

Manuscript
prepared 1988.11.30 for a volume in honor of George Gerbner,
to be edited by Nancy Signorielli and Sari Thomas, not published.

Towards a Cybernetics of (Mass-Media) Institutions

By
Klaus Krippendorff
The Annenberg School for Communication
University of Pennsylvania

Background

I met George Gerbner on one of those typically midwestern, ice cold, windy and snowless days, between Christmas and New Year 1961, at the University of Illinois' Institute of Communication Research in Urbana.

I had graduated from the internationally famed avant-garde design school in Ulm, Germany, spent a year at its Institute for Visual Perception and had come to the U.S. full of far-out ideas about a new synthesis between art, information theory, symbolic interaction, communication, cybernetics, sociology, all focussed on my main concern, design. To my utter disappointment and barely able to defend myself in English, I found myself photographed instead in front of the rat cages at Princeton University and introduced in one of its newsletters as a German psychologist (by implications interested in American rats). Hadley Cantril, whom I had known through his early work on public opinion and who had just left this psychology department for reasons similar to why I was now discouraged gave me a few addresses and the advice to look for a better place to study. I talked to well known scholars at Harvard, MIT, University of Michigan and when I stumbled into Michigan State University, David Berlo and Malcolm McLean immediately offered me an assistantship. But when I inquired about who would be concerned with the social aspects of communication they pointed to the

University of Illinois, Dallas Smythe and George Gerbner who had already been on Hadley Cantril's list.

The Institute of Communication Research was attractive to me not only for its social concerns but also for its liberally administered communication program. It enabled me to study cybernetics seriously, expand my knowledge in anthropology, sociology, social psychology and linguistics and brought me in contact with a variety of esoteric areas then blowing through the campus. But communication became my new home and George Gerbner my initial advisor.

George taught two courses, one on popular culture and another on social aspects of mass communication. Both were informed by his general model of communication, the notion that mass communication works very much like industrial production, Leo Loewenthal (1944), and Marshall McLuhan's cultural criticism, (1951, 1962) initially only his Mechanical Bride, and by content analysis results.

George's General Model of Communication (1956) essentially was a contextualization of his early journalistic experiences extended to any kind of social agency. It starts with an observer of reality: "someone--perceives an event--" and continues with what he, she or it intends to do with it, "and reacts--in a situation--through some means--to make available materials--in some form--and context," and, noting what such an activity entails, "--conveying content--of some consequence." It was an expansion on Harold Lasswell's "who--says what--to whom--

..." formula (1948) and associated with each of these verbal components an area of study or research questions he asked his students to explore. Much of his own research sought to illustrate the role these components play in shaping communication.

The idea that mass communication resembled more the assembly line of industrial production than the popular image of a critical journalist's or artist's mind came to him from his half-brother Laslo Benedik, a successful film maker with considerable experiences inside Hollywood. The metaphor of industrial production not only suggested a way of demystifying Hollywood, analyzing its politics, procedures, controls, financial and material resources of the communication industry in familiar terms, but also opened the door to Marxist criticism, describing communication as the mass production and dissemination of messages and paying attention to its institutional structure, its hidden ideological biases, its economic power bases and the corporate interests it served. In Urbana, George was an outspoken representative of this perspective.

Following Harold Innis' footsteps, Marshall McLuhan's early work had introduced popular culture notions and culture critical attitudes towards the transformations mass-media (including literature, magazines, newspapers and television) were thought to introduce into everyone's life by their own symbolic powers. McLuhan put these media into the center of his understanding society, just as George described them as the principal

humanizing agents and reconstructed the whole human history in these terms. For George, popular culture and mass production were two, perhaps unequally favoured, sides of the same coin.

The backbone of George's research always was and still is content analysis. Whereas others sought to find ways of using verbal data to infer psychological states and association structures in speakers' and hearers' minds, notably Charles Osgood, who was George's colleague and director of the Institute, or got involved in evaluating press performance by journalistic standards, George never appreciated psychological research, had no longer journalistic concerns and saw mass-media content as the principal phenomena that communication research needed to explain. Loewenthal's work on popular heroes in magazines fiction, perhaps also Siegfried Kracauer's analysis of popular films and Paul Lazarsfeld's distinction between administrative and critical communications research became cornerstones of this effort.

In fact, even in his working definitions of communication and in his later delineation of the field of communication (1966) messages became pivotal:

Communication can be defined as "social interaction through messages." Messages are formally coded, symbolic, or representational events of some shared significance in a culture, ... The distinction between the "communication approach" and other approaches to the study of behavior and culture rests on the extent to which (1) messages are germane to the process studied and (2) concern with the production, content, transmission, perception and use of messages is central to the approach. A "communication approach" (or theory) can be distinguished from others in

that it makes the nature and role of messages in life and society its central organizing concern. (1967a)

Although George never talked about his epistemology, he always considered messages as objective events that, because of their "formally coded symbolic, ...representational" and "imprinted" nature, have a factuality as unquestionable as the events they represent. This conviction led him to regard messages as part of an objective reality to be "unveiled" or "uncovered" without reference to an analyst's epistemology, theory or values and without reference to how people might interpret them in public. He states:

Our contention is not so much that inherent physical characteristics of media as such, or that formal elements of style, vocabulary, syntax, are themselves of profound and direct significance. Rather it is that the nature and consequences of these elements and characteristics can be understood best if content is viewed as bearing the imprint of social needs and uses ... Aside from the formal, conventional "message," mass-media content bears the imprint of concrete circumstances of its creation. This includes such things as external outlook and the internal dynamics of the producing industry; its relationship to competitors; its control over resources, facilities of production, and distribution; the position of its decision makers in the industrial structure; their relationships to audiences, markets, advertising sponsors. Out of these come a set of managerial assumptions--both implicit and rationalized--reflected in large systems of content, and performing some aspect of its perception. The social determinants of cultural industry thus find their way into the consequential meaning of the material... Unless the requirements and effects of a specific system of industrial and market relationships (such as the corporate structure) are fully grasped, mass-media content analysis remains superficial. (1958b).

Thus, although George consistently defines messages in terms of "shared significance", seeks to show "what they call to the

attentions of a community" and to reveal "what stories tell us," his content analysis play down the importance of conventional meanings and emic categories (the kind of understanding that members of a community could agree with or share) and the truth value of what these messages are about (what people see as factual or merely entertaining). Within the analytical presupposition that communication is "industrial behavior in the public domain," which can hardly be considered shared among audience members, his analyses are designed instead to uncover what he regards as the hidden, unintended, implicit and pervasive aspects of messages that escape casual reading but are objectively identifiable by qualified analysts, perhaps aided by statistical tools.

Consequently, George's research seeks to explain the frequency distributions in his own etic categories by (a) interpreting them as standard indicators, by (b) correlating these indicators with measurable variables of popular message consumption, to which mass production is just the other side of the same coin, and (c) by putting (a) and (b) into cultural, social, political and economic explanatory perspectives. Figure 1 (which already includes a distinction I want to discuss later) shows these relationships graphically:

Figure 1

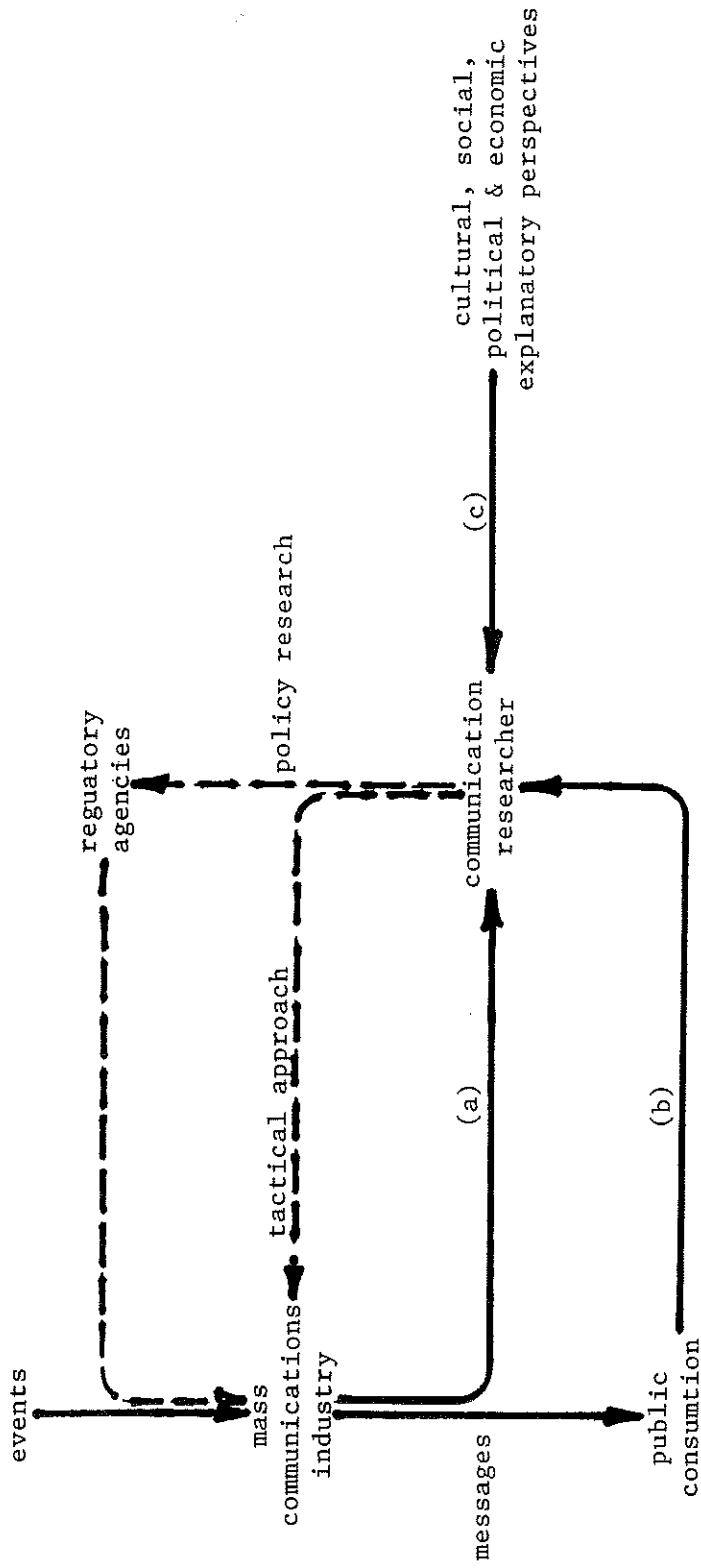


Figure 1

To give some examples for each, regarding (a), George interpreted the frequencies of occurrences in subject matter categories as measures of attention and used these measures to quantify media attention to mental illness (1959), to film heroes in six countries (1969b), to countries outside the U.S. (Gerbner and Marvanyi, 1977), among many others. Regarding (b), efforts to correlate content variables with other measures served to show the "imprinting" of message characteristics and provide evidence for their social consequences. For example, in his "Social Anatomy of the Romance Confession Cover Girl" he correlated visual characteristics of magazine covers with semantic differential ratings by subjects (1958a). In his and Larry Gross' "Scary World of TV's Heavy Viewer" he compared frequencies of violence in TV with survey data on the perception of real-world violence (1976) to which one may add numerous similar comparisons of TV populations with real populations, TV crime statistics with official crime statistics and TV attitudes with those found by actual surveys.

While George's quantitative work was simple and straight forward and perhaps for these reasons not always accepted (e.g. Hirsch, 1980), George's main strength is (c), to find challenging socio-political interpretations of his content analysis counts. He explained the social role of magazines in terms of where, by whom, to whom and in whose interest magazines would be sold (1958a), differences in reporting an alleged crime in terms of the known ideological perspectives and political tendencies of

newspapers (1964), the portrayal of mental illness in terms of hidden censorship and industry-wide controls in motion pictures (Gerbner and Tannenbaum, 1962) and later moved towards more cultural interpretations in terms of mainstreaming industrially profitable perceptions (Gerbner, Gross, Morgan & Signorielli, 1986) on the one hand and power roles of decision makers regarding communication content (1969a, 1974) on the other. His characterization of "Television as a New Religion" based on the global, instantaneous and ritualized access by few individuals to the largest number of people in history (1977b, 1980, 1982; Gerbner & Connolly, 1978) is a similarly challenging interpretation.

I always was intrigued with the novel connections George made, with his far-reaching interpretations and exploratory constructions. At the same time I also felt uncomfortable with explaining communication content as "objective industrial c" whose sheer massive presence would suffice to claim widespread sharing without the need to refer to possibly diverse understandings. Correlating (in the statistical sense) etic content categories with equally etic consumption variables and attitudes makes no allowance for individual choices to interpret texts differently either and when accepted as scientific findings perhaps even discourages new and deviant perspectives or raising questions of how society might be changed. The lack of freedom George attributed to readers, viewers and even producers, to the

public for short, stands in sharp contrast with the freedom he himself displays in developing his own ideas.

Disagreements with a respected teacher makes one think on one's own and since I always learned most from teachers that challenged my presuppositions, my course of study with George proved productive for me as well. In my University of Illinois Ph.D. dissertation, written after I had joined George at the Annenberg School, I sought to develop a new epistemological perspective for content analysis, one that was grounded in a contextual theory of meaning I had been playing with before and required the analyst to actively participate in the construction of the relationships between text and context, whether it concerned relationships between words and their linguistic surroundings, between social organizations and their socio-cultural environments or between data and a theoretical framework chosen by the analyst. The context of data did not need to be true in an objectifies sense but cognized by the analyst and, in the case of content analysis, empirically relevant and convincingly stated (e.g. Krippendorff, 1980). This kind of content analysis did not rule out causal connections, for example imprinting, but granted the communicators assumed to be involved the competence of making the same creative choices of contexts and meanings researchers like George would take for granted for themselves.

As its Dean, The Annenberg School provided George considerable resources and, having argued that messages should

not be seen in isolation but as connected and reinforcing each other's consequences, he sought to move further away from traditional notions of "content" and engage instead in what he called "message systems analysis."

The first of these large scale projects was commissioned in 1968 by the U.S. Surgeon General and concerned violence on TV. It came unanticipated. George felt unable to do it on its own and so, several of us at the Annenberg School, bringing different backgrounds and analytical competencies to the task, collaborated on what turned out to be a tremendously exciting effort (Brouwer, Clark, Gerbner & Krippendorff, 1969).

The initial success of such efforts and a content analysis conference we organized in 1967 encouraged George to build a superstructure on top of message systems analysis: the cultural indicators project. Based on his continued conceptions that "institutions package, media compose, and technologies release message systems into the mainstream of common consciousness" (1972), his cultural indicators project intended to be the most ambitious and global effort to take stock of mass-media's far-reaching involvement in cultural affairs. Seeking to build a cumulative data base for policy makers to make informed decisions in the cultural domain (1969a), he differentiated his own policy oriented approach from those that responded either to burning political issues "dear to the heart of a political clientele" or to industrial and business interests in the mass-media, summarily

characterizing them as tactical approaches (1967b)
(see Figure 1).

There had been precedences, of course. For example Alvan A. Tenney (1912) (a founding contributor of the Columbia School of Journalism) proposed a nation wide and continuous effort to monitor and record major changes in the political climate and public consciousness by a systematic and quantitative analysis of newspaper content "comparable in accuracy (and intent) to the statistics of the United States Weather Bureau". Tenney's ideas stimulated many quantitative newspaper analyses but the unavailability of computational devices at that time frustrated the extent of his proposal. With computers now on hand, George's similarly global questions had a better chance.

For his cultural indicators project, George defined three components of which message systems analysis was one:

How mass-media relate to other institutions, make decisions, compose message systems, and perform their functions in society are questions for institutional process analysis (later also called "institutional policy analysis" 1985:17); how large bodies of messages can be observed as dynamic systems with symbolic functions that have social consequences is the question of message systems analysis; and what common assumptions, points of view, images, and associations do the message systems tend to cultivate in large and heterogeneous communities, and with what public policy implications, are problems for cultivation analysis (1973:558).

Of the three, the institutional component is least developed and clear. In his initial conception for an institutional process analysis, he outlines a scheme for analyzing decision makers that do affect what the media communicate in terms of

their power bases, the type of leverage they command, the functions they perform, and the domain of mass-media operations in which these decisions are exercised. Decision makers could be individuals or groups and the source of their power is seen as residing in the structure of the institutional roles with leverage built into each (1973:558-562). Although George could relate several of his own earlier studies to this "first prong" of cultural indicators research and added a cross-classification of nine types of power roles, he recently observed: "Because of its direct policy orientation, this research is the most difficult to fund and, therefore, the least developed (Gerbner, Gross, Morgan & Signorielli, 1986).

Against the backdrop of the foregoing, I want to make a contribution to this area of mass-communication research and outline here an approach to the analysis of social institutions. I fully concur with George's critical spirit, with the large scope of social concerns he expresses, and am equally convinced of the central role of communication in society. The title of this paper contains "mass-media" in parentheses to indicate my uncertainty or perhaps unwillingness to draw a boundary around one industry or one technology and understand it by such an exclusive focus. The inclusion of agencies that connect with mass communication requires first of all a more encompassing unit of analysis. Second and consistent with my experiences that communication is a process, not a thing, and one that involves people in its own way, it needs a more dynamic and cognizable

framework for analysis. Finally, I am convinced that an adequate understanding of human communication requires an epistemology capable of self-reflection which is different from one that would suffice to understand rocks, computers, industrial production and communication systems from the outside. I believe a cybernetic epistemology informs such a framework, suggests appropriate units of analysis and unfolds a more cogent kind of truth, one that might be easier to live with than what the "scary world of television" currently encourages.

The following can do no more than sketch out this framework, develop a skeleton of concepts, explore some general hypotheses and suggest social implications. Since the framework is new, I have to accept the blame for all faults and overstatements that its repeated use would have weeded out, and since the space (and time) is limited, I have to apologize for the necessarily terse and definitional style. All I can do is show where my thinking goes and I will attempt to do this in eight sections:

- * Information
- * Noospheres and ecospheres
- * Institution
- * Social organization
- * Ecology of social organizations
- * Mass-media ecology
- * A cybernetics of mass-media ecology
- * A cybernetics of cybernetics
for mass-communication research

The first six sections define and elaborate on a few key terms that exemplify the spirit of the approach I am taking. The seventh assembles them into a picture that communication researchers might not find unfamiliar but is viewed here from an unfamiliar perspective. In the last section I am carrying this perspective to its logical conclusion and return to a critique of the concepts that I deliberately avoid in the picture I am painting thus showing its divergence from George's approach to media institutions.

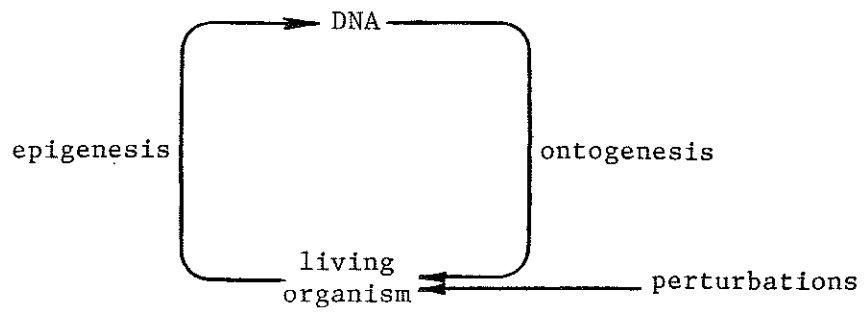


Figure 2

Information

The word "information" has many meanings including that of meaning. I will not review its etymology or alternative conceptions and plunge right into the notion convenient here: information is the logical or organizational work a pattern enables its receiver to do. A prototypical though limiting example is DNA. It consists of a particular string of genes whose chemical substances do not really matter except for the spacial configuration or pattern it manifests. By itself DNA knows nothing, does nothing, intends nothing, represents nothing, contains no significant amount of energy and quickly disintegrates. Only when implanted into a fertile environment, a womb, does it start realizing its potential, engages a network of interaction with available components, organizes them around itself and thus coordinates the growth of a living organism, including the capacity to reproduce a copy of the very DNA that initiated the process. Thus, information is not energy, as Wiener (1948) always insisted, not a thing, not even a message that could be separated from its context. It indicates a pattern's potential to guide an ontogenetic process whose complement is the re-storing (bringing back to storage and transmission) of DNA by an adult organism and is here called epigenesis. Both are depicted in Figure 2.

Figure 2

I am adding an arrow labeled perturbations to indicate that the circular process takes place in a medium and may be subject to mutation and other disturbances unknowable from the inside, causing the process of reproduction to drift.

In the social domain, blueprints, recipes, fairy tales and TV shows have similar capabilities. A blueprint, for example, when given to a building contractor who commands the necessary human and material resources to build many kinds of structures, enables him to set an organizational process in motion that is selective of people, coordinates their work, directs the flow of materials and ultimately leaves a certain kind of building behind. Just as in DNA and in blueprints, information is always tied to a particular context whose dynamics it directs. The blueprint probably means little to a cook whose recipes mean little to a construction crew. However, unlike DNA which is exhaustive (specifies an organism's growth process completely) and deterministic (leaves little to chance), blueprints and the like leave their receivers considerable organizational options including to reject them. To build a house requires much more information than a blueprint could provide (ranging from knowledge of building codes to acquired professional skills), and the process could not be realized without providing some collective benefit. Also unlike DNA, artifacts or the processes that produce them rarely create their own blueprints except with the help of people that make images, tell stories, offer

descriptions, write organizational manuals or create theories that eventually enable the very process they emerge from to be recreated at another place, at another point in time and in a different materiality.

If one were to analyze the information provided by a socially relevant message in the context of such a cycle, one would not ask what it physically contains, what it refers to or what its appropriate paraphrases may be, but what it enables someone to do with it, the activities it encourages or constrains, the distinctions it brings forth to someone, the role it can play in a receiver's life, the regulatory capability it has in the face of given perturbations--all in the context of required and available resources. Kenneth Boulding (1978) describes this information as "know how" not "know what." Indeed, many crime stories invented for television have found imitators and popular celebrities are adopted as models by members of a community provided these receivers have the resources and incentives to realize them in their own lives. Asking questions regarding ontogenesis may bring us closer to understanding public media in the process of making society happen than asking the traditional questions of representation, content (correspondence and truth).

Generalizing the diagram for DNA to the social domain leads us to Figure 3

Figure 3

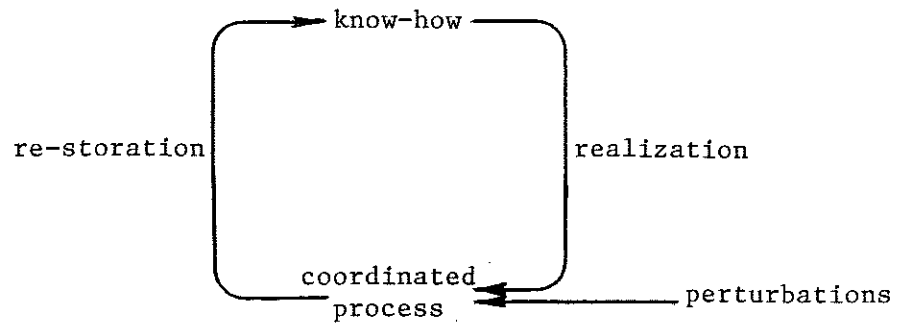


Figure 3

In biology some say that living organisms are the clever inventions of DNA to reproduce itself. Others characterize DNA as the endowment a parent organism passes to its offsprings. What unites both views and generalizes to the social domain is that the circularity preserves the potential of an ongoing genesis. Information is an essential ingredient of society as well, whether in the form of a continuous inter-translation of theory and practice, public knowledge and everyday life or of technological know-how and the ecology of artifacts it keeps in motion.

I am offering this concept of information also as a richer alternative to the notion of power in social discourse but will later comment on why.

Noospheres and ecospheres

It is important to keep the enabling pattern, know-how or information, analytically distinct from the actual processes they enable to be realized else it is difficult to understand what communication does. In biology the distinction between genes and living organisms and between a genosphere and a phenosphere proved enormously productive. Boulding (1978) draws an analogous distinction between the noosphere that contains all the know-how knowledge available in a culture and the ecosphere that contains all the artifacts a culture brings into interaction at a time, including socialized human beings and social organizations which are man-made as well. Following Carl G. Jung, Gregory and Mary

Catherine Bateson (1987) made a related distinction between creatura, the world we draw distinctions in and thereby make, and pleroma, the world of undifferentiated continua that we know nothing about but live in and that occasionally interferes with or perturbs our actions. Creatura embraces both of Boulding's spheres and I see pleroma as the medium in which the circular processes of ontogenesis and epigenesis take recognizably place.

The distinction between a noosphere and an ecosphere is particularly important in the light of the different processes operating in either sphere. Whereas physical interaction among people, machines, natural resources, and large energy flows clearly take their place in an ecosphere, the creation, construction, recombination (multi-sexual mating) of patterns through perception, thinking and above all their communication could be said to be defined in a noosphere. Anatol Rapoport's proposal that content analysis be concerned with studying the body of verbal corpses humans secrete into their environment as a system (1969) and George Gerbner's message systems analysis (1969a) have similar foci on the noosphere. However, I like to see the noosphere of a culture or society be analyzed neither as secretion from an ecosphere nor as representative of something but as the repository of what is physically and socially possible within a culture.

Institution

The words "institution" and "organization" are often used interchangeably. George's reference to mass-media institutions does not differentiate between them either. I believe a clear distinction is essential to an understanding of how communication enables the continuous creation of society.

Etymologically, institution comes from the act of establishing, of giving order to a thing, regulation, but also an established law, custom, usage or practice, a regulative principle or convention. In contrast, organization comes from organism, the process of being organized, but also the structure of interdependent or subordinate elements whose relations and properties are largely determined by their function in a whole (Oxford English Dictionary, 1933).

Already in common discourse we distinguish between the institution of family, for example, and a particular neighbor's family. Positivist sociologists seek to construe the difference as one between what is common to all existing families and the particular incident of a family. Although it is impossible to believe that ordinary people could know, are able to or care to find out what all families have in common, they do have a reasonably clear idea of what a family is or should be when they start one (even without first hand experiences in the role they are then taking), when they decide who does or does not belong (Jorgenson, 1986), when they evaluate someone else's family in whichever terms, or when they decide whether a particular family

is broken. What a family is is also instituted in written law and then guides judge's decisions in divorce and child custody matters. A particular family is a social organization that includes real people in interaction and obtains its identity when those involved invoke the regulative principles of (their own notion of) family as an institution.

Let me then define an institution as a coherent set of regulative principles that enable individuals to coordinate their behavior into definite organizational pattern within a particular domain (also see Eisenstadt, 1968). Institutions entail the interpersonal expectation that those interacted with conform to it, the desire to behave as expected and a willingness to act on deviations perceived in others. Besides an occasionally formal recognition by legal authorities, institutions are legitimized by generating unopposed or unchallenged recurrent interaction. Institutions also have names and lend their identity to the organizations they realize.

Thus, institutions realize a variety of organizations of a particular kind (with the same identity) which through unopposed pattern of interaction among members establish themselves as legitimate in a particular domain and in turn generalize themselves into or re-store (support or modify) the very institution that gave rise to it. Accordingly, institutions consist of know-how, have information, can be considered as belonging to a noosphere, and are communicable through experiences, by examples, in the form of stories or by written

messages (law). In contrast, the actual interactions among individuals that constitute a particular organization belong to an ecosphere, occupy physical space and take place in a medium. The processes that go on between the two are processes of continuous co-production or genesis in the face of perturbations from the medium in which these processes take place. Institutions also specify conditions for membership, the rationality applicable within its domain and the already mentioned organizational identity. The rationality dimension is particularly important here. It defines legitimate means, ends and optimizing procedures which may differ radically in different institutions (compare the cognized purposes of a family, a business enterprise, a church and a municipal government).

Eleanor Rosh (1978) would probably say here that institutions are cognitive prototypes against which the typicality of a particular organization (its deviations from an "ideal" reference point) is judged and its identity is established. The regulative principles that define an institution do not imply organizational hierarchies, however. Only the accomplishment of recurrent coordination of behavior among members matter. Institutions are also not super-individual entities or centrally issued rules and regulations (even though legal authority may enforce some of them). Institutions are located in individuals' cognition and interactions and distributed among human participants in organizational processes.

Without human participation neither social institutions nor social organizations can exist.

In sociology there is a tradition of distinguishing among institutional spheres, for example, the sphere of family and kinship, the economic sphere of industry, commerce and business, the political sphere of government and the sphere of cultural, educational and religious activities. These spheres are formed by sociologists putting a great number of organizations, thought to have something in common, into one category and then studying the transactions between these aggregates. This analytical practice has little to do with my preceding distinction which is grounded in participant experiences and informed by anthropological notions of institution, their expression in language and cognition, and intended to shed light on communication processes for which these objectifies sociological categories leave little room.

Social organization

In contrast to institutions, social organizations are real, involve an infrastructure of people, artifacts, communications, and operate in a medium of available resources including potential members and other organizations they may interact with and thrive on. Organizations may grow in size (by whichever measure) stay where they are or even perish, but always are in the process of realizing and re-storing the potential inherent in the institution to which they thereby belong and may do this

sequentially or concurrently involving same or different individuals. The same group of individuals could sequentially constitute themselves as a town meeting, as a country fair or as a religious congregation by each taking different roles. A particular institution also could give birth to a whole population of concurrent organizations, each involving different individuals at any one time as in advertising agencies, film producers or families. It is also common for individuals to move through an organization without affecting it, through employee turnover, for example, or joint memberships as when members of one organization sit on the board of another. There is more fluidity in social organizations than we commonly think. In this context, social organizations are mere patterned processes that may decompose and reassemble themselves at different times in different places with institutions being the medium through which the reproduction and dissemination of coordination of human interaction takes place. The diagram in Figure 3 applies here as well.

I have to say here that I am not a functionalist who believes that all social organizations are designed to pursue a particular goal, require consensus among members as to their purpose, must be organized in a hierarchical fashion or that all individual acts could or should be analyzed in view of the contribution they make to the maintenance (function) or weakening (dysfunction) of the whole. There are some organizations that are designed with some purpose in mind, but most just happen to

exist by projecting the sequence of their past realizations into their future. In fact, when asked, most managers in charge of large organizations are unable to state their organization's aims exhaustively and think about goals only in response to particular crises. That social organizations can preserve their identity in the face of changing membership or change their identity under preservation of their membership makes it misleading to compare them with biological organisms whose components, while replaceable, cannot help but stay together as long as they live.

However, it is safe to state three propositions. First, no social organization can exist for long unless it derives adequate benefits from interacting with its medium (environment), distributes these as incentives for participation to its members, and simultaneously maintains, improves or expands its infrastructure, relying on internally acceptable principles of rationality for this distribution. Second, no social organization can exist for long unless it can preserve a legitimate identity vis-a-vis other organizations, recruiting qualified members and socializing them into its own organizational culture. This means supporting, expanding, defending against threats to legitimacy the very institution that infuses "life" and encourages and coordinates the interaction among members constituting the organization. Finally, no social organization can exist for long unless it can observe the (manifest, and according to its own principles of rationality, self-serving) consequences of its own actions on its environment.

Thus the network of interactions constituting an organization must contain loops, however complex they may be, i.e., recursive processes involving its medium or environment, through which an organization can see itself. This circularity has elsewhere been called operational closure (Varela, 1984), informational closure (Ashby, 1956) and probably is the most important organizational unit of analysis proposed here.

To elaborate briefly, when A causes B, B causes C and C causes A, then A, B and C are said to be involved in a circular causality. A circle has no beginning and no end. Seeking to explain A, for example, requires one to go first to C than to B and back to A which was to be explained. Thus each participant in a circle ultimately explains itself via others and the whole resists manipulation from the outside. Similarly, when the communication paths through an organization lead to behaviors in an environment whose consequences are seen or fed back into the very communication paths that led to them, the circle is closed or open only to perturbations from its environment. Thus, social organizations explain themselves or constitute themselves in the circularity of their own communication paths. Decisions made inside mark an organization's autonomy. I hasten to add that my concept of information does not imply causality and the circularity that constitutes a social (as opposed to biological) organization is a circularly (and hence mutually) enabling one.

To take another step towards the framework for institutional analysis I have been promising, let me take ecology as model of

interaction, one that probably is the radical opposite of social organization, and then locate processes involving the mass-media dynamically in between.

Ecology of organizations

The idea of ecology comes from biology where it is defined as the interaction among many populations of species (not to be confused with the interaction between two or more organisms or between one and its environment) and applied there largely to animals and plants. As a framework for an institutional analysis it is attractive for four reasons:

First, populations of species live in their own environment or ecological niche to which they respond and which they organize in their very own categories. Ecological models do not presuppose that different species share an "understanding" of each other and see their worlds through the same eyes (Uexkuell, 1940). Similarly, there is no need to assume that a business enterprise, whose members collectively conceptualize their environment in terms of products, markets, competitors, financial opportunities and governmental constraints, construct their world in the same way as a police department or a church would do. Each has its own rational principles for converting resources into benefits of their own kind. Each has its own categories for reality constructions. Each lives in a virtually different world which does not prevent them from interacting with each other.

Second, populations of biological species seem to hang together through both competition for scarce resources and cooperation for maintaining a common gene pool without which a species ceases to exist. Similarly, because social organizations of the same kind are constitutively alike, construct their worlds in similar categories, thrive on similar resources, including a common pool of qualified members and therefore "understand" each other better than any other species of organizations can, they naturally compete among themselves. However, from an ecological perspective, it does not really matter which particular organization of a species does survive and how, as long as a sufficient number of such organizations continuously reproduce themselves and re-store their institution (or institutional sphere) either by their own recurrent behavior or by jointly supporting other organizations (e.g. for professional education, research or lobbying) that will.

Third, ecologies evolve stable relationships between species. To interact, different species need not know each other and often are categorically incapable of doing so except through the consequences of their own actions. From the perspective of an outside observer, recurrent actions and perceived consequences form complex and increasingly stable networks consisting of cooperative, competitive, symbiotic or parasitic relationship chains that simply emerge or are metaphorically speaking "negotiated" without outside intervention. (In fact an ecology recognizes no outsider, only participants). Ecologies are

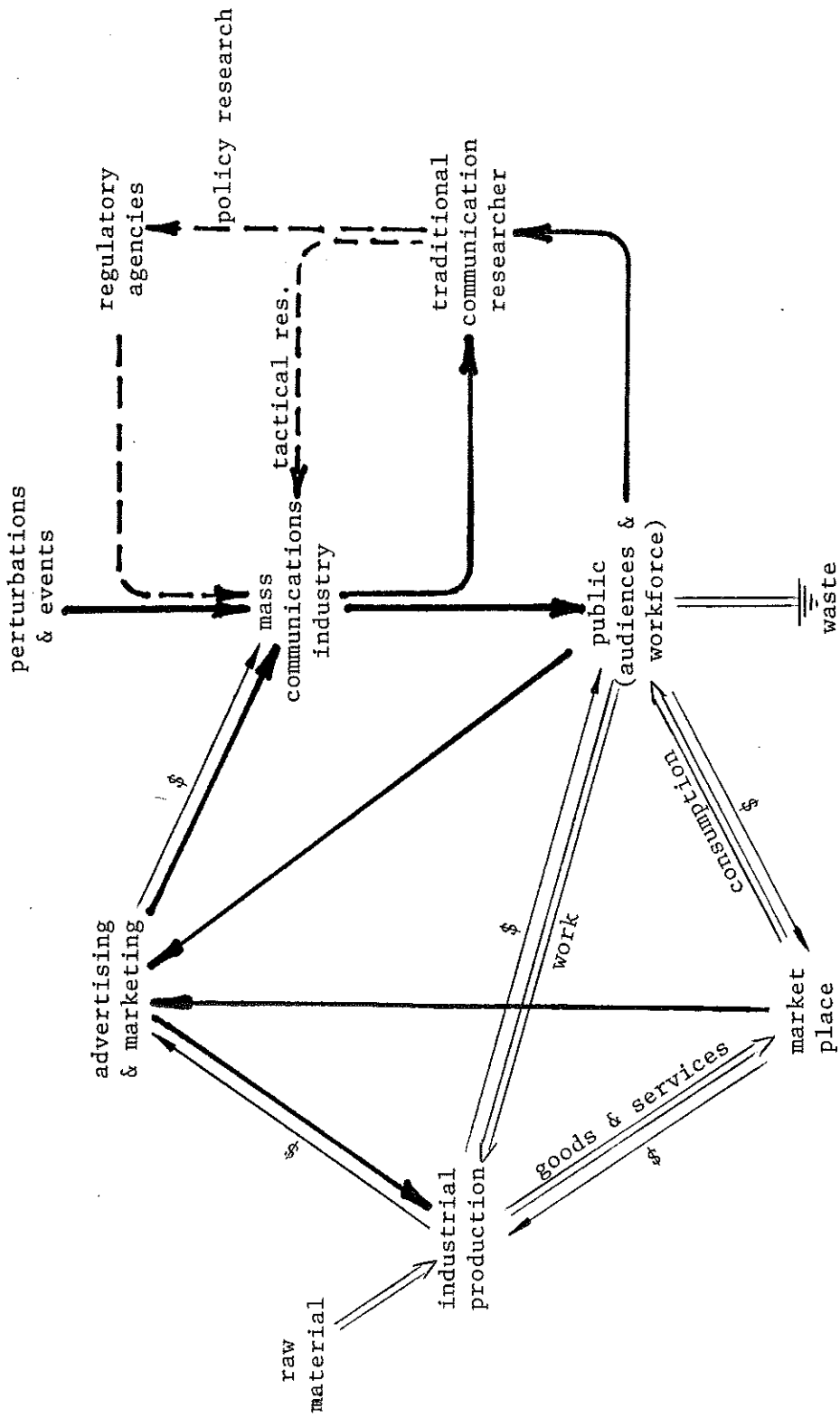


Figure 4

neither designed by a single species nor do they require a central ruler or authority to function. An ecology is not democratic, egalitarian or just but responsive to every connected population of species. (A biological ecology is also responsive to the human species, of course, but because we can neither understand other species well nor interact with them "reasonably," even though we continuously try, we experience our ecology as rather unruly and certainly unmanageable). An ecology is a radically heterarchical and distributed system.

Fourth, ecological systems seek balance or converge towards some equilibrium at which populations keep each other in check, continuously check and maintain an optimum variety of species, and assure the most efficient use of limited resources. Gregory Bateson (1972) is one of many who described such an equilibrating tendency as distributed wisdom. But, whereas the gene pools of different biological species are sexually incompatible, in the noosphere, the institutions of different species of organizations are rarely so distinct and laissez-faire under conditions of a coherent and purposively created noosphere can become pathological as Bateson pointed out (1972,1987) or collectively disadvantageous (Hardin, 1968).

Mass-media ecology

Let me now sketch with Figure 4 an extremely simplified and selective account of an ecology that includes such species of organizations as the mass communications industry and the public as constitutive parts, mass-media ecology for short.

Figure 4

The figure clearly does not do justice to the ecological complexities we know of. For example, the communications industry comprises stations, networks, wire services, journalists, production studios, not to forget the technological infrastructure around which it grew, a complex web all by itself. The figure also excludes financial organizations, civic action groups, universities that do in fact participate. People also have multiple organizational memberships and flow through this ecology as well. Nevertheless it serves the purpose of the argument and includes some of Figure 1 for it is the role of communication research I will end this paper with.

In this figure, one may see several circles. The money flow from the public to the market to industrial production and back in the form of compensation for work, regulates the consumption of goods, services and energy by the public. Money naturally flows in a direction opposite the flows of matter and energy. Several circles involve advertising and marketing in various

capacities. As the industry's eye on the market, advertising and marketing is implicated in optimizing the flow of goods and services. As the arm of industrial production it creates advertisements and financially supports mass communication which in turn delivers favourable markets. One may also observe that the money that pays for the communications industry's behavior in the public domain comes via advertising, via industrial production, sales and consumption of goods and services and ultimately from the public's earnings for contributing productive work. As George Gerbner (1977a) noted, this is a heavy tax paid by the public for entertainment believed to be free of charge. But the most important circle involves all five species of organizations.

Arrows in Figure 4 do not represent causes but information flows. They therefore do not depict what (multi-causally, conditionally, probabilistically or structurally) "determines" the occurrence of an event but the flow of patterns that enable logical work (computation or decision making) or organizational work (regulation, coordination of interaction) to be performed. The circularities in which the mass-media are implicated are enabling circularities: one pattern enables its receiver to create another pattern that enables some other receiver... and the whole chain ultimately proves itself as a viable pattern to all participants within the circle. The circular enablement may ultimately become a recurrent process that reinforces its own practice.

In this ecology, money is not seen as causing anything either. Money does not provide know-how by itself. It is an (economic) enabler in its purest form but useful only in conjunction with specific know-how from elsewhere. In an ecology of social organizations money becomes a co-driver of the informational enabling process.

Note also the role of perturbations in a mass-media ecology. Events may enter from the outside and are capable of introducing unexpected variations, disturbances or "news." Such perturbations may reverberate throughout an ecology, are systematically transformed in passing or rejected already at the entry point. Traditionally, and with a journalistic perspective and linear communication conceptions in mind, one may confuse such perturbations with the content of communication, with what news is expected to bring to public attention. My point is that within a mass-media ecology the information communicated throughout an ecological network, including as messages, goods services, money and interorganizational exchanges and agreements, pertains first of all to its own circular enabling processes. It is invented largely within these processes and supports or will at least not work against the continuous reproduction of the network, connecting a great many organizations as participants at different points in their processes, each for their own benefits. Only secondarily may the circularities be seen as perturbed by outside events. If they are, information about events is always systematically transformed, incorporated and assimilated into

internally communicable pattern. All conventions from linguistic representations to journalistic practices exemplify such systematic transformations which outsiders who can claim privileged access to its causes may consider biased but insiders consider established facts. Only if information from the outside resists such transformations may it become a true disturbance. Traditional preferences for linear causal explanations initiated by outside events and the belief in a correspondence conception of truth are thus necessarily partial, and if the flow of information in society is circular, goes back to where it started, describing the one-way flow of outside events to a public and stopping there is seriously misleading. As a unit of analysis, a linear causal chain would remove from understanding the very institutional/organizational phenomena that make this flow possible.

Note again that a mass-media ecology as presented here has no designated controller. It regulates itself through its network of interaction, establishes itself through the participation of each species of organizations, including those marked "regulatory" agencies which thrive on public information, perhaps as provided by communication researchers, and participate in the process by constraining perceived excesses. To recognizably conserve itself, each species of organizations needs to continually realize its own institution but does not require anything beyond a "myopic" view of the species it interacts with or "sees." This is true also for traditional communication

researchers who can pursue their own communication model without a conception of the ecology of which they are a part. The self-regulation of the circular enabling process is such an ecology's most outstanding feature.

A Cybernetics of Mass-Media Ecology

Cybernetics originated in the 1940's when a series of interdisciplinary conferences culminated in a better understanding of circular causal feedback mechanisms, later called cybernetics, the science of control and communication (Wiener, 1948). It offered a new approach to understanding purpose, not as an unanalyzable quality of living beings, not by reference to a vital substance or divine force, for example, but as a consequence of the way a system is put together and behaves. Cybernetic teleology explains or predicts behavior, whether it is geared to achieve a goal, maintains an equilibrium, systematically grow in some variable or appears entirely random. It does so by reference to the network of interaction underlying this behavior. Historically, structural-behavioral explanations are not new, but cybernetics also provided the mathematics and initiated the development of a new kind of machines proving such explanations to be sufficient. This had radical consequences initially in technology (development of automatic control devices, computers, and communication networks), but somewhat slower in the conduct of social science [evolutionary epistemology (Campbell, 1974); experimental episteology (McCulloch 1974), cybernetic explanations (Bateson, 1972) and radical constructivism (Glaserfeld, 1984)].

Since its inception, cybernetics has witnessed a wealth of conceptual developments, has acquired new definitions and

given birth to numerous disciplines, but circularity remained one of its pillars. Circularities are abundantly present in the mass-media ecology as described, essential to social organizations and built into my notion of information as the potential for ontogenesis. Process is another such pillar. Cyberneticians do not ask what something consists of or is but what it does (Ashby, 1956). Thus, while social organizations are composed of people, the individual qualities of their members are less important than how they communicate with each other, the network of enabling processes in which they constitutively participate and the institutions they interactively realize. In this section I want to merely sketch three hypotheses of an institutional approach to the mass-media. The first two are derived from the biologist Varela (1984), the third is characteristic of social systems.

In ecologies of social organizations,
recursive processes converge towards stable
realities.

Circular processes are describable by recursive functions whose definition implies that they are repeatedly entered into their own arguments and compute a chain of values analogue to going around and around the same circle. While some recursive functions are explosive (diverge from any starting point into infinity, like exponential functions

do), in the non-mathematical world of finite resources, infinity does not exist and organizations that are constituted with explosive circularities "blow themselves up", do not persist for long and become rare. Therefore, it is no surprise that most recursive processes that are indeed observed are converging (like the square root function or divisions by numbers greater than one), even in the face of perturbations from the medium in which they are embodied. The behavior towards which a recursively describable process converges is called its eigen-behavior (eigen-value, eigen-operation, etc.) which is characterized by regularity, the absence of differences or invariances under continuous perturbations. Recursive processes can be said to regulate themselves with goals and values implicit in the network of interaction underlying this behavior. I will give an example before coming to the main interpretation of this hypothesis.

If a farmer repeatedly plants the seeds from her highest yielding crop, the evolving strands will increase their yield until they reach a plateau at which continued selection is necessary to maintain but will then no longer improve that yield. At this point the recursive operation (of selecting seeds from the highest yielding crop) and its product (crop yielded) go hand in glove, one defines the other, and constitutes an eigen-behavior. The farmer may be fully aware of the self-imposed recursion and desire the ultimate outcome even though the continued effort without

further improvement may end up being an unanticipated burden. Burden or not, the farmer's recurrent operation and the yield constitute that farmer's stable, interactively predictable and structurally determinable reality, regardless of where the process may have come from.

In an ecology, a comparable awareness of its circularities is not required for convergence to take place. In the mass-media ecology of Figure 4, advertisers will certainly know who their clients are and respond to them but may not care about the other participants' modes of operation. Manufacturers tend to know their markets, appreciate the value of advertising and bring the two together but do not need to be aware of the latent consequences of advertising in order to reap their institutionally defined harvests from establishing the connection. The communication industry knows where the money comes from and the audiences it has to deliver in return but does not need to go much beyond this understanding, etc. If each species of organizations just optimizes its own benefits by its very own institutional criteria and repeatedly applies the same operations on the opportunities available information offers to them, the overall recursive process carried out by these organizations are likely to converge to an eigen-behavior at which the realities of each and every participant in the circle appears coordinated and reasonably stable, interactively predictable and manageable within individual spheres of

interest. It is the circular enablement within an ecology, not an overall system awareness, plus the individual institutions that regulate organizational behavior which gives the whole a certain direction, a structural purpose and the implicit goal of constructing mutually coordinated realities.

Reality constructions need not be individually created images, models or things, however, but viable ontogenetic-epigenetic processes between a noosphere and an ecosphere, spread throughout an ecological network of communication. If the repeated realization and re-storing of information is circularly enabling, then this process creates or constitutes realities that do not depict or represent anything outside that process. For example, most genres on television, talk shows, soap operas, quizzes, crime series, westerns, etc. did not exist before radio. They should be regarded as "negotiated" inventions that satisfy numerous organizational interests, whether for regular production schedules, advertising breaks, predictable programming, political interests, ethnic representations, civic concerns, etc. With realities thus increasingly fixed, TV networks, newspapers and radio stations may change hands but do not change the service to their audience members.

This convergence hypothesis has been largely substantiated on the level of individual communication (Kincaid, 1979), mass communication (Kincaid and Schramm, 1975), in social organizations (Rogers and Kincaid, 1981)

and is an underlying assumption in George Gerbner's cultivation research except that cybernetics provides structural explanation of this behavior. The idea of a collective communication theory with multiple participants and no single source of control has most recently been developed by Wickenden (1988).

Ecologies of social organizations change by natural drift while preserving their recursivities.

As above said, recursive processes develop "a life of their own" whose realities are somewhat resistant to control efforts from the outside and can therefore be said to be self-preserving. But what is preserved here is not a particular realization or everything that happens to be part of the resulting reality but its enabling circularities, its coherence. When A enables B enables C enables A, all three may commit themselves to continue to relate to each other so as to preserve the process of mutual enablement but not necessarily its physical manifestations. Indeed, in an ecology of social organization there is a constant turnover of components (of people, organizations and artifacts). Each such change introduces changes in its material composition, form and membership without affecting the (individually experienced) process of mutual enablement. The hypothesis suggests that recursivity under perturbation may send an

ecology adrift and that this drift is neither structurally determined nor purposive from within.

A new technology may radically alter the operation of one species of organizations and drive another species out of existence, but tends to modify only the medium in which circularities persist. Certain management practices may ruin one advertising agency but another typically already waits to expand into its place. Unsuccessful organizational practices may drop out of circulation in such drifts and may temporarily increase a system's overall efficiency, but this implies little if anything about long term gains. Events intruding from the outside, new laws, unexpected economic conditions, social revolutions, etc. may force evolutionary changes in other variables of a system, cause the whole to adapt, drift into new territories but rarely do they destroy the underlying recursivities. Unless the majority of participants or at least certain key players are enabled to participate in radically different networks and employ new rational criteria, the whole recursive process merely drifts. This drift is "natural" in the sense that its causes can not easily if at all be comprehended from within the reality constructions that a recursivity entails, and rarely is noticed as such.

The idea that recursive communication processes resist outside influences conflicts particularly with the traditional journalistic ideal of truthful (in the sense of objective, value-free and observer-independently verifiable)

reporting. We are made to believe that news is new, caused by unanticipated outside events of social significance and is to be completely and accurately covered by the media, and yet, we know too well that true surprises are personally difficult to understand and have hard times entering the self-supporting circular flows of information throughout organizations. Unless they can be phrased in familiar terms, seen as furthering cognized interests, or infringe only on the weakest or most dispensable components involved in a network, they are likely to be ignored. Witness the practice of defining what is newsworthy and what is not, the planning of news events or news conferences, or the mere adaptation of traditional themes, myths, stories, editorial formulae to contemporary circumstances, using ancient metaphors to render the incomprehensible understandable at least as far as tradition allows it.

Information in circuit first of all affects itself and thereby becomes constituted as real during repeated recursions. The unfolding of the history of mass-media content thus facilitates internal structural purposes. Only secondarily does a mass-media ecology drift, elaborate missing details, adapt to new circumstances, evolve or incorporate unignorable variation into the flow of information. What accumulates in response to perturbations is information whose survival value is not knowable from within, hence the "natural" drift.

In ecologies of social organizations,
recursive processes tend to become
institutionalized, especially in the presence of
public communication, thus transforming itself
(the ecology) into an integrated system of its
own.

As a model, an ecology accounts for interaction among populations of species that need not understand each other. No single controlling agency is required. None has a picture of the whole. Institutionalization is a process where accidentally arisen or consciously initiated organizational pattern become transformed into communicable, legitimized and regularized institutions capable of realizing networks of interaction similar to those that gave rise to it. Institutionalization is self-organization in the social domain. It is also a form of convergence that takes place in the noosphere in which language and human communication play decisive roles. Through institutionalization, the radically distributed nature of a social ecology erodes into an integrated social system, with regulative principles of its own, a social organization composed of different species of social organizations. Thus, in the social domain an ecology is a mere transitional phenomenon.

One source of institutionalization lies in the advantage standardized interfaces offer to participants. To

interact efficiently, manufacturing industry took the path of agreeing on norms for types, alphabets, frequencies, connections. The communications industry evolved program schedules, as printed in TV Guide, and a vocabulary by which audience members can talk to each other, make appropriate choices and express their preferences through surveys and interviews. Promotional agents connect talents with production studios by established categories. Lawyers promote the kind of distrust that enables them to provide and argue the validity of legally enforceable contracts, thus placing an interfacing institution in between. Multiple memberships on the boards of directors of supposedly independent industries are still another form of institutional integration through the regulation of interfaces.

Probably the most important source of institutionalization is the very information the mass-media provides to the public. The public does not merely participate as a component in the mass-media ecology of Figure 4, it also is the pool from which virtually all members of the other organizations are drawn and public information therefore penetrates the institutional spheres of nearly all participating organizations. Since Harold Lassell's proposal for a list of functions of communication in society is "the correlation of the components of society" (1948) recognized as such. George Gerbner says much the same when he proposed to look at mass communication in terms

of "what is related to what" (1969a). Indeed, it is only through some form of public communication that people can achieve an awareness of the system as a whole an overview of how the diverse constituents of a society hang together, by which principles the interaction intermittently existing social organizations are regulated, what options for social participation do exist, etc. However, the mass-media are not the only source of institutionalization. Others, regulatory agencies in government, expansionist business corporations, but also social theories of mass-communication compete with each other for providing legitimate accounts of how society operates and by which system principles it is to be understood and seen as regulated. As George once added to his analysis of (mass or public) "communication: Society is the Message" (1974). I would emphasize that such accounts not merely describe what is, they also make society happening.

In the competition for determining the direction institutionalization may take, those organizations most observant of the whole, most directly connected with the public or most authoritatively involved with a system are likely to institute their own principles of regulation before others can. Indeed, since "surveys" of mass-media's fictional populations have been made (e.g. Loewenthal, 1944; Berelson & Salter, 1946), such populations have been shown to be heavily skewed towards entertainers, actors, popular heroes, celebrities and other ethnic favorites who are

largely "made" by and representative of the mass-media and whose social role models assure these media a continuous supply of talent, popularity and large audiences. Moreover, the mass-media promote a show business ethic which underlies their very own rationality whose penetration into other institutional spheres (for example the politics of elections, sports, even war) makes the mass-media a dominant institution and creates a social system that hides the circularities on which the mass-media are actually organized.

On the other hand, social scientific theories of the structure of mass-media systems, which carry the weight of scientific validity in a manner to be described below, do compete with popular notions and those serving institutional interests and direct institutionalization as well. It is the willingness of communication researchers to become engaged in this "struggle" for institutionalization that makes communication theories socially relevant.

The last but perhaps the most important consequence of institutionalization to be mentioned here lies in limiting the variety of cognitive models accessible to people for organizing their own lives. A mass-media system by its own practice, selectively reproduces itself and elaborates primarily those parts of the noosphere that are beneficial or at least not harmful to the operation of that system and organizes the noosphere around the very regulative principles that legitimize its own organization. In the

extreme case, this amounts to supporting cognitive traps for individuals that serve to perpetuate the mass-media system as instituted and prevents individuals from taking different perspectives. This is accomplished not by the exercise of force, not even by deliberate elimination of options but by overwhelming the public with choices that are institutionally irrelevant: choices among similar entertainment programs, choices among competitive (and hence alike) consumer products, choices among political candidates that will do much the same, choices among answers to survey questions that are neither binding anyone nor threatening existing institutions. (In the sociology of knowledge, such limitations are associated with a dominant ideology. Here I do not presume a noosphere to be so consistent and am more concerned with the dynamic its variety implies).

A cognitive trap prevents individuals from shifting to larger perspectives, from seeing their world or themselves with different eyes, particularly when faced with apparently meaningless tasks, perplexing situations, or feeling of alienation or helplessness. Social scientists are not exempt from such entrapments. The seemingly endless repetition of research into manipulative notions of communication and attitude change, for example, requiring momentous efforts for only small gains in predictability might serve as an example. The trap results from believing this to be the only notion of communication meaningfully researchable without realizing that this very notion also

provides both the economic basis for the communications industry and the conceptual framework for creating popular entertainment to which social scientists are subjected as well.

Although the cybernetic framework sketched in the foregoing does explain processes that are essentially indigenous to a system, it involves scientific observers (me) as outsiders. When detached from their object of observation, scientist are likely to see themselves either as superior beings, capable of an understanding the observed people are not, or as cynics who nobody listens to for their taking of alien perspectives. The two positions entail constructing people either as trivial machines with no creative capability of their own (Krippendorff, 1986) or as pathetic creatures unable to help themselves and doomed to be controlled by others, e.g. by "the system." I believe this is the necessary consequence of an epistemology that forbids observing scientists to enter their domain of observation and expects them to describe reality objectively, that is, without awareness of their own creative role in this process. The next and final section seeks to transcend this outsider perspective on mass-media systems and develop a more responsible position.

A Cybernetics of Cybernetics for Communication Research

Ever since Margaret Mead suggested that cybernetics apply its knowledge to what cyberneticians do (1968) has cybernetic epistemology become an increasingly fascinating venture (e.g. Bateson, 1972; Foerster, 1974, 1979; Howe, 1975; Maturana & Varela, 1980; Keeney, 1983; Krippendorff, 1984; Segal, 1986). I am suggesting this autology (the application of knowledge onto itself (Lofgren, 1984)) applies to communication research as well. Communication researchers cannot but practice what they study, i.e., they need to communicate their theories of communication. The application of insights, principles and concepts of communication to how communication researchers come to their theories and communicate them to others, including to the people about whom these theories speak, is, I am convinced, epistemologically revolutionary here as well.

I take it to be obvious that social theories of communication are different from theories of how signals are transmitted between machines in that they constitutively involve people capable of learning from them. As human individuals, we are not only the ones who make them up but respond to them as well. Such responses may take the form of consciously accepting and applying them to our lives, but also of actively opposing them in public discourse, deliberately violating them, for instance, when they make us realize to what we have been conforming before. We also can

invent new or better theories and make them true in new kinds of practices. Under these conditions social theories are no longer either simply true or not. Their "truth" depends on acceptance, practice and consent and those proposing such theories through their very publication cannot escape participating in the process they may thereby set in motion.

That even data easily become invalidated by entering the stream of public communications is easily demonstrated. Earlier publications of content analysis statistics on racial bias in magazine advertisement and TV fiction in terms of frequencies of kinds of characters has made the population of the television characters a more fair representation of the population of viewers but shifted racial biases, where prejudices persisted, to not yet or principally immeasurable areas of expression. Feminist attention to male dominant language use, whether through pronoun construction, hidden presuppositions or stereotypical expressions, has increased linguistic awareness, modified sexual references in public discourse, created a new literature and area of research and significantly altered inter-gender communication. Theories of the emerging information society have construed information as a commodity and significantly altered the way corporations measure and account for their information processes and economy of intelligence. Making a big jump, both in scale and in time, Karl Marx' theories of class

struggle as the fundamental basis for societal development has become an unquestioned reality for revolutionary movements and the societies that emerged from them but do not work at all in the capitalist West where people took his predictions to heart, opposed the theories in public and in action and developed another society instead.

George Gerbner is of course aware of the potentially self-validating consequences of television content. One of the hypotheses he advanced is that heavy viewers of television violence develop exaggerated expectations of violence outside their home and are less likely to go out on the street at late hours, thus inviting criminal elements to rule the streets unchecked. That television stories become truer as they are watched, particularly in the "main stream" of the flow of mass produced messages is guiding much of George's cultivation research and is also quite consistent with the cybernetic theories that stable realities come into being by recursive networks of communication. George was featured frequently on television, testified in the U.S. Congress, wrote numerous articles in popular magazines like in TV Guide, Popular Psychology, Scientific American and business and religious newspapers. His TV violence data are also widely cited. His "message" certainly has been inserted into the noosphere, has been publicly discussed and has become part of the very television content it is concerned with.

And yet, I do not think his theories take account of the "institutional truth" they might be creating by their very publication (and George promoting them). Being involved in a "War against Violence" (1977c), he certainly wouldn't like to bring about the scary world of television he describes, or see that television replace religion. Surely, he must be painting these scary images to be provocative. But then, any criticism that merely uncovers, objectively describes and scientifically predicts the "terrible things the mass-media actually do," must firstly be accepted as authoritative accounts of what is going on in fact. Numerical backups play their symbolic role in suggesting their undesirable truth. This becomes secondly disabling, for scientific predications cannot be altered at will without denying their validity in the first place. Such criticism is thus unable to serve as a ground for intervention, at worst reinforces or legitimizes the very practice it calls to question and at best initiates a search for convenient scapegoats or remedies from outside the system. Criticism that would account of the institutional truths must create viable futures.

Moreover, George himself is living proof of a creativity and imagination that his communication theories deny those who watch television, maybe just as much as he does: Whereas, he expects audiences to become "mainstreamed" by the massive presence of industrially produced messages, he himself has become more--not less--

critical the longer he is exposed to this medium, etc. I am suggesting that the unavailability of institutional analyses of the mass-media which George lamented may be explained not so much by the lack of adequate funding but by the epistemological difficulties traditional researchers experience in making their analyses applicable to their own practice, having to include themselves.

The foregoing leads me to three stipulations, jointly amounting to the position of a new criterion for the validity of social theories of communication, here applied to the analysis of mass-media systems and institutions. They read as follows:

First: Theories of mass-media systems must be communicable and realize their own ontogenesis within the very system they claim to describe.

It recognizes that acts of communication are acts of bringing forth or changing the phenomena they describe and demands this to be recognized also for acts of communicating theories of communication. It specifically stipulates that said theories be realizable, result in viable communication practices and reproduce these practices, perhaps in other systems as well. Of course, the most obvious media to which such theories must be applicable is an existing mass-media system it may redirect or thereby transform. The stipulation simply considers theories as information with

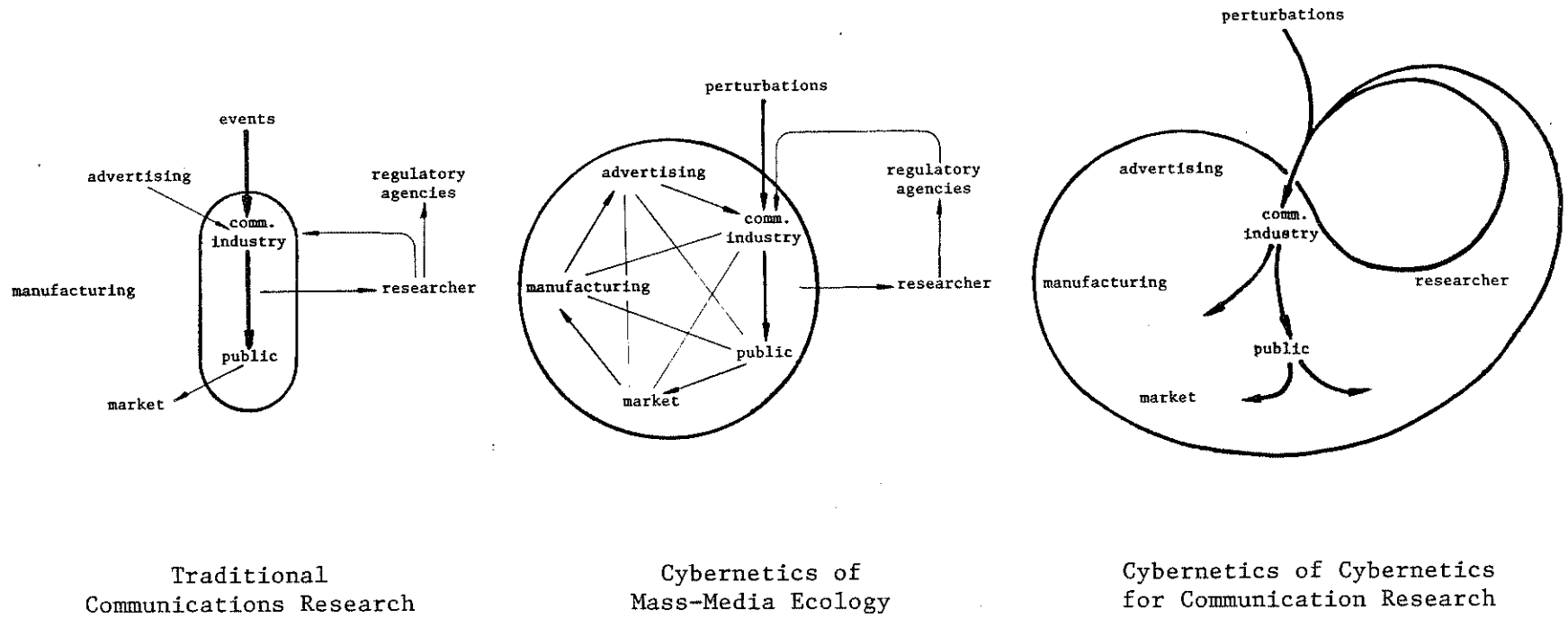


Figure 5

ontogenetic capabilities of their own. It implicitly rejects the positivistic correspondence notion of truth and the associated ontological assumption of an observer- and actor-independent reality that simply "waits" to be discovered. It suggests instead that the truths of theories lies in the process of making the realities such theories claim they can.

Second: The construction of theories of mass-media systems must include their creators as responsible participants.

It holds communication researchers fully accountable for the effects of their theory constructions and "findings," not merely to a scientific community or an arbitrarily chosen reference group, but to the human constituents of the very object (organization, network of communication or system) their theory describes, informs or may bring about. Theories are inventions and born in freedom but also entail participation and taking responsibilities for their consequences. It incidentally responds to feminist criticism of the typically male construction of "disembodied knowledge," which is rational, objective, emotionally detached without reference to the knower (Belenky, et al., 1986). Participation and responsibility implies that a theory not only works but also embody their creators.

Third: The creators of theories of mass-media systems must grant the human constituents of this system the same cognitive abilities they claim for themselves in constructing them and be willing to live in the very realities their theories could bring about.

This ethical stipulation is intended to prevent oppression resulting from the acceptance of theories that describe people in less than human terms and that could force people to be treated or become that way in practice. The first stipulation speaks of theories as being realizable (a theory that yields nothing, enables no one, simply is socially irrelevant). The second speaks of the participation and responsibilities of their creators. Circumventing the difficulty of spelling out the human qualities that must not be retarded by mass-media theory constructions and research, this third stipulation guarantees all human constituents of a system under analysis the same cognitive competence, freedom and responsibility the second attributes to the analysts of systems shaped thereby.

The form of such self-reflective theories is different from traditional forms. Theories that include their creators must be constructed within their very own object and the process of constructing such theories also as a process of reconstructing the object while it is described (Krippendorff, 1984). Figure 5, which schematizes Figure 4,

compares the domains of the three approaches to theory construction I have been discussing graphically.

Figure 5

Before relating these epistemological concerns to key concepts in the institutional analysis of mass-media systems and institutions, I might add that the proposed stipulations derive in part from previous work (Krippendorff, 1989) whose full implications can not be elaborated here. Moreover, I am also applying these to my own involvement in a very different domain, that of industrial design and development of future communication technology, where new ideas have both technical and social consequences, not unlike those of interest here. Although design is always intended to be creative of reality, more so than scientific theories are believed to be, taking responsibility for the reality either activity brings forth is largely neglected in both domains.

The framework sketched so far already reflects the cybernetic epistemology I ended up with here: it enables looking at social organizations as communication networks that change as they are described. It enables social researchers to responsibly participate in what is essentially their own affairs and it requires looking at institutions by being "kind" to their constituents, not denying them the cognitive abilities communication

researchers do claim for themselves. In the following contrasts I will merely show why these analytical concepts were chosen in preference to traditional ones.

Information versus power. In social science discourse and even in ordinary talk about politics and interpersonal relations, notions of power are rampant. Power is a metaphor from physics where it denotes a non-dimensional quantity that expresses the rate at which energy is exerted to causally effect mechanical work. In physics, power flows one-way only and is pitched against a measure of the resistance to change. Applied to people, the power metaphor entails that people are either powerful, powerless, or possess power in degrees and, depending on the rate of "energy" they have acquired, are able to force others to change. The use of power metaphors goes back to the early fascination with mechanisms and engineering at the beginning of this century. Consistent with his time, Max Weber defined "power (as) the probability that one actor within a social relationship will be in a position to carry out his own will despite resistance, regardless of the basis on which this probability rests"(1922:152). Here too, power is an attribute of individuals or groups on account of their position, status and personality.

In the social world, I am suggesting that power always resides in a relationship between people and abstracting it from its base, just to enforce causal explanations, is going back to mechanistic conceptions which even the "hard"

sciences have long abandoned. In society, it is submission, not resistance, that invites power to emerge. The use of coercive force makes sense only where the consequences of non-compliance are feared. Authority is effective only among those who accept or grant its legitimacy and are willing to subject themselves to it. Social influence primarily occurs where those influenced do indeed benefit from changes. I am suggesting that the use of power metaphors in social theories and discourse diverts attention from the complicity by the actors involved, conceals the relational source of social change, and reifies a mechanistic reality construction in which the capacity of the powerful cannot be questioned and the powerless remain cognitively trapped in continued submission. Power metaphors always serve the powerful and describing social relationships in these terms only amplifies alleged power differences. It objectifies power, breeds the power of the powerful and disables people to get out of such relationships. People that become aware of alternative reality constructions may also become aware of their entrapments and will then no longer practice what theories of power entail. The framework I propose is intended to encourage the latter.

For this reason, I propose that the analysis of social mass-media systems and institutions be based not on notions of power but on concepts of information as defined. Information always presupposes options, some freedom of

choice, can be rejected and its acceptance is predicated on understanding, in its receiver's very own terms, what it operationally entails and the benefits that can be expected from adopting the implied practice. I suppose this is the way we read scientific books, watch commercials on television, follow road maps, apply technical instructions and should consider obeying orders as well. In social situations, information can not force anything. It enables its receiver to coordinate something not possible otherwise. Within mass-media systems, information may flow through many paths, whether in the form of entertainment, payments for services or interorganizational exchanges, but the path most important here is from that system to communication researchers and back. It is through this loop that both the system and the researchers reorganize themselves and acquire interdependent identities.

Enablement versus causality. Linear causal explanations link a consequence to its cause, whether this link is conditional on other circumstances, multiply determined, probabilistic or merely sufficient. They presume relatively trivial mechanisms underlying both the phenomena and their models, mechanisms that do not involve recursive processes or internal circularities and can therefore have no "life of their own." Many communication theories are basically causal in nature, for example, when a message is said to cause a receiver to change his or her mind or to respond appropriately. Notwithstanding later

developments, Shannon's landmark Mathematical Theory of Communication was originally conceptualized as a statistics of probable causations. Here, words like message and communication merely replace the arguments in a logic of linear causality. Circular causalities have overcome limitations of linearity (although these notions are far from fully explored in communication research as I will argue below) but do not respond to my contention that one can not cause someone to think, understand or accept an argument, message or theory. Human communication is different.

I cannot develop here a more appropriate notion of communication except to point out that, while interactions through messages always are physically grounded, no doubt, causing sensations of sorts, what makes them cognitively relevant is that they enter as perturbations into internally coherent and intentionally directed cognitive processes and are interpreted, made sense of, or used there in a receiver-characteristic manner. Communication may either disturb and interfere with intentional processes or, by looking for what we want to see and ignoring what we have no use knowing, facilitate or enable such processes, hence the association of information with enablement rather than with causation or catalysis.

Explanations in terms of enablement no longer focus attention on initiating conditions, causes or senders but on relationships that receivers have a choice in co-

constructing with credit to "senders" or enablers for aiding their (structurally defined or asserted) efforts. I am convinced, enabling relationships, or networks of mutual enabling processes are the backbone of individual participation in organizations, the constitutive base of society, and provide a ground on which mass-media systems may be understood. Recursive enabling networks drive systems larger than their participants and can thus provide structural explanations for individual, organizational and ecological behavior.

Participation versus control. I already stated that most communication theories are linear and cast into causal frames. There is a sender, a message and a receiver. There is the communications industry, a message system and its mass audience, or public, etc. Linear communication theories imply instrumentality and control and research guided by such linear constructions or geared to elaborating, defining and perfecting such communication theories or generating data on their behalf naturally supports social control. This kind of theory and research is what advertising needs, totalitarian governments require and various kinds of authorities can thrive on. It not only enables those desirous of controlling others but, especially when so much research, theorizing and scientific authority is invested in this notion, it retards other forms of communication as well: dialogue, healing, altruism and love, for example, and discourages awareness of the larger

fabric in which that control is implemented. By reference to Figure 4, linearity can be achieved by cutting a circle into pieces and looking at one linear causality at a time. Moreover, defining communication either by reference to a particular technology, television for example, or focusing on what is conventionally conceived of as messages, traditional communication researchers tend to omit what does not fit such technologies or conventions and embed themselves thereby in the larger system in ways that coincide with dominant institutional interests in this system (see left diagram in Figure 5).

There are of course critical voices in communication research. But those who question merely the ends toward which control is employed continue to support the equation of communication and control and contribute little to overcome the helplessness, distrust, fear and oppression this equation ultimately encourages regardless of the critics' intentions.

The proposed framework takes two steps away from this dominant tradition in communication research. The first lies in the cybernetic proposal of viewing multiple communication links as networks, tracing its paths not just from one mode to another but also back to it. Cyberneticians have found recursive processes in such networks to be far more interesting units of analysis for they shed light on the self-referential dynamics, eigen-behaviors, reality constructions, etc., all of which escape

the study and aggregation of linear communication links between any two modes. This emphasis on circularity neither localizes and supports manipulative efforts nor does it lead to a search for ultimate controllers, foundationalist principles or prime movers. It always starts from and leads back to the constituents of a system (see the center diagram in Figure 5).

The second step away from the traditional preoccupation with control is accomplished by formally enabling communication researchers to participate in their own constructions. The cybernetics of cybernetics for communication research or a cybernetic epistemology realizes cognitive autonomy to be equally fundamental for both, the social scientists that create theories of society and the people that occur in and practice these constructions. As seen in the right diagram in Figure 5, this is not a mere addition or extension, like adding another node to an already large network. It puts the communication researchers as an active participant right into the self-referential mass communication process they are observing. It realizes that the act of communicating about observations also is an act of creating the phenomena being described and it suggests a new connection between language use and the cognitive constitution of society.

Ontogenesis of self versus ontology. The naturalistic tradition of science calls for describing reality the way it is or was before it was observed or "tampered" with by

scientific observers. It considers an observer-independent ontology the only meaningful object of scientific inquiry and all influences on it as frustrating this aim and biasing its results. We cling to this tradition through our methodological commitments as if it were the only way for the social sciences to proceed. Already the equation of communication and control, the belief in the ability of someone to cause others to think in ways they may not want to, bears the dilemma between describing the purposive tendencies of networks versus what exists. This dilemma is conventionally resolved by taking scientific observers out of the picture they are painting and rendering them as superior, detached and value-free beings who may not enter the world of others much less their own.

I am suggesting this 19th Century philosophy of science to be a trap, appropriate at best to distant astronomical objects, no longer capable of contributing to a society with enhanced communication and near universal participation but conveniently supported by those social organizations whose institutions benefit from disabling social scientists from actively participating in a society that continually creates and recreates or makes itself.

To take an extreme case, naive materialism regards matter and energy or the mode of production and consumption of tangible goods as the decisive determinants of social life (as if it mattered to copper whether it is cast into a bullet or applied to a computer chip, or as if socialist and

capitalist systems would automatically emerge from different technologies of production). This is not to deny that matter matters. It does indeed sustain living organisms and consequently also the social organizations involving them. But matter, energy and money by itself can not and do not have the specificity to determine the particular organizational forms that do arise as a consequence of a recursive processing of information. Not only is information different from matter or energy, as Wiener (1948), Bateson (1972) and many others have insisted, living organisms, social organizations and social systems largely determine their own pattern, are embedded in their own histories, contain their own explanations or inform themselves through the circularities of their own networks.

To look for determinisms outside ourselves in an "objective material substrate", in pleroma, is to belay our modern but nevertheless common experiences that we can, within physical constraints, make different things happen and that we can participate, by our very ability to communicate with others, in continuously shaping the realities we live in. Reality constructions built upon unidirectional determinisms not only absolves scientists from taking responsibilities for their theories and research findings, but also blinds them from seeing the ontogenetic consequences of their own communications and disables them from making relevant contributions to an evolving society. In contrast, the proposed framework for institutional

analysis takes a dynamic notion of communication as a starting point, carries it through to its self-application and encourages communication researchers to be responsibly involved in a process of continuous genesis.

Ecology versus mistaken holism. Social organizations in general and mass-media systems in particular probably are more heterarchical and self-directed to begin with than we are willing to see. In fact, we like to see pattern even in the face of obvious randomness and project dependencies where there aren't any. For this reason I took ecology as an initial and perfectly reasonable model for how people in organizations can interact with each other recursively without requiring central control or a global understanding. I also suggested that in the presence of public communication, an ecology of social organizations tends to institutionalize coordination and erodes into a social system. This emerging holism is a natural consequence of social self-reflection, the workings of the mass-media, global interests including scientific inquiries into mass-media systems and institutions, all of which compete for institutionalizing some kind of consensual practice or another. With reference to the stipulation given above, there are two forms of mistaken holism that can enter and transform a mass-media system as well: personification and objectification.

Personification involves projecting human qualities to naturally multifarious, complex and therefore only partly

understandable social organizations. In communication research this has taken the form of conspiracy theories, for example, whose proponents interpret every seemingly unfair event, e.g., the unequal distribution of goods, services and information throughout the world, as evidence of corporate intentions or imperialistic designs. Personification may also take the form of a reductionist search for a single controlling principle, plan, governing elite or leader, thought to have the immense power to coordinate people, events and economies to achieve its hidden objectives. Personification is evident in language use, metonymy in particular. It can offer simplistic explanations, shifts collective responsibility to convenient scapegoats, charismatic leaders or super-natural beings, and frustrates taking individual responsibility for participating in communication networks that constitute what personification veils.

Objectification arises in characterizing social systems and organizations as composite unities whose members derive their existence from the larger whole of which they are seen as parts, are subordinate to its function and are, by a correct but dangerous extension of this logic, dispensable in that organization's ontology. In such characterizations, analogies to biological organisms are common and general systems theory with its built-in preference for hierarchical explanations is prone to this mistaken holism as well. Examples of objectifications are found in statements like

"the whole is more than the sum of its parts," beliefs in super-individual qualities, explanations in terms of unquestionable over-arching values, and finally in legal or popular constructions of social institutions as entities whose objectivity is entirely independent of their human constituents.

Objectification is particularly prevalent in analyses of the mass-media system (as if there would be only one account), seeking to establish its organization from the outside (as if its constituents had no voice of their own) and explaining the behavior of its components as subordinated to an abstract overall objective, value or principle of unknown location. Such objectifications fail to see institutions as embodied in and interactively maintained by the human constituents of such systems, make no allowance for these constituents to have cognitive abilities similar to those scientific observers claim for themselves, especially regarding their creative participation, and are unable to describe communication as (recursive) processes through which a system becomes constituted as meaningful prototypes. Analyses based on such mistaken holisms would therefore have to be considered invalid by my stipulations. In such constructions, the institutionalization of personifications may be simplistic and diversionary but the institutionalization of objectifications tends to suppress awareness of social participation, creates respect for abstract system

principles nobody can call to question and legitimizes super-individual powers behind which oppressive structures can conveniently hide.

The framework sketched here is intended to be sensitive to and reveal these dangers. Based on the belief that nobody would consciously submit to oppression or opt to be confined into undesirable cognitive traps, it suggests that the analysts of mass-media systems and institutions see themselves as part of the system their description may bring forth, shape or create, commit themselves to live in it and in anyone's place.

Conclusion

When asked to apply their own theories of communication to themselves, traditional communication researchers must become painfully aware of their own schizophrenia, living in two distinct and conflicting worlds, the world their theories describe, in which people are constructed largely as trivial machines of sorts, (Krippendorff, 1986), and the world of cognitive competence and academic freedom in which researchers can invent and test any theory imaginable. Resolving this pathology by seeing themselves as part of a system their research informs entails a new epistemology in which the validity of theories is decided at least in part in competition for consensual practice, and the taking of responsibility for the ensuing reality construction becomes a requirement. It is my contention that social scientists

in general and communication researchers in particular have an obligation to guard against inhuman theories and research results in their own midst and in the system of their concern, wherever these constructions of reality may come from. Demystification has been a historical mission of science. To reveal dehumanizing communication theories and practices is a mere continuation of this critical mission. It is informed by new insights that human nature and communication is intricately intertwined and, after the invention of the mass-media, all embracing. George Gerbner has claimed this connection repeatedly. This paper merely unfolds the radical consequences of a different perspective and projects them into yet uncharted domains.

References

- Ashby, W. Ross. An Introduction to Cybernetics. London: Chapman & Hall, 1956.
- Bateson, Gregory. Steps to an Ecology of Mind. New York: Ballentine, 1972.
- Bateson, Gregory and Mary Catherine Bateson. Angels Fear: Toward an Epistemology of the Sacred. New York: Macmillian, 1987.
- Belenky, Mary Field, Blythe McVicker Clinchy, Nancy Rule Goldberger and Jill Mattuck Tarule. Womans Way of Knowing. New York: Basic Books, 1986.
- Berelson, Bernard and Patricia Salter. Majority and Minority Americans: An Analysis of Magazine Fiction. Public Opinion Quarterly 10, 2:168-190, 1946.
- Boulding, Kenneth E. Ecodynamics. Beverly Hills: Sage, 1978.
- Brouwer, Marten, Cedric C. Clark, George Gerbner and Klaus Krippendorff. The Television World of Violence, Pp. 311-339 & 519-591 in Robert K. Baker and Sandra J. Ball. Mass Media and Violence. Vol. IX. A Report to the National Commission on the Causes and Prevention of Violence. Washington, DC: U.S. Government Printing Office, 1969.
- Campbell, Donald T. Evolutionary Epistemology. Ch. 12, pp. 413-463 in Paul Arthur Schilpp (Ed.) The Philosophy of Karl Popper. The Library of Living Philosophers Vol. XIV Book I. La Salle IL: Open Court, 1974.
- Eisenstadt, Shmuel N. Social Institutions. Pp. 409-521 in David L. Sills (Ed.) International Encyclopedia of the Social Sciences. New York: Macmillian and Free Press, 1968.
- Gerbner, George. Mass Media Discourse: Message System Analysis as a Component of Cultural Indicators. In Teun A. van Dijk (Ed.) Discourse and Communication. Berlin, Germany: Walter de Guyter & Co., 1985.
- Gerbner, George. The Gospel of Instant Gratification. Business and Society Review. P. 68, Spring, 1982.
- Gerbner, George. TV: The New Religion Controlling Us. Long Island Newsday. Pages 1 & 6, November 9, 1980.

Gerbner, George. Controller of Our Fears. In a symposium on "The War Against Television Violence." Business and Society Review, Fall 1977c.

Gerbner, George. Television: The New State Religion? et cetera, June 1977b.

Gerbner, George. Popular Culture: Who Pays? Pp. 8-9 in Popular Culture ("Courses by Newspaper," University of California, San Diego, distributed by United Press International.) Del Mar, CA: Publishers, Inc., 1977a.

Gerbner, George. Communication: Society is the Message. Communication 1: 57-64, 1974.

Gerbner, George. Cultural Indicators: the Third voice. Pp. 555-573 in George Gerbner, Larry Gross and William Melody (Eds.) Communications Technology and Social Policy. New York: Wiley, 1973.

Gerbner, George. Communication and Social Environment. Pp. 111-118 in Communication: A Scientific American Book. San Francisco, CA.: Freeman, 1972.

George, Gerbner. The Film Hero: A Cross-Cultural Study. Journalism Monographs, No. 13, 1969b.

Gerbner, George. Toward "Cultural Indicators:" the Analysis of Mass Mediated Public Message Systems. Pp. 123-132 in George Gerbner, Ole R. Holsti, Klaus Krippendorff, William J. Paisley and Philip J. Stone (Eds.) The Analysis of Communication Content. New York: Wiley, 1969a.

Gerbner, George. An Institutional Approach to Mass Communications Research. Pp. 429-451 in Lee Thayer (Ed.) Communication: Theory and Research. Springfield: Charles C. Thomas, 1967b.

Gerbner, George. Mass Media and Human Communication Theory. Pp. 40-60 in Frank E.X. Dance (Ed.) Human Communication Theory: Original Essays. New York: Holt, Rinehart & Winston, 1967a.

Gerbner, George. On Defining Communication: Still Another View. Journal of Communication 16: 99-103, 1966.

Gerbner, George. Ideological Perspectives and Political Tendencies in News Reporting. Journalism Quarterly 41: 495-509, 1964.

Gerbner, George. Mental Illness on Television: A Study of Censorship. Journal of Broadcasting 3: 292-303, 1959.

Gerbner, George. On Content Analysis and Critical Research in Mass Communication. AV Communication Review 6: 40-53, 1958b.

Gerbner, George. The Social Role of the Confession Magazine. Social Problems 6: 29-40, 1958a.

Gerbner, George. Toward a General Model of Communication. AV Communication Review 4: 171-199, 1956.

Gerbner, George and Kathleen Connolly. Television as New Religion. New Catholic World, 221: 52-56, 1978.

Gerbner, George and Larry Gross. The Scary World of TV's Heavy Viewer. Psychology Today 9, 11:41-45 & 89, April 1976.

Gerbner, George, Larry Gross, Michael Morgan and Nancy Signorielli. Living with Television: The Dynamics of the Cultivation Process. Pp. 17-40 in Jennings Bryant and Dolf Zillmann (Eds.) Perspectives on Media Effects. Hillsdale, NJ: Lawrence Erlbaum, 1986.

Gerbner, George and George Marvanyi. The Many Worlds of the World's Press. Journal of Communication 27,1: 52-66, 1977.

Gerbner, George and Percy H. Tannenbaum. Mass Media Censorship and the Portrayal of Mental Illness: Some Effects of Industry-Wide Controls in Motion Pictures and Television. In Wilbur Schramm (Ed.) Studies of Innovation and of Communication to the Public, Stanford, CA., Stanford University Press, 1962.

Glaserfeld, Ernst von. An Introduction to Radical Constructivism. Pp. 17-40 in Paul Watzlawick (Ed.) The Invented Reality. New York: Norton, 1984.

Hardin, Garrett. The Tragedies of the Commons. Science 162: 1243-1248, 1968.

Hirsch, Paul. The "Scary World" of the Non-Viewer and other Anomalies: a Reanalysis of Gerbner et al.'s Findings of Cultivation Analysis, Part I: Communication Research 7: 403-456, 1980.

Howe, Richard Herbert. Some Problems of Social Cybernetics. Cybernetics Forum 7, 2:3-6, 1975.

Jorgenson, Jane. The Family's Construction of the Concept of Family. Ph.D. dissertation. Philadelphia: The Annenberg School of Communications, University of Pennsylvania, 1986.

- Keeney, Bradford P. Aesthetics of Change. New York: Guilford, 1983.
- Krippendorff, Klaus. On the Ethics of Constructing Communication. Presidential Address delivered to the International Communication Association Conference on Paradigm Dialogues, May 26, 1985 in Honolulu, Hawaii. In Brenda Dervin, Larry Grossberg, J. O'Keefe and Ellen Vartella (Eds.) Rethinking Communications: Paradigm Issues, Vol. 1. Newbury Park, CA: Sage, 1989 in press.
- Krippendorff, Klaus. On Constructing People in Social Inquiry. Philadelphia: The Annenberg School of Communications, mimeo, 1986.
- Krippendorff, Klaus. An Epistemological Foundation for Communication. Journal of Communication 34:21-36, 1984.
- Krippendorff, Klaus. Content Analysis: An Introduction to its Methodology. Beverly Hills: Sage, 1980.
- Kincaid, D. Lawrence. The Convergence Model of Communication. Honolulu, HI: East-West Communication Institute, 1979.
- Kincaid, D. Lawrence and Wilbur Schramm. Fundamentals of Human Communication. Honolulu, HI: East-West Center, 1975.
- Lasswell, Harold D. The Structure and Function of Communication in Society. Pp. 37-51 in Lyman Bryson (Ed.) The Communication of Ideas: A Series of Addresses. New York: Harper, 1948.
- Lofgren, Lars. Autology for Second Order Cybernetics. Pp. 77-83. Proceedings of the 10th International Congress On Cybernetics. Namur: Association Internationale de Cybernetique, 1984.
- Lowenthal, Leo. Literature and the Image of Man. Boston: Bacon Press, 1957.
- Maturana, Humberto R. and Francisco J. Varela. Antopoiesis and Cognition: The Realization of the Living. Boston: Reidel, 1980.
- McCulloch, Warren S. Recollections of the many Sources of Cybernetics, ASC Forum 6:5-16, 1974.
- McLuhan, Marshall. The Gutenberg Galaxy: The Making of Typographical Man. Toronto: University of Toronto Press, 1962.
- McLuhan, Marshall. The Mechanical Bride. New York: Vanguard Press, 1951.

Mead, Margaret. Cybernetics of Cybernetics. Pp. 1-11 in Heinz von Foerster, John D. White, Larry J. Peterson and John K. Russell (Eds.). Purposive Systems. New York: Spartan Books, 1968.

Rapoport, Anatol. A System-Theoretic View of Content Analysis. Pp. 17-38 in George Gerbner, Ole R. Holsti, Klaus Krippendorff, William J. Paisley and Philip J. Stone (Eds.) The Analysis of Communication Content. New York: Wiley, 1969.

Rogers, Everett M. and D. Lawrence Kincaid. Communication Networks. New York: Free Press, 1981.

Segal, Lynn. The Dream of Reality: Heinz von Foerster's Constructivism. New York: Norton, 1986.

Rosch, Eleanor. Principles of Categorization. Pp. 27-48 in Eleanor Rosch and Barbara B. Lloyd (Eds.) Cognition and Categorization. New York: Springer, 1984.

Tenney, Alran A. The Scientific Analysis of the Press. The Independent 73: 895-898, 1912.

Uexkuell, Jacob von. Bedeutungslehre. Band X, Abhandlungen zur theoretischen Biologie und ihrer Geschichte, sowie zur Philosophie der Organischen Naturwissenschaften. Leipzig: Johann Ambrosius Barth, 1940.

Varela, Francisco. Two Principles of Self-Organization: Pp. 25-32 in H. Ulrich and G.J.B. Probst. Self Organization and Management of Social Systems. New York: Springer, 1984.

Wickenden II, Thomas H. The Collective Communication of Social Choice Messages. Ph.D. Dissertation. Philadelphia: The Annenberg School of Communication, University of Pennsylvania, 1988.

Wiener, Norbert. Cybernetics or Control and Communication in the Animal and the Machine. New York: Wiley, 1948.