THE BROADER CONTEXT OF

ENVIRONMENTAL ENGINEERING -- POLITICAL ASPECTS

By

David J. Allee

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Environmental Engineering -- Political Aspects[1]

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Introduction

What are the politics of environmental issues? Problems that call
for the work of environmental engineers have some special characteris-
tics in the way public decisions come about. They also have much in
common with other kinds of problems. The purpose of this section is to
provide food for thought. Much must be left out about the politics of
the environment -- the many parts of the environment each have their
own politics.

Much environmental engineering comes about because of the incentives
produced by our system of regulation of the behavior of private firms
and increasingly of even public agencies. This system -- both in its
informal, extra-agency aspects and in its formal governmental procedural
aspects -- is undergoing major changes. Understanding more about why
the rules always seem to be changing should help us achieve more useful
and effective engineering solutions to our environmental problems.

Political decision processes exist to make choices. Obviously en-
gineers have to help pose those choices. How shall we use scarce re-
sources, time and money, valuable for so many things? Politics also
decides who shall sacrifice and who shall gain -- even if only by default.
The engineer is often asked to provide information about alternative
solutions that can differ widely in their effects on who gains and who
loses. He can rarely escape the debate that then arises.

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[1] Professor of Resource Economics, SUNY College of Agriculture and
Life Sciences at Cornell University and Associate Director of the
Cornell University Water Resources and Marine Sciences Center.

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Government, in the last analysis, makes and enforces choices for the larger society. It is inherently involved in environmental problems, almost by definition. Environmental problems usually arise because one person does something that could affect someone else's ability to do something. Pulp wastes affect the downstream would-be fisherman. Industrial smoke and dust hurt the neighbor's paint. Highway noises disturb sleep. Signs offend some people's view. We turn to government to control and arbitrate when neighbor-to-neighbor social pressure doesn't work.

But obviously governments have to make decisions for the people they serve. Thus besides governmental agencies we have to be concerned here with how society transmits its preferences to its many governments. Communication about almost anything, between almost anyone involved, usually has something to do with the transmission of preferences. Obviously the contributions of the engineer to the total stock of information moving from person to person can be crucial to the final decisions made. Making choices depends upon information. Who is "talking" can be as important as what he is saying. Those looked upon as technical experts are given an important role in deciding what should be done in our technologically oriented society. The resources needed to employ the talents of engineers are not even-handedly distributed between the groups who would have their preferences included. This places on the profession a special burden of responsibility for the public interest.

Patterns of Conflict Indicate Changes in Politics

Even today most environmental decisions are not made in an atmosphere of conflict. But the increasing number of times when opposing points of view are articulated in the media and to elected and appointed officials creates a kind of disequilibrium in the political system. Much like a physical or biological system, adjustments will be made to restore equilibrium.

The following is a sketch of a conflict situation involving environmental concerns. Probably no real situation actually followed this exact pattern. Rather it pieces together aspects of a number of cases in order to highlight who the participants are in environmental politics, what resources they possess, what stake they have and how the process of decision-making operates with and without conflict. This should provide a framework for our discussion of the broader context of environmental engineering.

Our story begins with the announcement by a locally important employer of plans for expansion including a substantial new facility -- perhaps a heat discharging power plant with associated transmission lines. The integrity of a residential neighborhood, or of an estuary important to fish spawning, or the draining of a swamp may be involved.

For virtually any of these and many more settings, there is apt to be someone in the area sensitized to the environmental effects.

One or more concerned local groups may already exist. More than likely they were organized and have carried on activities that have a broader base than the specific effect that is at first seen as the threat posed by the new facility. Say that the new plant will discharge heated effluent to a lake. An association formed many years ago dedicated to the protection of the lake, but dominated by cottage owners, takes an interest in the announcement, investigates, but can't decide whether to oppose or support the proposed facility. Sportsmen's clubs, service clubs, church groups do the same with the same result. Their membership and leadership is mixed enough so that while some would view the proposed facility with alarm, others would see it as totally good and many would be in between.

The Rise of Special Purpose Environmental Groups

A natural result is for a specialized group to organize. It may be called the Committee to Save Our Lake or something equally pointed. It will draw members and some leadership from the groups that have already taken an interest. It will recruit from others as well. While leadership and members will be above average in income and education with a good component of the prestige professions, the ease of contact with local officials may not be as great as for the leaders of more established groups. Not only is it easy to see that this group may provoke conflict, but its members probably include many who have participated in past fights.

Members will tend to be self-selected from those who view the proposed facility with alarm. Thus, it finds it easier to make decisions to oppose, to fight the proposal, or at least to seek environmentally responsive concessions. The leaders will identify themselves with those in the community who do not automatically have a voice in such decisions and will appeal to general public opinion -- in that way trying to speak for the public. The presumption will be, or will soon become, that the normal processes of public review and approval cannot be relied upon to represent adequately the interests and values that they are trying to represent. Thus, the natural tendency operates to broaden the base of involvement when either you start out weak or there is a chance of losing.

The natural tendency of the important local employer who sees conflict developing and who expects a favorable outcome from the usual processes of public review and approval is to move in just the opposite way. Expecting success, the proposers see no reason to broaden the base of involvement and every reason to narrow it. They try to build up the legitimacy of the existing regulatory arrangements -- which have quickly

been identified by the opponents as points where they may have some lev-
erage. The proposer becomes reluctant to release information except to
regulatory agencies, and then strictly on the issues that in the past
have been relevant. And the opponents are striving to have those con-
cerns broadened and so charge that the proposer is not cooperative.

National Recognition of Local Conflicts

As soon as possible the opponents will attempt to gain national or
at least regional recognition for their fight. Since environmental
questions are of growing prominence in national concerns, a shift in
values has taken place, national media are more and more apt to take
notice. People are curious about the environment, thus it is newsworthy.
Indeed, the press and television somewhat removed from the local area
may find the issue more sensational than their local counterparts, who
are closer to the participants in the growing conflict. Appearances at
hearings may become quite heated. Suits in the courts are begun or at
least prepared for. National environmental groups will take notice in
their many newsletters and magazines, whose readers are predisposed to
support the opponents. The industry's house media offer the opposite
predisposition of readers.

The result may be that state and federal agency officials will be-
gin to treat the issue differently -- with new respect. Old guidelines
for what was considered an adequate, likely-to-be-approved application,
seem to become less clear cut. Data is reviewed more carefully. Ques-
tions requiring more information and different evaluation than was orig-
inally contemplated seem to arise more easily. Officials both want more
careful documentation but are less sure what they need documented.

The proposers may have a long history of developing this kind of
facility. But things are different here. The site is more hazardous,
the facility will have different features. They are frustrated because
the standard operating procedure isn't getting the job done, and the
rules seem to keep changing. They are not likely to be sympathetic to
the direction they are being pushed, but they certainly would prefer
some kind of solid guidelines, whatever they might be, to the present
uncertainty.

War of Experts Adds to Uncertainty

In part this uncertainty may be a response to the war of experts
that has developed between the proposers and the opponents. Original
technical statements by the proposers may have come under attack. The
need for more capacity is challenged. Claims that existing standards
can be met are derided -- even though the opponents may be challenging
the standards themselves. The opponents' claims of likely environmental

effects are finally challenged by an expert in the proposer's employ or perhaps in an agency friendly to the proposal. The proposers, either as part of the pre-existing regulatory process or simply as an attempt to achieve some basis for working out the conflict, will have a study done by outside experts -- university scientists or a consulting firm. Almost inevitably they will only be able to partially study the range of questions that have been raised. At very least it will be impossible to measure likely long term effects in a short period of study. In any case, the credentials of those doing the study will be open to some question, if for no more than the fact that some of the questions raised will be at the frontiers of our knowledge.

The opponents may have access to their own experts. Agencies friendly to their interests may provide some support. Although if the issues are really quite new and unexplored they are apt to be short of expertise themselves and somewhat constrained because the legitimacy of their involvement hasn't been tested in the bureaucracy. Specialists will be recruited from two other sources -- national environmental organizations and nearby college faculties. In rare instances funds may be collected by the opponents to actually hire their own experts for substantial study, but usually they are restricted to commenting on the data and analysis provided by the proposers. In some cases, data collected as a part of public environmental monitoring or habitat management will be useful, but it is apt to be in short supply and not tailored to the questions at issue.

The give and take over the facts and the analysis can seem so emotional and biased to particular points of view that no resolution in favor of a "right answer" seems possible. Yet the initial questions raised get put into perspective. What seemed so important at first seems less so. The increment of environmental damage likely from the proposed facility is recognized as not as important as the cumulative effects of more such facilities and the precedents set here. The immediate impacts seem less crucial than the long run, less well understood impacts. Roles of agencies and their limits become understood.

Once the issue is established as of national or statewide significance, or even county-wide may be enough in some cases, elected officials will become more directly involved. A committee in a legislature may feel that this question is a logical extension of its area of responsibility even though the normal regulatory process is handled by an agency whose oversight is the jurisdiction of quite a different committee. Anxious to build a record or respond to constituents, it conducts hearings providing a very visible platform for an airing of the dispute. National organizations now have more influence than before. Whether or not new legislation results, agencies charged with the regulation of the environmental issues involved feel more pressure to find ways to resolve the questions raised.

The Fruits of Conflict -- A New Equilibrium

What is the result? New rules and procedures? Quite likely. It may take many such conflict situations to produce enough of a shift in regulatory arrangements such that confidence and stability return. Perhaps a new agency is created, or several are combined. New programs are added or old ones reshaped. Coordination mechanisms such as boards or commissions, planning requirements, strengthening the agencies that can evaluate and protect the threatened environmental values, new standards, new monitoring, research and development and so on, all are ways of restoring equilibrium. Changes in the approach to the design and location of similar facilities and the lasting changes in the private organizations that participated also play a large role in restoring equilibrium. While our tolerance for conflict may be increasing there is little doubt that our political system can live with only so much of it.

With the new arrangements much will have changed. Many things that were ignored in making decisions are now systematically considered. Points of view and the leaders of groups that hold them, have new standing in the eyes of decision-makers. Agency officials listen to different kinds of arguments and expect them to be presented. Results are different. Old players in the game have new roles and new stakes. New players are now in the game and have a stake in the way it is played. But why the need for conflict to produce change in our institutions?

Lagging Institutions and Affluence

When this was a young and developing nation, investment capital -- the real ability of the nation to set part of its income aside -- was limited relative to the opportunities and needs for private investment. It made some sense, in effect, to ask the public to bear a part of the cost of private investment, the risk of deterioration of our natural environment. The investor was motivated to construct facilities that would cut the risk of harm to natural environment only -- or almost only -- if there was a clear profit to be had from the marketplace as a result of those facilities. The concurrent public regulatory posture was consistent, and the burden was on those who would be damaged, directly or indirectly, to demonstrate that the risk was real and to find the political support necessary to impose public sanctions against the potential polluter. Affluence is changing this picture, hence the need to change institutions.

With a greater relative ability to save, the burden of the risk of deterioration of the natural environment is shifting. The posture of public regulation is more and more to put the burden of proof on the investor, public or private, to demonstrate that the risk from his actions can be made low. Even clearer, when such a risk is agreed to exist, it is the investor's burden to remove it.

And risk is closely linked to knowledge, our understanding of the effects of what we do. Hence, the response to seek more knowledge in environmental fights. But affluence and risk-taking are but part of the story.

The Environment -- A Blending of Values

When is it worth it to make a businessman, or a homeowner, or a community do things they wouldn't do otherwise? Even enlightened self-interest and personal responsibility to the welfare of society may not be enough incentive. The problem is one of judging when it pays to trade higher money costs and public energy for environmental gains. What values will we put ahead of others? But these questions become real only when we not only ask how shall we answer them but who will answer them. How cannot be separated from who except as an academic abstraction. And who means involving people of varying values, who are affected differentially by the choices, perceive them differently. They are influenced by those who they see from day to day and they do not contact everyone equally.

Since 1776 we have become accustomed to thinking of the market for goods and services -- the private economy -- as an equilibrium system, and we have some confidence that the results of the market can provide a kind of an optimum. But doubt undermines this faith in the market not only when there is inadequate competition or inadequate choice. Doubt creeps in if all costs of production are not borne by the producing firm or if all benefits are not borne by the purchasing consumer. Faith in the market can't go very far beyond the incentives that prices provide. Pollution is a cost of producing some products that are not fully borne by the firm that discharges the wastes.

Ecologists may have been studying eco-systems almost as long as economists have studied markets but it is perhaps only in recent years that very many people have looked to this equilibrium system as a source of insights into the problems that face society. The energy of the sun is used by many different primary producers of living material. These plants, whether on land or in water, are the basic units in a complex web of life. Man fits into this web, drawing his subsistence from it.

The significance of ecology is only partly that better understanding of how the eco-system is going to undergird many of the controls that will be proposed to manage the balance between our market system and the natural system. Like economics, ecology is providing us with ideas as to what is good and bad and where we can place our faith. Where competition and consumer choice suggest an optimum we now will also look to comparing diversity with simplicity, stability with instability. Just as we can have an equilibrium in the market that provides acceptable or unacceptable levels of employment, so also we can have eco-systems whose mix of species and characteristics are more or less acceptable.

Indirect Character of Use Values Adds Complexity

This is complex enough when there is a direct use involved. A scale of uses that are reflected in water quality standards is commonly drinking, swimming, fishing, boating and looking -- going from the most restrictive for pollution to the least. Fishing can usually be further sub-divided into several levels of species mix that require different levels of oxygen availability, temperature, nutrient levels and related habitat qualities. But as a few sanitary engineers have learned to their sorrow from the outraged conservationists, our ways of looking at uses, at water quality standards and doing something about them, are not well grounded on our understanding of aquatic eco-systems. The even broader significance of this to public decision-making is that direct uses do not include all of the values that society places upon natural eco-systems.

They are the largely unmarketed benefits of our environment. Some are indirectly valued by people who want the option of using the environment whether in the future for themselves or simply for everyone. And there are those -- more all the time as our knowledge of ecology spreads -- who value natural systems maintained at a high level of quality for their own sake, usually expressed by a diversity of species and incidentally including the more prestigious sport fishery and wildlife species.

Obviously, we have to grapple with the values that people hold. They exercise these values when they participate in decisions at either the private or public level. Values about these two equilibrium systems are very much involved in the challenge presented by the environment. We can't ignore the extremes involved, but we can't live by them either.

Weighing Values is a Political Task

This requires an implicit if not explicit common denominator between values. And it means searching out the places where one value inhibits the full development of another and weighing carefully the exchange of values involved. In the best sense of the term, this is politics.

When is it worth doing something about pollution? The engineer can identify some technical alternatives, the economist can help estimate some of the values and show where others fit into the problem. But the basic decisions and the evaluations of many of the key values have to be left to an administrative or political determination.

Whether at local, state or federal levels, regardless of who participates in the process, professional, administrator or politician, making these decisions is going to be difficult. It is aiming at a moving target of the most elusive kind. People's values are shifting all the time. Technology is shifting -- making old options obsolete and producing new sources of concern. But these aren't the only things that keep the target hazy.

How do you evaluate what something is worth to someone when he knows that it won't be denied to him if he doesn't pay his share? And most environmental quality situations have this aspect to them. An apple orchard in bloom may be worth a lot to the view but can you imagine the farmer taking up a collection to help pay for it. The corollary is that I need more of a lot of things if I can get you to pay for them. Such things make the picture hazy but don't change the fact that real values are there in that picture and responsible men will try to see them.

And in general, we, as a society, probably overly discount values that are conjectural, in the future, dispersed over a lot of people instead of concentrated and thus very important to a few, or non-marketable. This provides a constant source of second guessing or back pressure in the system. Conjectural events have a way of sometimes coming true. The future has a way of becoming today. Ignoring non-marketable values undermines confidence in the market system. Thus, responsible action to control the environment probably requires urging the whole system to give more attention to the risk of conjectured consequences of present action or inaction, to take more interest in the future, to give more weight to the unorganized and silent interest and to the non-market values.

Limits on Neighborliness Imply Government Action

Most of these kinds of interpersonal problems are solved by some social processes that might come under the term neighborliness. The limits on neighborliness as a social control device provide an important part of the challenge. Most of us want to be "good" neighbors, but the neighborhood is limited to the effectiveness of face-to-face communication. Reflect on what you might expect to be the difference in the way a locally owned and managed plant might relate to the community as opposed to a nationally owned plant. The national firm may evoke less sympathy and its response may be far less likely to be conditioned by face-to-face neighborly social pressure, unless it has a far-sighted public relations man. And consider how the community is apt to respond in either case if the pollution causes problems outside the area of the community.

A local industrial waste committee used a formalization of this "neighborliness" approach coupled with another idea -- the ethic of "doing the job right." The committee could verify for the polluter that the community was concerned by the damage that his particular wastes were doing; and since it has access to the industrial technology involved, it can define what "doing the job right" means. Most of the firms were locally owned and locally financed. Some of those hurt by the pollution were other businesses in the community. And the local financial institutions were represented on the committee. It was concluded that, using only local resources, this community couldn't do significantly better, no matter what tough sounding laws they might pass.

Some combination of land use zoning, conditional permits, discharge standards, environmental quality standards, monitoring and inspection, enforcement officers, formal penalties, and the like, could, in theory, take better care of the problem. But this locality -- a rural county -- simply did not have the administrative and political resources to insure that such a formal approach would in fact produce better results than the informal approach already in use.

Arbitrary "yes" and "no" controls are easy to administer. In between implies two kinds of needs, at least; 1) technical competence and 2) political support that is so broadly based that the parties at conflict are a relatively small part of the political structure. Performance standards, odor emission levels, chemical concentrations, visual esthetic standards, permits that contain conditional operation and process requirements imply that to be effective someone has to know what he is doing on a technical level. Politically to steer a middle path between "anything goes" and "nothing goes" you need strong enough support from somewhere to have both sides of any particular fight mad at you. This seems easier at higher and higher levels of government.

Should we give up on local government in environmental control? Like Mount Everest, it's there. And it has potentials that must be exploited but we need to be realistic about what it can accomplish. For example, irrigation is often used as an industrial waste disposal technique, but many plants are too far from land. For the individual plants this would be a much more difficult problem than for a public district. A district could acquire rights of way and the disposal area through condemnation, and more easily finance it. Such districts are usually an extension of a local government unit.

Protecting neighbors from each other through regulation is always a difficult task at best. Speed limits on roads, truancy in school, cleanliness in restaurants and a host of similar examples of successful regulation have several characteristics in common. First, there is wide understanding of the damage that can occur if there is no regulation, and equally important, there is understanding at least in a general way of the cause and effect processes that are inherent in the activity being regulated. Second, there is a high degree of self-interest in the individual's performance that meets the standard required. These may be essential characteristics for successful regulation from the total society point of view, and certainly seem to apply to the problem of controlling pollution.

While great progress has been made through education, technical assistance and cost-sharing -- and these are still the major tools to achieve the needed levels of control of pollution -- these are obviously inadequate without the pressure of regulation. And regulation is unable to do the whole job if for no other reason than the main political pressure on the regulators comes from those they must regulate.

Can Conflict be Avoided With Better Planning?

There is considerable evidence that more and better traditional planning is quite apt to perpetuate and re-enforce past points of view with respect to the environment. Planning may, however, provoke conflicts early enough to have the real rules changed in time so that they will apply when someone wants to act. Planners rarely seek such conflict; perhaps they should?

The ideal planning model begins by assuming that there is a set of relationships between individuals that indicate society's needs and values. This is expressed in a set of goals and determines the extent that trading between one goal and another would make society better off. At the same time there is a system to achieve these goals. This system has some parts that can be manipulated by agencies to achieve certain targets, such as dollars of credit for new houses, miles of diversion ditches, acres of urban renewal, treatment plant capacity installed, or acre-feet of storage, or acres under conservation plans, people on medicare, miles of stream classified or number of schools, miles of highway, etc. The idea is that these targets are directly related to our goals, and social welfare would say how our goals and thus our targets should be traded off one for the other to make us better off. Politicians are envisioned as knowing how to judge this social exchange relationship.

Now the function of planning in this view is to show what the alternatives are and to distinguish between the means and the ends. The product of schools is educated youth. The product of more advanced waste treatment plant capacity is a complex of better looking waters, better fishing, fewer odors, more recreation and so on. The planner is to indicate how much pollution control can be bought with some of the dollars being spent to produce educated youth. At very least he is expected to show whether it is cheaper to get your pollution control with one treatment measure or another.

This view of planning implies knowing a great deal about our values and goals, the ways that public actions produce results, and the ways that we are willing to let one public activity substitute for another. It has some other problems. For one thing, it doesn't have much to say about how you get the plans implemented. Something that is a "means" to one interest group is an "end" to another. Contractors and recreationists look at treatment plants from rather different points of view. Contractors may have a different view of measures to avoid the production of waste as an alternative to treatment than university economists. Another problem is that many of the points of decision in our political structure cannot consider very many alternatives. Land use control as an alternative means of reducing stream degradation is rarely open for consideration by an agency whose job is to build treatment plants.

But the basis of decision in this model for policy making is very appealing to many. It suggests that the most rational approaches be employed to choose only those alternatives that clearly are superior in enhancing social welfare. All alternatives are to be considered and choices are made only on objective grounds. You can't be against those sentiments, but clearly not many decisions get made that way.

An Alternative View

Let me suggest another view which probably more closely pictures the real world. It has been called the fragmented incrementalist model. Some argue its results are superior to the comprehensive planning model because it makes better use of what little knowledge we really have.

We start by recognizing that there are many decision-makers and each has very limited knowledge of the alternatives that are open. Further, their authority to implement alternatives is limited and is closely related to what they have done in the past. The power they can wield is also limited and so is the power over them by others. Again, past roles and relationships are very important in defining the scope of their power. Support and opposition is limited to a few interest groups and continuing within the outlines of past performance is much easier with respect to support or opposition than venturing into new activities. Hence, the term fragmented.

In this setting, program development comes about in small shifts -- hence the term incrementalist. Limited alternatives are considered and this allows the full use of limited knowledge of possible outcomes. Choices are simplified by ignoring alternatives that aren't understood or aren't easily available. Instead of goals in search of means, it becomes means in search of goals to serve. Successful ventures are expanded and less successful ones curtailed. Success is apt to be measured in terms of increased support, development of new power and the facilitation of new alternatives to be considered. Indeed, the basis of decision is acceptance by the other decision-makers and by the various interest groups concerned. Whatever coordination is done is the result of the process of getting acceptance.

This is not without its problems. It results in a "sum of projects" approach to planning. The plan is a list of those things on which agreement can be gotten. It has the advantage that plans and decisions to act are more closely related. Also, there is less assurance that the interest, value or goal of some politically weak group, some promising alternative, is going to be carefully considered. This view of decision-making may not be as satisfying intellectually, but it does seem to describe something that works.

Fragmented Communities Change the Role of the Environmental Engineers

But still why the rising level of conflict apparently needed to get our institutions to change? Shifts in values are certainly part of what's involved. But some suspect that there's a fundamental shift in the political decision-making structure in our local areas that explains a lot.

It helps to picture four kinds of political decision-making structures. For the first one, think of one great big triangle. Lines of power have their ultimate source in one man or a very small number of men at the top of the triangle. Decision-making is highly centralized, with lower echelons mainly carrying out the major policy decisions made by the small group at the apex. Conflict is largely absent since there is considerable agreement on values among the decision-makers and they are not seriously questioned by others. When bargaining takes place it does so within a highly structured and relatively stable system. The engineer can be, indeed has no choice but to be, a technician. The objectives and the values are clearly spelled out by this decision-making structure. Agreement and support are not his problem. All he has to do is figure out what it is they want to get done and then as a technician he tells them how to do it. That's one model.

Now for the second model, visualize three pyramids and a leader with a lasso, throwing the lasso around the tops of the three pyramids and pulling them in. He is apt to be some kind of an executive, and this model is referred to as the executive centered coalition. Here the leadership group is larger and comprised mainly of public officials and prominent private individuals representing many major interests in the community. You can see the parallel to the first model. Decision-making tends to be a matter of manufactured consent among the few who make up the caucus and who represent groups that are otherwise quite separate. But the caucus is generally brought together by a single individual. To be an effective planner you've got to get close to the caucus. You might get a chance to help it form, but not likely. The engineer's boss may become a member of it. The engineer continues to be a technical advisor. Decisions above values will be made by this group. The objectives will be passed on to the engineers, who will receive them and tell them how to achieve them.

In the United States, we may never have had these two kinds of models at the national level. They may have existed at the local level quite commonly, but when you moved away from the immediate community they no longer applied. And they don't apply very well today even at the community level.

Picture the engineer as broker and mobilizer for the third model, seven or eight pyramids, and three or four leaders throwing lassos trying to corral them in. Each may link up two or three at one time on one issue; maybe another time bring together two or three on another

issue. In contrast to the executive-centered system where one leader is prominent because of his ability to knit together existing groups, the competitive form, as this is known, occurs where there is more than one leadership group, each in competition with the others. They may be party identified or they may not be. While political control of the community does not necessarily alternate, in other words one group might stay in control, cohesiveness of the whole community has declined to the point where the group in power is constantly challenged and alternative groups regularly present themselves. Separate power structures are definable for different spheres of community activity. Typically, local government is in the hands of professional politicians with the community service organizations in the hands of the business and professional groups.

The broker role is the only one available to the engineer in the competitive form of a power structure. If he tries to be a technician, he'll probably end up talking to himself. He must offer variations and options that help form coalitions. He must sense what kind of a variation of a project or mix of projects can be offered that will get these groups together so that they will give support and move on to a decision. Becoming too closely identified with one competitive leadership group may reduce his effectiveness over time. He has to be flexible. If he just cranks out plans that are not responsive to the need of forming coalitions, nothing will happen. In that event his technical input will be provided by somebody else; he'll find somebody else playing the game that he thought he was paid to play. Plans are then less relevant than forming coalitions.

Finally we move to the much more completely fragmented model. You can just visualize a whole lot of little triangles. In the extreme, there aren't even very many leaders or executives who try to hold a continuing leadership group together -- issue after issue. Rather persons in elected or appointed positions of power lie back and wait for conflict to resolve itself, or at least wait until they are sure it won't arise. One political scientist has put forward a "dentist's" theory of democracy to describe this situation. Officials are viewed much like dentists by the electorate. They have little ability to judge their skills on the basis of merit so they use personal characteristics and evidence of conflict. If there is conflict -- regardless of the merits of anyone's position -- there is a presumption in favor of dumping the official.

For the engineer to be effective in this fourth model, he has to play the role of the mobilizer. He has to find ways to pull enough of these different groups together to have an effective level of support, and this is an extremely political process. Just writing up plans that might be accepted by a variety of diverse groups within the community is not enough. He doesn't simply offer proposals that will bring already existing groups together. He also has to prevent the planning

process from succumbing to the inertia characteristic of decision-making in the fragmented community. He has to play a far more active role, persuading otherwise uninvolved groups to support a proposal, actually organizing new groups to represent an interest, to bring them into the bargaining process, so that they won't later appear and block something that he wants to do by simply creating conflict. Obviously this means he has to adapt his plans to their interests and learn to manage conflict.

Are you prepared for the planners and engineers of the future becoming mobilizers? Planners may have no other choice if they are to solve problems. The public participation process then becomes one where planners recruit groups to support future projects. Indeed, while recruiting they don't even know what the projects are going to look like. If you don't see this role for the engineer, then who is to carry it out? And how is the engineer to be related to the mobilizer?

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