

Future Direction for Research and Management

Human Habitat at the Fringe of the Forest: The Character of the Place¹

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INTRODUCTION

The fringe of the forest is like the edge of the sea -- an interface between life-ways. The sea is more robust by far than the forest, however, and therefore more impervious to insult.

Edges attract the eye; they frame the image; they challenge the imagination. On one side of the boundary lie the shadowy depths, on the other a morphology easily converted to human scale. Individuals seeking places in these ecotones are generally non-conformers.

The edge-of-the-biome is usually more dangerous. Predators may come from both directions; natural hazards likewise. Any number of forces may cause the boundary to shift, thus stranding anyone rooted to a site. The human dwellings that fit the forest boundary zone best must nowadays be more secure than any peasant cottage appearing in Grimm's Fairy Tales. People live much longer now, and they have more demanding expectations than mere survival. If there is to be a greater investment in personal security, the structures must also last much longer -- they must withstand a wider range of threats.

We introduce here some of the major features of the new thinking about the design of dwellings in human settlement on the fringes of the forest. If people feel the need to be there, what are the most reasonable ways to live?

^{1/}Presented at the National Conference on Applied Techniques for Analysis and Management of the Visual Resource, Incline Village, Nevada, April 23-25, 1979.

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FORCES AFFECTING CHANGE

Since World War II human settlements have been invading the beaches, the deserts, the forests, and even the chaparral, partly as a result of campaigns to save well-drained fields and orchards. Former suburbanites, having learned early how to live much of their life on wheels while otherwise occupying a landscaped plot, very often seek to buy more space (fig. 1). They wish to put their backs to the wilderness and defend

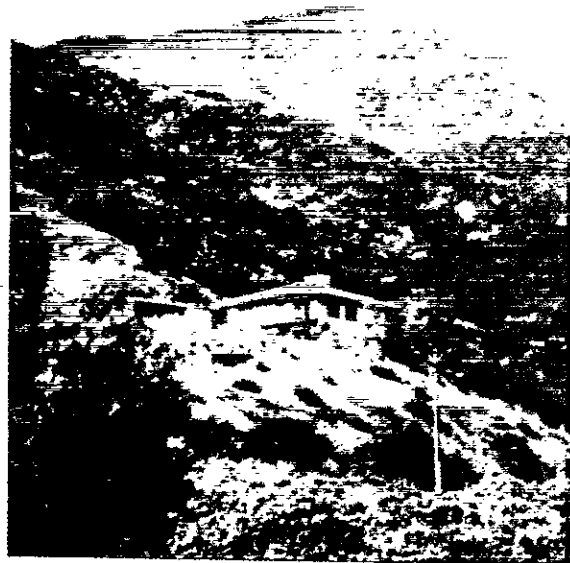


Figure 1--Habitat at the fringe of the forest, perched high in canyon chaparral.

their privacy in front by building on back lanes or introducing discreet green cover. In order to "get away from it all" they expect to spend only a little more time and fuel than before. Along the open coast line regulation has frustrated these would-be settlers; the vulnerability of the desert to assault by wheeled vehicles is expected to halt the infiltration there very soon. That puts extra heavy migration pressure upon the chaparral and the forest. ^{4/}

Simultaneously we see that hydrocarbons are on their way to becoming scarce. Gasoline and low pressure gas are expected to be in dwindling supply and probably rationed well before the latest mortgages are paid. If people were guided by purely economic considerations, the population on the fringe should thin out and the pressure on it would be relieved. However, it seems more likely that the flow of refugees from the suburbs will swell in volume, and those that arrive will establish themselves more solidly, living less of the time on wheels. The high value they put upon being at the edge, residing within sight, sound, and smell of the brush, and within viewing distance of the trees, makes them appear unreasonable. Yet they insist upon spending their life savings and personal attention on these out-of-the-way sites, while fuel scarcity is a problem they see easily resolved by drawing upon the resource at their back (fig. 2).

Many of the settlers are fearful of street crime in the cities, so they will accept other, more natural, risks instead -- the most serious of which is fire. When effective provisions are made to stop the fires, we all have learned that the fuel accumulates on the land. Then, when environmental conditions are most suited to ignition, a very serious fire results, possibly

People on the move annually 1977-1979

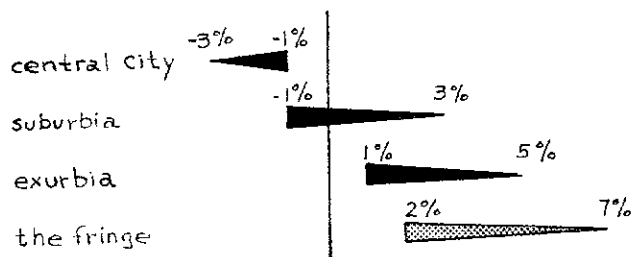


Figure 2--Whether the general trend away from central city continues at current rates or not, many more people will be moving to fringe areas.

even a firestorm. ^{5/} The new post-war wave of settlers is responsible for stricter fire prevention, and therefore for the buildup of the threat. Insurance companies seem to be more worried than the residents themselves -- except in those places which have already experienced fire losses.

Regulation of both building materials and native brush is the first line of defense from wildfire at the fringe. The table shows the benefits of regulation applied to a chaparral canyon if site conditions there were similar to those that pertained before Santa Barbara's horrendous 1977 wildfire in Sycamore Canyon. ^{6/}

SIMULATION SUMMARY	Total Houses	Houses Burned	%
Sycamore Canyon Conditions	287	115	40
Roofs Fireproofed or Brush Cleared	287	55	19
Roofs Fireproofed and Brush Cleared	287	2	1

^{4/} In the first half of this decade net migration to the empty areas of the United States was greatest for places known for their recreation and retirement amenities. In the edge-of-the-forest category only the Southern Piedmont Region and the Cotton Belt failed to show a complete turnaround in population flow. The most impressive movements are directed to California-Oregon, Michigan's upper peninsula, upper Florida, and the Intermountain Region from the Rocky Mountain range to the West. K.F. McCarthy and P.A. Morrison, "The Changing Demographic and Economic Structure of Non-Metropolitan Areas in the United States," Rand Corp. R-2399-EDA, Santa Monica, Jan. 1979.

^{5/} USDA Forest Service, Symposium on the Environmental Consequences of Fire and Fire Management in Mediterranean Ecosystems, Palo Alto, August 1977, General Technical Report WO-3, U.S. Department of Agriculture, Washington, 1977. See especially the contributions of Zivnuska, Biswell, Green, Lee, Taylor, Omi, and Philips.

^{6/} Prepared for a series of animated color computer simulations by the ACCESS Project in Santa Barbara. Three graphic simulations were run based on 1) the Forest Service's FIRESCOPE program, 2) ACCESS estimate of Sycamore Canyon (an unusual extent of shakerof houses), and 3) another Santa Barbara canyon. The two prime variables, roof type and brush clearance, were taken from an analysis of the 1961 Bel Air fire Decision Analysis of Fire Protection Strategy for

Another important growing influence often remains unnoticed -- the ever more economical capacity for telecommunication, computation, remote sensing, and automatic control. The most valuable land, urban or rural, is the hilltop or peak best suited to micro-wave relay installations. "Smart" instruments can now be put out to sense a threat, whether fire, flood, or earthquake, and the whole population at risk can be alerted in time. Therefore a disaster will destroy property much more than it causes loss of life; this shift will continue into the future.

The communications-computing revolution now under way is responsible for one other rising trend. A greater variety of professional-type urban jobs can be carried out in fringe-of-the-forest sites. It is easier to get to an airport or a freeway twice a week than to commute regularly, and a handy computer terminal attached to a telephone costs much less than operating a second car. People then have time to make community ties face-to-face, and keep them up via the telephone. As this immigration accumulates, many more people are finding it possible to make a living as jack-of-all-trades or jill-of-all-jobs, operating and maintaining the equipment on this frontier.

THE NEW CONSTITUENCY AND ITS NEEDS

Any civil servant will recognize that we are identifying a new vested interest in the forest landscape (fig. 3). It has already become more important, in the American West at least, than the traditional forest-based constituencies: (1) the lumber and paper communities, (2) the tourist-serving entrepreneurs, or (3) the pilgrims to forest shrines registering as day visitors.

The new population is attracted to the fringe by its quiet, its greenness, and its privacy. Its members are educated and they know how to organize (fig. 4) Their networks of contacts are more regional than local. Although

the Santa Monica Mountains: An Initial Assessment, prepared by Stanford Research Institute For Forest Service, U.S. Department of Agriculture, Pacific Southwest Forest and Range Experiment Station, Berkeley, California, 1973.

^{7/}It appears now that documents-manipulating occupations, such as insurance, can be almost fully disconnected from the Central Business District of R. Johansen, R. De Grasse, T. Wilson, Group Communication through Computers, Institute for the Future, Menlo Park, California, Feb. 1978.

College Educated in millions

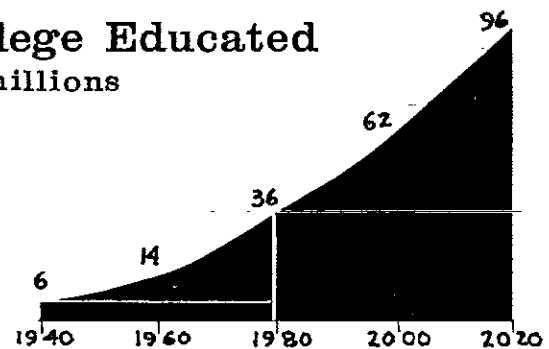


Figure 3--Large increases in college educated persons of all ages in the United States are a primary force increasing population pressure on the fringe.

Education of people at the fringe

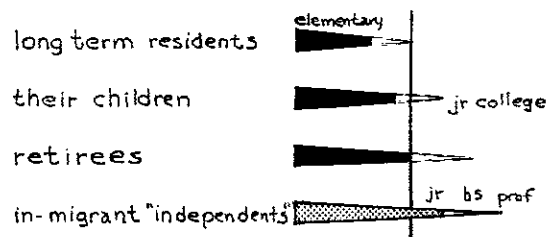


Figure 4--People moving to the fringe areas have had more college education than original settlers at the fringe. They bring with them new types of "independent" living.

the choice of locale in which to resettle is heavily influenced by its external appearance, these values are soon displaced to something people often refer to as the character of a place. Cultural meanings are attached to the landscape based upon its history, uses in daily activities, and the backdrop for special occasions of significance to the communities, such as the deer hunt or a Pioneer Day.

Being literate and well-connected, the new settlers will refer their problems back to their city contacts. They go to the media more often than they go to their Congressman. They will write an increasing volume of letters-to-the-

editor which attempt to generalize upon local complaints. They are led by spokesmen with an astonishing range of competences, manual as well as intellectual. At present we can gauge much too little about the kind of consensus they are likely to achieve regarding what is essential to "character." What are these new meanings now being introduced into the landscape (fig.5)? We will have to listen closely to the specialists in popular expression and the artists among them -- the novelists, journalists, advertising copywriters, camera masters, poets, composers, dancers, athletes, animal breeders, landscapers, historians, and others.

Life Styles at the Fringe

household \$ spent/year (in thousands)

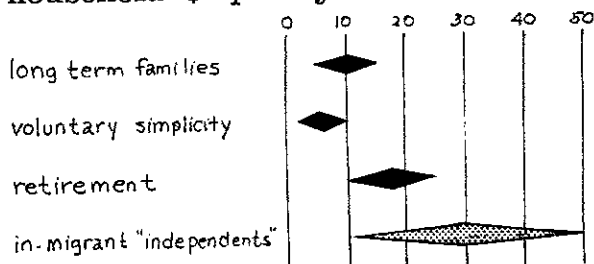


Figure 5--The new mix of life styles at the fringe will undoubtedly affect the politics and the character of the place.

Which of their concerns become items on the agenda of old and new organizations? Listening is the only way that the planners for the forests can learn, so they can be ready to act before situations explode or disaster strikes. The new publics, the bodies of appreciators of things to be preserved, and the subscribers to campaigns are expected to be quite different from elsewhere. Their images of what the forest landscape should be like are likely to come out on top.

FORCES FOR CONSERVATION

Between now and 1990 the Department of Energy is counting upon the forests for the principal "solar contribution" to the energy budget. The half of the tree that has not been harvested has become too valuable to leave behind. Because the salvaged biomass will follow the paths of the logs at least part of the way to the market, it will use personnel already

living in communities based upon wood technology, thus extending somewhat the range of their activities. The immediate effect upon the forest landscape should be small. In the long run the interior of the forest may become more parklike, but the change will probably be too gradual to notice.

But the salvage of waste is only the beginning. A demand for energy plantations will arise to deal with longer run problems. A current study in California suggests that the chaparral and marginal forest can be harvested, chipped, and converted into a variety of solid fuels with a harvest cycle of 8-12 years (fig. 6). Should it be allowed to grow back as is, be replaced by more valuable species, transferred to guayule or euphorbia to produce high-valued hydrocarbons, or held in reserve until conditions become more desperate? ^{8/} The new people at the fringe of the forest will have a strong influence upon the decision, and it appears that they will assert themselves on the basis of what they expect will happen to the "character" of their environment.

The other practical use of solar energy is domestic. Passive solar designs, based upon heat storage inside the house and flow controls at the windows, will be economic for heating,



Figure 6--Ecological redesign at the fringe on a regional scale, yielding new energy fuels, could occur around 1990 in areas such as the chaparral country of Southern California (shown in black on the Kuchler 1977 vegetation map).

^{8/} Bart Lucarelli, "The Energy Potential of California's Biomass Resources: 1976-2001," Ph.D. Dissertation, Expected Completion Date Dec. 1979.

and sometimes for cooling also. Wood stoves will be depended upon for back up heating for the dismal, cloudy periods of mid-winter. Obviously the forest should not overshadow the energy-collecting windows. So the fringe of the forest is trimmed to fit the needs of dwellings.

People who are "solarizing," or building anew in the solar way, must play games against the weather. Even today one can manage a standard house and save up to 50% of the energy required for heating, hot water, and food preparation, if the game is played smartly.

At this point a revelation occurs -- a house with 3-10 feet of soil over it will allow a 70-90% savings. Space does not cost energy in an earth-sheltered house^{7/} Those people

who go this way for security against disaster -- to avoid the costs of fire when living at the edge of the forest, the threat of tornados when living on the plains, and of hurricanes when near the shoreline -- can vouch for the ease with which comfort and convenience can be sustained with these extraordinary economies (fig. 7).

These high levels of conservation in the dwelling itself, matched by the need to economize on liquid fuels for transport, will put continuing strains upon the consensus about the desired character of the environment at the fringe of the forest. Very likely the communities will be demanding that quite different things be done for the visual character of the forest as they learn more about the possibilities.

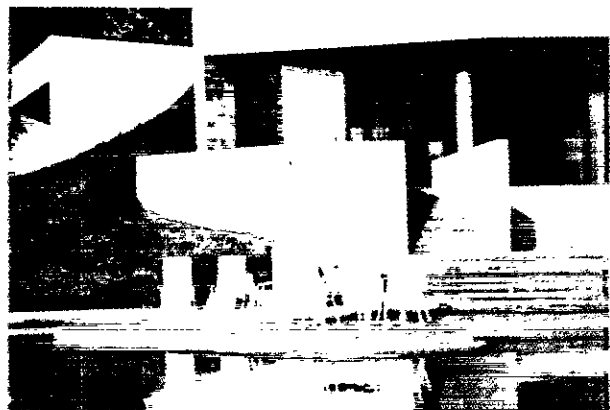


Figure 7--Earth-sheltered habitats are fireproof, conserve energy and blend into the landscape. Photographs show perhaps the most elegant one to date, the Alexander House by architect Roland Coate, built into a Montecity, California, foothill.

^{7/}Underground Space Center, Earth-Sheltered Housing Design, University of Minnesota and Van Nostrand Reinhold, New York, 1978.

CONCLUSION

The kind of regulation introduced in coastal planning, with its emphasis upon ecological preservation, viewsheds, and day visitors, is inappropriate for the fringe of the forest, despite the ecological similarities. A new kind of human population is occupying this zone, and feelings about the visual character of locales in the face of the demands for the salvage of wood waste, the need for energy conservation, and national planning for energy self-sufficiency with the aid of energy farms in the most accessible (therefore the most easily settled) regions, will probably determine which program will be undertaken. Add to this the observation that the new interest group determining the image of the forest will possess high competence in the various media, and will be well-connected with State and Federal political institutions.

The forest planner and manager is best advised to listen for the themes of the artists, specialists-in-expression, and propagandists which are picked up by organizations in the communities and can be amplified through the media. Their selection of imagery for treating underground construction solutions and planting alternatives should be closely watched.

LITERATURE CITED

- Johansen, R., R. De Crasse, and T. Wilson
1978. Group Communication through Computers. Institute for the Future, Menlo Park, California.
- McCarthy, K.F., and P. A. Morrison
1979. The Changing Demographic and Economic Structure of Non-Metropolitan Areas in the United States. Rand Corp., R-2399-EDA, Santa Monica.
- Stanford Research Institute
1973. Decision Analysis of Fire Protection Strategy for the Santa Monica Mountains: An Initial Assessment. USDA Forest Service, Pacific Southwest Forest and Range Experiment Station, Berkeley, California.
- Underground Space Center
1978. Earth-Sheltered Housing Design. University of Minnesota and Van Nostrand Reinhold, New York.
- USDA Forest Service
1977. Symposium on the Environmental Consequences of Fire and Fire Management in Mediterranean Ecosystems, Palo Alto, August 1977. U.S. Dept. Agric., General Technical Report WO-3, Washington.

Research Needs for Our National Landscapes¹

Elwood L. Shafer^{2/}

Abstract: The prevailing research problem for our national landscapes is: How shall we organize, control, and coordinate public and private development so as to protect, maintain, improve, and manage those landscape features that we value most? Research questions discussed include: environmental/political conflicts, taxation and zoning, landscape classification, public involvement, emerging technology, information and education techniques, landscape benefits, measurement of landscape demand and supply, and systems analysis approaches for comparing the social, economic, ecologic and physical measurements of natural landscapes.

INTRODUCTION

When Daniel Boone goes by, at night
The phantom deer arise
And all lost, wild America
Is burning in their eyes

Stephen Vincent Benet¹

At exactly 5:13 a.m., the 18th of April, 1906 a cow was standing in a field in the Old Shafter Ranch in California, minding her own business. Suddenly, the earth shook, the skies trembled, and when it was over, there was nothing showing of the cow above ground but a bit of her tail sticking up. Faced by a somewhat similar set of complacent circumstances, we need to develop--through additional research--the methodology and information necessary to understand, guide, and manage the great forces of change that influence the beauty of our national landscapes, or we may find some of them, like the Shafter cow, swallowed up some morning by vast upheavals of our skyrocketing technology.

¹/Presented at the National Conference on Applied Techniques for Analysis and Management of the Visual Resource, Incline Village, Nevada, April 23-25, 1979.

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Before we can specify what research is needed, we need to assess the situation briefly in the near, and even the distant, future.

SITUATION ASSESSMENT

Consider the following Environmental Protection Agency (EPA) projections for the next 21 years for a moment. EPA's educated guess is that population and market demands between now and the year 2000 will call for the duplication of everything that has been built in the history of the United States. For example:

- o Urban sprawl may eat up 19.7 million acres of potential recreation land by the year 2000. (That's an area equivalent to the states of New Hampshire, Vermont, Massachusetts, and Rhode Island).
- o Another 3.5 million acres may be paved over for highways and airports.
- o Five million acres of potential hunting and scenic areas may be removed from agriculture for public facilities, second home developments, and waste control projects.
- o And, another 2 million acres of right-of-way may be required for 200,000 additional miles of power lines.

At stake are the nation's irreplaceable estuaries, wetlands, beaches, flood plains, river and lake fronts, farms, forests, and scenic uplands--landscape resources that are paramount ingre-

dients of a healthy, vigorous, democratically-oriented society.

Why is economic growth destroying many of our landscapes? And, why must the growth be so chaotic and destructive to the landscape's natural beauty? The answer is deceptively simple: the states have delegated their authority to supervise land use to 78,000 units of local government. These local units support themselves mainly by taxing land. As a consequence, local governments are constantly searching for opportunities to develop the land, increase its assessed value, and make it produce more in taxes. Thus, the basic fact of private land development in the United States today is that some of the very units of government that are charged with controlling land use may be the ones most susceptible to pressures not to control it. A critical research question, then, is how to maintain the democratic ideal of local government and at the same time preserve the limited natural environments around towns, cities, and municipalities.

We are in a period of great ferment when citizens' groups, the courts, a number of state governments, the national administration, and congressional committees have begun to consider fundamental reforms in the way state and local governments control visual resources. At the heart of the ferment is recognition that land use decisions affect the visual sensitivities of people beyond local boundaries and that these decisions must be controlled by the states if critical environments are to be protected, and if development (needed by a region) is not blocked by local governments.

At the same time, it is imperative that land use planning to maintain landscape quality should not impede private economic growth. In most instances, laws aimed at protecting the ecology and beauty of natural landscapes can actually help responsible private development by assuring that the State's natural environment won't be paved over by urban-sprawl. Private investors are usually willing to spend the time and money legally required to protect the natural environment when they know the long term profit will be there.

For centuries, Americans have drawn strength and inspiration from the beauty of our country. It would be a neglectful generation indeed, indifferent alike to the judgment of history and command of principle, which failed to preserve and extend such a heritage for its descendants.

Yet the demands of an expanding urban population on a fixed land base is threatening to destroy in a few decades what has been cherished

and protected for generations. Residential development in suburbs is swallowing up vast amounts of natural beauty to meet the need for living space. Streams are piped and channeled; trees and meadows are bulldozed. Great swaths of land equivalent to a 50-acre park are obliterated for every mile of expressway. Ironically, many people move out from the city to get closer to nature, only to find that the once-pastoral landscape has been altered and disfigured beyond recognition.

Millions of people are compelled to live in cities without contact with natural surroundings. And, as rising energy costs force more people to live closer to their places of work, we can expect more people to seek residence in central cities. The opportunities for exposure to parks, trees, and outdoor playspace will become even more restrictive unless we take deliberate action.

THE FUTURE

If we were asked to try to capture in a single picture the complex challenges of landscape management that face us in the distant future, we might well consider as our background a vast chessboard that stretches to the far corners of the country. On one side of the board, we might place a white knight--representing the land-use planner, landscape architect, or similar professional faced with landscape management problems and challenges. Opposite the knight, on the other side of the board, we would place an enigmatic, little black box--called technology. In its calm inscrutability, it seems to have crept out of the world of the future. And perhaps it has. Studying the moves of these two pieces, we see that the confrontation between these two "pieces" will occur over a wide range of landscapes represented by the thousands of squares on the board; and instinctively one feels that whatever move the knight makes now, it will be the little black box that makes the last one.

Let's examine briefly some of the events that may affect the moves on our chessboard in the decades ahead. The Delphi Technique, which relies on the opinions of a panel of experts, was the method used to obtain the forecasted information (Shafer *et al.* 1977). By 1980, economic incentives may be offered to private landowners who manage for fish and wildlife. By 1985, these incentives may be broadened to include tax incentives for providing scenic amenities. The Federal role in coordinating natural resource planning may expand from establishing the first land, water, and air use plan in 1990, to a national land use zoning policy by 2000. By 2000, environmental planning may be effectively coordinated between all levels of government and private enterprise. Also by 2000, land use patterns may stabilize--land preempted for one use being replaced with comparable land. All natural resources, including marine and estuarine areas, may be under intensive management.

Biostructural designs may emerge in the distant future as the strongest single force in the landscape architect's repertory. Biological forms and systems provide an untapped reservoir of ideas for the design of environments that can meet man's needs but that emulate the beauty of nature. For example, solar collectors on the crest of a ridge conceivably could funnel sunlight (and thus the necessary energy source) through ducts into the interior of a megastructure of a mountain that would house a whole complex of human activities--ranging from non-polluting industrial industries to high density residential areas. The exterior of the "building" may closely resemble a terraced hillside.

Structures that grow--that is, or biostructures of all types--offer a vast field for landscape management inventiveness. Structures might be created out of green plants. Living enclosures could be shaped by nets, careful pruning, judicious use of nutrients, and so forth. With greater understanding of plant growth processes, it might even be possible to develop varieties of plants that would develop naturally into functional enclosures.

Imaginary natural beauty may be possible. People may be able to switch natural environments on and off by creating perceptually real, three-dimensional holographic environments in open spaces. People could walk through the components of the perceived environment as if they were mirages.

Another possibility for enjoying the beauty of natural environments may be possible by creating interference patterns among laser-projected images of nature's elements and then solidifying the shapes by introducing a polymerized plastic. In effect, the "mirage" or image would solidify into tangible reality.

Stretching this concept to its limits, some futurists would have people visualize various forms and shapes in nature and record--in an as yet unknown way--the distinctive brain wave patterns that the thoughts produced. The patterns could then be converted to sound waves which, when projected through directional antennas, form imaginary structures of environmental components.

Still other landscapes of the future may be possible by covering all surfaces of a room with television screens, thus creating infinite possibilities for bringing natural landscapes into the enclosure. In conjunction with video cameras and recording equipment, a person could live in a total video, natural environment. With computer access and a video synthesizer, an individual could play a keyboard and invent

visual effects beyond imagination--or call up scenes (the Grand Canyon, Yosemite, or any natural beauty spot he desired). By attaching the system to biofeedback devices, one could visually experience his own biological fluctuations. A prototype example of this phenomenon already exists in Disney World.

On a somewhat more mundane level, computers can design almost any kind of arrangement of natural components--grow forests, cut them, arrange roads to harvest them, or select the most scenic vista available in an endless array of vistas. At a more intimate level, the computer could be programmed to human moods by varying the color, light, sound, shape, and size of three-dimensional television scenes of natural environments.

RESEARCH NEEDS

And so what does this discussion of present and future natural environments mean in terms of research? The research problem that prevails is: How shall we organize, control, and coordinate public and private development so as to protect, maintain, and improve those landscape features that we value most? Such research should involve the biological, cultural, and esthetic characteristics of our national landscape.

New information and technology is obviously required to produce new ideas and approaches for enhancing the beauty of America, and its scope should not be restricted to Federal action. Research should look for ways to help and encourage state and local governments, institutions, and private citizens in their own efforts as well.

Some broad questions requiring answers are:

- o In the area of environmental/political conflicts what kind of quasi-public structure would best meet the needs for effective land use and reclamation for landscape values, as well as other needs of society?
- o What equitable and effective kinds of taxation and zoning would best support a landscape protection or maintenance policy that will meet the needs of the community while preserving the integrity of the environment?
- o What kinds of positive action should be taken by individual states to remove certain landscapes from the commodity market?
- o What kinds of landscape classification methods best meet the needs of resource planners and managers?
- o What means of public involvement work best in developing landscape protection and management policies?

- o In what areas is compromise most acceptable in conflicts between landscape quality and other social needs? That is, how can landscape values and needs be integrated with other land use goals?
- o What kinds of new technologies are emerging throughout the scientific world that will cause or help solve landscape planning and management problems?
- o What kinds of information and education techniques can be used to make the landscape meaningful ecologically--so the viewer is informed of the dynamics of its formation and how we need to depend on it for survival.

Underlying these broad questions are more specific challenges, such as:

- o What are the best ways to transfer relevant technology to management
- o What methods can be used to understand demands and the associated underlying benefits and values of our national landscape better?
- o What procedures can be used to inventory, maintain, protect, and augment the supply of landscape environments?
- o How can we design recreational facilities that blend harmoniously with the natural environment?
- o How can we coordinate landscape beauty supply-demand relationships with other resource uses?
- o How can we use a systems analysis approach to interlock the various methodologies described at this conference to develop comparative social, economic, ecologic and physical measures of natural landscapes.

The results of research along these lines will provide us with information to save our Nation's heritage of natural landscapes, it will show us ways to incorporate more of nature's charm and beauty into our urban landscapes, and it will help us to deal not only with man's life space but with man's spirit and dignity as well.

BENEFITS OF RESEARCH

What are the expected benefits of these kinds of research efforts? The benefits of research on natural beauty costs less than might be supposed, because such benefits are linked with many of the most practical ends of our society cherishes.

Beauty fosters safety. It dictates the control of flooding and erosion, and the landscaping and careful planning of, otherwise monotonous, highways to avoid fatigue and accident. Beauty is a component of mental well-being. It provides creative and wholesome outlets for the leisure society. Beauty is associated with economic efficiency; the soot and sewage that make for ugliness also make for wasteful expenditure in cleaning; smogs cause illness as well as displeasure.

Beauty can be a weapon in the fight against poverty, because an attractive community and countryside attract new enterprises, gifted people, and income from tourism. Beauty contributes to the real national income, for a person can derive great satisfaction from psychic relief and renewed spirit by seeing a mountain or from strolling in a fine city square. This psychic income, even though statisticians do not know how to quantify it, contributes to that person's welfare, and to the welfare of the nation.

Finally, living and working in beautiful surroundings is an objective which justifies itself. It was Thomas Jefferson who first observed that communities "should be planned with an eye to the effect made upon the human spirit by being continuously surrounded with a maximum of beauty." Beauty helps to make life and work worthwhile. And this very fact makes natural beauty immensely practical, for a citizenry that is nurtured by an inspiring environment will gain a heightened sense that its life is meaningful and ennobling.

LITERATURE CITED

- Shafer, Elwood L, Moeller, George H., and Getty, Russell E., 1977. Future recreation environments, USDA Forest Service, FS-316, Washington, D. C., 16 p.

The Energy Crisis and the American Landscape¹

Stuart Udall^{2/}

I might well have been in the audience as a participant had I not gone back into the law because a few years ago, for about five years after I left the President's Cabinet, I called myself an Environmental Planner, whatever that was. I had no credentials except experience and I can say to you it was one of the most satisfying things that I have ever done. I was thinking too, I believe it was Oscar Chapman who was President Truman's Secretary of the Interior who told me not long after President Kennedy had nominated me to be Secretary of Interior, he said, "Stuart there's one thing about that job. If you do your job right, when you finish, there are visible things that you can point to all your life." I think that's true of your profession. That is true of work that many of you are engaged in. Your work is left as a visible mark on the land and, if it's done right, it may be there a hundred, or who knows, a thousand years from now. I was asking myself as I came in yesterday and looked at the literature concerning this conference, how it happened. I want to commend the leaders. I asked myself, would it, five years ago, have been possible for a conference of this kind to be held on the national landscape with a primary focus on the visual resource? Ten years ago it would have been unthinkable and twenty years ago incredible. So I come to you today as an Environmental Planner of your type who took early retirement. I went back to law.

I did not come directly from Washington. I have been spending the last week in Utah

^{1/} Presented at the National Conference on Applied Techniques for Analysis and Management of the Visual Resource, Incline Village, Nevada, April 23-25, 1979, and transcribed directly from audio tape.

^{2/} Consultant, Duncan, Brown, Weinberg and Palmer, 1775 Pennsylvania Avenue, Washington, D.C.

and Nevada. I have been taking a crash course in low level ionizing radiation and have spent almost all of my time representing the people down wind from the Nevada bomb test in the 50's who got clobbered. That's a very tragic, demanding assignment and very interesting in fact. A great thing about my life is that I have, as the old saying goes, "lived more lives than one" and at 59, I don't know what's ahead of me, but I'm having a good time. I want you to know that.

I also have a need of a landscape architect if there are any of you in Washington who have some free time. I want you to know what I'm doing with my own life, because I'd like to focus this morning on the big picture and big decisions but we're also talking about small decisions aren't we? About redoing peoples' homes as one way to cope with the energy crisis. On the East Coast we are the people that get all of this oil from Middle East. We're dependent on that life line so I wondered, could one be decoupled from it? I live along and look down into the Potomac in McLean, Virginia where there are marvelous big trees. We converted back to wood stoves which was an interesting experience, but I have a problem right now. A big red Oak fell and I had it cut up, and I'm in the process of splitting it and stacking it for about two years wood for our house. I am left with the stump and the roots and I have a neighbor who is an architect and he's very fussy and I keep telling him, "well I'm going to landscape it and when you look out of your house it will look like a Henry Moore piece of sculpture." I haven't accomplished that yet and I may need some help, but I'm telling you that to let you know that I'm still part of the brigade trying to do my own little thing in my own back yard.

I thought it would interest you today to do a little quick tour of the horizon, to look at where we come from and then where we

are headed from one man's view. Very opinionated of course--take it or leave it.

One of the most interesting things to me about this crowd is how many young people there are, how many of you who in the last ten years have graduated from the universities and gone out and found places in this new and growing profession. The growth has been incredible, hasn't it? And isn't it a delicious irony, I just chuckle inside every time I think of it, that if the Strip Mine Act, stays on the books, that five or ten years from now the largest employer of landscape architects in the United States will be the coal industry. Isn't that something when you look at our past history. I remember Lawrence Halprin telling me that, when he began his career thirty years ago as a Landscape Architect, what Landscape Architects did was do gardens in people's yards. You know where his own career has lead and where some of your careers have lead or are leading. This is part of the change that has occurred.

It's interesting that one of the things that we have done, is that there has been a very strong process of maturing. I think the values of this country are different in part because of this. Because of the evolution of thought. I remember that when a President decides to leave office he concentrates on his own contribution to history and President Johnson had very strong feelings like that anyway. He knew he had his library and in the last weeks of his presidency he had all of us in and he taped interviews with us about what we thought we had done. I remember telling him then, eleven years ago and I feel the same way today, that although we had done significant things with regard to new national policies and land and resources, (Bill Duddleson mentioned some of them, the Wilderness Bill, the Wild and Scenic Rivers Bill, the Historic Preservation Legislation, the Land Conservation Water Fund, things of that kind) where we were really making new policy was with regard to the environment. But I thought the most important thing we had was not these laws. It was a change in awareness, the beginning of the evolution of what we later called ecological thing, the environmental ethic and so on.

Now a lot of you younger people think that the environmental movement began on earth day in 1970. There are even a lot of reporters who think that and maybe they are right. I don't know. I don't read history that way. It's usually more complicated when people are actually included. My own

thinking began to change with Rachael Carson's book Silent Spring And I know as time moved on there was a reassessing of values. I thought it was a wonderful moment for the country when Lady Bird Johnson, First Lady of this country and a very wonderful woman in a very sort of straight forward, simple, down to earth way, talked about natural beauty and the values associated with it. That became a theme that was propelled for awhile. In any event, as we moved on into the decade of the 1960s our thinking evolved. I remember a slogan I used to use in my speeches. I had borrowed it from the Sierra club in 1961 and the slogan was "What We Save Now Will Be All That Is Saved"--the idea was that we had a few precious years in which to grab off the finest of our remaining national seashores which is another thing we did in the 1960s. We had a few years for states to make decisions about the best remaining state park options, wild river, scenic rivers, and all the rest. As far as big decisions concerning the land, we felt that we were going to make most of them in the 1960s and I think that was a good judgment. I think it holds up.

But, as our thinking became more sophisticated, as we absorbed the message from Silent Spring, as we realized the number of pollutants that our industries were producing which were permeating out into the system, we began to realize that nothing was saved. Nothing was really saved and the wilderness itself was threatened everyday by these new kinds of pollution that were so subtle. They could be carried from place to place in a most subtle way.

One of the things I am proudest of today was that of the fight against SST. I'm going to make a boast here. The fight against SST really began right under President Johnson's nose in 1966 within the administration. I was allowed, or I got away with it somehow, to challenge whether the SST could ever fly overland in the United States. I appointed the Scientific Advisory Committee, which included people like Barry Commoner, and they came in with the arguments in 1966 or 1967 which killed the SST Program in 1972. I began to ask myself the question in talks with people in my department. Well, if the SST flies overland over the United States with a sixty mile sonic boom carpet, as they called it, where would they fly? Well, they would avoid big cities, middle size cities and small cities. They would head for the places where the fewest people were, and where were the places where the fewest people were? National Forests and National Parks, Wilderness and Wildlife

Refuges would be the sonic boom carpet.

These were the kinds of problems we were dealing with then and I review all this only to make the point that our thinking, our policies, changed gradually. I think that is still what is happening. We often times like to oversimplify things. Certainly out of this came very basic changes in thinking and much of that was embodied in what was probably the most important law of all. It was passed in 1969. That was when some of the work was done. Actually the idea for it was started in 1968 while I was there and it was the National Environmental Policy Act. This was certainly a new beginning. It mandated, Congress didn't understand what it was doing, an incredible thing. I don't think the authors of it really knew its implications and the guy who really deserves the most credit, I think, was Senator Jackson. I'm not sure he fully understood what the impact would be. What that Act said is that from now on the old kind of single-minded planning is out and we are going to plan in a more realistic and balanced way. Just think about what that one principle, as a matter of public policy, said. It also said that some of the values that have been left out of other considerations, some of the human values, some of the agricultural values, and all of the values of natural systems, will be taken into account in this planning process. That was an enormous step forward, although it was done by accident. I think it was a great day and a lot of you wouldn't be here probably today if that act hadn't been passed. Of course what has happened since then is that these new values and planning procedures have become institutionalized. To me, one of the key questions the last few years before the Congress and the country is, are we going to whittle away and repeal the National Environmental Policy Act. At the time of the oil embargo and when OPEC bared its teeth in 1973, a lot of the industry people in the United States thought, "Boy we got them now. We can't afford all this crap about environment and ecology and planning." They thought they had the arguments to say that we have to discard this kind of thinking and these kinds of values. But congress hasn't done that and the more it becomes institutionalized, the more it's built into our law, into our way of thinking, into our way of handling matters in government, the more it becomes something that is a permanent part of American life.

So out of this has come the moment of which you are a part, with your new techniques and your new skills representing

these new values. That's what I want to say. We have come a long way to be sure, but what about the next twenty years, where are we going? Where is it leading us? I believe that is the reason I choose the topic that I did, "The Energy Crisis or Energy Crunch in the American Landscape." I feel that we are facing profound changes. I believe your profession is going to be much more upfront even than it has been in the past. I feel this is the time for great opportunity because we are going to have to make some very big and very basic and very structural changes in American life. I thought there was a lovely little metaphor of the present predicament of the American people in the New Yorker Magazine a month or so ago. It showed a couple in what looked like a Japanese import car with ski racks and skis on the top. The woman is saying to the man, "I have a bad conscious. Everything I really like to do involves burning hydrocarbons." Well, that's where we are. We're addicted, and not only to hydrocarbons. Our economic system is built around the extravagant consumption of hydrocarbons. I'm not going to give you my energy speech. I decided not to speak, or speak very little, on energy until the nation is ready to listen. We are not ready to listen. I think most of you probably are, but there will be a time when people in general are ready to listen. Nevertheless, shortage is looming and already nibbling at the edges. But we in this country are unconvinced somehow. I'm amazed everytime I come to California, particularly Southern California, and see the great freeways and the cars moving and this is supposed to be beginning, this is suppose to grow? I know in my bones it's a climax stage and it is going slowly to die and change. The automobile has been such an incredible part of our lives, and our freedom in a way, and has provided a wide range of choice. This is going to change because we are running out of oil and have been for many years now. The world oil shortage, which some of these so called experts were telling us was off in the late 1980s, suddenly popped up when the Shah had his trouble a few months ago and the situation, the crunch, is closer than anyone thought. It is going to mean some very big and basic changes. And most of these changes, I believe, are changes which will involve redesigning America, redesigning our cities, redesigning our landscape, reconsidering much of what we are going to have to do. It certainly will mean an end of the freewheeling, incredibly mobile society that we have. How, when we are rushing pell-mell to be the first major oil-have-not nation in the world, can we in the

United States assume that we can continue having over half the automobiles, traveling well over half the miles that are traveled, using over half the gasoline in the whole world? How much longer can we do it? How much longer can we continue talking about becoming more independent? We are becoming more dependent by having our oil bill go up and so on. That's the big question? The end, or rather the climax, the crunch, is not all that far away. These changes that I mentioned a moment ago will be prolific.

We saw in this wonderful presentation earlier this morning how some areas of our country are already having to reconsider what a good house is or what housing is all about and how it fits into the landscape. The only thought that I had as I watched related to my favorite city, Santa Fe, New Mexico. I thought that the old timers didn't have a bad idea with adobe you know. Maybe we'll get down the road and even concrete won't be as cheap as it is. We may have to use even more earthy materials which they used to use down in Santa Barbara. But what does our future hold?

Are we really going to have all those new highways that we're talking about? Or do we have more now than we'll ever need if we are running out of oil? If we don't need the highways, are we close to the day? What a glorious day that will be and how busy all of you will be. I talked about it for years. In fact, I haven't mentioned this one for awhile. They are going to wake up in Washington and discover that we need to fill in the gaps and make our cities more compact. With gasoline rationing the best way to save energy and to improve the lives and help the people, is to take the highway money, or a big chunk of it, for two or three years and build within each of our cities greenways, places for people to jog, to walk, to bicycle, to use our own energy to go to work. And what does our jogging revolution say? What does this worry about health say? It says that at least 20% of us out there would use our own energy and unhook from the automobile to get to and from work if we were given the opportunity. That is, I believe, just around the corner and what a challenge that will be to landscape architects--to build these new facilities.

But we are still operating on the assumption that we will have fuel. What we are saying to everybody now is to fly. Everybody fly. I read an article in Las Vegas yesterday where they say "Well the gasoline thing is going to disturb the tourism that is so important to Reno and Las

Vegas and maybe the California people are getting nervous they won't come the way they used to. But now we are deregulating airlines so there is going to be a lot of new flights and everybody will fly." Well, the jet fuel comes out of the same barrel of oil gasoline does and if we are going to have a shortage of gasoline then we are going to have a shortage of jet fuel. The United States can't expect that we are going to dominate or consume all the jet fuel in the world. They seem to be saying that we don't need railroads, and let them go on down the tube and that's another problem.

There's a redesigning going on of everything including the houses. The way they fit into the landscape is being reconsidered. Cities are being redesigned to find out what a livable city is and what can be done to make it more livable. We're redesigning our transportation system, reconsidering even our energy systems and wondering if we are going to need all these power lines? Are we going to keep our commitment to the big mega-systems? I wonder some days whether we are really going down the wrong path. I read in the Wall Street Journal the other day what's happening. New York, in some ways, is a preview of the future. Some of the industries are decoupling themselves from the electric power system and building their own electric power systems which is completely counter to the whole trend. We very well may find many of the new houses of the future, in certain parts of the country, using wind energy solar energy, and other things. They may become largely self-sufficient and hooked up to their electric power company as a back-up rather than as a primary system. The electric power companies of the past, as we have known them, may primarily be providing commercial power rather than the power for homes at least in some communities and some parts of the country. I don't know where we're headed. I'm not sketching in any road map, blue print or scenario but I see enormous changes--structural changes, changes in design, changes in the landscape. I worry. The only thing worrying me about the present, the very fine presentation here this morning, is that I wonder if we're going to have to look at all of our land to grow biomass for energy. You know what kind of environmental problems that presents us with. How are we going to harvest it? How are we going to deal with it? We face big, big problems as we leave the period of cheap energy and enter into a period when energy will be very precious and when energy efficiency and conservation become the dominant and paramount ideas and concepts that our society must function

under. Then certainly you can see why I believe we are on the edge of a time which is much more challenging. There is more of need for your talents or skills than we even thought a few years ago. So what I'm suggesting also is that with this value revolution that has been implicit in much that we have been involved in, that we may even begin to ask some simple and sensible questions. Wouldn't we be better off and happier as individuals, and as a country, if we were less mobile? Would we care more about our own backyard and our own community instead of wheeling around the way so many Americans like to do these days? One of the great things that happened to me in the Kennedy years was to form a friendship with Robert Frost, the old poet in his last years. I was reading his biography again and the most creative period of his life was in his thirties. He was living in a little house out at the edge of a little town called Durham, New Hampshire. He walked to

school with his children, to the little school where he taught Little Academy, two miles in and two miles out everyday and by today's standards he was deprived. You know we would say poor man, there he is walking. But I wonder. I always wonder of the poems were created during his most productive period as a poet, how many of the poems did he write on those walks? I haven't read many poems lately of people who wrote them as they were driving in traffic jams or rushing across the country. You know, there is real human satisfaction. Maybe if we slow down and care more about our environment and what we see, and spend more time pattering in our gardens or pruning our trees or getting our firewood or whatever, that we would be a better country and a happier country. At least that is my thought. So I suggest, dream your dreams and plan your sensitive plans. Who knows, they may be needed tomorrow.