Persistent Cultural Systems

A comparative study of identity systems that can adapt to contrasting environments.

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The idea that understanding cultural change depends on the identification of elements and patterns of culture which are relatively unchanging has been insisted on by anthropologists almost from the beginning of the discipline (*1*). One method for such identification is the systematic comparison of cultures in depth—that is to say, as historical continuities. This has been advocated, as well as to some extent practiced, by anthropologists such as Franz Boas (*2*), Robert Redfield (*3*), and Julian Steward (*4*).

Systemic Patterns

The anthropologist who probably devoted most effort to comparisons of this sort was A. L. Kroeber. To him we owe the formulation of a number of useful concepts, as well as some useless ones that, as a result of his work, we can confidently discard. *Configurations of Culture Growth*, his most ambitious study, contained comparisons of aspects of the historical development of many cultures in the framework of the concept of "civilization" (*5*). It is, however, in connection with less ambitious formulations that some of Kroeber's most useful work was done. An example is his concept of systemic patterns, a consideration of which serves as the take-off point for this article—a report on a comparison of cultural histories, leading to the conceptualization of certain well-known cultural phenomena in terms of persistent systems.

The term "systemic pattern" does not seem today to say what Kroeber wanted it to say (*6*, pp. 312–316). The entities to which he gave this label constitute combinations of cultural elements that have remained in existence during long periods of time. His exposition of the alphabet as an example of such entities has become classic (*6*, pp. 509–537). He emphasized the number of centuries during which the alphabet has persisted as a recognizable cultural unit, as compared with pyramid burial, for example, which enjoyed a relatively short period of existence. Despite his emphasis on time span, Kroeber's exposition makes it perfectly clear that each instance he chose existed in a wide variety of cultural contexts. The striking example of the alphabet is probably an extreme in stability for this kind of arbitrary pattern. It existed in recognizably similar form among Phoenicians, Hebrews, Greeks, Arabs, Romans, and so on, into the late 20th century, when it has become, in the same ancient, basic form, tightly integrated into such knowledge storage and retrieval systems as indexes, encyclopedias, handbooks, city directories, and telephone books, systems on which complex modern societies depend for the maintenance of their total culture patterns. An artifact of the arrangement of sound symbols is thus identifiable in hundreds of fundamentally divergent cultural systems throughout the centuries.

Not long-term existence, but a stable form in sharply contrasting cultural environments would seem to be the most significant characteristic of the entity that Kroeber identified. He did not choose for illustration complexes of cultural elements that are known to have existed for long periods in the same isolated and unchanging societies, such as those of the aboriginal Australians.

Useful as it is, one of the limitations of the concept, like so many developed in the period in which Kroeber worked, is that it seems to have been conceived as a road map rather than as a traffic flow chart of cultures and their forms. As such, it has its uses in aspects of cultural description, but it gives no direct aid in the identification of any sort of process, whether of maintenance or of change. Nevertheless, the general idea of persistent systems must be taken up, following Kroeber's lead, and developed as an essential part of the study of cultural processes.

There are a number of different kinds of persistent cultural systems besides systemic patterns; some of these others seem better to merit the label "system," if we regard that as implying working parts comprising a whole. There are, for example, persistent systems that emerge in clear definition when one studies the disintegration of large-scale political entities such as empires, dynastic states, and nation-states. One variety of persistent system considered in the context of disintegrating, or newly integrating, states and empires has been variously designated as a "nation," "a people," or an "ethnic group." One may review the disintegration of empires in the Western world in recent times to become aware, at least in a vague and general way, of what is involved. We know from history of the disintegration of the Spanish Empire into Mexico and a score of other national entities, and we have seen the disintegration of that very large political organization—the British Empire—into the Republic of Ireland, India, Burma, Ghana, Tanzania, Nigeria, and others. Each of these entities had some kind of existence before being incorporated into the British Empire, and there is some kind of continuity between that former entity and what has emerged most recently. There is no question, for example, that Irishmen of the Republic of Ireland feel and express a continuity with the Irishmen of more than 1000 years ago, before their incorporation into Britain, and reject the idea of continuity with Englishmen. The kind of continuity that is involved in the instances mentioned, as well as in a large number of others, can be investigated with the aid of the concept of identity systems.

Identity Systems

The essential feature of any identity system is an individual's belief in his personal affiliation with certain symbols, or, more accurately, with what

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certain symbols stand for. There are collective identity systems as well as individual ones; I am concerned here with collective systems. The general phenomenon of collective identity is familiar enough—individuals hold in common a belief that, for example, a flag stands for something they conceive of as a land area, a political structure, perhaps a person in a leadership role, and a series of past events involving triumphs and sufferings of other people like themselves. The flag stands for an entity which is felt by individuals to be of supreme value and worthy of the highest kind of devotion. What we are dealing with here are beliefs and sentiments, learned like other cultural elements, that are associated with particular symbols, such as artifacts, words, role behaviors, and ritual acts. A relationship between human individuals and selected cultural elements—the symbols—is the essential feature of a collective identity system; individuals believe in and feel the importance of what the symbols stand for. The display and manipulation of the symbols calls forth sentiments and stimulates the affirmation of beliefs on the part of the individuals who participate in the collective identity system.

Working with this kind of concept has definite advantages over working with one such as the systemic pattern. These advantages are evident in the following three ways. First, the concept of an identity system is built on what has become a fundamental of theory in cultural anthropology: that elements of culture have not only form, but meaning—they are significant to human individuals. The concept of identity places in the foreground the relationships between human beings and their cultural products. People express belief and feeling in their actions and interactions in a process that Linton described so clearly as "participation in culture" (*7*). It is this social dimension of artifacts, roles, and other cultural elements that a concept like systemic pattern leaves aside.

Second, the identity concept brings in what may best be called the historical dimension. We are concerned with the kind of identity system that is persistent, or that has historical depth. There are evanescent identity systems that disintegrate almost as soon as they are formed, as in various kinds of crowds, but we are not analyzing these. In persistent identity systems, the meanings of the symbols consist of beliefs about historical events in the experience of the people through generations. The belief that the experience is shared with and through ancestors is basic in such systems. We may think of the set of identity symbols as constituting a sort of storage mechanism for human experience, a means for organizing the accumulating experience of people. The identity concept thus takes into consideration the cumulative character of culture and encourages the search for process.

Third, the identity concept brings individual motivation into the field of analysis, or at the least opens the way for such analysis. The cumulative image that people build of themselves in the meanings of the identity symbols is the source of this motivation. The continuation and fulfillment of the image of themselves as performing in the series of historical events that the symbols emphasize becomes a vital concern. An identity system may emphasize triumphant achievement or bitter suffering. Whatever the specific quality, it defines an historical destiny in which the people believe and which they are motivated to fulfill.

It should be clear that I am not concerned with any sort of biological phenomena; the people who believe in a given identity system at one time may have no genetic characteristics in common with people who believe in that same system at a later time. This has been the case with the Jews in the course of their history. Further, it should be clear that I am not speaking of objectively organized historical facts. I am focusing on history as people believe it to have taken place, not as an objective outsider sees it. It is history with a special meaning for the particular people who believe it. A further caution seems necessary in this initial delimitation of the concept. Working with a very similar idea nearly 200 years ago, Herder (*8*) seemed to hold that the "national groups" in which he was interested possessed some kind of capacity for eternal existence. There is no such implication in the idea that I am developing. Identity systems are subject to total disintegration, just as they are subject to being built up through processes of integration. However, it is true that we are focusing attention only on those identity systems that demonstrate a capacity for existence in different kinds of cultural environments—systems, in this sense at least, that are persistent, in contrast with systems that are nonpersistent.

Persistent Identity Systems

General as it is, perhaps the term "persistent identity system," is adequate, at this stage of our understanding, to describe the phenomena with which this article deals. However, there is need for an additional term for the individuals who believe in such identity systems. They constitute the basic, empirical phenomena that students of identity systems must observe, and they are the ones whom students must interview when gathering their data. This kind of collectivity, or something very similar, used to be referred to in Western Europe as "a nation." Two hundred years ago, Indian groups with common cultures in the New World were so spoken of when they were discovered by Europeans; groups with common cultural characteristics in the multicultural environment of Europe were also so designated. The term "nation," however, has increasingly been applied to groups of persons who maintain and control a state apparatus, or who aspire to do so. This term cannot be used because I wish to maintain precisely a distinction between political systems and identity systems, so that the relations between these kinds of entities may be studied and determined. Therefore, I shall make use of a phrase that does not have political connotations and that is, in fact, somewhat vague in English: "a people." This phrase will mean a determinable set of human individuals who believe in a given set of identity symbols. Even though it sounds somewhat awkward in English usage, I shall also employ the plural, "peoples."

In almost any relating of human history it is apparent that collectivities of some sort, as well as individuals, appear and disappear. The accounts of historians take note of people whose names recur through many centuries and whose names must be used if the events and the connections between events are to be adequately presented. On the other hand, it is equally apparent that there are named groups whose activities cease and whose names are never mentioned again after a period of prominence. I am concerned with the first phenomenon—that is, the long-term existence of peoples in contrasting cultural environments. The investigation has grown out of such questions as the following: Is continuity of peoples during long spans of human history, such as is generally recognized in the case of the Jews,

purely an illusion resulting from the misapplication of a single term to many widely divergent social and cultural phenomena? If there is something more than illusion involved, what is its nature? Are phenomena of this kind subject to any sort of systematic inquiry? If the Jews' long-term continuity be accepted as a cultural reality, is it wholly unique?

Answers to these questions have been attempted not on the basis of a consideration of the whole range of relevant data, but rather through the tentative formulation of concepts that seem to permit a beginning in the ordering of the very abundant historical information on persistent identity systems. With these concepts as exploratory tools, it should be possible to move further in comparative analysis and establish the framework within which systematic inquiry can be carried on. I have selected ten instances of persistent cultural systems for preliminary investigation: those of the Jews, the Basques, the Irish, the Welsh, the Catalans, the Mayas, the Yaquis, the Senecas, the Cherokees, and the Navajos (*9*).

The selection has not been made with reference to "culture traits" in the usual sense. Although a few of the Old World peoples have exhibited several cultural complexes in common throughout their history, there are no cultural traits that have characterized all ten peoples. The selection is obviously on some basis other than particular cultural elements. In addition, the selection is clearly not based on time span. The reliable historical record for the Jews goes back more than 3000 years, while for Navajos, Cherokees, and Yaquis it is less than 500 years. The known periods of existence of the others fall somewhere between. Not only is time span obviously not the basis, but any interpretation of the historical records shows great differences in the particular kinds of events experienced.

Cultural Environments

It is only when we look at the historical events in each case as indications of the nature of the social and cultural environments that similarities become apparent. Each, with the exception of the Navajos, has outlived as an identifiable entity two, three, or more kinds of state organizations into which they had been incorporated. Each has experienced pressures for economic, political, or ecclesiastical assimilation into larger organizations. Each has resisted this incorporation in some degree and manner. Each has developed well-defined symbols of identity differentiating it from other peoples, especially from the peoples controlling the state programs that they opposed. Their local communities have not been incorporated into the political systems under which they have lived on the same basis as neighboring communities; there have always been differences, either imposed by the incorporating state or insisted on and maintained by the people concerned. None as a group has controlled a political organization that included peoples other than themselves for more than a few decades at a time; most have not controlled any state organization during the greater part of their existence.

It should be clear that the basis of selection is similar behavior in similar kinds of environments. My position is that, for example, the Yaquis have developed the same kind of identity system as the Jews, even though their known period of existence is little more than 400 years, as compared with perhaps 4000 years for the Jews. The Jews, during their period of existence, have been incorporated into, and have resisted, a great many different types of states (the precise number depends on how one classifies the varieties of political structure during the past several millennia in the Middle East, Europe, and elsewhere). The Yaquis have thus far been incorporated into only three, possibly four, distinct kinds of states—the Spanish Empire, feudal Mexico of the 19th century, and the modern welfare states of Mexico and the United States. Both cases may be included in the category of persistent identity system on the basis of their demonstrated capacity to survive in contrasting sociocultural environments. I include the Navajos not because of their demonstrated capacity for survival in distinct kinds of political environments—they were never incorporated into either the Spanish Empire or feudal Mexico—but rather because their identity system, especially in their present phase of resistance to cultural assimilation into the United States, has characteristics unmistakably like those of the others. In addition, I include them because so much detailed and current data is available regarding the processes by which their identity system is being formed.

The Oppositional Process

To summarize the similarities in terms of process, there is apparent in all of these instances a continued conflict between these peoples and the controllers of the surrounding state apparatus. The conflict has occurred over issues of incorporation and assimilation into the larger whole. Sometimes it has taken the form of warfare, but by no means always. More commonly, and during most of their history, the peoples have been relatively weak politically and have been unable to organize for warfare. But whatever the specific form of the conflict, the fact of continued opposition is clear in each history. I have not delineated in detail the nature and cultural products of the oppositional process, but there is no question that it can be identified in almost identical terms in each case. The persistent identity system is a product of this process. Its formation and maintenance are intimately bound up with the conditions of opposition. Tentatively, on the basis of our limited data, it appears that the oppositional process is the essential factor in the formation and development of the persistent identity system.

The oppositional process is, of course, a mutual experience. Those who are politically dominant are affected by the process along with peoples of the kind I have selected for study. I believe, however, that the combination of state power with participation in the oppositional process does not ordinarily result in persistent systems. There are, nevertheless, instances in which it may bring about something very similar. This may be, for example, the proper interpretation of the history of the Castilians, who have controlled state power over most of the Iberian peninsula for six centuries. Perhaps we should regard them as having the same sort of identity system as do the Catalans, Basques, and Galicians, whose systems have been formed in the oppositional process since the 1300's. More often, however, the possession of state power dissipates the kind of identity system under discussion. The relations between state power and persistent identity systems constitute an important field of investigation. Apparently, the condition of holding state power may result in either the breakdown of an identity system or the reinforcement of it, but the latter result would seem to be a product of certain rather special conditions.

Having identified a variety of persistent cultural systems as the products of oppositional processes engendered by the incorporative growth of political organizations, I turn to a consideration of the internal characteristics and maintenance processes of such systems. As a result of comparative study thus far, I describe them in the following terms: (i) the set of identity symbols and their configuration of meanings, (ii) spheres of participation in the common understandings and sentiments associated with these symbols, and (iii) the institutionalized social relations through which participation in the system of meanings is maintained.

Identity Symbols

It may be that a distinctive feature of this kind of identity system, as compared with other kinds, is that the set of symbols is necessarily characterized by some combination of land and language elements. Once such a tentative statement is made, it is necessary immediately to guard against interpreting it as supporting the widespread view that persistence of a particular language, or residence in a particular territory, is a necessary condition for the survival of the kind of people I am discussing here. Without going beyond the range of the few selected cases, it is apparent that a territory once occupied by a given people may be lost without the breakdown of the identity system. Thus, the Jews several times became separated from the territories they occupied; the Yaquis, the Navajos, and the Cherokees were displaced from all or part of their territories; breakdown of identity did not follow. The facts suggest that this kind of displacement most often has the effect of reinforcing identity, provided that certain structural conditions can be maintained within the group. Sentiments regarding the land become intensified, as in the cases of the Jewish Zion and the Yaqui "Eight Towns," and become of even greater importance in the configuration.

What happens in the case of language loss is more complicated, but of the same general character. The outstanding examples in our cases are the Jews and the Irish, but a portion of the Welsh, the Cherokees, and the other North American peoples should probably be included. The Jews have lost "their" language several times and have sometimes developed new languages to replace the lost ones. The Irish, at the very time that independence sentiments reached their highest intensity in the late 19th century, had just reached the point at which one could say that English had finally replaced Gaelic. Thus, the loss of the language coincided precisely with a high point in intensity of sentiment about Irish identity. The less and less frequently used Gaelic language became in itself a symbol of primary importance in the identity system, as indicated by the Gaelic League and many other efforts to keep the language in existence. Further, just as the names of selected places, after the territory is lost, may become very sacred symbols, so selected words and phrases in a lost language may become of utmost importance in the religious and ritual life of a people.

In addition to land and language symbols, common constituents of identity systems are music, dances, and heroes. Perhaps music and dance are as nearly universal in this kind of identity as land and language. It is notable, however, that their role changes profoundly from one historical phase to another. An interesting example is that of the Sardana dance among the Catalans. During the 19th century, when the Catalans were undergoing a cultural renaissance after centuries of assimilative pressures, the Sardana steadily grew from a "country" dance of a limited area to a "national" dance with intense symbolic meanings for most Catalans. Feelings reached such intensity that the central Spanish government took measures to suppress it. The deer dance of the Yaquis has also intensified in significance in recent years, but instead of being suppressed by the Mexicans, who continue to carry on an assimilative policy, it has in some measure become a symbol in the Mexican identity system. Certainly heroes—human or legendary figures believed to have played important parts in various events—are always present in identity systems, but their roles vary tremendously. While the Jewish system is replete with named persons vital in the configuration, as is the Irish, it is hardly possible to claim that the Catalan system emphasizes heroes as much as it does certain social and political institutions that have become symbolic of the particular kind of opposition which has characterized Catalans and Castilians. It is true also that there is a notable tendency on the part of Yaquis to consider institutions, such as their historic town organizations and certain sodalities, as more important in their set of symbols than the human individuals who figured in their history.

One cannot expect that any universal roster of ever-present symbols, in terms of aspects and traits of culture, will be discovered. What is most characteristic of these symbol systems is that there is great flexibility with regard to the kind of cultural element which can be included. One of the bases of the adaptability of this kind of identity system would seem to be that a wide variety of elements may come to have symbolic significance. What becomes meaningful is probably a function of the oppositional process. Where the pressures are focused in the cultural repertoire of the people, there the symbols and their meanings are brought into the identity system, and these pressures change as the interests of dominant peoples change. An identity system thus develops independently of those processes by which a total culture pattern, a set of particular customs and beliefs constituting a way of life, is maintained. The continuity of a people is a phenomenon distinct from the persistence of a particular set of culture traits.

What makes a system out of the identity symbols is not any logical, in the sense of rational, relationship among them. The meanings that they have fit into a complex that is significant to the people concerned. The meanings amount to a self-definition and an image of themselves as they have performed in the course of their history. The selection of cultural elements for symbolic references goes on in terms of the character of this image; the frequent shifts in emphasis are part of the process of maintenance in response to alterations in the environment. Continuity, either in the consistency of the parts of the image or in the peoples' belief in their symbols, may be broken in a variety of ways. The conditions under which formation of persistent systems takes place and under which disintegration sets in constitute another important problem area. The essential basis for its study is the full and clear determination of the cultural "logic," or consistency, of a particular identity system at a given time; in short, sound ethnographic research.

Spheres of Participation

Another kind of flexibility of the persistent identity system is apparent in connection with what we shall call spheres of participation. In the course of the existence of a given identity system, there are always notable fluctuations in the intensity of sentiments associated with the symbols. These seem best interpreted in terms of varying participation in certain of the areas of common understanding necessary for the maintenance of any cultural system. Three such areas seem to be important in the maintenance of an identity system: (i) communication through language, (ii) the sharing of moral values, and (iii) political organization for achieving the objectives of group policy. There can be no identity system without common participation in all of these spheres, but fluctuation in participation is characteristic.

The language sphere refers to whatever language is used by a people at a given time, not to a particular language that is maintained continuously through time. The language a people uses in maintaining its identity system may be one that is replacing a language used until that time, as in the case of 19th-century Ireland. It appears to be essential that there be a common mode of reference to themselves and to the other peoples involved in the interactions of that particular phase—in other words, a terminology of opposition. The names for themselves and for other peoples are important vehicles for stimulating and communicating sentiments. The Yaquis, during a phase when opposition reached a high intensity, imposed on the Mexicans whom they were resisting both their own term for themselves—Yoemem—and their terms for Mexicans—Yorim. Thus, Mexicans for two generations or more participated in a small way in the sphere of the Yaqui language. Ordinarily, however, the vocabulary of identity is the exclusive preserve of the persistent peoples. Language becomes a means for maintaining not only internal solidarity, but boundaries between themselves and others as well; the specialized vocabulary is a vital part of the mechanism of social separation, and it seems doubtful that the identity system could exist without such language exclusivism.

To say, however, that participation in language is the single necessary condition for the maintenance of the identity system is to go too far. Equally necessary is participation in the moral sphere, by which I mean a people's set of values regarding ideal behavior. Each persistent people, like all other peoples, maintains a conception of a moral world; but there is a part of the general moral world that becomes specialized for guiding them in the realities of opposition. The meanings of symbols include ideal behaviors relative to opposing peoples and stereotypes regarding the behavior of those peoples. The moral world as a whole may be much influenced and differentiated by class and other factors within the persistent society, but that part of the moral world involving interethnic relations remains quite separate from such influences. Participation in the moral sphere is hardly imaginable apart from some language participation; every important moral value may be expected to have a corresponding name, which is associated with certain sentiments of greater or lesser intensity. Thus the langauge and the moral spheres are very closely interrelated.

The third sphere, which I call political participation, requires actual organization. A people may, during long phases of its existence, exhibit little or no common political participation, for example, after military defeats or during extremely repressive developments on the part of an opposing people. During such phases of quiescence, however, there may be a more or less intense maintenance of identity through moral and language participation. The growth of political participation to realize objectives in relation to opposing peoples often comes as a surprise to the latter, who have misinterpreted this situation to mean that the identity system of the persistent peoples has disintegrated. It is in the sphere of political participation that one finds the greatest fluctuation during the course of a people's history. Frequently, studies of "nationalistic movements" pay attention only to this sphere, whereas studies of the processes by which linkage among the spheres and breakdowns in participation occur could yield a better understanding of persistent systems.

Internal Organization

The institutional means by which identity systems of this type are maintained require more comparative study. Judging from this survey, it seems clear that there is no one type of either kinship or local group structure that is common to all of the cases. There is no one type of household composition, of descent or inheritance rule, or of marriage system to be found in all the instances, nor is there any one kind of relationship between a kin unit and a land unit. It is not so clear that there are no common features of local grouping and government; there are indeed interesting variations of what may be characterized as a high positive valuation of the local community in some form.

Summary

I have indicated here some features of a kind of entity which I have called a cultural identity system, and I have focused on a variety of this general type—the persistent system. In general terms it is best described as a system of beliefs and sentiments concerning historical events. I suggest using the term "a people" for the human beings who, at any given time, hold beliefs of this kind. These are phenomena with which we have been long familiar, but they have not been systematically studied by any but a few investigators.

I have emphasized that a persistent system is a cumulative cultural phenomenon, an open-ended system that defines a course of action for the people believing in it. Such peoples are able to maintain continuity in their experience and their conception of themselves in a wide variety of sociocultural environments. I hold that certain kinds of identifiable conditions give rise to this type of cultural system. These may best be summarized as an oppositional process involving the interactions of individuals in the environment of a state or a similar large-scale organization. The oppositional process frequently produces intense collective consciousness and a high degree of internal solidarity. This is accompanied by a motivation for individuals to continue the kind of experience that is "stored" in the identity system in symbolic form.

The persistent identity system is more stable as a cultural structure than are large-scale political organizations. When large-scale states disintegrate, they often appear to decompose into cultural systems of the persistent

type. Large-scale organizations also give rise to the kind of environment that can result in the formation of new persistent systems. It is possible that, while being formed, states depend for their impetus on the accumulated energy of persistent peoples. A proposition for consideration is that states tend to dissipate the energy of peoples after transforming that energy into state-level integrations, and then regularly break down in the absence of mechanisms for maintaining human motivations in the large-scale organizations that they generate.

References and Notes

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NEWS AND COMMENT

Lead in the Air: Industry Weight on Academy Panel Challenged

A major report on the health effects of airborne lead, released by the National Academy of Sciences in September, has become the focus of a controversy over the academy's use of industry employees on its advisory panels to the Environmental Protection Agency (EPA). Critics in the environmental sciences community, including two prominent researchers who contributed to the report on lead, question the neutrality of the panel that wrote it and accuse the academy of giving scientists in the lead industry an excessively free hand in shaping the report, which was meant to serve as background for the EPA's regulatory policy on lead.

The academy, in turn, insists that industry is often the best source of essential expertise, and that when industry scientists serve on its advisory panels they are simply expected to rise above their allegiances to employers and to put aside their biases.

The report in question was written by an ad hoc Panel on Lead of the Committee on Biologic Effects of Atmospheric Pollutants (BEAP), a part of the National Research Council. The lead panel's report is the first of a series of similar surveys and evaluations of the literature on selected pollutants—which may eventually number as many as 20—being conducted by the NRC under contract to the EPA. Compiled over an 8-month period from July 1970 to February 1971, the report has been widely commended for its thoroughness in reviewing the literature on lead. The point of controversy is the panel's interpretation of the collected mass of information.

Early in its planning, the panel decided that, in order to place airborne lead in a proper perspective, it would have to expand the scope of its discussion and consider the effects of lead at far higher levels than those found in urban air. This was necessary, the panel said in its preface, "because lead attributable to emission and dispersion into general ambient air has no known harmful effects." From this premise, the panel worked its way through some 600 references to conclude that lead concentrations currently found in the nation's air pose no known hazard to the general population. Although the panel noted that some groups of workers and children in inner-city neighborhoods might potentially be at risk, it found that the amount of lead in the air of most major cities "has not changed greatly" in the past 15 years.

To judge from press releases issued in the wake of the NRC report, the lead industry was delighted with what it perceived as a clean bill of health from the National Academy of Sciences. The Ethyl Corporation, a major producer of lead additives for gasoline (the principal source of lead in the ambient air) took the report's conclusions as vindication of its contention that antiknock additives in no way "endanger the public health or welfare," and are therefore not subject to control on those grounds.

EPA officials, who had hoped that the report would furnish the scientific underpinnings for a national air quality standard to control lead (which would require evidence of a danger to health or welfare) showed considerably less exuberance.

The EPA still plans to announce in mid-December the first federal controls on leaded gasoline since the antiknock additives were introduced in 1923. At the least, EPA officials say, they expect to require that oil companies begin selling one grade of unleaded gasoline by 1974, with the expectation that the market for leaded gas would disappear of its own accord 8 to 10 years thereafter.* Backed with sufficient evidence of its hazard to health, EPA officials say they could also impose a national air quality standard for lead—a more severe measure that would speed the demise of leaded gasoline by 3 to 4 years. But they indicate, somewhat grudgingly, that the academy report has made such a standard harder than ever to justify. "It is a conservative document . . . we would like to have seen a little more enthusiasm for getting the lead out," one source in the Air

* Amendments to the federal Clean Air Act in 1970 permit the EPA to control fuel additives if these are shown to impair the operation of pollution control devices. Beginning in 1974, new cars are expected to use catalytic mufflers to reduce smog-generating emissions. Particles of lead in the exhaust degrade catalysts intended for use in the mufflers.