post Office has a special bulk mailing rate for non-profit organizations. On the FM radio band, certain frequencies are reserved for non-profit educational and low-wattage stations. The airwaves are in the public domain; they belong to no one. For this reason, the FCC has the mandate to uphold "the public interest, convenience and necessity." An even more compelling argument is that satellite technology is the product of \$80 billion in taxpayers' money; it seems quite reasonable that the public have some say and be able to reap some benefit.

One of the most exciting aspects of PISA's work is its aid in assisting community and other not-for-profit groups to utilize the communications technology of NASA's experimental Application Technology Satellites. The National Institute of Education, which is the technical arm of the Office of Education, has between sixteen and twenty million dollars allocated over the next four years to fund experiments in the public use of the NASA hardware. PISA has been helping several groups to formulate their

NASA Experimenters

The following non-profit groups have formulated proposals for the use of NASA's experimental communications satellites:

- Arkansas Community Organization for Reform Now (ACORN)
- Association of Investigative Reporters and Editors
- Community Video Satellite Organization
- National Association of Neighborhood Health Centers
- National Education Association
- National Federation of Community Broadcasters
- Northwestern University
- Pacifica Foundation
- Public Interest Research Groups (PIRGs)
- South Dakota Indian Education Association
- United Farm Workers

For further information on the proposals, or for more information about satellite communication and its importance to your community, write to: Bert Cowlan and Andy Horowitz, Public Interest Satellite Association (PISA), 55 West 44th Street, New York NY 10036.

proposals to NASA and to prepare management plans and implementation schedules as required — groups like the United Farm Workers, the Arkansas Community Organizations for Reform Now (ACORN) and the National Association of Neighborhood Health Centers (see box). Each of these groups has a detailed plan for how satellite communications could be of assistance to them in their work. ACORN wants to be able to expand its regional community organizing activities; the National Federation of Community Broadcasters and Pacifica want to establish a satellite-based FM radio network; the Farmworkers want to interconnect migrant camps on the East and West Coasts, for the purpose of exchanging data and providing vocational education. The possibilities are exciting and PISA is eager to help other groups.

One possibility envisioned by PISA director Andy Horowitz is a community information communications center with a small satellite antenna on the roof. "Think of a Western Union storefront," he suggests. "All the hardware is in the back room. Groups could share in the maintenance and support and use of the facility. You could either come into the storefront for the data or you could call. And then you would only be paying local charges for information which comes a very long way." It may even, in the future, be possible to use micro-wave transmission (which is now used by businesses to avoid AT&T rates) to link a number of different organizations in the same city to the same network. PISA wants to help set up a few model community information communications centers: they are currently looking for communities around the country which would be able to utilize and would benefit from such experimental communications systems.

The potential is real; and it is exciting. The political opposition, though, is equally real and is extremely powerful. The fight for public access to publicly funded technology will not be won by PISA alone. It may seem like science fiction to us today; but soon the corporate domination of the skies will be science fact. The possible uses of the technology for community purposes, for the freeing of information and the democratization of the media, are too important and potentially liberating not to be developed.

—Richard Kazis

Power to the People

Solar cells are direct competitors with nuclear power plants. They are not to be confused with solar collectors, which produce heat. Solar cells generate electricity. They are semi-conductor devices, developed in the early 1950's using theory articulated during the development of transistors. Although the theory is highly sophisticated, the device itself is simple; and its simplicity has revolutionary implications for decentralized energy generation.

A solar cell is a wafer thin device, usually about three inches in diameter. Solar cells are made from silicon, which is reduced from silicon dioxide, or ordinary sand. Since silicon constitutes 27% of the earth's crust and is the most plentiful material in the world, we do not have to worry about running out of it. (Sand, incidentally, is the only material produced by every state in this country.) Slight quantities of other materials, like arsenic and boron, are added as impurities. These set up a junction, or barrier, in the silicon so that when sunlight hits the cell, a photon "pushes" an electron across the barrier, causing it to flow through a completed circuit to provide electricity.

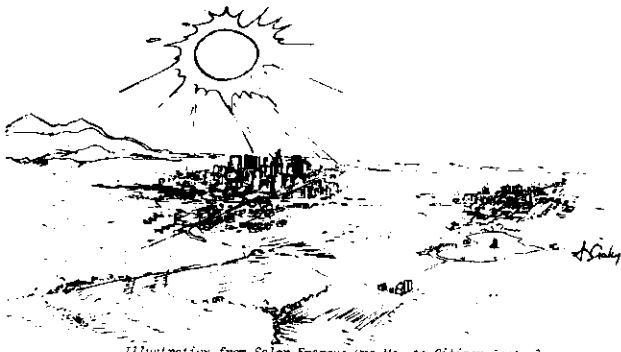


Illustration from Solar Energy: one Way to Citizen Control?

The first solar cells had low efficiencies, of between 4-6%. However, it is commonplace for modern cells to have efficiencies of 16%, and in the laboratory such devices have almost reached the theoretical limit of 22% efficiency. This means that for every kilowatt of power that falls on the cell, 160 watts of power is available for use as electricity. The average American home, excluding space heating (which should be done by solar collectors rather than solar cells), requires about 700 kilowatt hours (kwh) of energy per month, or one kilowatt of power operating continuously.*

To understand the power potential of solar cells, it is necessary to distinguish between their average power and their peak power. The peak power is the amount guaranteed at full sunlight with a temperature of 70 degrees Fahrenheit. Average power is generated over a long period of time. If one includes the number of cloudy days, the night time hours, rainy weather, and so forth, one finds that a fairly accurate generalization is that the

average power is about one-fifth of the peak power, except in the southwestern United States, where the high degree of sunlight might bring the average power level closer to peak power. Therefore, in order to generate an average power of one kilowatt continuously for one month, enough power for the average American home, a 5 kilowatt peak system must be installed. Such a system can be installed on most rooftops: that is, we can actually supply all our electric needs from our rooftops. Indeed, several calculations indicate that given adequate storage facilities, we could provide for both our thermal and electric needs from the average roof.

This is one of the most interesting and important aspects of solar cells as an energy source: they work best if decentralized, and installed close to the source of demand. Dr. Jerold Noë, a physicist working with Tyco Laboratories, has said, "We have made a calculation that the roof of an average house around Philadelphia could produce enough energy to supply the needs of a home, with enough left over, to, say, charge an electric car." According to Dr. Martin Wolf of Pennsylvania State University, a pioneer in solar cell development, about three times the present average household consumption of electric power can be collected from the roof of an average-size family house, even in the northeastern part of the United States.

The simplicity of solar cells has revolutionary implications for decentralized energy generation

If a house requires one kilowatt of power, it needs about 450 square feet of solar cells, or some 500-550 square feet of total roof space at average insolation. (Insolation to the southwest decreases this area by 25%.) In very dense areas, of course, there may not be enough rooftop space; high-rise buildings, for example, do not have enough rooftop space to meet their electricity needs. Where central power stations are necessary, though, they will probably be rather small. One study done by a solar cell manufacturer found that solar cell power stations operating on larger than the community level become inefficient because of the cost of transmitting electricity.

Economics

Throughout the 1960's, the price of solar cells remained very high. They were used exclusively in space satellite systems, and, because the cost of the power system was a minute fraction of the total cost of a satellite, and because no other market seemed likely even if prices were reduced, the few manufacturers maintained a stable price of about \$200 per peak watt.

In the early 1970's, however, a number of terrestrial applications were found for solar cells. Prices dropped from \$100 per peak watt in 1970 to \$30 in 1973, to \$17 in 1975, and most recently to \$10. This means that the current cost is about 20 times that of nuclear power.

*The difference between power and energy is always confusing to non-scientists. Energy is the amount of power used over time. If we speak of a one kilowatt system, that refers to the amount of power it puts out. In one hour, operating at peak power, a one kilowatt system delivers one kilowatt hour of energy. Were it to operate full time for a month, it would deliver one kilowatt for 720 hours, or 720 kilowatt hours. Your electric meter charges you per kilowatt hour.

Solar Cell Manufacturers

Solarex Corporation

1335 Piccard Drive, Rockville MD 20850

Solar Power Corporation (subsidiary of Exxon)

23 North Avenue, Wakefield MA 01880

Spectrolab (formerly part of Textron, recently sold to Hughes Aircraft)

12500 Gladstone, Sylmar CA 91342

Sensor Technology

210-12 Lassen Street, Chatsworth CA 91311

Optical Coating Laboratory Photoelectric Division, 2784 Giffen Avenue (P.O. Box 1599), Santa Rosa CA 95403

Solar Energy Systems (financed by Shell; manufactures cadmium sulfide cells)

1 Tralee Industrial Park, Newark DE 19711

Solar Technology International

9701 Lurline Street, Chatsworth CA 91311

Manufacturers, researchers, and government officials agree that the high cost of solar cells will drop dramatically if production is sufficiently scaled up to permit automation. Currently the silicon wafers are cut by hand, the cells are etched and tested by hand, the electrodes are soldered by hand, and so on. Automobiles produced by similar methods would, and do, cost twenty times more than cars produced on the assembly line. Solar cells, though, lend themselves easily to mass production techniques since they are electronic devices. The solar cell is actually simpler to produce than an integrated circuit. The integrated circuit requires about 500 individual processing steps; the solar cell probably requires fewer than 100 steps for fabrication.

When estimating future cost reductions, those active in the solar cell field sometimes rely on the experiences of other disciplines. A study done in the late 1960's, by the Boston Consulting Group, entitled *Perspectives in Experience*, found a correspondence between volume increases and price decreases in a wide variety of industries: as volume doubled, costs dropped by 20 to 30 percent, as a result both of automation and of improved production techniques and efficiency. To date, the cost reductions for solar cell production have correlated exactly with these predictions. In the last three years, the volume of solar cells has increased by four times and the cost has dropped 40%.

As do all devices which use solar energy, solar cells require storage systems. At present, storage costs are only a small part of the total cost of a solar cell system, about 2.5 to 3 cents per kwh; but as the price for the cell itself drops, the storage system will become a significant cost item. Current technologies utilize lead acid batteries. New types of batteries are being developed and, spurred on by interest on the part of utility companies, research is being conducted on flywheel and pumped storage of electricity. It is expected that advanced battery systems with significantly longer lives and lower costs will come on line within five years.

The industry stands on the verge of new technological breakthroughs, both in materials and in production processes. Price reduction, however, is not dependent upon such breakthroughs. As the Solar Energy Task Force Report of Project Independence noted, "by just extending conventional silicon crystal growing and slicing techniques, and not counting on any major new

technology advancements, we are able to project solar cell array costs to about 75 cents per peak watt."

The Market

Already, solar cells are cost-competitive in remote applications, in areas where it would be too costly to lay electric cables or where primary batteries are used and discarded after they are discharged. Solar cells are currently used in forestry outposts, buoy systems, weather service stations, for pumping and irrigation, and, in one case, in a sanitary facility at Yellowstone National Park.

There are indications that the remote application market is expanding. Arizona's state highway patrols, after experimenting during the past year with the use of solar cells for radio repeater stations, has apparently given the go-ahead to use them statewide. New Mexico has already been using them for about a year. The Coast Guard, after over two years of testing, is converting its entire buoy system off the coast of Florida to solar cells. There are some 8,000 buoys and 10,000 minor lighting systems under the Coast Guard's jurisdiction, and, as one official explained, once these cells are installed it becomes attractive to hook other things onto the buoy. The power requirements might increase by as much as a factor of three. The World Bank has recently concluded that solar cells are now competitive for use in educational television receiver stations in developing countries. The Ivory Coast alone has some 4,000 ETV receivers with a total peak capacity of 200 kilowatts.

The Defense Department, currently surveying its facilities in an effort to determine the cost-competitiveness of solar cells, is discovering many applications for cells which are competitive immediately or will be in the very near future. Remote military bases, for example, now rely on diesel generators with operating costs of 20 cents per kwh, making solar cells an attractive alternative. Few people, though, are confident that the remote-application market will grow rapidly enough to permit small manufacturers to reinvest sufficient capital to refine and expand their production techniques. Without a rapid expansion of the market plus some subsidies for research and development, solar cell costs will decline slowly rather than drop quickly.

Politics and Solar Cells

At present the federal government is doing almost nothing to support the development of solar cells. The solar cell industry is relatively new, and therefore has little clout with Congress. The Energy Research and Development Administration was only a short time ago the Atomic Energy Commission, and has, as a result, a built-in bias in favor of nuclear energy. Until a year ago the head of the photovoltaic section was a nuclear physicist. Also, since the federal government believes that only big business can significantly affect future energy supplies, it does not actively support the small manufacturers who dominate solar cell production.

The role of the Defense Department is also an important factor. In the early 1950's, there was a need in the military for a very light-weight electronic replacement for vacuum tubes. As a result, the Department of Defense underwrote its development and, within a few years, the price of \$25 per transistor had dropped to 25¢ per transistor. In the early 1960's, the Defense Department assisted in the development of the integrated circuit, which was needed for the Minuteman missile. Now, seeing little military use for solar cell electricity, the military has remained aloof from its development. This is so even though the export

of nuclear reactors has recently come under attack because it provides developing and hostile countries access to materials capable of being used to build atomic bombs.

The result is a federal program which is tepid at best. In fiscal year 1975, nuclear fission and fusion were provided \$1.5 billion while solar cells were allocated \$8 million. In the proposed 1977 budget, the executive branch is going to spend almost 40 times more money on nuclear energy than on the total solar electric program, which includes not only solar cells, but wind and thermal electric. Indeed, the federal government is planning on spending twice as much in protecting nuclear plants against sabotage and Americans against exposure to nuclear wastes than it is to develop the entire solar energy program.

Yet, despite this lack of attention, the prices continue to fall. With the cost of nuclear plants rising by 15-20% per year and the cost of solar cells dropping by an equal amount each year, it is a matter of only a few years before the one is competitive with the other. Even the solar cell division of ERDA predicts the cost lines will cross in the mid-1980's.

Which brings up an interesting point. Currently, it takes ten

years from the time a nuclear plant is first proposed before it begins to produce electricity. Solar cells can begin producing electricity within a few months, or, if the production capability is geared up, within a few weeks. This means that by the time a nuclear reactor now proposed comes on-line, it will produce more expensive electricity than will solar cells. In addition, solar cells can be put on-line in modular form. This means that the generating capacity can be expanded as the need arises. With nuclear reactors, future consumption habits must be predicted accurately; and, as the collapse of the nuclear industry in the last two years has shown, such predictions are very shaky. Finally, solar cells require relatively short term capital investment, whereas nuclear requires long term capital financing. An investment in nuclear will not return any profit until a decade later.

As a result, we can expect that private capital will shortly forsake the nuclear area for solar cells. And when this occurs we will have to develop entirely new concepts of utility structures and energy generation. For then our homes and neighborhoods will become electricity producers rather than consumers.

—David Morris

Organic Hydroponics: A Simple Solution

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vegetable yield, that they enjoyed working with soil and compost. They wanted to learn about soil and they were quite willing to make do with the intensified problems of container soil for the chance to work with that medium.

For people concerned with the economics and yields of urban food production, though, hydroponics makes a great deal of sense. Though soil is cheaper to buy than perlite and vermiculite, the labor costs for the Montreal group in carting 100 cubic yards of soil to the roof were significant. These costs were slashed with the switch to the hydroponic medium which weighed only two percent the weight of soil. Further, since container soil does leach so readily and does require repeated fertilization, the actual cost of fertilizer for container plants grown in soil is comparable to the cost for hydroponic nutrients. Two more considerations must be mentioned. First, since the hydroponic medium is so much lighter than soil, a much larger surface area of the roof can be covered with containers without the fear of structural collapse. Also, since hydroponic roots do not need to grow as far in search of nourishment as do the roots of plants grown in soil, planting densities can be more intensive and higher yields can be achieved.

In terms of complexity, hydroponic food production requires neither sophisticated equipment nor supervision. The technology is simple and easy to construct. The container must be slightly elevated at one end and have drainage holes at the opposite end. One-inch polyvinyl chloride pipes with holes drilled every three inches are laid about an inch under the medium and raised at both ends of the box. Smaller rubber hoses from the nutrient supply are inserted into the pipe at one end; the upward bend in the pipe at the other end stops the flow of the solution. A gravity system for controlling nutrient flow, composed of two five gallon buckets elevated on boxes and standing two feet above the top of the growing container makes care for the hydroponic vegetables simple. The nutrients can be mixed directly into the water in the buckets; filling the buckets and adding the nutrients takes approximately five minutes of work each day. The hydroponic medium holds water so effectively that care is further simplified; it is quite possible to skip a feeding for a day or two without causing any damage to the plants.

The experiments conducted in Montreal are important ones: the potential of organic hydroponics for producing both high

What is hydroponics?

Hydroponics is the cultivation of plants in a medium other than soil. When you start an avocado pit or root a plant cutting in a glass of water, you are practicing the simplest form of hydroponic culture. As the technique is more commonly used, the plants are grown in a bed of material such as gravel, sand, or even sawdust. At ILSR, we use a mix of perlite and vermiculite, the one a lava product and the other a kind of puffed mica. The soil-less growing material provides the physical support which the root system needs. A nutrient solution is fed into the mix periodically so that the roots can absorb all the nutrients which they would normally extract from the soil.

More information on hydroponics — on its advantages and disadvantages, the cost, the chemistry, and the procedure — is available in a ten-page packet published by the Institute for Local Self-Reliance. If you are interested, send \$1.00 and 25¢ for postage to: ILSR, 1717 18th Street NW, Washington DC 20009. Ask for the Hydroponics Packet.

yields and healthy produce on the rooftops of urban homes and businesses is significant. That the project was conducted in a low-income area and that the community residents have indeed taken over the garden project is also encouraging. Further work remains to be done: we hope to continue researching the methods and techniques of organic hydroponics in our newly completed rooftop greenhouse at ILSR. And we hope that more community groups try their luck with organic hydroponics: in Montreal, some people grew to love it.

— Miranda Smith

Miranda Smith is the director of the Urban Agriculture Project at the Institute for Local Self-Reliance. She joins us from Montreal where she participated in the work referred to in this article.

Notes

Energy Utilization in Vermont Agriculture is a new publication from the Center for Studies in Food Self-Sufficiency of the Vermont Institute of Community Involvement. The report analyzes egg and dairy production in Vermont in terms of both economic and energy efficiency, concluding that Vermont's dependence upon fossil fuels for agricultural production makes for inefficient energy usage. Changes in production are suggested which include the utilization of farm wastes for energy, and smaller, more energy efficient farms which are more labor-intensive. The report is available for \$1.50 from the Vermont Institute, 90 Main Street, Burlington, VT 05401.

An Attached Solar Greenhouse, by W.F. and Susan Yanda, is a fine new design manual for a solar greenhouse which costs under \$2.50 per square foot. Written in both English and Spanish, this guide contains many helpful illustrations, and explains in a concise and clear way practically all one needs to know in order to build a solar greenhouse attached to the house. The booklet is available for \$1.50 plus 25¢ postage from the publisher: The Lightning Tree, Inc. PO Box 1837, Santa Fe NM 87501.

Periodicals that Progressive Scientists Should Know About is a list of over 200 periodicals which should be of interest to scientists and non-scientists alike. It includes many magazines and newsletters which report on environmental issues and appropriate technology. The September 1976 edition is available free if you send a self-addressed, stamped envelope to: Progressive Technology, PO Box 20049, Tallahassee FL 32304.

The Promise of the Coming Dark Age, by L.S. Stavrianos, is one of the best books to date on the potential for humanly scaled communities. With a strong grounding in history, Dr. Stavrianos makes the case that our troubled times carry within them the seeds of a new age, based on decentralizing technologies and worker self-management. This book was a long time in the writing; its publication coincides perfectly with the new interest in small scale and self-management. Available from W.H. Freeman and Company for \$8.95.

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The Institute for Local Self-Reliance is a research and consulting organization which explores the potential for, and the implications of, high density population areas becoming independent and self-reliant. The Institute, incorporated two years ago as a tax-exempt non-profit organization, conducts basic research; develops working demonstration models of new technologies, institutions and small-scale production systems; develops educational materials and disseminates information.

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The Dawning of Solar Cells—revised and expanded	\$2.00

All publications are available from ILSR, 1717 18th St. NW, Washington DC 20009. Please include 25¢ with each order for postage and handling (50 cents with orders for garden chart).

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