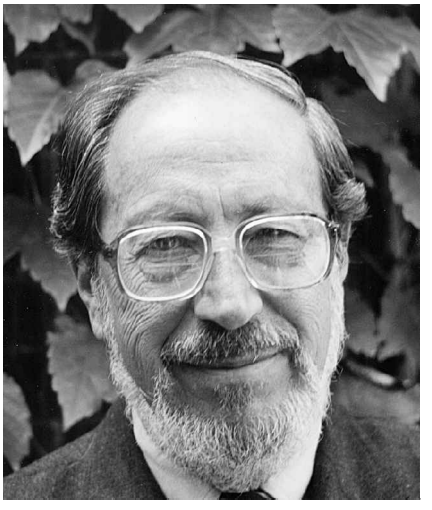
From the Founding Editor

EDITORIAL

Dear Reader,



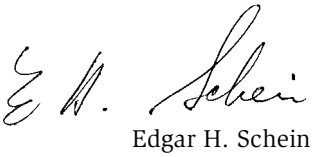
I want to introduce *Reflections: The SoL Journal* and tell you what our basic purpose is and how we propose to go about fulfilling it. What makes the Society for Organizational Learning (SoL) as an organization unique is the effort on the part of researchers, consultants, and practitioners (active managers) to build bridges to one another's domains so that knowledge and skill that is developed in one domain can be disseminated and used in the other domains. We start with the assumption that each of these communities has important insights into how organizations can be improved and how our global environment can be better sustained, but we are highly aware of how difficult it is to communicate across the cultural boundaries that grow up in each of these communities. It is my hope that *Reflections: The SoL Journal* can contribute in a meaningful way to the creation of a genuine dialogue that will stimulate the creation, dissemination, and utilization of knowledge and skill in all of these communities.

To achieve these goals, we will create a journal that is somewhat different in that it will try to draw material from each community and try to speak meaningfully to each community. We will solicit a broad range of research pieces, case histories, essays, interviews, learning histories, and classic articles that illuminate individual, group, and organizational learning. To supplement original pieces, we will rely to a considerable degree on reprinting articles that either have not been seen by our community or that warrant another look. We will also count on communications from you in the form of letters, short articles or think pieces, comments, elaborations, or anything else that you believe will communicate your point of view.

The selection of our editorial board reflects our goal of broadening the knowledge base on which we want to draw and, as you will see, our selection of pieces for the journal reflects this same effort to expand. The effort to broaden should not, however, encourage a loss of focus on what SoL represents. To this end, I want to make available to our readers some of the thoughts of our society's first Managing Director Göran Carstedt. The publication program will attempt to speak to the purposes and principles Göran articulates in the next piece and, especially, to work to build knowledge across the boundaries of research, capacity building, and practice.

We have a terrific team working on the production end of this enterprise: Karen Ayas will be the managing editor, Judy Rodgers has managed to convince MIT Press to publish the journal, and Stephen Buckley has done a heroic job of managing all of the day-to-day affairs at SoL. In addition, Paula Cronin has done some of the key editing. Otto Scharmer has lent support at all stages. And special thanks should go to Jean LeGwin for the design. This team will continue to work to make *Reflections* the best it can be.

Our goal is to be innovative. None of us wants one more journal in a world in which we already are inundated with written material of all sorts, so we will attempt to evolve a method of publication that will make readers want to read. However, we cannot succeed without your input and feedback. As we embark on this publication venture together, let us know what you think, send in contributions, and involve yourself in any way that makes sense to you.



Edgar H. Schein

About SoL

Göran Carstedt

The several thoughts that follow are based on Göran Carstedt's presentation to the Society for Organizational Learning members at the annual meeting on June 23, 1998.

Who We Are

SoL is a global learning community dedicated to building knowledge about fundamental institutional change.

Why We Are

To help build organizations worthy of people's fullest commitment.

For Whom We Are

For any institution and individual that is committed to SoL's purpose and principles.

How We Make It Happen

By discovering, integrating, and implementing theories and practices for the interdependent development of people and their institutions, through integrating:

- Research
- Capacity building
- Practice

How We Organize

- A nonprofit, membership society
- Self-organizing, self-governing organization
- Fractals (chapters) connected through SoL International

Our Guiding Principles

- *Drive to learn:* All human beings are born with an innate, lifelong desire and ability to learn, which should be enhanced by all organizations.
- *Learning is social:* People learn best from and with one another, and participation in learning communities is vital to their effectiveness, well-being, and happiness in any work setting.
- *Learning communities:* The capacities and accomplishments of organizations are inseparable from, and dependent on, the capacities of the learning communities that they foster.
- *Aligning with nature:* It is essential that organizations evolve to be in greater harmony with human nature and with the natural world.
- *Core learning capabilities:* Organizations must develop individual and collective capabilities to understand complex, interdependent issues; engage in reflective, generative conversation; and nurture personal and shared aspirations.
- *Cross-organizational collaboration:* Learning communities that connect multiple organizations can significantly enhance the capacity for profound individual and organizational change.

EDITORIAL

In This Issue

Edgar H. Schein and Karen Ayas

As part of our editorial duties, we will briefly introduce the issue to our readers. Eventually we intend to use the left-hand column next to the various offerings to share our reflections and to indicate what should be especially relevant for practitioners, consultants, and researchers.

In each issue, we will offer you a selection of classics and a diverse array of features that deepen and broaden our perspectives. In addition, we invite you to meet remarkable people in the field.

Classics

A sense of history is a great help to understanding the present, so we begin with a historical classic. Kurt Lewin's seminal research on autocratic and democratic authority systems opens the issue, with a brief commentary from Edgar Schein.

We follow with the Russell Ackoff classic on the nature of knowledge and systems and introduce there our concept of having commentaries serve as a vehicle for transmitting knowledge across the constituencies. An experienced consultant, William Altier, and a senior manager from General Motors, Vincent Barabba, kindly supplied those comments.

The article "Metanoic Organizations" from Kiefer and Senge rounds out the classics section. It is particularly interesting, fun, and educational to see how far back some of the ideas behind SoL actually go, to witness the authors' reflections as they look back, and to read the comments from Lotte Bailyn on "the young Peter Senge." You should at least skim these three classics.

Features

Under features, we offer a variety of fare for a variety of readers. This section begins with a testimonial. David Berdish describes how the use of learning tools made a major difference in his organization. Nick Zeniuk brings to the story the perspective of a consultant and former manager. Karl Weick introduces the researcher's perspective in an incisive, deep, and thoughtful commentary. It is the interplay of description of experience with a conceptual analysis that should attract the reader most. This is clinical research and concept building with Ackoffian wisdom at its best.

We follow with the Schein article on Lewin's contributions, with comments from Karen Ayas, Michele Hunt (a consultant) and Tim Savino (a manager). This article is most relevant to practitioners, as it describes in detail how a change course can be taught. At the same time, it argues for taking culture and the creation of helping relationships more seriously. Otto Scharmer reflects on this further.

We sharpen our focus on the human side of organizations with Arie de Geus's essay, which offers a new lens through which to view businesses and tools for thinking about strategy.

We go both broader and deeper as we continue to explore the interdependency between business and biology with Humberto Maturana's ideas and their elaboration by Pille Bunnel. This essay and the commentary by David Meador (a manager) and Dennis Sandow (a researcher) must be read reflectively.

We close this section with Stella Humphries's analysis of how language evolves in different occupational communities and how it begins to constrain and bias our thinking. As Schein's comment on this article indicates, this is one of the most important articles in the issue because it highlights the problems we will encounter in our own efforts to communicate across our various subcultures.

People

We plan to give voice to people in as many ways as possible—through interviews, letters, comments, poems, pictures, reports, and anything else we can think of that will put a human face on the community. As a start, we present an interview with one of the great early explorers in the field of organizational learning, Donald Michael, as conducted by Otto Scharmer. Don's message is complex and realistic, which is what makes it powerful. But be forewarned; it is not an easy message to digest.

Looking Ahead

This issue is our first effort to explore new terrain. We welcome reactions and comments.

In the next issue, we want to create a special section for ongoing conversations. Our aim is to engage all our readers in the weaving of knowing, reflecting, and acting. This, after all, is what learning is about. *Reflections* is a forum for cultivating conversations among researchers, consultants, and practicing managers. We invite you to be a participant in conversations of co-inspiration and collaboration.

To keep the people section lively, we will need to hear your voice. We also welcome for our News & Views section book announcements, reviews, recommendations, and notices that inform the community.

Send all mail electronically to pubs@sol-ne.org or to Editor, *Reflections: The SoL Journal*, 222 Third Street, Suite 2323, Cambridge, MA 02142. Thank you.

Experiments in Social Space (1939)

CLASSIC

Kurt Lewin

I

I am persuaded that it is possible to undertake experiments in sociology which have as much right to be called scientific experiments as those in physics and chemistry. I am persuaded that there exists a social space which has all the essential properties of a real empirical space and deserves as much attention by students of geometry and mathematics as the physical space, although it is *not* a physical one. The perception of social space and the experimental and conceptual investigation of the dynamics and laws of the processes in social space are of fundamental theoretical and practical importance.

Being officially a psychologist I should perhaps apologize to the sociologists for crossing the boundaries of my field. My justification for doing so is that necessity forces the move, and for this the sociologists themselves are partially to blame. For they have stressed that the view which holds a human being to be a biological, physiological entity is utterly wrong. They have fought against the belief that only physical or biological facts are real, and that social facts are merely an abstraction. Some of the sociologists have said that only the social group has reality and that the individual person is nothing more than an abstraction—a being who properly should be described as a cross section of the groups to which he belongs.

Whichever of these statements one might consider correct, one certainly will have to admit that psychology has learned, particularly in the last decade, to realize the overwhelming importance of social factors for practically every kind and type of behavior. It is true that the child from the first day of his life is a member of a group and would die without being cared for by the group. The experiments on success and failure, level of aspiration, intelligence, frustration, and all the others, have shown more and more convincingly that the goal a person sets for himself is deeply influenced by the social standards of the group to which he belongs or wishes to belong. The psychologist of today recognizes that there are few problems more important for the development of the child and the problem of adolescence than a study of the processes by which a child takes over or becomes opposed to the ideology and the style of living predominant in his social climate, the forces which make him belong to certain groups, or which determine his social status and his security within those groups.

A genuine attempt to approach these problems experimentally—for instance, that of social status or leadership—implies technically that one has to create different types of groups and to set up experimentally a variety of social factors which might shift this status. The experimental social psychologist will have to acquaint himself with the task of experimentally creating groups, creating a social climate or style of living. The sociologist I hope will therefore forgive him when he cannot avoid handling also the so-called sociological problems of groups and group life. Perhaps the social psychologist might prove

Kurt Lewin

Commentary
by Edgar H. Schein

Kurt Lewin was a scientist and researcher par excellence, yet Lewin probably contributed more to the practice of management and to the field of organizational consulting than anyone in history. On the scientific front, Lewin was a genius in creating true social experiments that demonstrated unequivocally the impact of leadership style and social climate on the productivity and emotional life of the group. Between the studies he initiated in the 1930s and the Hawthorne studies conducted in the 1920s, overwhelming evidence was produced that participation and empowerment influence productivity and morale in a positive direction. He showed clearly the dysfunctional aspects of the autocratic leadership style, a lesson we have yet to learn.

Why should consultants and managers read this article? First, to get a sense of history, to realize that the problems of organization and leadership with which we are wrestling today are not new: Much wisdom

has accumulated historically, if we choose to pay attention to it. Second, to see that good research has immediate practical applicability: What happened in these kids' clubs is readily recognizable in our own organizations. And, third, to get a deeper insight into Lewin's observation that democracy has to be learned: Autocracy can be imposed, but not so with democracy. We all need to ponder this insight, especially when we try to impose empowerment on employees who have grown up in an autocratic environment.

Lewin's contribution to the practice of education, consultation, and management is brought out further in my article. Lewin showed us that great research usually is motivated by tackling difficult, real problems. As he evolved his theories and methods, he demonstrated how intertwined practice and research really are. Action research, action learning, action science, clinical research, and a host of other methods practiced today by both researchers and consultants derive from the seminal insight that one cannot understand a system until one attempts to change it. Lewin set a wonderful example of how practitioners, consultants, and researchers can inform one another in the quest for more usable knowledge and skill.

to be even of considerable help to the sociologist. Frequently the investigation on the border line between two sciences has proved to be particularly fruitful for the progress of both of them.

Take, for instance, the concept "social group." There has been much discussion about how to define a group. The group often has been considered as something more than the sum of the individuals, something better and higher. One has attributed to it a "group mind." The opponents of this opinion have declared the concept of "group mind" to be mere metaphysics and that in reality the group is nothing other than the sum of the individuals. To one who has watched the development of the concept of organism, whole, or Gestalt, in psychology this argumentation sounds strangely familiar. In the beginning of Gestalt theory, at the time of Ehrenfels, one attributed to a psychological whole, such as a melody, a so-called Gestalt quality—that is, an additional entity like a group mind, which the whole was supposed to have in addition to the sum of its parts. Today we know that we do not need to assume a mystical Gestalt quality, but that any dynamical whole has properties of its own. The whole might be symmetric in spite of its parts being asymmetric, a whole might be unstable in spite of its parts being stable in themselves.

As far as I can see, the discussion regarding group versus individual in sociology follows a similar trend. Groups are sociological wholes; the unity of these sociological wholes can be defined operationally in the same way as a unity of any other dynamic whole, namely, by the interdependence of its parts. Such a definition takes mysticism out of the group conception and brings the problem down to a thoroughly empirical and testable basis. At the same time it means a full recognition of the fact that properties of a social group, such as its organization, its stability, its goals, are something different from the organization, the stability, and the goals of the individuals in it.

How, then, should one describe a group? Let us discuss the effect of democratic, autocratic and laissez faire atmospheres or clubs which have been experimentally created by R. Lippitt, and by R. Lippitt and R. K. White, at the Iowa Child Welfare Research Station. Let us assume the club had five members and five observers were available. It might seem the simplest way always to assign one observer to one member of the club. However, the result at best would be five parallel micro-biographies of five individuals. This procedure would not yield a satisfactory record even of such simple facts of the group life as its organization, its sub-groups, and its leader-member relationship, not to speak of such important facts as the general atmosphere. Therefore, instead of assigning every observer to one individual, one observer was assigned to record from minute to minute the organization of the group into subgroups, another the social interactions, et. In other words, instead of observing the properties of individuals, the properties of the group as such were observed.

…the child from the first day of his life is a member of a group…

In one additional point sociology may well profit from psychology. It is a commonplace that the behavior of individuals as well as groups depends upon their situation and their peculiar position in it. In my mind the last decade of psychology has shown that it is possible to give a clearly detailed description of the peculiar structure of a concrete situation and its dynamics in scientific terms. It can even be done in exact mathematical terms. The youngest discipline of geometry called "topology" is an excellent tool with which to determine the pattern of the life-space of an individual, and to determine within this life-space the relative positions which the different regions of activity or persons, or groups of persons bear to each other. It has become possible to transform into mathematical terms such everyday statements as: "He is now closer to his goal of being a first-rate physician," "He has changed the direction of his actions," or "He has joined a group." In other words, it is possible to determine, in a geometrically precise manner, the position, direction, and distance within the life-space, even in such cases where the position of the

person and the direction of his actions are not physical but social in nature. With this in mind let us return to the social experiment which was undertaken at the Iowa Child Welfare Research Station.

© Linda Cooper

II

It is well known that the amount of success a teacher has in the classroom depends not only on her *skill* but to a great extent on the *atmosphere* she creates. This atmosphere is something intangible; it is a property of the social situation as a whole, and might be measured scientifically if approached from this angle. As a beginning, therefore, Lippitt selected a comparison between a democratic and an autocratic atmosphere for his study. The purpose of his experiment was not to duplicate any given autocracy or democracy or to study an "ideal" autocracy or democracy, but to create set-ups which would give insight into the underlying group dynamics. Two groups of boys and girls, ten and eleven years of age, were chosen for a mask-making club from a group of eager volunteers of two different school classes. With the help of the Moreno test both groups were equated as much as possible on such qualities as leadership and interpersonal relations. There were eleven meetings of the groups, the democratic group meeting always two days ahead of the autocratic one. The democratic group chose its activities freely. Whatever they chose the autocratic group was then ordered to do. In this way the activities of the group were equated. On the whole, then, everything was kept constant except the group atmosphere.

The leader in both groups was an adult student. He tried to create the different atmospheres by using the following technique:

Democratic

1. All policies a matter of group determination, encouraged and drawn out by the leader.
2. Activity perspective given by an explanation of the general steps of the process during discussion at first meeting (clay mould, plaster of Paris, papier-mâché, etc.). Where technical advice was needed, the leader tried to point out two or three alternative procedures from which choice could be made.
3. The members were free to work with whomever they chose and the division of tasks was left up to the group.
4. The leader attempted to be a group member in spirit and in discussion but not to perform much of the actual work. He gave objective praise and criticism.

Authoritarian

1. All determination of policy by the strongest person (leader).
2. Techniques and steps of attaining the goal (completed mask) dictated by the authority, one at a time, so that future direction was always uncertain to a large degree.
3. The authority usually determined autocratically what each member should do and with whom he should work.
4. The dominator criticized and praised individual's activities *without giving objective reasons,* and remained aloof from active group participation. He was always impersonal rather than outwardly hostile or friendly (a necessary concession in method).

During the meetings of the two groups, the observers noted the number of incidents and actions per unit of time. It was observed that the autocratic leader put forth about twice as much action towards the members as the democratic leader, namely, 8.4 actions as against 4.5. This difference is even greater if one takes into account only the initiated social approach, namely, 5.2 as against 2.1. Still greater is this difference in relation to ascendant or initiated ascendant behavior: the ascendant actions of the autocratic leader were nearly three times as frequent as those of the democratic leader.

In regard to submissive actions, the proportion was opposite, namely, more frequent by the democratic leader, although in both groups submissive actions of the leader were relatively rare. A similar relation held for the objective, matter-of-fact actions. Here too the democratic leader showed a higher frequency.

On the whole, then, there existed a much greater impact on the members of the group by the leader in autocracy than in democracy, and the approach was much more ascendant and less matter-of-fact.

When we attempt to answer the question "How does the leader compare with the ordinary member in an autocracy and a democracy?" we must refer to an ideal average member who is a statistical representation of what would happen if all activities were distributed equally among the members of the group, including the leader. In Lippitt's experiment the figures showed two facts clearly: first, in both groups the leader was really leading. The autocratic leader showed 118 per cent more initiated ascendant acts than the average ideal member, and the democratic leader 41 per cent more. Both leaders were less submissive than the average member, namely, the autocrat 78 per cent, the democrat 53 per cent. It was interesting to note that both showed also more matter-of-fact action than the average ideal member.

However, the difference between the ordinary member and the leader was much less pronounced in democracy than in autocracy, both in ascendant and submissive action. The democratic leader distinguished himself, also relatively, more by his greater matter-of-factness.

What do these figures indicate about the situation in which the autocratic and democratic group members find themselves? I can only mention a few aspects: In the autocratic group it is the leader who sets the policy. For instance, a child says: "I thought we decided to do the other mask." The leader answers: "No, *this* is the one *I* decided last time would be the best one." In dynamical terms such an incident means that the child would have been able to reach his own goal but the leader puts up a barrier against this locomotion. Instead he induces another goal for the child and a force in this direction. We are calling such goals, set up by the power of another person, an *induced* goal.

© Linda Cooper

A parallel example in the democratic group might be this: A child asks, "How big will we make the mast? Are they out of clay or what?" The leader answers: "Would you like me to give you a little idea of how people generally make masks?" In other words, the leader in the democratic group, instead of hindering the children in getting to their own goal, bridges over whatever regions of difficulty might exist. For the democratic group, many paths are open; for the autocratic only one, namely, that deter-

mined the leader. In an autocracy the leader determines not only the kind of activity but also who should work with whom. In our experimental democracy all work co-operation was the result of spontaneous sub-grouping of the children. In the autocracy 32 per cent of the work groups were initiated by the leader, as against 0 per cent in the democracy.

On the whole, then, the autocratic atmosphere gives a much greater and more aggressive dominance of the leader, and a narrowing down of the free movement of the members, together with a weakening of their power fields.

III

What is the effect of this atmosphere on the group life of the children? As measured by the observers the child-to-child relationship was rather different in the two atmospheres. There was about thirty times as much hostile domination in the autocracy as in the democracy, more demands for attention and much more hostile criticism; whereas in the democratic atmosphere co-operation and praise of the other fellow was much more frequent. In the democracy more constructive suggestions were made and a matter-of-fact or submissive behavior of member to member was more frequent.

In interpreting these data, we might say that the "style of living and thinking" initiated by the leader dominated the relations between the children. In the autocracy instead of a co-operative attitude, a hostile and highly personal attitude became prevalent. This was strikingly brought out by the amount of group or "we" feeling as against "I" feeling: Statements which were "we-centered" occurred twice as often in the democracy as in the autocracy, whereas far more statements in the autocracy were "I-centered" than in the democracy.

So far as the relation of the children toward the leader was concerned, the statistical analysis revealed that the children in the autocratic group who were *less submissive* to each other were about *twice* as submissive to their leader as the children in the democratic group. Initiated approaches to the leader in the democratic group were less frequent than in the autocratic group. In autocracy the action by the member toward the leader had more the character of a *response* to an approach of the leader. The approach to the leader in the autocracy was more submissive or kept at least on a matter-of-fact basis.

On the whole, then, the style of living in both atmospheres governed the child-child relation as well as the child-leader relation. In the autocratic group the children were less matter-of-fact; less co-operative, and submissive toward their equals, but more submissive to their superior than in the democracy.

Behind this difference of behavior lie a number of factors. The tension is greater in the autocratic atmosphere, and the dynamic structure of both groups is rather different. In an autocratic group there are two clearly distinguished levels of social status: the leader is the only one having higher status, the others being on an equally low level. a strong barrier kept up by the leader prevents any one from increasing his status by acquiring leadership. In a democratic atmosphere the difference in social status is slight and there exists no barrier against acquiring leadership.

This has a rather clear effect on the amount of individuality. In our experiment every individual in the de-

© Linda Cooper

mocracy showed a relatively greater individuality, having some field of his own in spite of the greater "we" feeling among them, or perhaps because of it. In the autocratic group on the contrary the children all had a low status without much individuality. The type of sub-grouping showed this difference even more clearly. In the autocracy, there was little "we" feeling and relatively little spontaneous sub-grouping among the children. If the work required the co-operation of four or five members, it was the leader who had to order the members to get together. In the democracy those groups came together spontaneously and they kept together about twice as long as in the autocracy. In the autocracy these larger units disintegrated much faster when left to themselves.

These group structures, in combination with the high tension in the autocracy, led in Lippitt's experiments to a *scapegoat* situation. The children in the autocratic group ganged together not against their leader but against one of the children and treated him so badly that he ceased coming to the club. This happened to two different children during twelve sessions. Under autocratic rule any increase in status through leadership was blocked and the attempt to dominate was dictated by the style of living. In other words, every child became a potential enemy of every other one and the power fields of the children weakened each other, instead of strengthening each other by co-operation. Through combining in an attack against one individual the members who otherwise could not gain higher status were able to do so by violent suppression of one of their fellows.

One may ask whether these results are not due merely to individual differences. A number of facts rule out this explanation, although of course individual differences always play a role. Of particular interest was the transfer of one of the children from the autocratic to the democratic group, and of another from the democratic to the autocratic one. Before the transfer the difference between the two children was the same as between the two groups they belonged to, namely, the autocratic child was more dominating and less friendly and objective than the democratic one. However, after the transfer the behavior changed so that the previously autocratic child now became the less dominating and more friendly and objective child. In other words, the behavior of the children mirrored very quickly the atmosphere of the group in which they moved.

... Autocracy is imposed upon the individual. Democracy he has to learn ....

Later Lippitt and White studied four new clubs with other leaders. They included a third atmosphere, namely that of laissez faire, and exposed the same children successively to a number of atmospheres. On the whole, the results bear out those of Lippitt. They show a striking difference between laissez faire and democracy very much in favor of democracy. They show further two types of reaction in the autocratic groups, one characterized by aggression, the second by apathy.

On the whole, I think there is ample proof that the difference in behavior in autocratic, democratic, and laissez faire situations is not a result of individual differences. There have been few experiences for me as impressive as seeing the expression in children's faces change during the first day of autocracy. The friendly, open, and co-operative group, full of life, became within a short half-hour a rather apathetic-looking gathering without initiative. The change from autocracy to democracy seemed to take somewhat more time than from democracy to autocracy. Autocracy is imposed upon the individual. Democracy he has to learn.

IV

These experiments as a whole, then, bear out the observations of cultural anthropology and are well in line with other experiments on the effect of the situation as a whole. The social climate in which a child lives is for the child as

important as the air it breathes. The group to which a child belongs is the ground on which he stands. His relation to this group and his status in it are the most important factors for his feeling of security or insecurity. No wonder that the group the person is a part of, and the culture in which he lives, determine to a very high degree his behavior and character. These social factors determine what space of free movement he has, and how far he can look ahead with some clarity into the future. In other words, they determine to a large degree his personal style of living and the direction and productivity of his planning.

It is a commonplace of today to blame the deplorable world situation on the discrepancy between the great ability of man to rule physical matter and his inability to handle social forces. This discrepancy in turn is said to be due to the fact that the development of the natural sciences has by far superseded the development of the social sciences.

No doubt this difference exists and it has been and is of great practical significance. Nevertheless, I feel this commonplace to be only half true, and it might be worthwhile to point to the other half of the story. Let us assume that it would be possible suddenly to raise the level of the social sciences to that of the natural sciences. Unfortunately this would hardly suffice to make the world a safe and friendly place to live in—because the findings of the physical and the social sciences alike can be used by the gangster as well as by the physician, for war as well as for peace, for one political system as well as for another.

From *The Next Choice: Controls or Connections* by Tony Richardson and Jock Macneish, Don't Press, 1995.

Internationally we still live essentially in a state of anarchy similar to that of the rule of the sword during medieval times. As long as no international agency exists which is able and willing to enforce international laws, national groups will always have to choose between bowing to international gangsterism and defending themselves.

It seems to be "natural" for people living in a thoroughly democratic tradition like that of the United States to believe that what is scientifically reasonable should finally become accepted everywhere. However, history shows, and experiments like the one I have described will, I think, prove anew, that the belief in reason as a social value is by no means universal but is itself a result of a definite social atmosphere. To believe in reason means to believe in democracy, because it grants to the reasoning partners a status of equality. It is therefore not an accident that not until the rise of democracy at the time of the American and French revolutions was the goddess of "reason" enthroned in modern society. And again, it is not accident that the first act of modern Fascism in every country has been officially and vigorously to dethrone this goddess and instead to make emotions and obedience the all-ruling principles in education and life from kindergarten to death.

I am persuaded that scientific sociology and social psychology based on an intimate combination of experiments and empirical theory can do as much, or more, for human betterment as the natural sciences have done. However, the development of such a realistic, nonmystical social science and the possibility of its fruitful application presuppose the existence of a society which believes in reason.

CLASSIC

On Learning and the Systems That Facilitate It

Russell L. Ackoff

Russell L. Ackoff

Introduction

The extensive literature on learning deals almost exclusively with sociopsychological aspects of learning, that is, how to learn from others. All learning ultimately derives from experience, however, our own or others. Learning from experience is particularly important in organizations in part because of the continuous flux and turnover of personnel. My focus here is on learning from experience in an organizational context. It is meant to redress a shortage of discussion of experiential learning by and within organizations. This is *not* meant to diminish the importance of interpersonal learning within organizations.

I begin with definitions of what I believe are important distinctions between the different content of *learning*: *data*, *information*, *knowledge*, *understanding*, and *wisdom*. This is intended to rectify the bias in much of the organizational-learning literature toward consideration of information and knowledge to the exclusion of understanding and wisdom. Since there are no generally accepted definitions of these terms, I use my own, which I have found useful in many applications.

Then I distinguish between *learning* and *adaptation*; the latter can be considered a special case of the former. I have also found confusion in the literature on this distinction (for example, Haeckel & Nolan, 1996). In particular, I will deal with the very important role of *mistakes* in learning and adaptation and also with learning how to learn, what Gregory Bateson (1972) called *deutero-learning*.

Finally, I present a design of a *management learning and adaptation system* that meets the varied requirements formulated earlier in this paper.

The Varied Content of Learning

The learning literature contains very little about the *content* of learning, what is learned. In this article, I try to compensate for this deficiency. What one learns consists of either *data*, *information*, *knowledge*, *understanding*, or *wisdom*. Unfortunately, we tend to use *data*, *information*, and *knowledge* interchangeably; *understanding* as a synonym of *knowledge*, and *knowledge* all-inclusively. *Wisdom* is treated largely as mysterious and incomprehensible, even untransmittable.

Not only are the differences between the various contents of learning important, but they also form a hierarchy of increasing value, as reflected in the adage: An ounce of information is worth a pound of data; an ounce of knowledge is worth a pound of information; an ounce of understanding is worth a pound of knowledge; and an ounce of wisdom is worth a pound of understanding.

Nevertheless, most of our formal education and most computer-based systems are primarily devoted to the less important types of learning: to the acquisition, processing, and transmission of data and information. There is less effort devoted to the transmission of knowledge, practically none to the trans-

mission of understanding, and even less to wisdom. This allocation of effort is reflected in the popular and persistent preoccupation with information in the press, on television game shows, and in such popular games as "Trivial Pursuit." How appropriate this name!

Data and Information

Data consists of symbols that represent objects, events, and/or their properties. They are products of *observation*. Observations are made either by people or by instruments, for example, thermometers, odometers, speedometers, and voltmeters. The dashboards of automobiles and airplanes are filled with such devices.

Like metallic ores, data are of little or no value until they are processed into usable forms. Data that have been processed into useful forms constitute *information*. Therefore, information also consists of symbols that represent the objects, events, and their properties. The difference between data and information is their usefulness—functional, not structural.

Information is contained in descriptions, in answers to questions that begin with such words as *who*, *what*, *where*, *when*, and *how many*. Information is usable in deciding *what* to do, not *how* to do it. For example, a list of the films currently playing in movie houses enables us to select one to see, but it does not tell us how to get there. Similarly, the address of a cinema tells us where it is but not how to get there. Answers to *how-to* questions constitute knowledge.

Knowledge

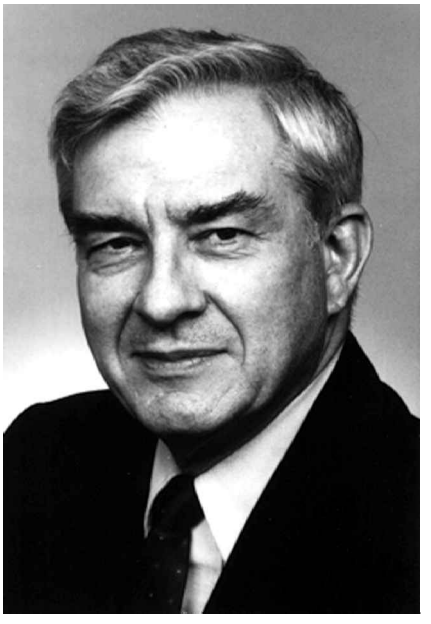
Knowledge is contained in instructions. Knowledge consists of *know-how*, for example, knowing how a system works or how to make it work in a desired way. It makes *maintenance* and *control* of objects, systems, and events possible. To control something is to make it work or behave *efficiently* for an intended end. The efficiency of a course of action is usually measured either by its probability of producing an intended outcome when a specified amount of resources is used or by the amount of resources required to attain a specified probability of success.

Knowledge can be obtained either from experience—for example, by trial and error—or from someone who has obtained it from experience, their own or that of others. When computers are programmed and people are instructed, they are *taught* how to do something. Such teaching is *training*, not *education*. Failure to distinguish between training and education is commonplace and results in a so-called *educational system* that devotes a good deal more time to training than it does to education. The content of education should be understanding and wisdom.

Computer-based *expert systems* are systems that have had the knowledge of an expert programmed into them. They store and dispense knowledge. In addition, at least since Shannon developed his electronic maze-solving rat, computers have been programmed to acquire knowledge, to *learn*. Programs for acquiring knowledge, however, are still very limited.

Intelligence is the ability of an individual to acquire knowledge. Therefore, the proper measure of intelligence is an individual's rate of learning, the ability to acquire knowledge, not how much one knows. Expert systems that do not learn, and most do not, cannot legitimately be said to have intelligence, artificial or otherwise. Unintelligent systems, ones with no ability to learn, can possess knowledge but cannot acquire it on their own.

Management obviously requires knowledge as well as information, but information and knowledge are not enough. Understanding is also required. Management suffers more from lack of knowledge than it does from lack of information and more from lack of understanding than it does from lack of



William J. Altier

Commentary
by William J. Altier

As I read Russ Ackoff's article and reflected on his hierarchy of the content of the human mind—data, information, knowledge, understanding, and wisdom—my mind was quickly drawn to the current fad of more and bigger acquisitions and mergers. I recalled many comments in the business media to the effect that "So many mergers fail to deliver what they promise that there should be a presumption of failure. . . ."

So what's the point? Going back to Dr. Ackoff's hierarchy, no doubt the executives responsible for these acquisitions and mergers go into them with considerable data, information, knowledge, and perhaps even understanding—all related to doing things right. But the question is: Do they go into them with adequate wisdom; do they do the right things?

Ackoff observes that "*[g]rowth* is an increase in size or number. *Development* is an increase in one's ability and desire to satisfy one's legitimate needs and desires and those of others." It would appear that the focus of today's merger mania is growth, not development. Perhaps that's the reason why the average life span of today's multinational corporations is between 40 and 50 years. As Arie de Geus points out in *The Living Company* (1997), companies that develop themselves can live for centuries.

Many of the travails that organizations experience are, *de facto*, the result of a lack of wisdom on the part of those who make critical decisions. One factor behind this could be that many executives' mind-sets acknowledge the roles of data, information, knowledge, and understanding but stop short of the cognizance of wisdom. It is hoped that Russ Ackoff has shattered that glass ceiling. He makes the case that wisdom—the fifth

element in his hierarchy of learning—should be recognized as being at the pinnacle of organizational achievement, just as satisfying the fifth element in Maslow's hierarchy of needs—self-actualization—signifies the pinnacle of personal achievement.

Ackoff suggests that "learning is least likely to occur the higher one goes in an organization"; this is precisely the stratum at which errors of omission are most likely to occur and "the decline or demise of organizations is generally more likely to derive from errors of omission."

The pinnacle of learning, wisdom, is the most critical element in successful decision making and in reducing errors of omission. The paradox is that the higher echelons of the organization do possess the decisive elements needed to acquire wisdom. As Ackoff notes, "[T]he acquisition of wisdom...is usually associated with age and experience because it is concerned with the long-run consequences of action."

Ackoff states, "Wisdom is the ability to perceive and evaluate the long-run consequences of behavior." Clearly, this ability does not seem to be overly abundant. It is hoped that the world of management will recognize this shortcoming and make Ackoff's hierarchy of learning its mantra for tomorrow. This hierarchy, particularly its fifth element, will be a boon for those who use it as a model to remedy the void in their organizations' learning.

Speaking as a management consultant, I find it ironic that big companies often pay big bucks to obtain advice dispensed by newly minted MBAs who lack the critical prerequisites for wisdom. What are they getting for what they pay? Could there be a corollary here?

Ackoff has a profound message for another hierarchy—the hierarchy of management. Take heed!

knowledge. Most managers suffer from information overload, not from either an overload of knowledge or understanding.

Understanding

Understanding is contained in explanations, answers to *why* questions. We do not learn how to do something by doing it correctly; in such a case, we already know how to do it. The most we can get out of doing something right is confirmation of what we already know. We can acquire knowledge, however, from doing something incorrectly but only if we can determine the cause of the error and correct it. Mistakes can be corrected by trial and error, but this is often very inefficient. A mistake that can be explained by identifying what produced it is understood. Understanding facilitates and accelerates the acquisition of knowledge.

Understanding is required in any situation to determine the relevance of data and information, understanding why the situation is what it is and how its characteristics are causally related to our objectives. On the other hand, explanations can be, and frequently are, suggested by observations. Theories, of course, embody explanations that are obtained by deductions from them.

Objects, events, or their properties may be explained by identifying their cause or producer, for example: "The boy is going to the store because his mother sent him." The behavior of an entity that can display choice may also be explained by identifying that entity's intended outcome, for example: "The boy is going to the store to buy an ice cream cone." Only purposeful entities have intentions. (A purposeful entity is one that can pursue the same end (1) in different ways in the same environment and (2) the same way in different environments.) Therefore, to say that an apple falls from a tree because it wants to get to the ground is no explanation at all, but to say that a person climbed a tree to avoid attack by an animal is.

It is possible to construct computer-based systems that explain the failures of some relatively simple mechanical systems. For example, some automobile-manufacturing companies have developed sensing devices that can be applied to their engines. The data collected are then processed by a computer to determine whether the engine is defective, and if so, what is the cause of the defect or its location. The Russians developed a number of such systems for application to heavy military vehicles.

Some computerized systems have been developed to diagnose the malfunctioning of organisms, but they are still in relative infancy. The types of malfunctioning that can be explained by computerized diagnostic systems do not involve choice, or purposefulness. As yet, we do not have the ability to program computers to determine the intentions behind, or the producers of, purposeful behavior.

Data, information, knowledge, and understanding presuppose each other. They are acquired and develop interdependently. They form a hierarchy with respect to value, but none is more fundamental than the others. Although computers have made inroads into providing data, information, knowledge, and understanding, I am aware of no computerized wisdom-generating or disseminating systems.

Wisdom

Peter Drucker once made a distinction between doing things right and doing the right thing. This distinction is the same as that between efficiency and effectiveness. Information, knowledge, and understanding contribute primarily to efficiency but provide little assurance of effectiveness. For effectiveness, wisdom is required.

Wisdom is the ability to perceive and evaluate the long-run consequences of behavior. It is normally associated with a willingness to make short-run sacrifices for the sake of long-run gains.

What one does is clearly the product of the information, knowledge, and understanding one has. The value of information, knowledge, and understanding is *instrumental*; it lies in their ability to facilitate the pursuit of ends—desired outcomes, objectives, and goals. Although one must be aware of the end that is being pursued in order to determine the efficiency of a means for pursuing it, one need not be aware of the value of that end. Therefore, one can talk about the efficiency of immoral as well as moral acts—for example, the relative efficiency of different ways of breaking the law or harming another.

On the other hand, the effectiveness of behavior necessarily takes the value of its outcome(s) into account. Effectiveness in the pursuit of an end is the product of the efficiency of that pursuit and the value of that end. Therefore, the inefficient pursuit of a valuable end may be more effective than the very efficient pursuit of a negatively valued objective.

Put another way, it is usually better to do the right thing wrong than it is to do the wrong thing right. When one does the wrong thing right, one's error is reinforced, and this encourages further improvement in the pursuit of the wrong end. For example, improving the quality of the current automobile, which is destroying the quality of life in an increasing number of cities, is a conspicuous example of doing the wrong thing *righter and righter,* hence making things *wronger and wronger.* On the other hand, when one does the right thing wrong, identification and diagnosis of the error can lead to improved pursuit of the right end.

Wisdom is normative as well as instrumental. The difference between efficiency and effectiveness, which differentiates wisdom from understanding, knowledge, and information, is also reflected in the difference between *growth* and *development*. *Growth* is an increase in size or number. *Development* is an increase in one's ability and desire to satisfy one's legitimate needs and desires and those of others. A legitimate need or desire is one the satisfaction of which does not reduce the chances of others satisfying their legitimate needs or desires.

Although growth and development can effect each other, they can also occur independently of each other: An entity can grow without developing (for example, a rubbish heap), and a person can continue to develop long after he or she has stopped growing. *Standard of living* is an index of growth; *quality of life* is an index of development. One can grow without wisdom but one cannot develop without it. Growth and increases in standard of living do not necessarily entail increases in the value of what is obtained; but development and increases in quality of life do.

One who seeks to increase wisdom must be concerned with the value of outcomes (long-run as well as short-run) but value to whom? One person's behavior usually affects others. Then, ideally, all our behavior should serve the legitimate needs and desires of all those it affects, its *stakeholders*. This means that effective decisions must be value-full, not value-free. Objectivity, which is usually defined as the absence of value considerations in decision making, is antithetical to effectiveness, hence wisdom. Objectivity is better taken to be value-full, not value-free, that is, as a property of decisions that make them valuable to all they affect, whatever their legitimate values.

Evaluation of outcomes is a product of *judgment*. As yet we do not know how to program the process of making value judgments. In fact, this appears unprogrammable. On the other hand, the determination of efficiency can often be programmed because, among other things, the efficiency of an act is independent of the actor. This is not so for effectiveness. The value of the outcome of an act is *never* independent of the actor and is seldom the same for two actors even when they act in the same way in the same environment. It may not even be the same for the same actor in different environments or in the same environment at different times. In contrast, the efficiency of an act in a specified environment is constant.

Vincent P. Barabba

Commentary
by Vincent P. Barabba

This article by Russell L. Ackoff is of inestimable value to those interested in understanding the differences between a systemic approach to learning and adaptation and the traditional ways in which we have been taught to manage the use of knowledge. The extent to which the reader can reap these rich rewards, however, is related directly to how well the reader is cognizant of Ackoff's other contributions—particularly related to systems thinking and idealized design. For example, Ackoff, along with Drucker and others, has made significant contributions to illustrating the change that has taken place as we have moved from an industrial-age, mechanistic approach toward a knowledge-age, organismic approach to systems thinking.

The systems thinking approach to knowledge use starts out with the belief that in any enterprise striving to meet its full measure of success, the parts that make up the enterprise, by themselves, are of little value outside their interaction with all the other parts. Familiarity with the writings of Ackoff has led me to believe that concepts such as knowledge management and data warehousing—based on taking an inventory of what is known—are ideas whose value is passing. From a systems thinking perspective, these concepts are replaced by decision support systems that pump a free flow of contextual data, information, knowledge, understanding, and wisdom (as precisely defined by Ackoff in this article) into a series of networked dialogs that take place continuously across the functions within the firm, as well as between the enterprise and its extended alliances, which include the ultimate consumers of its products and services.

A distinction between two metaphors helps illustrate the importance of these differences. The industrial-age mechanistic mind-set encouraged us to think about managing business as if it were made up of replaceable parts—like pieces in a jigsaw puzzle. The metaphor fit reasonably well for that era. When you start a puzzle, you know

how many pieces you are supposed to have, and chances are good that they are all there. Each of the parts will interact with only a small portion of the other parts. If you have trouble deciding how to put the pieces together, you have a picture on the box to remind you that there is a single solution to the problem. Finally, though some puzzles are more complex than others, the underlying process of putting them together is always the same.

However, today's business challenges are more complex than this. We operate in a world of complex problems compounded by an accelerating rate of change. It is an environment that consists of constantly changing processes, relationships, and interacting components—more like a DNA molecule than a jigsaw puzzle. Depending on how the pieces come together, we can end up with a different final result than we had any reason to expect. We cannot always know up front exactly what we are creating.

Trying to "manage" this complexity is not necessarily the best approach. In many circumstances, that sort of thinking implies there is a single right way—a correct outcome or a predictable framework—and if we could only get all that we know to fit into that framework, we would come out with the "right" answers.

I believe that many of the current purveyors of knowledge management techniques and practices are anchored in the industrial-age way of thinking, based primarily on the predictable world of the make-and-sell business design. With that mental model, we are encouraged to believe that we can manage knowledge in the same way that we manage the more predictable aspects of our enterprises. These purveyors of knowledge management also bring up the issue of establishing a value for our intellectual assets. I am certainly not opposed to the need to justify expenditures for collecting and using information. I am also not negating the value of the tools that provide the proper information to those who make value-adding decisions for our public and private enterprises. What I *am* concerned about is that the attempt to establish such value forces us to try to separate the components of a system and assign value to them independently when, as Ackoff has stated elsewhere, "a system is a whole that cannot be divided into independent parts."

The experience of beginning to implement the learning and adaptation system here at General Motors leads me to believe that it is of great potential value. For it to work well, however, the enterprise needs to create an environment that stresses the interdependence of information users and providers.

My advice to the readers of this article is to read also, at a minimum, "Our Changing Concept of the World," the first chapter in Ackoff's book *Creating the Corporate Future*, or, if the reader is truly serious, the recently

Values are very personal matters. Therefore, wisdom-generating systems are ones that are very likely to continue to require human participation. It may well be that wisdom, which is essential to the effective pursuit of all ends, is a characteristic of humans that ultimately differentiates them from machines and other organisms.

Learning and Adaptation

To learn is to acquire information, knowledge, understanding, or wisdom. Systems that facilitate learning, computer-based or otherwise, can be called learning support systems. The varieties of learning—acquisition of information, knowledge, understanding, or wisdom—can, but need not, take place independently of each other.

Individuals acquire information when their range of possible choices increases over time. To inform someone serves to increase his or her probability of making one or more choices. For example, telling someone that it is raining outside is likely to increase the probability of his or her carrying an umbrella.

Individuals acquire knowledge when their efficiency increases over time. Such increases can take place under constant conditions, as in successive tries at hitting a target with rifle shots. The acquisition of knowledge (learning) can also take place when the conditions affecting the efficiency of one's choice change—for example, a strong cross-wind arises or a distracting noise interferes with shooting. Under such conditions, new learning is required to maintain, let alone to increase, efficiency. Such learning is called *adaptation*.

To adapt is to change oneself or one's environment so as to maintain or increase efficiency/effectiveness when changes of internal or external conditions, if they are not responded to, result in decreased efficiency/effectiveness. Therefore, adaptation is learning under changing conditions.

As has been noted above, one does not learn from doing something right, but one can, but does not necessarily, learn from doing something wrong, by making a mistake. In order to learn from mistakes, they must first be detected—this requires information. Then their cause or source must be identified—this requires understanding. Finally, successful corrective action must be taken—this requires knowledge.

Therefore, *a complete learning system* is one that detects errors, diagnoses them, and prescribes corrective action, and these activities require information, knowledge, and understanding. The values served by such a system are those of the individuals served by the system, hence reflect their wisdom, or lack of it.

It should be noted that in most organizations mistakes tend to be concealed even from those who make them. The likelihood of such concealment increases with rank or status—the higher the rank, the greater the claim to omniscience. This implies that learning is least likely to occur the higher one goes in an organization.

There are two kinds of mistakes: *errors of commission,* doing something that should not have been done, and *errors of omission,* not doing something that should have been done. Those organizations that reveal mistakes generally reveal only errors of commission, not those of omission. Errors of omission include lost opportunities. Unfortunately, the decline or demise of organizations is generally more likely to derive from errors of omission than from errors of commission. It is much harder to correct errors of omission; these, like Clemestine, are usually "lost and gone forever."

In order to accelerate learning, decisions must be made and monitored that will improve the ability to learn continuously. *Learning how to learn* is called *deutero-learning*. Such learning occurs when we identify and correct mistakes made in trying to correct mistakes. Because of the accelerating rate of change in our environment and its increasing complexity, much of what we know becomes obsolete in less and less time. Therefore, learning how to learn is much more important than what we learn.

Most learning by adults and organizations involves replacement of something thought to be known by something new; that is, much learning presupposes *unlearning*. Nevertheless, the literature on organizational learning has virtually ignored the unlearning process until recently when Peters (1994) and Hamel and Prahalad (1994, p. 59), among others, gave it a little attention. The system described below not only facilitates learning (including adaptation), but it also facilitates learning how to learn, and unlearning.

Only entities that can display choice can learn and unlearn, that is, only *purposeful* individuals or systems. Learning and unlearning can only take place in the context of decision making. Therefore, systems that support decision making should facilitate rapid and effective learning and unlearning and, of course, the acquisition and development of information, knowledge, and understanding. In addition, a *learning support system* should facilitate the following aspects of decision making.

- Identification and formulation of problems
- Making decisions—that is, selecting a course of action
- Implementing the decisions made
- Controlling implementation of the decisions, their effects, and the assumptions on which they are based
- Provide the information required to carry out these functions.

The Design

The design illustrated in figure 1 is meant to be treated as a theme around which each organization should write its own variation, one suited to the uniqueness of its structure, business, and environment. No two of its applications have ever been exactly the same. For example, its application in the North American organization of General Motors is very different from its application in one of the divisions of DuPont. It should be noted that the apparent complexity of the design derives from the not-so-apparent complexity of the processes of learning and adaptation. All the functions contained in the model are usually carried out in the mind of an individual who learns from experience, most of them, of course, unconsciously.

Numbers and letters in parentheses below refer to figure 1. The boxes shown in figure 1 represent functions, not individuals or groups. As will be seen, they may be performed by individuals or groups or even by computers and related technologies.

Since the support of learning should be continuous, a description of it can begin at any point, but it is easiest to follow if we begin with the generation of *data, information, knowledge,* and *understanding* (1) about the behavior of the organization being managed and its environment. These inputs are received by the *decision support* function.

In another article (Ackoff, 1967), I argued that management suffers more from an overabundance of irrelevant information than from a shortage of relevant information. Therefore, I suggested that a management support system should *filter* incoming messages for relevance and *condense* them to minimize the times required to acquire their content. That these two functions have received relatively little attention in the learning literature is, in my opinion, a serious deficiency.

Data must be processed to convert them into information, knowledge, or understanding; therefore, data processing is a necessary part of the *decision support* function. Information, knowledge, or understanding is transmitted to the *decision-making* function in response to its *request for support* (2).

When the decision makers receive the information, knowledge, or understanding with which they are provided, they do not always find it useful. They may find it unreadable or incomprehensible, doubt its validity, or question its completeness. Therefore, the receipt of information often leads them to addi-

published *Ackoff's Best*. In that way, readers will increase their chances of gleaning insight from the incredible amount of knowledge, understanding, and wisdom developed by this very thoughtful man, an important portion of which is presented in the article reprinted here.

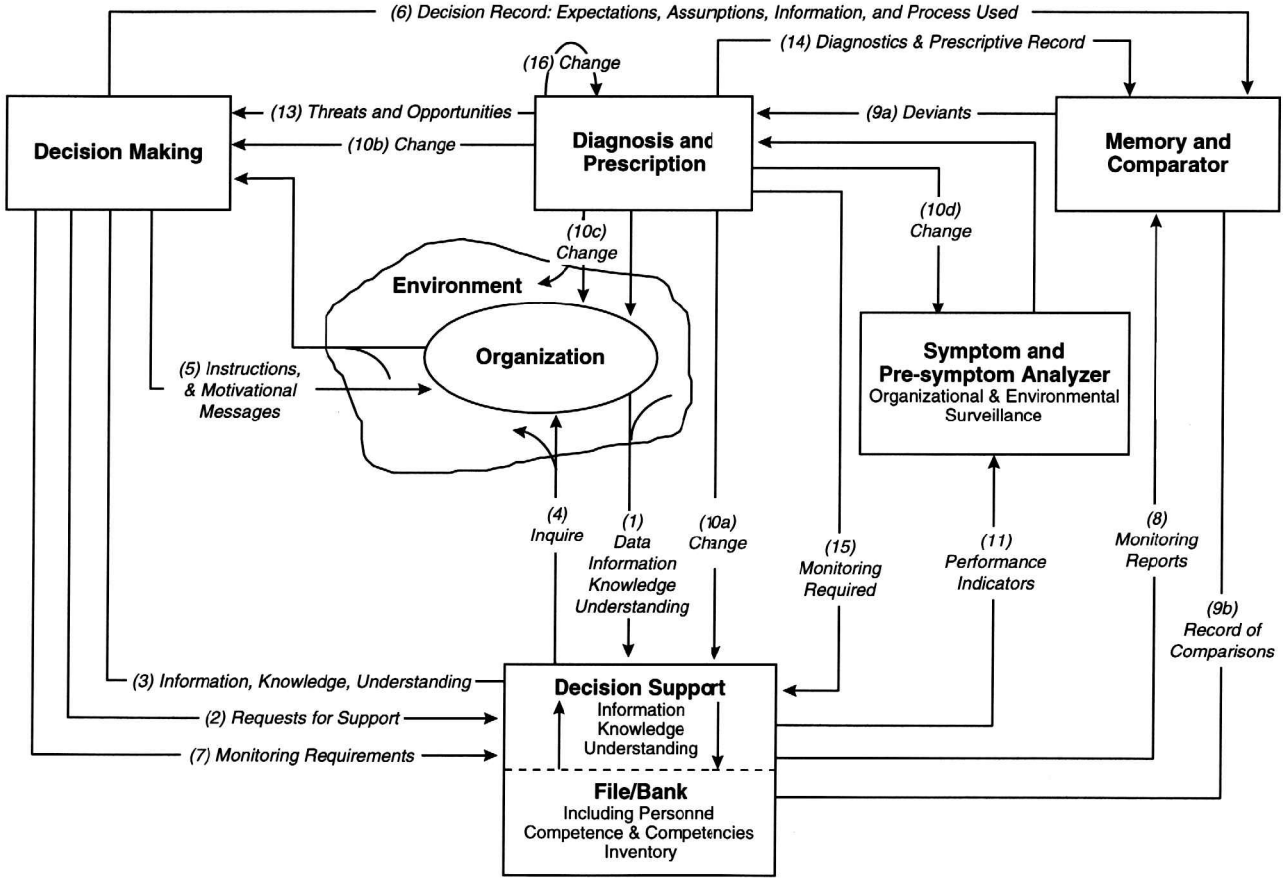


Figure 1 Management learning and adaptation system.

tional requests (2). Such requests require two additional capabilities of the decision support function. This subsystem must be able to generate new data—that is, *inquire* (4) into the organization and its environment so that the additional data, information, knowledge, or understanding (1) required can be obtained. It must also have the ability to reuse data, information, knowledge, or understanding previously received or generated. This means that it must be able to store data in retrievable form. A data-storage facility is a *file/bank*, whether it resides in a drawer or in a computer. It is a part of the decision support function.

Once the new or old data have been processed to provide the information believed to be responsive to the request received from the decision-making function, it is transmitted back to them. This request-fulfillment cycle may continue until the decision makers either have all the information, knowledge, or understanding they want or have run out of time and must make a decision with whatever they have. In some cases, they may believe that the time and cost of further inquiry is not likely to be justified by the improvement or increase of information, knowledge, or understanding they believe is possible.

The output of a decision to do something is a message that is either *instructive* or *motivational* (5) and is addressed to those in the organization whose responsibility it will be to carry out the instructions or whose motivation is the target. An instruction is a message to others or to oneself that is intended to increase or maintain the *efficiency* of the organization. A motivational message is one intended to effect the organization's, or some of its (internal or external) stakeholders' values, hence the organization's *effectiveness*. A decision, of course, may be to do nothing as well as to do something. In this case, no instructions are required but a decision record (6) is.

Every decision has only one of two possible purposes: to make something happen that otherwise wouldn't or to keep something from happening that otherwise would. In addition, there is always a time by which the effect of the deci-

sion is expected. Therefore, to control a decision, its expected effects and the expected times of their realizations should be made explicit and recorded. All this is equally true of decisions involving the implementation of a decision. If, for example, a decision has been made to build a new factory, there are expectations about when it should be completed, what it should cost, and so forth. Implementation decisions should be separately recorded and tracked. In addition to the expected effects and when they are expected, for each decision a record should be kept of the information, the assumptions on which the expectations are based, and the process by which the decision was reached, by whom, and when.

All this should be recorded in the *decision record* (6) that should be stored in an inactive *memory and comparator.* (An example of a decision record that has been used is shown in figure 2.) There is more on the comparator below. Because human memories are inclined to modify their content, especially forecasts and expectations, over time, it is important that the memory employed be completely inactive. Inactive storage of information may be the only thing a computer can do that a human cannot do.

A version of the decision record (6), *monitoring requirements* (7), should be sent to the decision support function, which has responsibility for checking the validity of the expectations, assumptions, and information used in making the decision and for its implementation. When obtained, information about the validity of the expected effects, the relevant assumptions, and the information used should be sent to the memory and comparator in the form of a monitoring report (8). Then, using the information on the decision record (6) stored in the memory and the monitoring reports (8), a comparison should be made of the actual and expected effects and the assumptions and relevant occurrences.

Figure 2 An example of a decision record.

Decision Record

Issue Identification No.: _____

Prepared by: _____

Description of issue: _____

Outcome (check one):

___ No decision ___ Decision to do nothing

___ Decision to do something (Describe): _____

Documents pro: _____

Documents con: _____

Expected consequences or effects, and when they are expected: _____

Assumptions on which expectations are based: _____

Information used: _____

Who participated in dealing with the issue? _____

Who is responsible for implementation (if anyone)?: _____

Implementation plan: _____

Observations on the decision-making process: _____

Expected consequences or effects, and when they are expected: _____

Upfront learnings, if any, from dealing with this issue: _____

Additional comments: _____

When the comparator finds no significant difference between expectations and assumptions and the performance actually observed and reported in the monitoring report (8), nothing need be done other than to enter a *record of comparisons* (9b) in the memory for future reference. This record preserves what is known or believed. Therefore, it should be stored in an easily retrievable form, for example, by the use of key words. If a significant difference is found, however, it is reported as a *deviant* (9a) to the *diagnosis and prescription* function.

Such deviations indicate that something has gone wrong. A diagnosis is required to determine what is wrong and what should be done about it. The purpose of the diagnosis is to find what is responsible for the deviations and to prescribe corrective action. In other words, the diagnostic function consists of explaining the mistake, and therefore, producing *understanding* of it.

There are only a few possible sources of error, each of which requires a different type of corrective action.

1. The information, knowledge, or understanding (3) used in making the original decision was in error, and therefore the decision support function requires *change* (10a) so that it will not repeat that type of error. The information used in decision making can also come from the symptom and presymptom analyzer that is described below. Therefore, it too may require change (10d).
2. The decision making may have been faulty. In such a case, a change (10b) in this subsystem should be made.
3. The decision may have been correct, but it was not implemented properly. In such a case changes (10c) are required for either the behavior of those in the organization who were responsible for the implementation or the communication, instructions and motivational messages (5), to them.
4. The environment may have changed in a way that was not anticipated. In such cases, what is needed is a better way of either anticipating such changes, decreasing sensitivity to them, or reducing their likelihood. Such changes involved changes (10a, 10b, or 10c) in either the decision support function, the decision-making function, or the organization.

Through these types of corrective actions, the diagnosis and prescription function assures both learning and adaptation.

Now consider how threats and opportunities that are not related to previous decisions are identified and formulated. A *symptom* indicates the presence of a threat or an opportunity. It is one of a range of values of a variable that usually occurs when something is exceptionally right or wrong but seldom when things are normal. For example, a fever is an abnormally high body temperature that is seldom associated with good health but frequently associated with illness.

Variables used as symptoms are properties of the behavior of the organization or its environment. Such variables can also be used dynamically as presymptoms or omens: indicators of future opportunities or problems. A presymptom is nonrandom, normal behavior, for example, a trend, a (statistical) run, or a cycle. Therefore, a trend of rising body temperature, each of which is separately within the normal range, is a predictor of a coming fever. There are many statistical tests for non-randomness, hence presymptoms, but the naked eye and common sense can identify many of them.

A complete *management learning and adaptation system* regularly obtains information on a number of internal and external *performance indicators* (11), some of whose values are revealed as *symptoms and presymptoms* (12) by the *symptom and presymptom analyzer*.

When symptoms and presymptoms (12) are found, they are sent to the diagnosis and prescription function. Once a diagnosis is obtained, the *threats and opportunities* (13) revealed are reported to the decision-making function.

Whenever the diagnosis and prescription function prescribes a change, a diagnostic and prescriptive record (14) of it should be prepared. This record is sent

to the memory and comparator where its content can be compared with the facts supplied by the decision support function in response to the *monitoring required* (15) issued by the diagnosis and prescription function. Deviants (9a) are then reported to the diagnosis and prescription function where corrective action should be taken. Such corrective action may involve *change* (16) of the diagnosis and prescription function or making any of the types of change previously referred to. Such changes are what makes possible learning how to learn and adapt.

Finally, information on *threats and opportunities* (17) may be sent directly to the decision-making function by a source within the organization or its environment but outside the management learning and adaptation system.

Implementation

As was noted above, the functions shown in figure 1 may be carried out by individuals or by organizational units. In a small organization, the entire system can be carried out by one person.

All the functions except diagnosis and prescription (g) can currently be automated to some degree. This ability increases over time with the further development of computers and communication technologies.

Parts of the system can be created separately. Obviously, free-standing management information systems are commonplace, but I believe it is wrong to start by building such a system. I think it is wrong because the other parts of the learning support system are seldom added subsequently when an information subsystem is created first. The problems of maintaining such a system are so great that little energy and time are left for extending the system to other functions. In general, it is better to create a complete learning support system for part of an organization than a subsystem for the whole organization. Complete and coordinated systems are more likely to be developed by other parts of the organization than are subsystems to serve the entire organization.

... wisdom involves awareness of the long-run consequences of actions and their evaluation ...

If only one part of a system is to be developed separately, it should be the control subsystem—monitoring decisions made, correcting errors, and detecting changes that require attention in the organization managed or in its environment. There are several reasons for this preference. First, the payoffs come much sooner than they do from constructing an information system and are much more visible. Second, a successful control system in one part of the organization invites other parts to follow suit. Third, the successful operation of a control subsystem leads naturally to inclusion of other subfunctions. Unlike an information system, a control system does not give the impression of being self-sufficient. Finally, without the type of control described here, unlearning is not very likely, and without unlearning, learning is difficult or impossible to achieve.

Acquisition of Wisdom

We normally do not refer to the acquisition of wisdom as learning perhaps, because it is not normally associated with schooling. It is usually associated with age and experience because it is concerned with the long-run consequences of action. Therefore, the acquisition of wisdom tends to be anything but systematic.

Because wisdom involves awareness of the *long-run consequences* of actions and their *evaluation*, it necessarily requires ethical judgments. Such judgments can only take place where choice is possible. (This is why ethics is a distinctively human concern.) Therefore, ethics necessarily requires the preservation and increase of legitimate options available to others as well as to oneself. *Legitimate options* are those that do not reduce the options available to others.

Wisdom must be directed toward the maintenance, if not the increase, of options for two reasons. First, we cannot forecast with accuracy most long-range consequences of choices made today so we must allow for possible error; second, we cannot predict with accuracy what choices we and others will value in the future. Both of these deficiencies are exacerbated by the accelerating rate of change occurring in our environments and their increasing complexity.

To assist in the acquisition of wisdom, a record should be made of the expected long-range effects of decisions, if any, and their ethical evaluations. When the actual consequences become apparent, they should be assessed ethically. The assessment process should be treated much like the diagnostic and prescriptive function in the system described above. Where an unethical consequence occurs, it should be noted and recorded in a memory so that future wrongs of this type can be avoided or made less likely.

Conclusion

I have tried to show how learning and adaptation—the acquisition and preservation of information, knowledge, and understanding—can be facilitated. A good deal of such a system can be computerized, but it need not be. The entire system can be installed in either a single mind or multiple units of a large organization. In addition, I suggested how the acquisition and preservation of wisdom might be initiated in a manner similar to the way information, knowledge, and understanding are treated in the management learning and adaptation system described here. The principal difference in the acquisition of wisdom lies in the amount of lapsed time between decision and evaluation of consequences. This increases the importance of acquiring it whenever and wherever it is possible to do so.

Bibliography and References

Ackoff, R. L. "Management Misinformation Systems." *Management Science* 14, no. 4 (December 1967); B-147–B-156.

Ackoff, R. L."From Data to Wisdom." Journal of Applied Systems Analysis 16 (1989): 3–9.

Ackoff, R. L. et al. *The SCATT Report: Designing a National Scientific and Technological Communication System* (Philadelphia: University of Pennsylvania Press, 1976).

Argyris, C. *On Organizational Learning* (Cambridge, MA: Blackwell Publishers, 1993).

Bateson, Gregory. *Steps to an Ecology of Mind* (New York: Ballantine Books, 1972).

De Geus, A. "Planning as Learning." *Harvard Business Review* 66 (1988): 70–74.

Geranmayeh, Ali. *Organizational Learning Through Interactive Planning: Design of Learning Systems for Ideal-Seeking Organizations* (Philadelphia: University of Pennsylvania Press, 1992).

Haeckel, S. H. and R. L. Nolan. "Managing By Wire: Using I/T to Transform a Business From Make-and-Sell to Sense-and-Respond" in *Competing in the Information Age: Strategic Alignment in Practice,* ed. J. N. Luftman. (New York: Oxford University Press, 1966).

Hamel, Gary, and C. K. Prahalad. *Competing for the Future* (Boston: Harvard Business School Press, 1994).

Peters, Tom. "To Forget Is Sublime." *Forbes ASAP Supplement* (April 11, 1994): 126, 128.

Sachs, Wladimir. Man Machine Design: An Inquiry into Principles of Normative Planning for Computer-Based Technical Systems (Ph.D. dissertation, University of Pennsylvania, Philadelphia, September 1975).

Senge, P. *The Fifth Discipline* (New York: Doubleday/Currency, 1990).

Stata, R. "Organizational Learning: The Key to Management Innovation." *Sloan Management Review* 30, no. 3 (1990): 63–74.

CLASSIC

Metanoic Organizations in the Transition to a Sustainable Society

Charles F. Kiefer and Peter M. Senge

Two distinct, long-term dynamics are now merging to create unique forces for social change: One is the life cycle of industrial growth; the other is the economic long wave. The life cycle is a one-time phenomenon, based on depletion of finite natural resources such as land, oil, natural gas, water, and the capacity to dissipate pollution. Abundant resources, often at diminishing real costs, gave rise to a period of unprecedented industrial expansion with little attention to the longer-term consequences of growth for the environment.

During the transition to a postindustrial society, the interdependencies between the economic system and the environment become clear, with a concomitant shift in attitudes and values. *The Limits to Growth* by Meadows et al. and subsequent studies point to the present as a time of unprecedented stress, where the attitudes, values, and expectations of the industrial-growth era are challenged for the first time. Pitirim Sorokin, founder of the department of sociology at Harvard University, forecast over a half-century ago that industrial society would become increasingly disillusioned with its materialistic goals, decline, and then perhaps reemerge as an "integral culture" characterized by a balance between material and spiritual values. With 20 years of survey evidence, Daniel Yankelovich today sees just such a shift. He argues that "instrumentalism," which views material possessions as the instruments for generating satisfaction, is gradually being supplanted by a "sacred" outlook that seeks the intrinsic value of human experience in the family and the workplace.

The transition to a postindustrial economy spans probably 30–50 years. What makes the 1980s a period of particularly rapid change is the concurrent cresting of the economic long wave or Kondratieff wave. This is historically a period of economic stagnation, as the major depressions of the 1830s, 1880s–1890s, and 1930s show; but it is also a period of experimentation and innovation. Economic growth since World War II has been built primarily on a series of remarkable innovations—television, jet propulsion, digital computation—that came to light in the 1930s and 1940s, that is, during the last long-wave transition.

The long-wave transition is a period of great stress for private business. Bankruptcies are high, particularly in older, traditional industries. Pressures to cut costs and maximize flexibility handicap the top-heavy bureaucracies of the former period of relatively stable growth. Economic conditions favor more resilient organizations that can adapt to complex technological and market changes.

The convergence of the life cycle of industrial development and the economic long wave is causing fundamental changes in the business environment. The life cycle is creating fundamental shifts in values and attitudes. The long wave is creating extreme economic stress. A small but significant number of American corporations are emerging as prototypes of a new kind of or-

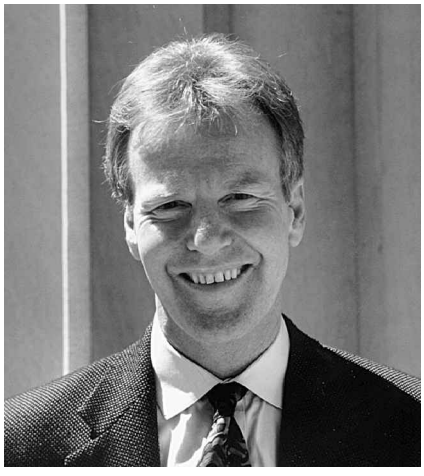
Foreword

When we wrote this article more than 17 years ago, its ideas made great sense to us. Moreover, they arose from approximately 10 years of experience from consulting and workshops with senior and midlevel managers. However, to say the least, they were "on the fringe" of management theory and practice. Looking back now, we are surprised to see how widely some of these ideas have spread—such ideas as vision, alignment, empowerment of people, systems thinking, and more decentralized organization designs.

None of this, however, means that the notion of metanoia, a fundamental movement of mind, is either well understood or widely embodied in today's organizations. In some ways, the more that basic ideas become familiar to

Charles F. Kiefer

Reprinted from *Technological Forecasting & Social Change,* vol. 22, Kiefer & Senge, "Metanoic Organizations in the Transition to a Sustainable Society," 109–122. Copyright © 1982, with permission from Elsevier Science.



Peter M. Senge

us, the more easily may the deeper meanings that lie behind them elude our grasp. We all speak the proper words but, in so doing, may mislead ourselves into thinking that new words mean new understanding and new practices. Everywhere today people speak of "vision," but how many think about purposefulness, what it would mean if each and every person worked from a deep sense of their work? Likewise, *empowerment* has become a buzzword in recent years, but how many have actually thought about the key assumptions that lie behind it—assumptions both about people and about the inability to control complex living systems from the top? The same rise in popularity seems now to be happening with so-called systems thinking; yet, how many organizations actually are seriously investing in developing new capabilities by which to understand cause and effect as distant in time and space? How many are starting to escape the addiction to "quick fix–itis" that afflicts industrial-age institutions, the incessant focus on short-term fixes that end up creating more damage in the long term?

Looking now at this article, we can see the flaws in the picture we painted 17 years ago. For example, we surely gave too little attention to the importance of learning processes that can increase the intelligence of local decision makers and align local actions across large organizations. The absence of such learning processes can prove fatal for inspired innovators seeking to empower and decentralize. At the time, we had little experience with the extraordinary personal, political, and cultural challenges involved in redistributing power in large enterprises. We talked in the article mostly of younger, smaller enterprises and neglected the important questions of bringing about change in large, tradition-bound institutions. These are things about which we have all been learning a good deal in recent years.

All in all, we found that rereading our ruminations of many years ago left us proud of sticking our necks out and encouraged us—all of us—to be bolder in moving forward. Likely, the next 17 years will bring no less dramatic changes than have the last 17.

ganization. We call them "metanoic" organizations, from a Greek word meaning a fundamental shift of mind. The term was used by early Christians to describe the reawakening of intuition and vision. These organizations operate with a conviction that they can shape their destiny. They nurture understanding of and responsibility for the larger social systems within which the individual operates. Their role in the transition to a sustainable society is vital, for metanoic organizations evidence a unique sense of corporate responsibility for the larger social systems within which the individual operates. Their role in the transition to a sustainable society is vital, for metanoic organizations evidence a unique sense of corporate responsibility. Unlike the defensive, narrowly self-serving nature of most "corporate responsibility" programs, the activism of metanoic organizations centers on the long-term viability and vitality of the larger social system within which the organization operates.

Metanoic Organizations

We use the term "metanoic organization" to describe a unifying principle underlying a broad base of contemporary organizational innovations: that individuals aligned around an appropriate vision can have extraordinary influence in the world. Antecedents of the metanoic organization can be found in many places: the management theories of Douglas MacGregor, for example; the writings of systems theorists like Jay Forrester, and the basic beliefs in freedom and self-determination expressed in the founding of this country. In metanoic organizations, these beliefs form a coherent organizational philosophy with four primary dimensions: (1) a deep sense of vision, or purposefulness; (2) alignment around that vision; (3) a persistent focus on systematic organizational design; and (4) the balance of reason and intuition.

At the heart of the metanoic organization is a deep sense of purposefulness and a vision of the future. The vision can be abstract, such as excellence, service, or creativity. In one company, people speak of the "diamond in the sky" to symbolize the excellence they strive for. Their vision is also to demonstrate that people are most creative within a context of freedom and responsibility. Alternatively, the vision can be concrete. At one computer manufacturer, the vision is to build a computer that never breaks down. In another, it is to build the world's largest and most powerful computer.

Although the substance of the vision obviously varies from firm to firm, the alignment of individuals around that vision is inherent in all metanoic organizations. Alignment is a condition in which people operate as part of an integrated whole and is exemplified in that profound level of teamwork that characterizes exceptional sports teams, theater ensembles, and symphony orchestras. When a high degree of alignment develops among members of a team committed to a shared vision, the individuals' sense of relationship and even their concept of self may shift. In *Eupsychian Management,* Abraham Maslow observed that in a highly aligned business team "the task was no longer something separate from the self, something . . . outside the person and different from him, but rather he identified with this task so strongly that you couldn't define his real self without including that task."

Alignment is crucial for two reasons. First, it bonds a group of disparate individuals into a common body, wherein each feels that his or her contribution matters. Secondly, highly aligned teams can produce results most people think impossible. Just as the 1980 U.S. Olympic hockey team shocked the world by winning the gold medal against the vastly more talented and experienced Russian and Finnish teams, when this synergy is sustained in business teams, overall performance improves dramatically.

The third characteristic of metanoic organizations is a consistent focus on the organization as a complex system. Though attention in most organizations is customarily focused on events and personalities, attention in metanoic organizations is continually redirected toward basic design. Understanding the organization as

an integrated system can reveal how policies that maximize performance in one area may be detrimental to the organization as a whole, or how policies that boost short-term results may erode profits in the long run. Each of the companies described below has implemented basic innovations in organizational design. Most are highly decentralized, in some instances breaking totally with traditional, hierarchical structure. All have developed incentive systems that encourage employee initiative, responsibility, and a sense of ownership. All continually evolve policies and structure as required to realize their vision.

Yet this quest to understand complex systems is tempered by the recognition that there is no "complete" model of the organization. Consequently, intuition must complement rational analysis and planning in order to understand the company's internal dynamics as well as its interactions with its environment. Vision and alignment are also intimately liked to intuition. A compelling and inspiring vision by its very nature transcends rationality. Likewise, alignment develops from the intuitive interconnectedness of people that allows individuals to act spontaneously in the best interests of the whole. Noted futurist Willis Harman has observed that at the heart of the world's spiritual traditions is the notion of a personal "life plan" that is known only by listening to our creative "inner voice." He writes, "Acting in accordance with this 'plan,' I can expect my actions to be in harmony with the ultimate well-being of all those around me." "The founding fathers who set up this nation were very clear on this. They specifically recommended the way in which this nation should govern itself, the way in which choices should be made, namely through this kind of collective listening."

Highly aligned groups perform complex tasks in ways that cannot be planned rationally. In *Second Wind: Memoirs of an Opinionated Man,* former basketball star Bill Russell describes this intuitive component of alignment in recounting games that were

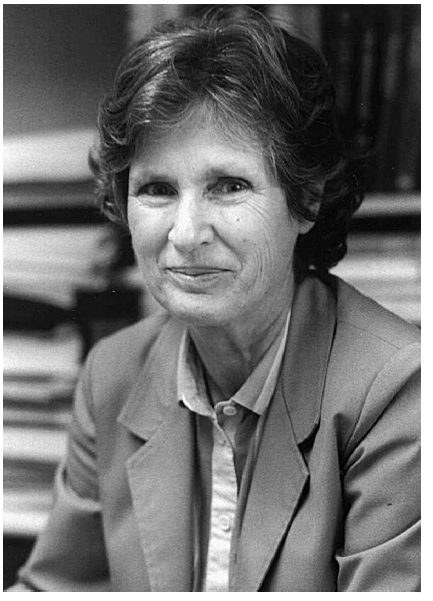
> more than physical or even mental . . . and would be magical. . . . It was almost as if we were playing in slow motion. During these spells I could almost sense how the next play would develop and where the next shot would be taken. . . . My premonitions would be consistently correct, and I always felt then that I not only knew all the Celtics by heart, but also all the opposing players, and that they all knew me.

Case Studies

The metanoic organization represents an ideal toward which many companies appear to be evolving. The four companies below have been selected because they have advanced further than most toward this ideal. They exemplify how the general principles described above can be translated into specific changes in design and policy and the importance of such changes to the individual and to the organization.

Kollmorgen Corporation

Kollmorgen is a diversified manufacturing company headquartered in Stamford, Connecticut. It markets printed circuit boards, periscopes, electro-optical equipment, specialty-purpose electric motors, and related products. Sales in 1981 were $230 million, having doubled every 3 1/2 years for the past ten. Comprised of 13 virtually autonomous divisions, the company embraces a small-is-beautiful philosophy through decentralization. Each president reports to a division board of five or six other division presidents and corporate officers, replicating the relationship between a corporate chief executive and a board of directors. Important decisions, such as capital expansion, R&D expenditures, and the hiring and promotion of senior management, remain at the division level. Divisions are kept small (typically less than $50 million in sales and 500 employees) so that each



Lotte Bailyn

Commentary
by Lotte Bailyn

Reading this 1982 article by the young Peter Senge and Charles Kiefer, the then-president of Innovation Associates, I felt suspended in time between *The Limits to Growth* and *The Fifth Discipline*. Here is all the concern about sustainability and what industry is doing to the environment, the key role of vision and purposefulness, and the importance of aligning individuals around them. The organizations they envision as encompassing the necessary characteristics they call *metanoic*, indicating a fundamental shift of mind, an entire new set of assumptions about the nature of individuals, organizations, and industrial growth. Their key characteristics build on Jay Forrester's system thinking, on McGregor and Maslow, and on a certain amount of intuition and spirituality.

The basic message is that given the right assumptions and understanding correctly the embeddedness within a system, a corporation's business growth and sustainability are not incompatible. Thinking systemically and, in the long range, decentralizing control, aligning to a vision, and empowering the individual are the keys to the metanoic organization. Further, these organizations, which apply the principles to their own design, are the hope for a sustainable society. In 1982, the authors were optimistic that the number of such organizations would increase and quoted one manager who said, "Our way of operating is just so far superior...others will have a hard time competing."

Herein lies the challenge to the researcher. Despite the compelling logic of the argument, we are no nearer now to a spread of these principles than we were then. A few organizations still fit the bill (though not always the same ones), but not many more—perhaps even fewer after reengineering, downsizing, mergers and acquisitions, and a

general shift of the "employment contract" away from the common good. We continue to be aware of the danger of thinking in terms of either-or dichotomies: cost versus quality, profit versus protecting the environment, shareholders versus employees.

Yet, our behavior continues to reflect this either-or thinking. Local successes with changing such work practices (e.g., establishing a learning organization, designing work so that both business goals and employees' personal needs can be met) tend not to be sustained. Why? What stands in the way? How can we explain the resistance of organizations to follow a logic that seems so self-evident? The argument continues to be made in ever more compelling ways and with better and more complex examples, but the results stay stubbornly constant. We need to understand and explain this phenomenon. The sustainability of our society may depend on it.

employee can feel part of a family where his or her contribution matters. When divisions grow past this point, they generally split. Although there are about 4,500 employees in Kollmorgen, the corporate staff numbers only 25.

This organizational design is intended to expose all employees to the incentives and pressures of a free market. All employees share in their divisions' profits. Not only are the divisions run as free-standing businesses; product teams within divisions function highly autonomously. They may share equipment and overhead support with other teams, but they typically set their own prices, determine their own sales goals, and manage their own production schedules. Incentives within product teams are great, for most new divisions grow out of successful ones.

Organizational innovation has recently extended to corporate management. A "partners group" of the division presidents and senior corporate officers has been formed to bring freedom and equality into corporate policymaking. Decisions are by consensus, each partner having veto power over any major issue. In this atmosphere, absolute honesty and trust are imperative.

Cray Research

Unlike Kollmorgen, Cray Research manufactures several versions of a single product: the Cray 1, one of the world's largest computers. It is used for such tasks as weather forecasting and simulation of nuclear power generation, that require very large data-base and computational capacity. Sales in 1981 were $100 million, with growth in the 50%–100% range over the past five years. The company currently employs about 1,100 workers, mostly in the Minneapolis–St. Paul area, where it was founded in 1972.

Although a divisional structure like Kollmorgen's would be inappropriate to Cray's limited range of products, Cray embraces the same objectives of freedom, honesty, and responsibility. Product-development and marketing teams are small and independent, often located in separate facilities. As Chairman and Chief Executive Officer John Rollwagen explains, "We have always found that people are most productive in small teams with tight budgets, time deadlines, and the freedom to solve their own problems."

One of the things that distinguishes Cray is a pervasive spirit of people collectively engaged in a significant and daring undertaking. The technical and managerial challenge of building the world's most powerful computers seems to be shared throughout the organization. Rollwagen sees the ability to pursue "audacious tasks" as central to Cray. Moreover, he believes that they can be easier for an organization to achieve than more mundane goals: "Such a vision creates an environment that takes people beyond day-to-day problems. It creates enormous excitement. While this seems very risky, it's not really, because people are focused on a single purpose, and they know that there's no backup." He views this focus on a single vision as the key to Cray's management style: "If we lost track of our overriding purpose, all the other things we do would not be enough to guarantee our success."

Dayton-Hudson Corporation

Dayton-Hudson is a large retail operation headquartered in Minneapolis. Created in 1969 by the merger of two large department store chains, the company currently has approximately $5 billion in sales and about 88,000 employees in several autonomous divisions. The whole corporate staff numbers 250, however, a ratio of only one corporate person to about 400 employees.

A corporation's normal priority is to make money for shareholders. A distinctive feature of Dayton-Hudson, however, is its commitment to four constituencies: its customers, its employees, its shareholders, and its community—in that order. It is precisely this commitment to customers and employees that allows them, they believe, to server their stockholders. The company envisions itself as

the "purchasing agent for its customers." Its commitment to its employees is most evident in a strong emphasis on decentralized authority and decision making by consensus, as illustrated by the unwritten rule that all four principal corporate officers must agree on key corporate policy questions. A level of employee participations that is unique in the retailing industry is found in several divisions—for example, Mervyn's, a department store chain on the West Coast that has grown at over 50% for the past five years through this philosophy.

Dayton-Hudson is also distinguished in its social commitment. The company was one of the founders of the Minnesota 5% Club, which now includes a large number of corporations that give at least 5% of their pretax earnings to local social programs. The corporation views this giving as an important business investment, since its long-term profitability is intrinsically linked to the economic and social well-being of the communities in which it operates.

Analog Devices Incorporated

Analog Devices is a Norwood, Massachusetts, manufacturer of analog–digital converters and related devices for computerized measurement and control systems. The company has grown at 35% a year for the past five years (1981 sales of about $200 million) thanks in large part to a clear corporate philosophy that values the contribution of each individual. ADI's value statement could have been taken from any of the organizations we have studied:

1. We believe people are honest and trustworthy, and that they want to be treated with dignity and respect.
2. They want to achieve their full potential, and they'll work hard to do so.
3. They want to understand the purpose of their work and the goals of the organizations they serve.
4. They want a strong hand in determining what to do and how to do it.
5. They want to be accountable for results and to be recognized and rewarded for their achievements.

This commitment to the individual is again maintained through decentralization and distributed decision making. Chairman and President Ray Stata works to erode the mentality of hierarchy. The corporation explicitly places its first commitment to employees (followed by customers, then stockholders). Workers are regularly reminded, as Stata puts it, that "Human judgment is above procedure and on an equal footing with policy at Analog." Stata seeks "to break the procedural syndrome, whereby people seek to impose themselves on others through establishment of rules."

Respect for the individual is independent of his or her position in the organization. People at Analog seem determined to create an environment where power and influence derive from ability and commitment, not position. "We are not trying to eliminate all hierarchy," Stata says, "but to undercut the value system that is linked to the hierarchy. The greatest limitation in traditional organizations is that people further down the hierarchy somehow consider themselves lesser beings than those above them."

Others

Many other companies are developing along the same lines. Tandem Computer is a young, rapidly growing company (1981 sales of $200 million) with a vision of producing computers that offer continuous, nonstop service. It illustrates another characteristic of the metanoic organization: a marked deemphasis of formal organizational structures and management systems. At Tandem, the structure within working groups is fluid. People avoid memoranda and formal procedures whenever possible, so communication is generally immediate and oral. As Jim Treybig, Tandem's president, says, "Most companies are overmanaged. Most people need less management than you think." Steak and Ale. a highly success-

ful division of Pillsbury of over 300 restaurants, shows that freedom and individual responsibility can thrive in the restaurant business as well as in high-technology manufacturing. By establishing company norms of honesty, integrity, and open communication across all levels, Steak and Ale creates an atmosphere where employees consider themselves directly responsible for customer satisfaction and where most organizational change comes from the ground up.

Basic Assumptions

More and more, organizational specialists are examining "corporate culture" to determine what distinguishes successful corporations. Edgar Schein, well-known organizational theorist at the Massachusetts Institute of Technology (MIT), suggests that corporate culture can be considered on at least three distinct levels: artifacts (language, rules and procedures, organizational structure), values (explicit goals and principles for their pursuit), and basic assumptions. He emphasizes that basic assumptions, however difficult they may be to observe, represent the deepest level of culture and must be examined to understand how an organization affects its members. Such examination is particularly important for understanding how metanoic organizations might foster assumptions consistent with a sustainable society.

People Are Good, Honest, and Trustworthy

A central theme in every metanoic organization is that people are basically honest and trustworthy and that each wants to contribute to the organization. It is assumed that failure to behave accordingly signals the organization's failure to create an atmosphere conducive to such behavior. Kollmorgen's 1979 Annual Report expresses

> an unspoken conviction that man is basically good, that each individual is the basic measure of worth, and that each, by pursuing his own good, will achieve the greatest good for the greatest number.

People Are Purposeful

That people are basically good and want to contribute is well known as the "theory Y" view of management, to which the metanoic viewpoint adds a still more spiritual, visionary dimension. Rollwagen of Cray says it is important to "share the spiritual benefits of our success with all people in the organization." State of ADI sees alignment of personal and organizational purpose as a prerequisite for productivity. In his words, "I cannot commit a large part of myself without a 'rationalism'—that is, seeing the relationship between what I care deeply about and what the organization stands for." He believes that an organization's vision must reach from concrete business plans to a sense of cosmic purpose aligned with people's deepest values.

These views reflect a deep belief that personal satisfaction lies not in material rewards alone but in the opportunity to pursue a lofty objective. Metanoic organizations do not reject material rewards or the role of private enterprise in generating wealth. They do reject the "instrumental" view that people work *solely* for purchasing power, for they find no inherent conflict in the pursuit of a lofty vision and financial gain. Indeed, most argue that the two are complementary. This assumption is nowhere more clearly articulated than in Kollmorgen senior management's mission statement:

> to fullfill its responsibility to Kollmorgen shareholders and employees by creating and supporting an organization of strong and vital business divisions where a spirit of freedom, equality, mutual trust, respect, and even love prevails; and whose members strive together toward an exciting vision of economic, technical and social greatness.

Each Individual Has a Unique Contribution to Make

It is frequently assumed that only the extraordinary individual matters and the only power that matters is positional power. Those not formally in positions of power can at best connive to influence those who are. In metanoic organizations, positional power is secondary to what James MacGregor Burns and Warren Bennis call "transformational power," or the capacity to empower oneself and others to realize a common vision. It grows from the clarity of the individual's personal purpose and commitment to the organization's vision, not from position in the hierarchy.

John Rollwagen illustrates the importance of individual commitment by relating that within the Cray 1 computer is a cylindrical mat (about a foot thick, four feet in diameter, and five feet high) of some 70 miles of hand-woven copper wire. It takes three shifts of four people working three months to wire a Cray computer. In the past two years, many have been completed without a single mistake in over 100,000 connections! Not only is this a source of tremendous pride for the wiring teams, it has had a direct impact on the company as a whole. When the wiring is completed on time and is mistake-free, the computer passes inspection and is ready for delivery a month early. The result is not only a significant saving in cost but a direct gain in revenue, since a Cray 1 computer rents for close to $300,000 a month. Everyone in Cray benefits because all employees are on profit sharing.

Complex Problems Require Local Solutions

Complex "system" problems have long been held to require large, institutional solutions. This assumption has dominated our approach to public issues, resulting in an ever-increasing government involvement in fighting urban decay, environmental stress, and economic stagnation. Analogously, inside our organizations we assume that major problems, such as falling productivity or market share, must be solved from on top.

By contrast, metanoic organizations show that small institutions can typically be more responsive than large ones and that local decisions can be more effective than centralized ones. They have developed ways of making the smallest feasible unit an autonomous and effective decision-making body. As Stata explains:

> We try to adopt an organismic approach to management control. We continually emphasize local control for local problems, because it's simply not possible to figure it all out from the top.
>
> We try to decouple local control from hierarchical control. The management hierarchy needs to provide direction, awareness, and a sense of how the game is played, but it needs to respect the greater ability of small groups to solve their own problems.

Rollwagen adds that "We need to rely on individuals and small groups to identify and correct their mistakes. By the time a mistake gets to top management, it's often too late for effective correction." Decentralized, participatory decision making at Dayton-Hudson is exemplified by the weekly "ad meetings" at Mervyns, where merchandising managers from the entire company lay out a week's advertising. The open, free-flowing, and often confrontational meetings are a far cry from centralized advertising planning and so are the results: New ads are produced in three weeks, whereas competitors average 16.

A company's commitment to decentralization can be no stronger, however, than its faith in the wisdom and responsibility of the individual worker. Most managers do not trust people to function efficiently and effectively without elaborate rules and procedures. However, when we asked a division manager at Kollmorgen to see the procedure manual, he said simply, "We don't have one. We trust people." Another commented wryly, "It's the Bill of Rights,

Ten Commandments, the Sermon on the Mount, and the company bonus plan. Why rewrite something that already exists?"

The Concept of Leadership

In traditional organizations, including our federal government, the people at the top are seen as the people in control. By contrast, leaders in metanoic organizations are responsible for sustaining vision, catalyzing alignment, and evolving structure. They frequently conceive of themselves as teachers, but they do not control the system. Most do not even think it is possible to control an organization effectively from on top.

In the past those who led and those who are led have represented separate, if not antagonistic, classes. Leaders were assumed to possess unique understanding and power. This authoritarian attitude runs deep. As Stata observes, "Much of our traditional organizational thinking is derived from the Catholic Church and the Roman Army, institutions predicated on the notion that the person on top has information and influence not shared by others." To overcome such notions, leaders in metanoic organizations typically involve themselves heavily in teaching employees how the organization operates. As Jim Treybig at Tandem says, "Each person in the company must understand the essence of the business." "We want to run the company in a completely open way," says Swiggett of Kollmorgen, "so that there are no information monopolies—everybody knows everything. We don't want secrets. We don't want 'closed books.' We don't want people feeling special by virtue of the fact they have certain information."

. . . leaders in metanoic organizations are responsible for sustaining vision, catalyzing alignment, and evolving structure . . .

However, efforts to break down the barriers separating different levels in the organization are not always welcome, particularly by those who come from authoritarian backgrounds, be they managers or not. Swiggett says, "Many people have been brought up with the idea that they cannot operate if they haven't got somebody telling them what to do. People are comfortable with authority; they've built their lives on it." Leaders in metanoic organizations recognize that they must work continually to overcome the authoritarian mentality, because it is inimical to the spirit of equality and responsibility they seek.

Me and You versus Me or You

Traditionally, there is in organizations an underlying assumption of separateness and competition. The spotlight is on the distinct, often conflicting needs, desires, and aspirations of individuals. People operate according to what Buckminster Fuller calls the "me-or-you" orientation, vying for scarce resources such as money and recognition, because they assume there is not enough to go around.

Metanoic organizations do not avoid competition; in fact, they seem to share a unique zest for it. They are energized by the risks and rewards of a challenging game. What is different is the context. Competition is transformed by the pursuit of a common vision, ground rules for how the game is played, and strong ethics of honesty and integrity. People insist on fair play and clear rules. They want clear winners and losers. When people have, in Swiggett's terms, "an honest game" to play in pursuit of a lofty vision, creativity and innovation are maximized. In such a context, competition becomes a strategy rather than an end in itself. Under these conditions, there may be interim winners and losers, but all benefit in the long run.

Robert Galbin, chairman of Motorola, describes how this "me-or-you" attitude extends into the organization's relation with its environment:

> Generally in an industrial society, we are simultaneously suppliers and customers, licensors and licensees. We can't do without each other. Each of us is better off that the other survives. We must and do compete vigorously. At times, one of

us will be a little better than the other, providing the opportunity to win on that occasion. Next time the other may be the winner. Each competitor is important to the market and to each other, for we need multiple sources. The world requires diversity. The American society, to be dynamic and strong, needs the aggregate of all the ideas and all the efforts.

Implications for a Sustainable Society

We have a good understanding of the mechanisms that generate material growth in a free-market society. What sort of mechanisms might be in order for a sustainable, free society? Some might come from a redefinition of self-interest on the part of our private corporations to include the long-term vitality of the social systems within which the corporation operates. Many have argued that economic and social stability are necessary for business growth and that corporate involvement in guaranteeing such conditions is only logical. Yet, businesses often fail to grasp this logic.

The failure of most corporations to see the link between sustainability and business growth may be due to the fact that they themselves are trapped in the same "unsustainable" cultural beliefs and assumptions as society at large. Writing in *Coevolution Quarterly,* Donella Meadows, co-author of *The Limits to Growth,* says these assumptions include:

1. There is not enough to go around, so someone must lose if others are to win.
2. Physical and environmental limits are far away, so they can be ignored.
3. Each individual must look out for himself.
4. The future will be much like the past, only bigger and better.

The seed for a different type of relationship between the corporation and society is present in metanoic organizations. The assumptions in these organizations differ sharply from those listed above. There is an attitude that "either we all make it, or none of us does." It is assumed that everyone can win and that each individual has an important part to play in determining that outcome. In effect, there develops an awareness of and sense of responsibility for the larger social systems within which the individual operates.

Systemic Awareness and Responsibility

Awareness of a larger system arises naturally from alignment around a common vision. This is exemplified by the individual players in an orchestra, who know that their success is intimately tied to the success of the others. Most of the organizational innovations discussed above serve to clarify how individual actions influence collective performance. For example, Kollmorgen's divisions split whenever they grow to the point that the individual can "no longer get his hands around the business as a whole." The emphasis in all the companies on small, autonomous business units, be they product-development teams or retailing groups, underscores the message that each individual's actions matter. By eschewing formal rules and procedures, the organization encourages the individual to be responsible for results, not for following rules. Individual responsibility is reinforced by leaders who act as guides rather than as omnipotent and omniscient controllers of the destiny of the company and its employees.

Responsibility for larger social systems carries over to the corporation's interaction with its environment. The corporate responsibility programs of the metanoic organization tend to address the long-term well-being of the communities and regions within which they operate. Unlike the narrowly self-serving social activities of many companies aimed at protecting business interests, the metanoic organization sees its self-interest more broadly. The role played by Dayton-Hudson in revitalizing the depressed Whittier section of Minneapolis illustrates this. In 1977, Dayton-Hudson pledged a million dollars to help found the Whittier Alliance, a nonprofit community-development partnership

of local residents and businesses. Since its inception, the Alliance has assisted in over 650 home improvements, rehabilitated nearly a hundred multifamily units and converted them to cooperative home ownership, and upgraded streets, sidewalks, and public squares. Most of the work has been done by residents and local businesses. In 1981, Dayton-Hudson concluded its formal partnership according to plan and left the community with new skills, a credible community organization with visible accomplishments, and a renewed sense of self-sufficiency. The process is now being repeated in Pontiac, Michigan with plans for expanding into other communities.

Dayton-Hudson also encourages other corporations to become social activists. It co-founded the Minnesota 5% Club in 1976, the first such business group in the country, which has grown to include about 50 member organizations. The Club now plays a major role in fostering public-private cooperation on key Minnesota issues.

Similarly, Analog Devices helped found the Massachusetts High-Technology Council, an association of business leaders intent on promoting a healthful business climate in the commonwealth. One of the first issues confronted by the MHTC was high property taxes, a barrier to attracting and holding talented young workers. The MHTC fomented "Proposition 2 1/2," a referendum to limit and reduce property taxes, which the voters passed resoundingly in 1980. Tax reduction has been complemented by a campaign led by Ray Stata to boost business support of local universities and community colleges through the "two-percent solution," a pledge of 2% of corporate R&D expenditures to institutions of higher learning. To State, "such a pledge isn't a charitable contribution; it's an investment in the company's future."

System Principles

Systemic awareness and responsibility alone are insufficient, however, for the transition to a sustainable society. An advanced society in balance with its environment will also require a deeper understanding of the nature of complex systems. Meadows argues that the unsustainability of our present society arises from the lack of such understanding.

> The world is a complex, interconnected, finite, ecological-social-psychological-economic system. We treat it as if it were not, as if it were divisible, separable, simple, and infinite . . .
>
> No one wants or works to generate hunger, poverty, pollution, or the elimination of species. Very few people favor arms races or terrorism or alcoholism or inflation. Yet those results are consistently produced by the system-as-a-whole, despite many policies and much effort directed against them.

Meadows is describing the characteristic of complex systems often called *policy resistance*—the tendency of systems to resist attempts to change their behavior. Current economic issues such as stagflation, declining productivity, and weak capital investment persist despite repeated efforts to correct them. Efforts to solve such problems by addressing symptoms directly can actually make matters worse.

System theorists have been writing about policy-resistant complex systems for many years. Yet these insights have had a negligible impact on public policy making. Our present policy-making apparatus has so far failed to develop the orientation needed to handle long-term systemic problems. By and large, we continue to throw more money and people at symptoms without understanding underlying causes. Despite rhetoric to the contrary, we continue to assume that major problems must be solved from the top down. Given the time horizon allowed government officials to solve problems, this only reinforces the symptomatic approach.

Local environments are needed where systemic thinking can be nurtured and take root. Emerging metanoic organizations are providing just such environments. They represent a radical alternative to our accepted methods of

managing complex systems. They replace top-down control with decentralized control; they replace rules and regulations with alignment around a common vision to guarantee that people work together; and they demonstrate that leaders who catalyze alignment, responsibility, and intuition can be far more effective than traditional authority figures. These organizations are gradually assimilating system principles many have argued are necessary for a sustainable society. As they carry these principles into their dealings with competitors and government, they will become more widely understood.

In addition to policy resistance, one such system principle is the characteristic of "better before worse" behavior, where interventions improve conditions in the short-term only to lead to further deterioration in the long run. This principle has led metanoic organizations to oppose legislation that, although directly beneficial to it in the short run, may be detrimental in the long run. Swiggett and Rollwagen have been directors of the American Electronics Association (AEA). The AEA opposes legislation it views as inhibiting to free-market forces, such as the business tax cuts of the Reagan Administration that were felt to be forms of protectionism designed especially for large businesses in stagnating industries. The AEA felt that short-run benefits to member companies of accelerated capital depreciation or investment tax credits did not justify the likely long-term costs to the economy as a whole.

A third principle is the need for policies designed to work *with* the forces in a system rather than against them. Buckminster Fuller has often accused nonsystem thinkers of trying to "invent the future" rather than understanding the laws governing change as a guide to planning. Swiggett, in his 1982 speech to Kollmorgen's stockholders, criticized the Reagan economic program for its failure to recognize the long-term forces causing economic stagnation. Despite strong support for Reagan's intention to reduce government involvement in private affairs, Swiggett states that "[b]y implying we can make major changes in three or four years, President Reagan is running the risk of building high expectations and being washed out of office on a tide of disappointment." He goes on to assert that the economy is in the midst of a long-wave transition to a new mix of dominant technologies and industries and that policies designed to speed that transition are needed. Swiggett backs up his speeches with action; he and the AEA helped to initiate the 1978 Steiger amendment reducing capital gains taxes to spur investment in new business.

None of the companies see themselves as social missionaries, preaching morals to fellow businessmen; but they do see themselves as demonstrating that freedom, honesty, and responsibility make good business.

A fourth system principle understood by metanoic organizations is "shifting the burden to the intervenor"—the tendency of system-control mechanisms to atrophy in the presence of external assistance, creating dependency on still further intervention. This principle is central to understanding the reinforcing spiral of government assistance. The emphasis on autonomous business units in all the companies we have studied grows out of their understanding of the principle of "shifting the burden." Frequently, when product teams at Kollmorgen seek assistance, managers inquire whether the assistance represents a one-time need for help or is likely to lead to increasing dependency. They ask, "Are you shifting the burden?" Sharing and intergroup assistance is commonplace but only where it strengthens both parties.

Understanding how external assistance can foster dependency makes most metanoic organizations strong believers in free-market mechanisms. They vigorously oppose government assistance that may undermine the self-reliance of individuals and businesses. What distinguishes them from the host of other businesses that decry government intervention is their commitment to empower free-market forces to work for everyone's advantage. They recog-

nize that, in order for a free-market system to remain viable and responsive to society's changing needs, there must be an uncompromising commitment to honesty and integrity coupled with a strong sense of social responsibility. None of the companies see themselves as social missionaries, preaching morals to fellow businessmen; but they do see themselves as demonstrating that freedom, honesty, and responsibility make good business.

The Metanoic Viewpoint

Ultimately, the metanoic organization's greatest contribution may simply be its belief in the creative powers of highly aligned individuals. The vast majority of organizations simply do not work so well as people would like. Disillusionment, dissatisfaction, lack of alignment, and inefficient use of human resources are accepted as normal: "Things don't work, and there's nothing I can really do about it. I'm dissatisfied, but I'm stuck in a system too big, too unresponsive, and too complex to influence." This point of view is so pervasive it easily becomes an "absolute truth" and a self-fulfilling prophecy. It not only permeates most organizations and institutions but is the root cause of our sense of powerlessness in tackling the problem of creating a sustainable society.

The essence of the metanoic shift is the realization within each individual of the extraordinary power of a group committed to a common vision. In metanoic organizations people do not assume they are powerless. They believe deeply in the power of visioning, the power of the individual to determine his or her own destiny. They know that through responsible participation they can empower each other and ultimately their institutions and society, thereby creating a life that is meaningful and satisfying for everyone.

Can these organizations catalyze metanoia in society as a whole? Given that our country was founded on the very same belief that people can determine their destiny, it is entirely possible. Companies like Kollmorgen, Cray, Dayton-Hudson, and Analog Devices are direct expressions of this belief. They see themselves not as inventors of a new philosophy but as caretakers of an ancient vision, adapting it to the realities of the present.

The reality of the present, however, is that society operates by and large from a belief that the individual is at the mercy of huge, hopelessly complex, and unresponsive systems. Yet such beliefs can change, and when they do, everything else changes with them, even one's physical environment and perception of reality. As Willis Harman writes:

> What you believe determines what you perceive as reality.
> What you believe determines what you feel you can do about it.
> What you believe determines the exhilaration and joy you get out of life.
> Some beliefs are wholesome; others are definitely unwholesome. (Along the way most of us pick up a lot of unwholesome beliefs.)
> Beliefs can be changed.
> In a life that is constructed around an inadequate or erroneous set of basic beliefs, it will include a lot of problems and pain.
> If a society is guided by an inadequate or erroneous set of basic beliefs, it will tend to foster a great deal of human misery.
> At the level of society, too, beliefs can be changed.

One such change is the emerging belief, "we can collectively envision and create the society we want." Metanoic organizations provide a safe environment for this most basic belief to take root and develop.

It is too early to gauge the long-run effects of metanoic organizations. The number of companies operating in this manner will likely need to increase before their impact is felt on society. However, this seems the least uncertain element. As one Kollmorgen manager put it, "Our way of operating is just so far superior in organizational and human terms to the way most companies work, others will have a hard time competing. In a free society, this is the most potent force for change."

FEATURE

Learning for Operational Excellence: A Manager's Story

David Berdish

Background

David Berdish

This is the story of the Electrical and Fuel Handling Division (EFHD),[1] one of the Ford Motor Company's smallest divisions, and its drive to become the world's leading supplier of air and fuel charging, charging and starting, ignition, fuel delivery, and wiper and washer components. It is a story that unfolds over 5 years (1992–1996), and it tells how EFHD achieved its goal of becoming a leading worldwide components manufacturer using the tools and methods of organizational learning.

This is EFHD's story, told by myself (EFHD's process leadership manager)[2] and many of the critical players involved with EFHD's effort to become a learning organization. We describe significant events, key decisions, and turning points that made EFHD a learning organization. We test memories, reflect on our observations, and draw conclusions. We make judgments!

Participants in the process of becoming a learning organization often document that process, and their documentation becomes a learning history.[3] This article is not a learning history, however; it is an advocacy paper. We decided to make it an advocacy paper because we wanted to make these judgments, and we wanted to be able to blurt out: "If you want to beat your competition, make money, and actually work with people who care about and share your vision, *become a learning organization*." We wanted to be able to say also, "This is how we did it. These are the actions we took. These are the results we got. You may not get the same results, but you will benefit in ways you never imagined!"

We knew that the readers of this article wanted to hear these things, too. Let's face it: People in our business (automotive systems and components) are not interested in stories that leave questions unanswered or issues open. These people want answers. They demand results. So, we wanted to tell them our story—the very nature of a learning history.

Our Story

EFHD was formed in July 1988. At that time, it comprised three plants that manufactured mature "gas and spark" products (which, by the way, were designed by someone else, including our competition). Engineering costs were less than 1% of sales, quality indicators were low, and labor costs were high. It was not a pretty sight. We were ready to try something new.

Enter the learning organization. In 1992, Bob Womac, EFHD's general manager,[4] decided to invest time and energy in making EFHD a learning organization. His reasons: to increase the ability of EFHD employees to think cre-

Nick Zeniuk

Commentary
by Nick Zeniuk

The Electrical and Fuel Handling Division (EFHD) story is real, passionate, and informative; in fact, it is instructive of successful organizational transformation. We should all read it because it describes a process for initiating and sustaining organizational change and learning, because it works, and because it reinforces similar methods used in other organizations (e.g., Ford, Harley Davidson, Intel). What is instructive in David Berdish's story is the powerful and critical role of leadership in meeting the challenges of successful transformation. Much of the success can be attributed to the leadership of Bob Womac, the senior leader, and David Berdish, the internal networker, who helped Bob define the opportunities around business challenges. Together they were able to engage line-leaders throughout the organization in applying to the work the five disciplines. Through attention and focus on business issues, the usual constraints for change (e.g., time, purpose, alignment, capacity) were diminished. David's advocacy and passion were the source of energy for overcoming the early skepticism within the organization.

Transformational change does occur in traditional organizations, but the journey is difficult and the challenges can be overwhelming. The new book by Peter Senge et al., *The Dance Of Change*, explores these challenges in depth.

Bud Marx, then the executive vice president of diversified products at Ford, recalls clearly how Bob Womac and his team were taking charge of creating the business they wanted. Bud had not been involved in and did not know about the learning initiatives, and he was most impressed by how the executives from EFHD were behaving. They were less reactive, less defensive, more open and collaborative—and the bottom line was getting better.

As I reflect on my own experience on the Lincoln Continental project at Ford,[1] team members attributed the success of the pro-

atively; to shorten response time to team members, customers, and suppliers; to expedite strategic transfer of technology; and to help to gain a sustainable edge on our competition. Bob's direct reports—EFHD's Division Operating Committee (DOC)—agreed. Off we, and everyone else, went.

Becoming a learning organization meant we needed to operate in entirely new and different ways. We needed to think and work together differently. We needed new ideas, and we needed to learn them faster. We also needed people with the guts to place their hearts on their collective sleeves, who would work to avoid the "same old played-out scenes" and who stood for something!

Lessons Learned

Looking back on our experiences with organizational learning, I believe we have several lessons to share with managers at EFHD, the Ford Motor Company, and the rest of the industry:

- Make the transformation to a learning organization yourself. We did. We developed internal capacity to promote learning throughout EFHD by seeking all kinds of information about organizational learning from internal and external sources, including (but not limited to) Peter Senge, the Massachusetts Institute of Technology (MIT) Organizational Learning Center, David Kreutzer, Vic Leo, and Roger Saillant.
- "Walk the talk." Each member of the DOC made a personal commitment to become a new leader and to practice the five disciplines described by Peter Senge in his book *The Fifth Discipline*.
- Develop an infrastructure to support and roll out organizational learning:
    1. committing to practice dialogue;
    2. sponsoring and designing the initial learning team;
    3. identifying the learning organization as a strategic initiative in the business plan;
    4. establishing a learning organization course;
    5. recognizing learning as the foundation for improvement efforts;
    6. appointing a full-time resource (person) to learning organization efforts;
    7. holding regular learning events; and
    8. disseminating organizational learning to departments and staffs.
- Ensure that the organization's leader believes in organizational learning *strongly* and *completely*.

Bob Womac was a great leader. He was strong, patient, and thoughtful, and he was a good listener. He held to the convictions of openness and honesty regardless of politics. No matter how ugly the situation, he acted as a teacher. He concentrated on the system and avoided getting bogged down in the details of the operations, even if that area was the one in which managers seemed the most comfortable. He *walked* the talk—at every team meeting and dialogue session; he encouraged people to share the lessons that were learned and could be used to create successful processes and policies for the business. He was a man we respected, trusted, even loved. In addition, he demanded the same behaviors from his direct reports.

Separate from the leader of the company or organization, any group committed to organizational learning needs a motivated, passionate, and "thick-skinned" person to lead the learning effort. As the learning leader, I was motivated, passionate and, at times, thick-skinned. For everyone, I created a space in which to learn. I held to the convictions of the strategy regardless of the cynics. Further, I carried the message to everyone, no matter how ugly the responses; as you will see in this article, not everyone at EFHD was immediately taken with this stuff. I emphasized the value of learning and ignored the politics and ranks of the people with whom I worked and the old ideas about the way business "should be" conducted—even when that was the place in which people were the most uncomfortable. I delivered a message that was

consistent with Bob Womac's beliefs and the "feel" of the learning organization. I made sure that our team learning sessions and the course practiced the five disciplines. I always tried to involve everyone. I believed in EFHD and what we were trying to accomplish.

The Impact of Organizational Learning on EFHD

The impact of organizational learning on EFHD was tremendous. Organizational learning simply helped the division perform better. It helped people to learn to trust one another and to work together to achieve the division's shared vision of being the best-in-class components manufacturer in the world. It helped people to communicate, making the exchange of learnings quicker and easier. Finally, it helped a division that had lost $50 million in 1991 to earn more than $150 million in 1996.

Organizing an Advocacy Paper

We begin our story by remembering the atmosphere at EFHD before we began our effort to become a learning organization. Some said the ground was fertile for change, which may or may not have made the difference for EFHD. We present the rest of our story in an approach-deployment-results format common to the automotive industry. First, we describe our approaches to support organizational learning at EFHD. Then, we describe how we deployed several of those approaches. Finally, we describe the impact of organizational learning on EFHD.

Leaders Set the Framework

In 1991, EFHD's general manager attended an executive development seminar on systems thinking. He was intrigued by how quickly the Japanese were able to transfer their learning into productivity. He knew that EFHD had the same technical and technological capabilities as the Japanese, but it lacked their ability to turn learning into productivity quickly. This prompted the general manager to begin his effort to turn EFHD into what he termed a *learning organization*, not knowing that Peter Senge had already published *The Fifth Discipline*, which contained the theories and methods of organizational learning. "I didn't feel nervous about trying something new," he said. "The old ways weren't working. We were in trouble. We had to do things differently." A DOC member reiterated:

> EFHD was ready to become a learning organization. Its leaders were dedicated to rebuilding a troubled business and were interested in a challenge. They were focused more on the team and team results than on individual results. The *type* of leaders had a lot to do with EFHD's ultimate success.

Several people said that EFHD's culture was conducive to the learning organization concepts right from the start, mostly because of the division general manager's leadership style. "He held meetings that tried to extract the gold from the people around the table," said one DOC member. Said another,

> He opened the door to input from his operating committee instead of evoking a classic Ford mentality. We were struggling to get over a plateau. He could have handled the plateau "the Ford way." In the old Ford culture, you had to be hard as a rock and make decisions quickly, because almost any action was better than inaction when you were supplying the big Ford machine with tens of thousands of parts a day. So here's a guy who, for his entire career, was in one of the hardest-nosed environments in the world. Yet he had the strength to turn over his command-and-control position to his operating committee.

Another reason why learning organization principles seemed right for EFHD was that DOC members made several decisions that set in motion the gram not to the theories, methods, and tools of organizational learning but to the transformation of their leadership. The leaders played a major role in addressing organizational challenges, which allowed the natural capabilities of the team to emerge. It was the five disciplines and tools and methods similar to those at EFHD, however, that helped the leaders to change and effectively engage the organization.

1. This is documented as a learning history in the forthcoming book *Car Launch: The Human Side of Managing Change* (New York: Oxford University Press, 1999).

need to accelerate learning. They included the decisions to increase engineering capability, to institute a simultaneous engineering policy, and to expand facilities globally. A member of the Competitive Products Learning Team (CPLT) observed that "the group made it clear to all managers beneath the DOC that 'We are a team. If you don't act like a team, we'll find people who will.'"

Leaders Commit to Learning

In 1992 (the year after the division general manager found out about how quickly the Japanese learned), the DOC decided to make EFHD a learning organization. Over the next couple of years, committee members took several actions to develop an infrastructure to support and roll out the learning organization principles. They took some of these actions by design and some just because they seemed right. All the actions were needed to make EFHD a learning organization.

One of the most important decisions DOC members made was to become disciples of the learning organization themselves so that they could "walk the talk" (see later). They made personal commitments to understand learning organization concepts and to become leaders, not managers. They made business commitments to spend time and money to support learning efforts throughout EFHD. What follows are the eight most significant actions of DOC members, listed in the order in which they were taken.

1. They committed time to practice dialogue.
2. They sponsored and designed the initial learning team.
3. They designated the learning organization as a strategic initiative in the business plan.
4. They approved and promoted the learning organization course.
5. They made learning the foundation for improvement efforts.
6. They devoted a full-time resource to learning organization efforts.
7. They led learning efforts by attending learning events.
8. They spread organizational learning to departments and staffs.

Committing Time to Practice Dialogue

EFHD sent several DOC members to MIT to attend Peter Senge's 5-day course on the philosophies of *The Fifth Discipline*. These so-called missionaries brought back information on the tools and methods of the learning organization so that EFHD could begin applying them quickly.

Immediately after the missionaries returned from MIT and shared their learnings with the other DOC members, the DOC set aside 2 hours each week for dialogue sessions and appointed a full-time lead learner (an advocate-sponsor of organizational learning efforts and one who was not a DOC member but had been a missionary) to facilitate these sessions. These weekly dialogue sessions helped the team to create a shared vision and to communicate. They also sent a message to the rest of the division that the DOC was serious about becoming a learning organization. Here are two comments by DOC members about that decision:

> We decided to schedule weekly dialogue sessions separate from our business meetings, because we recognized that the rules had to be different for the two meetings. We even held the dialogue in a separate room and at a separate time.

> During our initial sessions, we dialogued around what we were going to do with this [the tools and methods of the learning organization] and how we were going to use it to boost our rate of learning.

Several DOC members stated that the division general manager's strong support for the dialogue process was key to its ultimate success. One said,

> [He] dedicated 2 hours each week to sit in those dialogue sessions with us. That kind of commitment is hard for a general manager to make. To spend that time with us, talking through the issues, letting us understand his point of view, and then acting on what we had talked about, was the signal that the general manager was willing to *play the game* to its fullest.

Disruptions to the initial dialogue sessions frustrated both sides. Whenever DOC members tried to use the dialogue as a typical meeting, a DOC member commented,

> We said, "We're not here to discuss issues. This time was set aside for us to dialogue, to get to know each other, and to explore issues, not solve them." Some DOC members would say, "We have problems to solve. We're all here, so let's solve the damned things because we're wasting time. We have real work to do." The division general manager was firm. He said, "No. This is what we need to do now." And that was that.

Sponsoring and Designing the Initial Learning Team

Soon after the dialogue sessions began, the DOC decided to focus its learning efforts on improving EFHD's product launches, so it created the product launch success team (PLST). The DOC hoped that the PLST would use learning organization tools and methods to facilitate learning between people who had been through a product launch and people who were about to initiate one. The DOC looked for an honest exchange of things gone right, things gone wrong, lessons learned, and a speedy transfer of this knowledge. It appointed its lead learner to lead this team.

The PLST increased awareness of the learning organization and the opportunity for EFHD employees to practice learning organization principles. News about the PLST spread fast. When attendance soared, the DOC decided to control attendance by keeping it voluntary. The general manager stated:

> We focused the dialogue sessions on product launch management, our biggest weakness. Recently, the alternator and starter had been launched together. They were difficult launches and consumed all of our resources as well as all of the division's resources. It was essential that we learn how to launch products without consuming everybody and affecting our bottom line. That's how the product launch success team got started and grew into what it is today.

Making the Learning Organization a Strategic Initiative in the Business Plan

After seeing the results from both the PLST and their own dialogue sessions, DOC members decided to include learning organization principles in EFHD's mission statement and to make the learning organization concept a strategic initiative in the business plan. They wanted to show that this was how they were going to conduct business. One of them said,

> During a meeting about business planning objectives and initiatives, the operating committee started talking about ways to enhance EFHD's business. We asked ourselves, "How can we steepen our improvement curve? How can we learn to profit from our mistakes, instead of making the same mistakes over again?" These kinds of questions helped us realize we needed to become better, faster learners.

Approving and Promoting the Learning Organization Course

Over the next year, DOC members saw the number of new learning teams increase and PLST membership grow. More and more people wanted to know how to use learning organization tools and methods. However, EFHD could not get the information out as quickly as it was needed, so learning was slowed.

To solve this problem, the DOC approved the design, funding, and roll-out of an educational course on the five disciplines and learning organization principles, "The Learning Organization: Theory and Practice." The course was held at a local community college, and the entire DOC participated. When the course was modified to include international participation, the DOC approved the additional time commitment and travel expenses. Interest in the course was so great that the DOC continued to keep participation voluntary.

Making Learning the Foundation for Improvement

By 1995, the PLST was a success. Product launches were improving, and attendance at PLST meetings, even though it was voluntary, was soaring. DOC members looked to organizational learning to have the same effect on other process improvement efforts, some of which were having trouble in generating participation and results.

The DOC made a commitment to promote learning as the foundation for all its improvement efforts. Process improvement efforts no longer would be handled as "flavors of the month." Now they would be handled as operating behavior. Learning teams were formed, such as the Ford total productive maintenance team, the value-added–value engineering team, the Ford production system team, and the total cost management team. Other teams were formed to learn, share, and improve administrative processes, scheduling, machining, material costs, core competencies, customer relations, high-mileage useful life, supplier relationships, and so on. "In time, people will realize that this isn't going to go away," a general manager said. "This is a different way of doing business. It's the way we're going to do things in the future."

Dedicating a Full-Time Resource to Learning Organization Efforts

In 1995, the DOC created the process leadership office to integrate the learning process with process improvement efforts. It made its lead learner the manager of this new office. The process leadership manager was clear about why he had been appointed:

> EFHD could not afford to throw precious dollars at expensive consultants. The leader had to have the DOC's trust, which was easier to do as a member of the family than as an outsider. He needed to have insight into product strategy, competitive analysis, manufacturing processes, and the division's "pulse"—critical insights that only an insider could have. He had to be willing to make changes and challenge the views of others higher in the organization than himself.

Several people added that it was important to have a passionate sponsor, someone who had the "intestinal fortitude to make sure the other learners did not revert to normal behavior. That's where he was useful in snapping us in line."

Leading Learning Efforts

To make organizational learning something more than the flavor of the month, DOC members agreed that they would have to lead the learning efforts themselves. They showed their own involvement and support for the teams by participating in many learning events, including many off-site events. "The division general manager went to almost every single PLST meeting," the process leadership manager said. "He went to as many little meetings as he could, just to say, 'Thank you, good job.'" According to one PLST member,

> [I] always enjoyed being at the PLST off-sites when the division general manager was there just to hear what was on this guy's mind. I learned to appreciate the kind of pressure he was under and to understand what he was thinking and what he thought was important. You don't get that anywhere else.

Spreading Organizational Learning to Departments

As DOC members saw the PLST and other learning teams succeed, they began advocating the power of learning to their own departments. The business planning and employee relations managers began using learning methods as part of their management processes. Plant managers began using visioning (a technique for imagining a picture of the future you desire to create) to develop shared objectives. "The more the DOC members experimented with the learning organization principles in their own backyards, the more positive feedback they got from their teams, which encouraged them to do more," the process leadership manager observed. "By spreading these principles to their departments, DOC members also advanced their own learning organization skills."

Leaders Act as Coaches and Facilitators

When the DOC decided to make EFHD a learning organization, its members decided to lead the effort themselves rather than to rely on traditional Ford methods of launching new programs. They believed that people at the grassroots of the organization would become learners only if they proved that they could introduce, facilitate, energize, and sustain the learning effort themselves. People would observe their behavior at high-pressure meetings such as project reviews, cost-reduction forecasts, and business-planning sessions. They would have to forget their "sacred cows" and hide their "stripes."

DOC members realized that leading this new culture required a skill set different from the one they used in traditional business settings. They found inspiration in what Peter Senge describes as the "leader's new work"—leading by becoming designers, teachers, and stewards. The lead learner of the DOC dialogue sessions helped DOC members to become these new leaders by developing lesson plans for the dialogue sessions, including strategic topics on the leader's new work, and highlighted the use of several tools and methods:

- Hexagons to generate collective understanding
- Causal loop diagrams to encourage dialogue about issues such as the impact of overtime and shifting the burden to union plants
- Scenario modeling to encourage dialogue about global expansion
- Visioning and creative tension exercises to help to improve the shared vision

He also included dialogue sessions on personal mastery to help DOC members to learn to balance their home and work lives. They dedicated these sessions to the memories of two DOC members who died while they were at EFHD. Their deaths had an emotional impact on the DOC members and triggered dialogue about family matters, death, security, sickness, and work.

To develop the lesson plans and to help spur the DOC's learning, the lead learner became a voracious consumer of information about the leader's new work and organizational learning. He sought out books, movies, exercises, tools, methods, and any other thought-provoking media he could find on the topic. In addition to Senge's *The Fifth Discipline* and *The Fifth Discipline Fieldbook*, he (and thus the DOC) reviewed and held dialogue sessions on topics represented in such books as *Stewardship* by Peter Block, *Creating Shared Vision* by Marjorie Parker, *Leadership and the New Science* by Margaret Wheatley, and *Ishmael* by Daniel Quinn.

How DOC Members Perceive Their Responsibilities as New Leaders

All the DOC members interviewed for this article described their perceptions about being these new leaders. Said one,

> The most important thing that systems thinking, team learning, and Peter Senge said to me was that leaders have to be nontraditional, because traditional leaders aren't going to make it. Kids today have access to more and more informa-

> tion, which makes them more knowledgeable and better able to answer questions for themselves. They have no use for a George Patton–type leader who pounds you into submission, tells you what to do, and off you go to do it.

"After you get good people, you have to trust them. You have to listen to them, and you have to learn from them," said another.

DOC members did not want the learning organization to be perceived as something that would go away once EFHD reached its business objectives. They did not want to design "organizational learning in a box." So they began to develop a shared vision about a culture in which learning behaviors were part of the norm and their behaviors would lead by example. In the words of one DOC member:

> We wanted to be able to formulate a vision for what these theories meant so we could emulate them for the rest of the division. It was important to do this because some people may have difficulty accepting learning organization concepts, which are subtle and fly in the face of traditional values organizations hold about how to communicate and conduct business. We recognized that we had to be consistent and reinforce our expectation that this is the way we want things to be done. And, oh, by the way, this is the way we, the operating committee, is [*sic*] acting, too.

How DOC Members Respond to Their Responsibilities as New Leaders

DOC members realized that becoming a learning organization would take a tremendous amount of courage and commitment on their parts. One member recalled:

> The division general manager led by example, not by recrimination or criticism. At an early dialogue session in Europe, several people joined in who had just transferred to EFHD. At the end of the dialogue, one person said, "As far as I'm concerned, this was a big waste of time. I would have been more productive if I had spent the time back in the office." Not a word was said in response to this statement. That was just one person's opinion, and we respected it. A minor thing like that sent big signals.

"We started demonstrating behavioral changes ourselves," said another DOC member. "People started to notice and ask, 'Why are they doing those things?' This turned out to have been the best way to create interest in the learning organization. It was a key step to the evolution of the process."

How Others Perceive Their Leaders

Several people talked about how the division general manager's support of organizational learning affected them. A PLST member found that "[a]s the division general manager became acquainted with the disciplines, he became a strong advocate. He supported organizational learning from the top." On one occasion, the division general manager agreed to sit out of some DOC dialogue sessions because his presence constrained honesty. People who were not members of the DOC noticed this action and regarded the division general manager and learning in a different light.

Dialogue: The Foundation of Team Learning

Ever since the learning effort began at EFHD, strategic dialogue had been the most useful tool for promoting team learning and effective problem solving. It was adopted by people from all levels and by teams of all types—from the DOC to the PLST to plant-operating teams—and became the basis for most teams' learning efforts. Teams used dialogue because it added value: to the process,

in which it provided a forum in which issues could surface without team members having to fixate on a single event or to struggle for an immediate solution; and to individuals, helping team members to develop more open and honest communication with one another, without fear of politics or recrimination.

One person compared traditional management behavior to a learning management behavior and commented that being able to dialogue and listen were two skills that Ford management needed.

> Some disciplines of the learning organization require you to listen better, which upper management doesn't always do well. Generally, upper managers are strong leaders, quick decision makers, and action-oriented. They're better at speaking than listening, and real learning takes place when you listen. In our busy schedules, we always want to make the decision and get going. But if we don't spend time talking about things, we miss the chance to develop a clear understanding of the issues and what people are thinking.

For two reasons, the DOC dialogue sessions strongly influenced the acceptance of organizational learning throughout EFHD. First, the fact that the division general manager set aside 2 hours to dialogue sent a message to the other operating committee members, and the rest of EFHD, that he was serious about learning. This kept the nay-sayers away long enough for dialogue principles to become institutionalized. Second, the dialogue sessions helped DOC members to coalesce as a group to create a shared vision for the kind of workplace they wanted to create. Two members offered the following comments:

> Over time, the things we did in dialogue subtly shifted into the operating committee. I didn't see a difference between the way we conducted business and dealt with issues at either meeting. That came from the understanding we generated among ourselves. The trust we developed in the dialogue session allowed us to take our relationships into the regular business meetings.

> We didn't have any tremendous bursts of insight. We were the same people plodding along, but we started to look at things differently and work together better. We could develop the synergy that enabled us to accomplish things better collectively than we could individually.

Learning for a Purpose

During early DOC dialogue sessions, two questions continued to surface: Why does EFHD keep making the same mistakes over and over again? Why do traditional tools and processes keep giving EFHD the same bad results? DOC members knew EFHD was good at acquiring knowledge: It had the finest engineers and quality workforce who could fix business problems. However, EFHD could not understand the systemic relationships that help a business to run better. Understanding this concept seemed an insurmountable problem and something that could not be solved during soft and squishy dialogue sessions. However, that is just what happened. From its dialogue sessions, the DOC developed a vision that organizational learning should be used for a purpose and that organizational learning tools and methods should be used to speed up learning and to challenge the rest of the division to "think outside of its box."

Several people commented on the effectiveness of integrating the soft tools and methods of the learning organization (communication, openness, honesty, trustworthiness) with such hard tools as total productive maintenance, value management, and benchmarking, to improve performance. "The learning organization toolbox gave us stuff that no one had," the process leadership manager said. "People couldn't say, 'I've already done that,' because no one had ever done it before."

Deploying the Vision

The DOC asked its lead learner to figure out how to apply learning organization tools and methods to real business issues. At the same time, the DOC started the PLST to help to improve product launches. The PLST became the lead learner's testing ground for developing the learning process at EFHD (described later).

After careful research into the tools and methods of organizational learning, the lead learner chose those that seemed most useful for EFHD. After experimentation, he found that hexagons, causal loops, system archetypes, visioning, and scenario planning worked best. Finally, he organized off-site meetings and put the tools to practical use. He deployed the following strategy for the meetings (which process turned out to be the basis for the EFHD team learning project model, described later):

1. An operational issue was chosen, and a "banner" (theme) was designed, under which the team would learn and the activities for the off-site event were scheduled.
2. Anyone remotely involved with the issue was invited to attend, and the effort was made to keep the teams diverse and cross-functional and, in keeping with the DOC's wishes, voluntary.
3. Issues and action items were generated using the tools and methods the lead learner had chosen.

Applying Organizational Learning to Real Business Issues Through Teams

Between 1992 and 1996, more than 30 learning teams were formed to improve a variety of performance issues, such as supplier relationships, cost-reduction efforts, and total productive maintenance. More than 1,730 people participated. The PLST, the first learning team created, and CPLT, are two examples of this growth.

The Product Launch Success Team

The PLST was composed of a cross-functional group of product launch managers, product and manufacturing engineers, production personnel, and administrative staff members, all of whom had as their main goal to use learning organization methods and tools to improve product launches.

Another goal of the PLST was to *share*—share things gone right, things gone wrong, and lessons learned from successful and unsuccessful launches. "Before the PLST," a PLST member said, "people felt uncomfortable talking about failures. And they felt uncomfortable talking about successes because they didn't see any value in it, either. People on new product teams were left to fall into their own holes. That wasn't an overt behavior. It just happened that way."

The Competitive Products Learning Team

The CPLT was created to improve performance. It was composed of 21 product groups and included a cross-functional representation of product and manufacturing engineers, production personnel, administrative staff members, and 40 purchased-parts and raw-materials suppliers whose main goal was to use learning organization methods and tools to reduce total costs of individual product lines. One supplier saw the dialogue as "a watershed," he said.

> During a CPLT off-site, the process leadership manager separated the suppliers from the other Ford employees and led us in sort of a "bitch" session. We were encouraged to voice our feelings about our relationships with Ford. We were told not to hold anything back and to say what was really on our minds. The session was a watershed in terms of getting things going between the suppliers and Ford.

Diverse and Cross-Functional Team Participation

One reason why the learning teams met their goals is that they usually were made up of employees from various departments and from more than one location around the world. Each member brought assumptions, perceptions, and world views, which pushed aside functional boundaries and allowed team members to approach business issues more systematically. According to the general manager:

> Our product launches improved because we got together all the stakeholders or participants involved with the product launch—purchasing, operators on the floor, skilled trades, engineers, fuel-control people, finance—everyone with any significant involvement with a launch. One of the most memorable examples of this type of involvement was the launch of the turbine fuel pump processes. The launch managers got the operators and skilled trades to help to write the equipment specifications for the quotes. Then purchasing, engineering, and the operating skilled trades evaluated each supplier's quote, picked the supplier, and participated in the design, build, and launch of the equipment. You didn't see that in past launches. People on the floor looked at the equipment as purchasing's equipment or engineering's equipment. When the equipment didn't work, it was the fault of the engineer or the purchasing guy. But now, the people on the floor own the equipment and want it to succeed. There's no finger pointing when something goes wrong.

Voluntary Team Participation

Another reason why the learning teams met their goals was that participation was voluntary. On the whole, organizational learning was by invitation, not mandate. The hope was that those who chose not to participate would see the results and begin asking, "What is that stuff all about?"

At the same time, as the learning teams tried to do more, team members were upset when key people were missing, preventing the team from realizing its full potential. The process leadership manager saw a PLST dialogue session change into a debate "when members became frustrated by the low attendance of certain departmental functions. The frustration was compounded when team leadership responded that learning was voluntary and people did not have to become involved, even if their experiences would help the PLST progress."

Some team members even suggested that the benefits achieved from participating justified forcing attendance. "We can't just let people sit on the outside and look in whenever they choose to. In cases where we expect a certain behavior, we need to make sure we lead and communicate that."

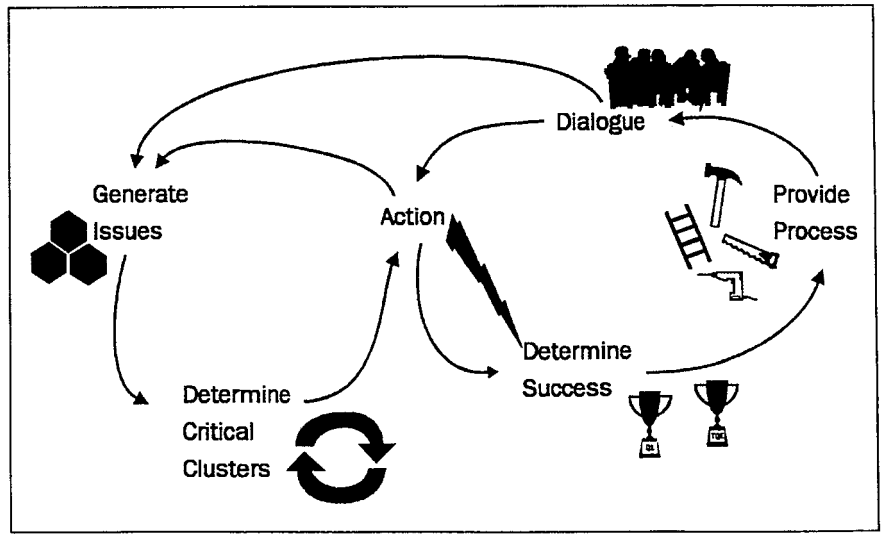
Learning Models Required by Learning Teams

As the number of learning teams and participants on these teams grew, the lack of a common EFHD learning model began hindering the teams' performance. Team members felt EFHD needed a learning process that featured certain elements:

- A common starting point for all teams
- The EFHD-preferred tools and methods (hexagons, causal loop maps, visioning, action generation, and dialogue)
- A common vocabulary (e.g., "That's a red one! Let's dialogue.")
- A disciplined approach to the fundamentals (so-called rebounding and dribbling)
- A process that generated issues, actions, and possibilities
- A process that documented things gone right and things gone wrong

Members created the EFHD team learning project model (next) that is now part of the EFHD organizational learning toolbox.

Figure 1 EFHD Team Learning Project Model



Getting the Information Out

From 1992 to 1994, EFHD applied learning organization tools and methods with amazing results. Interest in the learning teams, the five disciplines, and organizational learning grew rapidly. Then the capacity for providing learning to these teams began to "max out." People became frustrated by their lack of knowledge. EFHD needed to increase its internal capacity to help these teams and to provide more information about the learning organization. However, it could not afford to increase capacity by sending more than 5,000 employees to Peter Senge's 5-day course.

The lead learner promoted the development of a learning organization course at a local community college. The DOC agreed and approved the design, funding, and roll-out of an introductory systems thinking and organizational learning course titled "Learning Organization: Theory and Practice." The 8-day course defined the five disciplines, described the theories of the learning organization, and illustrated how these theories could be applied to real EFHD issues. In the final session, participants used the EFHD team learning project model to apply their new learnings to an EFHD work issue.

The course was taught by EFHD process leadership office employees and community college faculty. EFHD led the sections on team learning and systems thinking and funded the course and travel expenditures for EFHD participants. The community college led the sections on shared vision, mental models, and personal mastery and provided the course's conceptual and theoretical framework.

Initially, the course met on eight consecutive Fridays and attracted participants only from southeastern Michigan (the plants closest to the community college). Some DOC members, including the lead learner, worried about the lack of participation from satellite plants in Indiana, South America, the United Kingdom, and Eastern Europe. As the division general manager said, "Learning doesn't just take place in southeastern Michigan."

To remove barriers that prevented participants from attending, the lead learner condensed the course from 8 days to 4, and the division general manager agreed to incur the costs of bringing participants to Michigan. The first "international" course was successful and led to many unanticipated learnings and benefits (see later). It became truly international when it was held at EFHD's satellite locations.

Almost all the people interviewed for this article said that "Learning Organization: Theory and Practice" helped national and international team members to communicate. Some said that if nothing else were accomplished during the course, the relationships they developed there made the travel and other costs worthwhile.

One general manager who participated said, "People started realizing that we are a global business with a mixture of nationalities: Irish, British, Hungarian, American, and South American. That helped us all grow in our capabilities."

The Workplace As a Community

When DOC members and managers who embraced the learning organization put their learnings into action, EFHD was transformed from a traditional workplace to a learning community. Several most compelling aspects of this community emerged:

- An open and honest environment: People felt comfortable taking risks and being open and honest.
- A community-shared vision: People shared best practices so that everyone benefited. People felt less competitive.
- Personal mastery: People worked to balance their home and work lives using the personal mastery discipline.
- Respect: People treated one another with respect, which helped to build friendships, to speed processes, and to create the magic that turned a losing business unit into an enterprise community, with annual earnings of more than $150 million.

Several DOC members described their shared vision for making EFHD a learning community. "First, we had to make people feel empowered to learn," the process leadership manager said.

> We had to make them feel that the workplace was theirs, that the business was theirs to run. We wanted them to be proud of what they produced. Second, we had to cultivate relationships among plants, departments, global regions, other Ford operations, and the MIT learning community. By nurturing these relationships, we would push learning beyond its limits. Third, we had to create a culture based on trust, openness, and honesty to allow people to feel comfortable taking risks to run the business. The objective was to encourage people to share best practices and discourage competition between plants or product teams. We made personal mastery the framework on which work and home life could be balanced. Finally, and most importantly, we wanted EFHD people to treat each other with respect, which would help build friendships and speed processes.

Was the DOC successful at making EFHD a learning community? Several DOC members described the community spirit they thought was nurtured at EFHD. "The learning organization helped break down chimneys and develop relationships among people working together," said one. "Once you see the organization holistically, rather than from your engineering or finance chimney, you get very different, better results," said another. Yet another observed, "The learning organization improves the environment. I don't know what justification we need for the learning organization beyond that."

The Impact of Organizational Learning on EFHD

The impact of organizational learning on EFHD was tremendous. Simply put, it helped the division to perform better. It helped people to learn to trust one another and work together, to achieve the division's shared vision of being the best-in-class components manufacturer in the world. It helped to open lines of communication, enabling people to exchange learning more quickly and easily. Finally, it helped a money-losing division to become profitable.

The following changes were most significant and evident at EFHD after it became a learning organization:

- An atmosphere of trust and cooperation had been created.
- Trust was leading to speed.

- Trust was being translated into cost savings.
- Product launches had improved significantly.
- Global expansion was becoming easier.
- Quality, profitability, and timing requirements had improved.

Creating an Atmosphere of Trust and Cooperation

Almost every person who was interviewed commented on the atmosphere of trust and cooperation that had been created when EFHD became a learning organization. This trust helped to increase employee satisfaction and to facilitate better communication among employees—nationally, internationally, and across job functions. Managers began trusting their teams and stopped keeping "follow-up" files to check on their teams' progress. Managers also began trusting other functions and spending less time protecting their turf. When it came time to make decisions, managers spent less time in scrutinizing data.

This new atmosphere of trust and cooperation came about as division leadership helped leaders to become tough on issues, not people; to give people more responsibility for the total business; and to create an informal atmosphere.

Getting Tough on Issues, Not People

Before EFHD became a learning organization, project reviews and financial forecasts with division leadership often were perceived as "bloodbaths." As leaders began practicing organizational learning concepts and methods, these meetings began to change. Leaders still took problems seriously, but they no longer punished the persons trying to tell their story. Instead, they coached the persons and helped them to look for the ways to solve the problems. The general manager described it this way:

> To have real learning take place, you have to learn from every angle: success or failure. In the past, for fear of repercussion, loss of career, whatever, more effort went into hiding problems than into surfacing them. Most people only talked about successes. Few were comfortable talking about problems. When people fear that their careers will be short-lived if they talk about problems, there is no incentive to learn from mistakes, no sharing.
>
> The DOC encouraged sharing and prevented people from being reprimanded or held in a bad light for sharing. In fact, the people who were the most open were the ones we promoted.

People said that, because they trusted their leaders, they were no longer afraid when things went wrong.

Giving People More Responsibility for the Total Business

EFHD had no choice: It had to run lean; it had to run with fewer layers of management and fewer people. Everyone had to take on more responsibility. With limited staffs and huge workloads, division leaders used learning organization tools and methods to build trust and to empower their employees so that everyone could get more done faster.

Almost every person who was interviewed said that running lean and giving all grades of employees more responsibility for the business helped to make EFHD more competitive. "EFHD is a small division," a general manager said. "People get more responsibility at a much lower level than they would at a larger organization. It's an opportunity for people to get more experience and responsibility earlier in their careers." A DOC member saw fewer layers as "the real competitive advantage of EFHD":

> We can do so much with so little. We go from the general manager to the hourly employee in four steps, which makes us fast and flexible. We can get a change a month. We're never the reason a program doesn't sail through the prototype stage. That comes from being quick, nimble, and flexible.

Creating an Informal Atmosphere

When division leadership started using organizational learning tools and methods, the overall atmosphere became more informal. People no longer had to make over-formal presentations or write white papers to present their projects (thereby saving time and money). They made their case openly and were done with it. They felt trusted. "The informality of our business meetings is a tremendous time saver," one DOC member also noted. "When I see the number of people putting together formal presentations at other divisions, I ask myself, 'Is that really necessary?'"

Translating Trust into Speed

EFHD's atmosphere of trust and cooperation broke down barriers among the traditional functional chimneys and sped up decision making. A DOC member was glad that "you could be completely open and honest. You didn't have to play games. You could just say what you thought, why you thought it, and what you thought might be the best course of action." Before the PLST, a PLST member recalled,

> Launch reviews were much different. Back then, you met with the division general manager and some of his top reports reviewed the whole project, including the assumptions, financials, whatever. The reviews could take a year. Now, you present a project to this same group of people and, in one review, it's 'Does everybody agree with this? Yes or no?' And you go."

Translating Trust into Cost Savings

EFHD's collective mental model was that management always reduced capital-funding requests. To offset these reductions, project managers automatically added a "cushion" or contingency to their budgets. As division leaders began trusting their project managers, things changed. Management stopped making reductions, and project managers stopped adding cushions, thereby allowing more funding for other important EFHD capital and technological projects. A DOC member explained why:

> The dialogue process leads to a better understanding and trust of the guys sitting across the table from you. We cut out having to hide our contingencies to cover our ass. It's "You tell me what you've got in mind and we'll start with that," or "We need to have a contingency to protect the division so let's decide up front in an open, honest dialogue to put 50 cents against this product." In the past, that would not have happened. That all comes about as a result of the dialogue process.

Improving Product Launches

The PLST and the organizational learning helped to make EFHD product launches more efficient and timely. Significant improvements to the process included better communication among employees, functions, and departments; reduced costs to launch; and an increased number of products launched at any one time.

Organizational learning improved communication between workers and among functions and departments, which in turn helped to attain remarkable results. For example, improved communication between engineering and purchasing increased the speed at which equipment and test parts were delivered. Improved communication between engineering and production improved the efficiency of test runs. A general manager said,

> Each successive launch was better. We got to a point where we were able to launch the Alba plant on one continent while we were preparing to launch the Brazil plant on another continent, and we did this without disrupting the whole division. Before the PLST, we couldn't even launch two products at one time in one plant, right there in southeastern Michigan!

The costs of launching a product were reduced because managers spent less time in overseeing the launch, they made decisions faster and better, and the number of repeat errors—in equipment buys, test parts, scrap, product development time, and so on—was reduced. According to the general manager:

> For our initial launches, we tried to budget about 15% of the total cost of the project for the launch (and we far exceeded that). Recently, however, we budgeted 10% and underran that. So we cut the cost of a launch by almost half. But, more importantly, the amount of management attention needed for a launch has been reduced. In the past, a launch consumed everybody. It was like going out of business while the store was being remodeled. Now, management can focus on the entire business and keep the store open during remodeling.

Organizational learning helped to create a process whereby more than one product could be launched successfully at one time. In 1988, EFHD had trouble in launching the PM starter and 3G alternator products together and severely overran the budgets for these launches. In 1996, EFHD delivered six major product programs, several minor application programs, and two entire plants, all under budget and on time. One DOC member commented thus:

> We no longer have reservations about launching new products or new models. We have launched so much. In starter, we have almost 95% to 100% of all Ford business in the United States, and we're gaining every day in Europe. In alternator, we have probably 100% of the domestic business, and we're starting to gain in Europe. I can go all the way down the product lines. New launches are no longer deterrents to getting new business.

Another DOC member had this to say:

> The plants don't even whimper at launches anymore. Because we are a components group, we launch a lot of products around here—this plant probably launches 20 or 30 products a model year. We just sort of blow right through them. I attribute 80% of that success to the product launch success team.

Making Global Expansion Easier

DOC operating reviews, PLST meetings, and the EFHD learning course provided forums wherein people from all levels, functions, and locations of the division became friends, built strong relationships, and learned to value what they did beyond their desk, computer, or spot on the line. All these effects helped to ease the launch of plants, products, and administrative policies anywhere in the world.

"We use learning organization terminology as a common language to describe our cultures' methods, phenomena, and value systems in nonabusive terms, and we talk about cultural issues and problems in non-harsh and clinical terms," a DOC member said. Another said,

> Looking back 10 or 15 years, it would have been very uncomfortable and unusual for someone in a US plant to call a plant making a similar product in Europe or Asia and say, "I've got this problem. Have you had it and what did you do about it?" Today, we send people to the learning organization course for a week and, within that week, they grow as close as if they had been together for 1 or 2 years. They develop the faith, trust, and confidence to call their coworkers because they know where they're coming from. From a global standpoint, that process helped to weave us together as a division around the world.

Improving Quality, Profitability, and Timing Requirements

The division general manager spoke of the improvements to quality, profitability, and timing requirements that the learning organization helped create at EFHD:

I attribute the entire turnaround of the business to the learning organization. When we formed EFHD, we started out spending less than 1% of our revenue on engineering, and we were licensing just about every product we made. We were also losing about $50 million, only had three plants in the United States, and sales were about $1 billion. By the time I left in 1996, we were no longer a licensee to anyone. Everything was our own technology. We were making about $150 million, and we were a global business, with 10 plants located throughout the world. Sales have more than doubled to $2 billion, and we have orders on the book to get us to about $2.5, $2.6 billion by the end of the century.

Notes

1. The Electrical and Fuel Handling Division is now the Powertrain Systems Controls Division of Visteon Automotive Systems, an enterprise of Ford Motor Company.
2. I am now the process leadership–learning organization manager for Visteon Automotive Systems.
3. A learning history is a highly effective method designed to help organizations become aware of their learning and change efforts. The history presents the experiences and understanding of participants. It tells the story in their own words. It draws no conclusions and makes no judgments.
4. Womac was EFHD's general manager from 1988 to 1996. He is now senior vice president of Visteon Automotive Systems Operations.

Mindful Moments in a Mindless Organization: Becoming a Learning Community

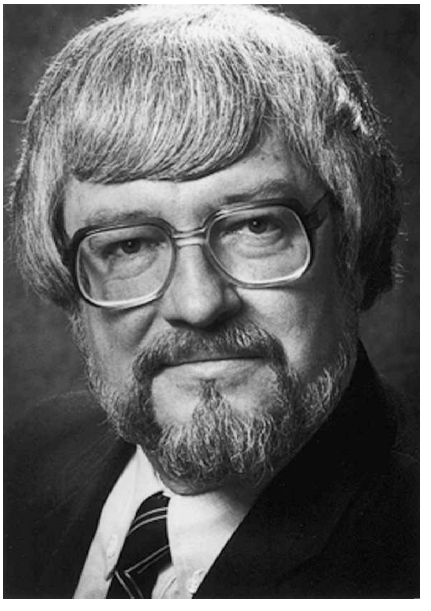
Commentary by Karl E. Weick

When people act in a mindful manner, they actively differentiate and refine the distinctions with which they work, create new categories that capture new portions of their experience, and develop a more nuanced appreciation of context and alternative ways to deal with that experience (Langer, 1989).

David Berdish recounts a series of mindful periods in the Ford Motor Company's Electrical and Fuel Handling Division (EFHD), when people set aside their mindless routines and talked a new way of walking into existence. Mindful attention to what previously had been taken for granted as "the Ford way" revealed that other ways of acting produced better outcomes. These other ways were consolidated under the label *learning organization*. This newer way of working, which top management first hammered out and then exemplified, began diffusing through the organization. Learning at EFHD, as Berdish describes it, is a mixture of change, leadership, transformation, and growth—all active concerns in organizations struggling to adapt to changing times.

Berdish's passionate account allows those of us who try to understand learning processes to look more closely at practices that seem to work and to conceptualize about how and why they might work the way they are described.

Before sampling some of the issues that Berdish stimulated for me, I must be clear about my own biases with respect to learning. I define learning as a "change in an organization's response repertoire" (Sitkin et al., 1999). I tend to treat learning as the attachment of new responses to old cues or as a broadening of the range of cues that evoke old responses (Weick, 1991). This definition in turn leads me to miss, with some regularity, those times when learning involves the strengthening of relationships between existing cues and responses. Usually, learning occurs only when order and chaos are momentarily balanced (Weick & Westley, 1996). Learning is tied closely to action; often, learning is indistinguishable from retrospective sense making (Weick, 1995), it tends



Karl E. Weick

to follow an evolutionary epistemology, it is stored as routines that are invoked mindlessly, and it is experienced as the rolling back of limitations (Pye, 1994).

With these biases acknowledged, I mention under three headings some of what I find interesting in EFHD: hesitations (possible puzzles that invite closer looks), connections (possible outcroppings of phenomena discussed in mainstream research), and reaffirmations (possible candidates for fundamental principles of organizational learning).

Hesitations

Several assertions in Berdish's account warrant a closer look and, possibly, alternative interpretations. What is important about these points of hesitation is that discussions of them touch on subtle conditions that may encourage both better and poorer learning. Many of these points are lost when people invoke more generic models of learning.

Variety

As the shift toward a learning organization gained momentum at EFHD, the decision to keep the program voluntary came under increasing attack. The increasing mix of the trained and the untrained—the "haves" and the "have nots," the disciples and the skeptics—triggered alarm. The mix was seen as undesirable, and managers leaned with heavier and heavier hand on the people who had not yet attended the learning course.

The potential for a problem exists here. If one goal of an organization is to adapt continuously to a changing world, memory can be an enemy, and homogeneity of personnel can reduce the number of options considered. Later in the case, this limitation was acknowledged when an interviewee said, "For real learning to take place, you have to learn from every angle." Nonattendees to the learning course could be key, unacknowledged resources, because they represent more "angles" than are represented in an organization filled with true believers who know some things very well but are collectively blind to what they do not know.

The key issue here is whether, in adopting Senge's principles (or anyone's principles, for that matter), these people had become more simple or more complex. Had they, in adopting a single design for their organization, simplified the repertoire of actions and interpretations available to deal with a changing world? Conversely, had they made their repertoire more varied, richer, and more complex as an indirect result of their greater capability to listen and to speak candidly?

If a sudden environmental shift suddenly favored the ignorant organization (e.g., "Stick to your knitting!") rather than the learning organization, would a learning organization be the first or the last organization to discover and make this shift? It might be the first because individuals would feel free to speak up and describe unsettled feelings that things are changing. It might be the last because individuals with that same unsettled feeling would not speak up, in the belief that if change really *were* occurring, their sensitive learning system would have detected it and others would have mentioned it (the fallacy of centrality; Westrum, 1982).

To trust a system—any system—may be to underestimate its liabilities, misperceptions, and blind spots (Landau & Chisholm, 1995). A system that misses its blind spots also will miss environmental shifts that fall into those blind spots. The more varied the assumptions a system embodies (Turner & Pidgeon, 1997), the less likely the system is to fall into this trap. Further, an organization filled with disciples has fewer diverse assumptions in play than does an organization in which disciples mix with skeptics. That is a dramatic tension that lay just below the surface in Berdish's account.

Crisis

Clearly, EFHD was in trouble in the late 1980s. Less clear is that EFHD was "ready to become a learning organization." What seems more likely is that EFHD was ready to become a *different* organization. When systems stagnate and get out of touch, renewal can take many forms (see, for example, Hurst, 1995; Waterman, 1987). The important point is that the system find some pretext for a fresh start and for some framework within which relationships and practices can be reexamined and realigned.

Renewal is about mindfulness directed at discovering underdeveloped, taken-for-granted capabilities. It is about energizing activities and redoing routines. These changes can occur in the name of becoming a learning organization. They also can be mobilized in the name of becoming a total quality organization, a reengineered organization, an excellent organization, or a networked organization. What is difficult to determine in EFHD's case is the extent to which the improved performance is attributable to the specifics of a learning organization as opposed to a general stirring up of old patterns that settled down into new patterns that better fit a changed environment.

Speed

Clearly, EFHD wanted to become a learning organization, but with at least one stipulation: It wanted to learn more quickly. People at EFHD wanted to accelerate their learning, and they wanted to transfer knowledge more rapidly. These desires are understandable. They also can be self-defeating. Growing evidence points to a speed-accuracy tradeoff to information processing. Under pressures for speed, people tend to search for information that confirms their initial hunches rather than for information that accurately depicts their problems. Thus, when they process information swiftly, preconceptions rather than evidence control the conclusions they draw.

EFHD's dilemma was that learning typically necessitates reexamining preconceptions. Yet, those very preconceptions are what people are most likely to shield by searching for information that confirms them. If learning requires disconfirmation of these preconceptions, swift searching precludes learning. To its credit, EFHD might have been addressing this potential flaw without realizing it when it refused to shorten dialogue sessions to less than 2 hours and when it kept current issues off the agenda. Both small rules reduced the pressure for speed, neutralized preconceptions, and rendered the search for confirmation irrelevant.

History of Learning

Constructing a learning chronology is a good idea. It enables investigators to search for earlier causal sequences, precedents, antecedents, and predispositions that may influence later outcomes. What is striking about the history that Berdish presents is its singular focus on meetings, courses, and plant launches, as if these events were the crucial learning moments. From the perspective of the institutionalization of change, they may be crucial milestones. And crucial places. However, I suggest that this account is rich in a different kind of significant event. These events form their own history and seem to be no less defining, and no less filled with meaning and learning, than those that Berdish lists. Indeed, they actually may be the stuff of which deeper change is made.

If I were building a history of learning at EFHD, it would include these telling moments: (1) the first time no one asked, "Is this a risk-free conversation?"; (2) the meeting at which the division general manager was asked to leave the dialogue and did; (3) the first time the intention to become a learning organization actually showed up as an item on the business plan; (4) the dialogue during which a newcomer said, "This is a big waste of time," the comment was respected as one person's opinion, and the discussion moved on; (5) the first time the dialogue expanded to include work-family balance; and (6) the time the dialogue included discussion of the sudden death of one of the original dialogue participants.

Moments such as these seem to me just as defining of a learning history as meetings, courses, and product launches. They make explicit how learning works, what it means to learn, how learning can affect who one is, the look and feel of successful and unsuccessful learning, and the reality of accumulation. These events also test what has been learned and require the practice of essential skills in new contexts. Each event enacts the new reality of a learning organization in a way that is more concrete, more vivid, and more demanding than calling a meeting, distributing a syllabus, or celebrating a plant opening. Each of the more personal, defining events is akin to a test. Each is a defining moment in which one pathway ("Is this a risk-free conversation?") leads to a deeper commitment to learning and the other ("There is no risk-free conversation anywhere, anytime in this organization") subverts that commitment.

Learning is both a moment and a place. A history of moments may be more beneficial than a history of places in uncovering conditions that facilitate learning.

Customizing the Learning Organization

Managers searching for meaningful change often buy, and buy into, off-the-shelf programs that do not fit their needs exactly. Beer, Eisenstat and Spector (1990) have discussed this problem in a thoughtful manner. What is interesting about EFHD's situation is that it sheds an entirely different light on this issue. The relevant text is the discussion under the heading, Deploying the Vision. The key sentence reads, "After careful research into the tools and methods of organizational learning, the lead learner *chose* those that *seemed most useful* for EFHD" [author's emphasis]. Suppose that people do not like surprises, that they normalize what appear to be anomalies, that beliefs control what people see (Inkpen & Crossan, 1995), and that people prefer confirmation to disconfirmation. Granted these possibilities, selective attention to tools and methods of organizational learning is inevitable.

Further, the grounds for selection will tend to be the same, taken-for-granted assumptions that accompanied the descent of the organization into its crisis. Thus, the moment the lead learner begins to "cherry-pick" an organizational learning program, the stage is set to recycle the old organization essentially unchanged. For example, if people in the old organization avoided speaking truth to those in power, their choice to use dialogue, but with the proviso that powerful people can be invited to leave, recycles the old avoidance.

As a student of both change and learning, I have always been a booster of improvisation, ad hoc adjustments, customizing to fit idiosyncrasies, small wins, and most other adjustments that reaffirm autonomy. However, not until thinking about the EFHD case did I realize the extent to which customizing can be a foot in the door to keep things the same. If the "lead learner" who composes the learning program just happens to be a learner near the top of some authority hierarchy, even though the change is transformational in name, as it is in EFHD's case, that learner's artful selection of learning tools can produce a flurry of activity wherein nothing much changes. This line of argument suggests that learning, or the lack of it, by the lead learner is even more crucial to EFHD's success than may be apparent. To alter this dynamic might necessitate presenting learning programs as interventions available only on an all-or-none basis.

Connections

Several descriptions in Berdish's story resonate with issues that researchers pursue apart from the topic of organizational learning. Making some of these issues explicit might permit enrichment of studies of learning by incorporating into them themes that have been developed elsewhere. This brief section illustrates some plausible connections.

As an initial example, Berdish continues to talk about dialogue, as do his interviewees, yet never once does he or anyone else define what dialogue is. Though at first that omission may seem irritating, on second thought, it may point to one of the reasons why this effort was successful. Strategic ambiguity, which often takes the form of consensus building *without* an insistence on explicit definitions, often allows people to maintain the illusion that they agree while sparing them the embarrassment of discovering that they do not (Eisenberg, 1984). What is crucial is not so much that this saves face as that it gets people into action more quickly and preserves some variety in how they respond. I mentioned this same beneficial variety earlier as being instrumental when systems find it necessary to adapt to unfamiliar changes in novel ways.

One of the richest veins to mine in Berdish's account is EFHD's continued insistence that participation in the learning program be voluntary. Those who participated in the program did so by their own choice, irrevocably and publicly, which Salancik (1977) first posited, followed by Tushman and O'Reilly (1997), as the three conditions likely to produce behavioral commitment, justification and, at times, escalation (Weick, 1993). To do something publicly and irrevocably is to provide clear evidence that an action has occurred. To have that public, irrevocable action be seen also as a chosen action is to link that action with a person. Once the action is linked with a person, that person feels pressure to justify the action as a good one. Thus, those people who publicly chose to be associated with the learning program had a big stake in proving that they had made a good choice. The success of the program, in the sense of dissemination and behavioral change, may be due as much to efforts of people to justify their public commitment to

it as to any particular contents in the program itself. Again, this observation is not to cast doubt on the learning program. Instead, its intent is to connect the fact of voluntary involvement at EFHD with a body of research that shows that justification begets persistence and that justification and persistence together beget higher performance (Pfeffer, 1997).

A third connection is suggested by the imperatives that seem to be associated with the practice of dialogue and by the imperatives of trust, trustworthiness, and self-respect that researchers regard as fundamental to social life (Campbell, 1990). Campbell argued that we all profit from both our experience and the experience of others, which is all well and good until those experiences come into conflict. Then we have the problem of what weights to put on our vantage point versus that of others. As the world is fallibly and indirectly known, and as our frames of reference are limited, we cannot afford to ignore completely what others think is happening. Therefore, if we want to pool our observations with those of others for maximum adaptiveness, we must live by three imperatives:

- *Trust:* Our duty is to respect the reports of others and to be willing to base our beliefs and actions on those reports.
- *Honesty:* Our duty is to report honestly, so that others may use our observations in coming to valid beliefs.
- *Self-respect:* Our duty is to respect our own perceptions and beliefs and to seek to integrate them with the reports of others without deprecating them or ourselves.

Whenever learning proves difficult, likely one or more of these three imperatives has broken down. Dialogue may ensure the balanced salience on all three. Again, that balancing, rather than learning practices themselves, explains the positive outcomes at EFHD.

Though other connections could be pointed out, these are sufficient to make the point that connecting can be a productive use of Berdish's account.

Reaffirmations

Much in Berdish's story reaffirms what people thought to be true of organizational learning before they read the story. I see his tale as reaffirming many verities, including that learning is difficult and that people prefer to abandon it and revert back to the norm. People interact more readily when they coalesce around a task rather than when they coalesce around paying attention to themselves. Also, listening is rare and difficult, and it matters. Open, honest conversation saves enormous time, and consistent action is persuasive.

"Soft and squishy" is a dumb way to depict the human condition. Additionally, team work is just as difficult as is learning: "Work like a team or leave." Reflecting on failure makes more sense than denying its existence. Learning is more an open-ended quest than a closed-ended discovery.

Further, command-and-control leaders who "pound you into submission" are relics. Conversely, voluntary participation in organizational projects probably is an oxymoron. Everything changes: The EFHD division already has been reorganized, Berdish already has changed positions, the divisional general manager of this learning project already has changed positions. Yet, everything stays the same: "These people want answers."

References

Beer, M., R.A. Eisenstat, and B. Spector. *The Critical Path to Corporate Renewal* (Boston: Harvard Business School, 1990).

Campbell, D.T. "Asch's Moral Epistemology for Socially Shared Knowledge," in *The Legacy of Solomon Asch: Essays in Cognition and Social Psychology*, ed. I. Rock (Mahwah, NJ: Lawrence Erlbaum Associates, 1990), 39–52.

Eisenberg, E. "Ambiguity as Strategy in Organizational Communication." *Communication Monographs* 51 (1984): 227–242.

Fiske, S.T., and S.E. Taylor. *Social Cognition*, 2nd ed. (New York: McGraw-Hill, 1991).

Hurst, D. *Crisis and Renewal* (Boston: Harvard Business School, 1995).

Inkpen, A.C., and M.M. Crossan. "Believing Is Seeing: Joint Ventures and Organizational Learning." *Journal of Management Studies* 32 (1995): 595–618.

Landau, M., and D. Chisholm. "The Arrogance of Optimism: Notes on Failure Avoidance Management." *Journal of Contingencies and Crisis Management* 3 (1995): 67–80.

Langer, E.J. "Minding Matters: The Consequences of Mindlessness-Mindfulness." *Advances in Experimental Social Psychology* 22 (1989): 137–173.
Pfeffer, J. *New Directions for Organization Theory* (New York: Oxford Press, 1997).
Pye, A. "Past, Present, and Possibility: An Integrative Appreciation of Learning from Experience." *Management Learning* 25 (1994): 155–173.
Salancik, G. "Commitment and the Control of Organizational Behavior and Belief," in *New Directions in Organizational Behavior*, eds. B.M. Staw and G.R. Salancik (Chicago: St. Clair Press, 1977).
Sitkin, S.B., K.M. Sutcliffe, and K.E. Weick. "Organizational Learning," in *The Handbook of Technology Management*, ed. R.C. Dorf (Berkeley: CRC Press, 1999).
Turner, B., and N. Pidgeon. *Man-Made Disasters*, 2nd ed. (Oxford: Butterworth-Heinemann, 1997).
Tushman, M.L., and C.A. O'Reilly. *Winning Through Innovation* (Boston: Harvard Business School, 1997).
Waterman, R. *The Renewal Factor* (New York: Bantam, 1987).
Weick, K.E. "The Non-Traditional Quality of Organizational Learning." *Organization Science* 2 (1991): 116–124.
Weick, K.E. "Sensemaking in Organizations: Small Structures with Large Consequences," in *Social Psychology in Organizations: Advances in Theory and Research*, ed. J.K. Murnighan (Englewood Cliffs, NJ: Prentice-Hall, 1993), 10–37.
Weick, K.E. *Sensemaking in Organizations* (Thousand Oaks, CA: Sage, 1995).
Weick, K.E., and F. Westley. "Organizational Learning: Affirming an Oxymoron," in *Handbook of Organization Studies*, eds. S.R. Clegg, C. Hardy, and W. Nord (London: Sage, 1996), 440–458.
Westrum, R. "Social Intelligence About Hidden Events." *Knowledge* 3 (1982): 381–400.

FEATURE

Kurt Lewin's Change Theory in the Field and in the Classroom: Notes Toward a Model of Managed Learning

Edgar H. Schein

Introduction

Few people have had as profound an impact on the theory and practice of social and organizational psychology as Kurt Lewin. Though I never knew him personally, I was fortunate during my graduate school years at Harvard's Social Relations Department in 1949–1950 to have been exposed to Alex Bavelas and Douglas McGregor who, in my mind, embodied Lewin's spirit totally. As I try to show in this essay, Lewin's spirit and the assumptions that lay behind it are deeply embedded in my own work and that of many of my colleagues who practice the art of "organization development." This essay attempts to spell out some of Lewin's basic dictums and show their influence in my own and others' contemporary work. I endeavor to show how my own thinking has evolved from theorizing about "planned change" to thinking about such processes more as "managed learning."

"There Is Nothing So Practical as a Good Theory": Lewin's Change Model Elaborated

The power of Lewin's theorizing lay not in a formal propositional kind of theory but in his ability to build "models" of processes that drew attention to the right kinds of variables that needed to be conceptualized and observed. In my opinion, the most powerful of these was his model of the change process in human systems. I found this model to be fundamentally necessary in trying to explain various phenomena I had observed, and I found that it lent itself very well to refinement and elaboration.

My own early work in clinical/social psychology dealt with the attitude changes that had occurred in military and civilian prisoners of the Chinese Communists during the Korean war (Schein, 1956, 1961, 1968). I found contemporary theories of attitude change to be trivial and superficial when applied to some of the profound changes that the prisoners had undergone, but I found Lewin's basic change model of unfreezing, changing, and refreezing to be a theoretical foundation upon which change theory could be built solidly. The key, of course, was to see that human change, whether at the individual or group level, was a profound psychological dynamic process that involved painful unlearning without loss of ego identity and difficult relearning as one cognitively attempted to restructure one's thoughts, perceptions, feelings, and attitudes.

Unfreezing as a concept entered the change literature early to highlight the observation that the stability of human behavior was based on "quasi-stationary equilibria" supported by a large force field of driving and restraining forces. For change to occur, this force field had to be altered under complex psychological conditions because, as was

From *Systems Practice*; 9 no. 1 (1996): 27–47. Reprinted with permission.

often noted, just adding a driving force toward change often produced an immediate counterforce to maintain the equilibrium. This observation led to the important insight that the equilibrium could more easily be moved if one could remove restraining forces, since there were usually already driving forces in the system. Unfortunately restraining forces were harder to get at because they were often personal psychological defenses or group norms embedded in the organizational or community culture.

The full ramifications of such restraining forces were understood only after decades of frustrating encounters with resistance to change, and only then did we begin to pay attention to the work of cognitive psychologists on perceptual defenses, to what psychoanalysts and the Tavistock group were trying to show us with their work on denial, splitting, and projection, and to Argyris's seminal work on defensive routines (e.g., Argyris, 1990; Hirschhorn, 1988). In trying to explain what happened to POWs, I was led to the necessity to "unpack" further the concept of unfreezing and to highlight what really goes on there. Unfreezing is basically three processes, each of which has to be present to some degree for readiness and motivation to change to be generated.

Disconfirmation

It is my belief that *all* forms of learning and change start with some form of dissatisfaction or frustration generated by data that disconfirm our expectations or hopes. Whether we are talking about adaptation to some new environmental circumstances that thwart the satisfaction of some need or whether we are talking about genuinely creative and generative learning of the kind on which Peter Senge (1990) focuses, some disequilibrium based on disconfirming information is a prerequisite. Disconfirmation, whatever its source, functions as a primary driving force in the quasi-stationary equilibrium.

. . . all forms of learning and change start with some form of dissatisfaction or frustration . . .

Disconfirming information is not enough, however, because we can ignore the information, dismiss it as irrelevant, blame the undesired outcome on others or fate, or, as is most common, simply deny its validity. To become motivated to change, we must accept the information and connect it to something we care about. The disconfirmation must arouse what we can call "survival anxiety," or the feeling that if we do not change, we will fail to meet our needs or fail to achieve some goals or ideals that we have set for ourselves ("survival guilt").[2]

Induction of Guilt or Survival Anxiety

To feel survival anxiety or guilt, we must accept the disconfirming data as valid and relevant. What typically prevents us from doing so, what causes us to react defensively, is a second kind of anxiety which we call "learning anxiety," or the feeling that if we allow ourselves to enter a learning or change process, if we admit to ourselves and others that something is wrong or imperfect, we will lose our effectiveness, our self-esteem, and maybe even our identity. Most humans need to assume that they are doing their best at all times, and it may be a real loss of face to accept and even "embrace" errors (Michael, 1973, 1992). Adapting poorly or failing to meet our creative potential often looks more desirable than risking failure and loss of self-esteem in the learning process.

Learning anxiety is the fundamental restraining force which can go up in direct proportion to the amount of disconfirmation, leading to the maintenance of the equilibrium by defensive avoidance of the disconfirming information. It is the dealing with learning anxiety, then, that is the key to producing change, and Lewin understood this better than anyone. His involving workers on the pajama assembly line, his helping the housewives' groups to identify their fear of being seen as less "good" in the community if they used the new proposed meats, and his helping them to evolve new norms were a direct attempt to deal with learning anxiety. This process can be conceptualized in its own right as creating for the learner some degree of "psychological safety."

Creation of Psychological Safety or Overcoming of Learning Anxiety

My basic argument is that unless sufficient psychological safety is created, the disconfirming information will be denied or in other ways defended against, no survival anxiety will be felt, and consequently, no change will take place. The key to effective change management, then, becomes the ability to balance the amount of threat produced by disconfirming data with enough psychological safety to allow the change target to accept the information, feel the survival anxiety, and become motivated to change.

The true artistry of change management lies in the various kinds of tactics that change agents employ to create psychological safety. For example, working in groups, creating parallel systems that allow some relief from day-to-day work pressures, providing practice fields in which errors are embraced rather than feared, providing positive visions to encourage the learner, breaking the learning process into manageable steps, and providing on-line coaching and help all serve the function of reducing learning anxiety and thus creating genuine motivation to learn and change.

Unfortunately, motivation is not enough. A theory or model of change must also explain the actual learning and change mechanisms, and here Lewin's cognitive models were also very helpful in providing a theoretical base.

Cognitive Redefinition

By what means does a motivated learner learn something new when we are dealing with thought processes, feelings, values, and attitudes? Fundamentally it is a process of "cognitive restructuring," which has been labeled by many others as frame braking or reframing. It occurs by taking in new information that has one or more of the following impacts: (1) *semantic redefinition*—we learn that words can mean something different from what we had assumed; (2) *cognitive broadening*—we learn that a given concept can be much more broadly interpreted than what we had assumed; and (3) *new standards of judgment or evaluation*—we learn that the anchors we used for judgment and comparison are not absolute, and if we use a different anchor, our scale of judgment shifts.

An example will make this clear. The concept of "teamwork" is today highly touted in organizational circles, yet the evidence for effective teamwork is at best minimal. The problem lies in the fact that in the United States, the cultural assumption that society revolves around the individual and individual rights is so deeply embedded that, when teamwork is advocated, we pay lip service but basically do not change our individualistic assumption. How, then, does change in this area come about? First, we need to *redefine* teamwork as the coordination of *individual* activities for pragmatic ends, not the subordination of the individual to the group. If we define teamwork as individual subordination, as treating the group to be more important than the individual, we arouse all the defenses that lead to quips like camels being horses constructed by a committee, negative images of "group think," lynch mobs, etc.

Second, the redefinition of teamwork also allows one to *redefine* individualism in a way that preserves its primacy, not to "substitute" groupism for individualism. This process of redefinition in effect *enlarges* the concept of individualism to include the ability and obligation to work with others when the task demands it. In other words, helping a team to win is not inconsistent with individualism. And third, one can *change the standards* by which individual performance is rewarded. Instead of rewarding "rugged individualism" or the competitive winning out over others (which makes collaborative behavior look "weak"), individuals can be increasingly rewarded for their ability to create, lead, and participate in teams (which makes collaborative behavior look "strong"). The best individual, then, is the one who can be an effective team player. What Lewin did with the housewives was to help them to change their standard of what was an acceptable meat, so that kidneys, liver, etc., became cognitively redefined as acceptable to buy and serve. This process is fundamental to any change if one wants it to last.

The new information that makes any or all of these processes possible comes into us by one of two fundamental mechanisms— (1) learning through positive or defensive *identification* with some available positive or negative role model or (2) learning through a trial-and-error process based on *scanning* the environment for new concepts (Schein, 1968).

Imitation and Positive or Defensive Identification with a Role Model

Cognitive redefinition occurs when the learner has become unfrozen (i.e., motivated to change) and has, therefore, opened him- or herself up to new information. The next question to address, then, is how the new information that leads to cognitive restructuring is to discover in a conversational process that the interpretation that someone else puts on a concept is different from one's own. If one is motivated to change (i.e., if the factors described above have been operating), one may be able to "hear" or "see" something from a new perspective.

The best examples come from what has colloquially been labeled "brain-washing," where POWs who were judged "guilty," yet felt innocent, finally were able to admit their guilt when they could identify with their more advanced cell mates sufficiently to realize that the concepts of "crime" and "guilt" were defined differently by the Chinese communists. One was guilty because a *crime* was defined as "*any* action that *could* be harmful to the communists" even if no harm had occurred. A postcard to home could conceivably contain information that would help the enemy, so sending the postcard was an act of espionage and the sender had to learn to appreciate and confess his or her guilt. Being born into the wrong social class was a crime because middle-class attitudes *could* be very harmful to the communist cause. Semantic redefinition, cognitive broadening, and changing standards of judgment were all present in this process.

. . . unfreezing creates motivation to learn but does not necessarily control or predict the direction of learning . . . .

Only by recognizing this potential for harm, confessing one's guilt, and acknowledging the incorrectness of one's social origins could one hope to learn how to be a good communist or to be released from jail. Once one had accepted the new cognitive frame of reference and learned the new definitions and standards, one could make rapid progress in reeducation and remove the heavy disconfirming pressure. The key to the whole process, however, was to identify psychologically with other prisoners who had already made the cognitive shift and learn to see the world through their eyes.

Readers who are familiar with socialization processes in families, schools, companies, religious movements, and other organizational settings will readily recognize this mechanism as the key to apprenticeships, to "big brother" programs, to the concept of "mentoring," and to the various more formal group-based indoctrination programs that organizations use. The mentor or big brother is often both a source of psychological safety and the role model to facilitate cognitive redefinition (Schein, 1968; Van Maanen & Schein, 1979).

Defensive identification is a rarer process that occurs when the learner is a captive in a hostile environment in which the most salient role models are the hostile captors (e.g., prison guards, authoritarian bosses or teachers, etc.). The process was first described in relation to Nazi concentration camps where some prisoners took on the values and beliefs of the guards and maltreated fellow prisoners. In the face of severe survival anxiety, for some learners "identification with the aggressor" was the only solution (Bettelheim, 1943). Genuine new learning and change occurred but, of course, in a direction deemed undesirable by others. In considering such outcomes one is reminded that unfreezing creates motivation to learn but does not necessarily control or predict the direction of learning. If the only new information available is from salient and powerful role models, learning will occur in that direction. One of the key elements of a managed change process is, therefore, what kind of role models one makes available to the learners once they are unfrozen.

If either no good role models are available or one wants the learning to be more genuinely creative, one has to create the conditions for what I call "scanning."

Scanning: Insight or Trial-and-Error Learning

A learner or change target can be highly motivated to learn something, yet have no role models or initial feeling for where the answer or solution might lie. The learner then

searches or scans by reading, traveling, talking to people, hiring consultants, entering therapy, going back to school, etc., to expose him or herself to a variety of new information that might reveal a solution to the problem. Alternatively, when the learner finally feels psychologically safe, he or she may experience spontaneously an insight that spells out the solution. Change agents such as process consultants or nondirective therapists count on such insights because of the assumption that the best and most stable solution will be one that the learner has invented for him or herself.

Once some cognitive redefinition has taken place, the new mental categories are tested with new behavior which leads to a period of trial and error and either reinforces the new categories or starts a new cycle of disconfirmation and search. Note that in the process of search, if role models are readily available, they will most likely be used. Identification is thus an efficient and fast process, but it may lead to solutions that do not stick because they do not fit the learner's total personality. If one wants to avoid that, one must create learning environments that do not display role models, thereby forcing the learner to scan and invent his or her own solutions.

It is this dynamic, to rely on identification with a role model, that explains why so many consultation processes go awry. The consultant, by design or unwittingly, becomes a role model and generates solutions and cognitive categories that do not really fit into the culture of the client organization and will therefore be adopted only temporarily. A similar result occurs when organizations attempt to check on their own performance by "benchmarking" (i.e., comparing themselves to a reference group of organizations and attempting to identify "best practices"). The speed and simplicity of that process are offset by two dangers. It may be, first, that none of the organizations in the reference set have scanned for a good solution so the whole set continues to operate suboptimally or, second, that the identified best practice works only in certain kinds of organizational cultures and will fail in the particular organization that is trying to improve itself. In other words, learners can attempt to learn things that will not survive because they do not fit the personality or culture of the learning system. For change to remain more stable, it must be "refrozen."

Personal and Relational Refreezing

The main point about refreezing is that new behavior must be, to some degree, congruent with the rest of the behavior and personality of the learner or it will simply set off new rounds of disconfirmation that often lead to unlearning the very thing one has learned. The classic case is the supervisory program that teaches individual supervisors how to empower employees and then sends them back into an organization where the culture supports only autocratic supervisory behavior. Or in Lewin's classic studies, the attempt to change eating habits by using an educational program that teaches housewives how to use meats such as liver and kidneys and then sends them back into a community in which the norms are that only poor folks who cannot afford good meat would use such poor meat.

The implication for change programs are clear. For personal refreezing to occur, it is best to avoid identification and encourage scanning so that the learner will pick solutions that fit him or her. For relational refreezing to occur, it is best to train the entire group that holds the norms that support the old behavior. It is only when housewives' groups met and were encouraged to reveal their implicit norms that change was possible by changing the norms themselves (i.e., introducing collectively a new set of standards for judging what was "OK" meat).

In summary, what I have tried to show above is that Lewin's basic model of change leads to a whole range of insights and new concepts that enrich change theory and make change dynamics more understandable and manageable. It is a model upon which I have been able to build further because its fundamental concepts were anchored in empirical reality. Intellectual knowledge of the change process is not the same as the know-how or skills that are learned in actually producing change. In the next section I examine the implication of Lewin's thinking for the practice of change management.

"You Cannot Understand a System Until You Try to Change It": Process Consultation and Clinical Research

The change and consulting literature is filled with the notion that one first diagnoses a system and then intervenes to change it. I learned early in my own consulting career that this basic model perpetuates a fundamental error in thinking, an error that Lewin learned to avoid in his own change projects and that led him to the seminal concept of "action research." The conceptual error is to separate the notion of *diagnosis* from the notion of *intervention*. That distinction comes to us from scientific endeavors where a greater separation exists between the researcher and the researched, particularly from medicine, where the physical processes are assumed to be somewhat independent of the psychological processes (an assumption that is not even holding up in many parts of medicine).

The classical model is that the doctor makes an examination, runs certain tests, decides what is wrong, and writes a prescription which includes recommendations for therapy or, if necessary, for other interventions such as surgery. The consulting industry has perpetuated this model by proposing as a major part of most projects a diagnostic phase in which large numbers of interviews, questionnaires, and observations are made the basis of a set of recommendations given to the client. Consultants differ on whether they feel they should also be accountable for the implementation of the recommendations, but they tend to agree that there is a discrete billable period in any project that is basically considered necessary—namely, a diagnosis of the problem—and that the consultant's basic job is done with a set of recommendations "for future intervention." If interviews or surveys are done, the attempt is made to be as scientifically objective as possible in gathering the data and to interfere minimally during this phase with the operation of the organization. What is wrong with this picture?

If Lewin was correct that one cannot understand an organization without trying to change it, how is it possible to make an adequate diagnosis without intervening? So either consultants using the classical model are getting an incorrect picture of the organization or they are intervening but are denying it by labeling it "just diagnosis." Isn't a better initial model of work with organizations something like the stress test that the cardiologist performs by putting the heart under pressure to see how it will perform, even knowing that there are some risks and that some people have been hurt during the test itself? This risk forces the diagnostician to think about the nature of the "diagnostic intervention" and to apply clinical criteria for what is safe, rather than purely scientific criteria of what would seemingly give the most definitive answer.

It is my contention that Lewin was correct and that we must all approach our consulting work from a clinical perspective that starts with the assumption that everything we do with a client system is an intervention and that, unless we intervene, we will not learn what some of the essential dynamics of the system really are. If we start from that assumption, we need to develop criteria that balance the amount of information gained from an intervention with the amount of risk to the client from making that intervention. In other words, if the consultant is going to interview all the members of top management, he or she must ask whether the amount of information gained will be worth the risk of perturbing the system by interviewing everybody and, if the answer is "yes," must make a further determination of what is to be learned from the reactions of the management to being interviewed. That is, the interview process itself will change the system and the nature of that change will provide some of the most important data about how the system works (i.e., [w]ill respondents be paranoid and mistrusting, open and helpful, supportive of each other or hostile in their comments about each other, cooperative or aloof, and so on?) The best information about the dynamics of the organization will be how the organization deals with the consultant, because his or her very presence is de facto an intervention.

. . . unless we intervene, we will not learn what some of the essential dynamics of the system really are. . . .

Yet the focus in many traditional consultation models is on the "objective data obtained in the interview," with nary a reference to how the interviewer felt about the process and what could be inferred from the way he or she was received. The irony in all of

this is that Lewin was by training a physicist and knew very well the rules of scientific inquiry and objectivity. For him to have discovered that human systems cannot be treated with that level of objectivity is, therefore, an important insight that is all too often ignored in our change and consultation literature.

In actual practice what most change agents have learned from their own experience is that "diagnostic" activities such as observations, interviews, and questionnaires are already powerful interventions and that the processes of learning about a system and changing that system are, in fact, one and the same. This insight has many ramifications, particularly for the ethics of research and consulting. Too many researchers and consultants assume that they can "objectively" gather data and arrive at a diagnosis without having already changed the system. In fact, the very method of gathering data influences the system and, therefore, must be considered carefully. For example, asking someone in a questionnaire how they feel about their boss gets the respondent thinking about an issue that he or she might not have focused on previously, and it might get them talking to others about the question in a way that would create a common attitude that was not there before.

The concept of *process consultation* as a mode of inquiry grew out of my insight that to be helpful one had to learn enough about the system to understand where it needed help and that this required a period of very low-key inquiry-oriented diagnostic interventions designed to have a minimal impact on the processes being inquired about (Schein, 1987, 1988). Process consultation as a philosophy acknowledges that the consultant is not an expert on anything but how to be helpful and starts with total ignorance of what is actually going on in the client system. One of the skills, then, of process consulting is to "access one's ignorance," let go of the expert or doctor role, and get attuned to the client system as much as possible. Only when one has genuinely understood the problem and what kind of help is needed, can one even begin to think about recommendations and prescriptions, and even then it is likely that they will not fit the client system's culture and will, therefore, not be refrozen even if initially adopted. Instead, a better model of help is to start out with the intention of creating an insider/outsider team that is responsible for diagnostic interventions and all subsequent interventions. When the consultant and the client have *joint ownership* of the change process, both the validity of the diagnostic interventions and the subsequent change interventions will be greatly enhanced.

The flow of a change or managed learning process, then, is one of continuous diagnosis as one is continuously intervening. The consultant must become highly attuned to his or her own insights into what is going on and his or her own impact on the client system. Stage models which emphasize up-front contracting do not deal adequately with the reality that the psychological contract is a constantly evolving one and that the degree to which it needs to be formalized depends very much on the culture of the organization.

In summary, Lewin's concept of action research is absolutely fundamental to any model of working with human systems, and such action research must be viewed from a clinical perspective as a set of interventions that must be guided primarily by their presumed impact on the client system. The immediate implication of this is that in training consultants and change agents, one should put much more emphasis on the clinical criteria of how different interventions will affect client systems than on the canons of how to gather scientifically valid information. Graduate students should be sent into field internships as participant observers and helpers before they are taught all the canons of how to gather and analyze data. Both are necessary, but the order of priority is backward in most training programs.

What can be done to enhance an understanding of these models and to begin to build the necessary skills to implement them? We turn next to an experimental course that attempts to teach "the management of planned change."

Kurt Lewin in the Classroom: Teaching the Management of Planned Change

The idea for a "planned change workshop" goes back to the mid-1960s, when Richard Beckhard and I designed a program on "planned change" for the National Training Labs. The essence of our program was that participants should be involved in real projects which could be of 1 or 2 years' duration and that the time spent together should be devoted ini-

tially to learning diagnostic intervention tools and models and, thereafter, to reporting progress to each other. That program started with a 1-week workshop and was followed by quarterly meetings of 3 days' duration. Participants were organized into teams geographically and were expected to meet regularly with each other to share problems and progress.

What Beckhard and I learned from this program is that (1) to learn about managing change one must be involved in a real project and (2) one of the most powerful sources of motivation to work through all the frustrations involved in managing change is to have to report regularly on progress to "teammates" and to the faculty. All of the participants noted during and after the program how important it had been to give quarterly progress reports, to have a chance at those times to rediagnose, to recalibrate their own situation, and to share war stories and frustrations with others who were in the same boat.

Criteria for choosing the initial project were (1) something that the workshop participant was personally involved in and cared about; (2) something that would make a real contribution to the organization from which the participant came; and (3) something that was realistic in terms of being doable in the time allocated to the workshop (i.e., 1 or 2 years). We considered the workshop a success and felt we had learned what the essential components of such a learning experience had to be. But it was not until two decades later that I found a way to implement my own learning in the more traditional classroom environment.

The MIT One-Semester Course on Managing Planned Change

In 1987, I decided to experiment with a version of the Beckhard/Schein model in the regular master's curriculum of the MIT Sloan School. I offered a minicourse that ran for 10 weeks, 3 hours per week. Eventually it was expanded to a full 14-week-long semester elective course for full academic credit. Enrollment in the first 3 years averaged around 25 students, but in the last year or so it caught on, so I ended up in 1994 with three sections of 30 to 35 students each.

In the first session I emphasized that the core of the course was not the class time or reading, but two actual change projects—one personal and one focused on an organization and carried out by a group. The *personal project* asked each student to pick some personal change goal that he or she wanted to work on for the next 14 weeks. The first week's paper had to spell out the goals and the method that would be used to achieve them, including some system for appraising progress week by week. Each week a one-page progress report had to be handed in to me detailing outcomes and any reactions or thoughts about the change process. These reports were private between me and each student and provided me an opportunity to react and coach, typically by asking questions and making suggestions. Reading 100 one-page papers was time-consuming but very engaging because each student was wrestling with real and personally meaningful issues—stopping smoking, losing weight, overcoming shyness, learning to talk more in large classes, improving a relationship with a spouse or child, increasing reading speed, developing a more healthy, balanced lifestyle, overcoming chronic lateness, and so on.

The *group projects* were to be realistic efforts to make an organizational change somewhere in the MIT environment. At the opening session I collected data from the class on possible organizational change projects they might wish to undertake in small *teams*. Given that the project had to be completed in 14 weeks, we focused on organizations to which students had access already, which meant de facto that most of the projects were located in and around the MIT Sloan School.

We started with a brainstorming session on all kinds of things that could and/or should be changed around the school, followed by a joint critical analysis of what was feasible and worthwhile. My role in this was to provide a "sanity" or "reality" check on the ideas that were brought up. When we had a list of feasible projects we duplicated it and then, in the second class session, did a straw vote to see how many people were interested in which, to reduce the number down to roughly one-fourth the size of the class, so that each team could consist of four or five students. Final choice of projects and signing on to the teams was the last step, usually accomplished by the third or fourth class session.

In the end I required only that each team had at least two people and no more than seven or eight. It was essential that each student picked a project that he or she was genuinely motivated to complete. This process stood in sharp contrast to what most other classes

were offering as projects, where students selected from prearranged topics, sites, or problems instead of having to wrestle with what they would personally actually commit themselves to. Lewin's insight about the importance of involving the learner was not lost here.

Once the teams were formed, they met weekly during and after the class sessions and were required to submit a weekly progress report on specific goals selected, diagnostic thinking about the project, action steps taken, and results. Sample projects that were undertaken were to revise the particular curriculum of a key course on strategy to make it more international, to resurrect the European Club and to improve its process of helping students find jobs in Europe, to improve the responsiveness of the career development office, to reduce the bureacracy of the MIT housing office, to fix a leak in the bridge between two buildings that had been left alone for the past 3 years, to develop a student lounge, to redesign the form on which students gave feedback to faculty on their teaching, to increase the interaction between first- and second-year master's students, to increase the range of food offerings in the local student cafeteria, to create a lecture series that would expose students to some of the more prominent faculty at MIT, and so on.

My Multiple Roles

I served as the animator, teacher, monitor, coach, and consultant. In the initial 3-hour session I provided the structure, the tasks, the rules, and the challenge. The bulk of the time in class was devoted to explaining how things would work, convincing the class that these projects were for real and that at our last session we would all share what was actually accomplished. Students were so overtrained to be passive that animating them to get involved was, in fact, the first challenge. The most important element of that process was to convince students that I meant it—that they actually had to choose their own projects and commit to them.

Teaching

Starting with the second class I played a teacher role in providing various diagnostic models for the students to use in analyzing their individual and team projects. I suggested a number of books and asked people to read as much as possible early in the 14-week period since all of the diagnostic material was relevant up front. At the same time I gave weekly reading assignments to focus us on relevant materials during the first half of the semester. Diagnostic models such as the Beckhard/Harris change map, force field analysis, role network analyses, and the Lewin/Schein stages of change were presented in the early weeks and rediscussed at later sessions so that the groups would have all of the tools available early on but could revisit them as they became more relevant.

A major chunk of time was devoted initially to the concept of process consultation because the change teams would have to operate without formal position power. I argued that their best chance of forming into effective teams vis-á-vis each other and their change targets was to define themselves initially as internal process consultants who would have to develop some kind of access and a constructive relationship with their selected change targets. I also pointed out that this way of defining planned change was virtually synonymous with how one might define the process of management itself, except that one did not have formal position power. In this context I also reminded students that most managers report that having position power is not enough to make planned change happen.

. . . having position power is not enough to make planned change happen . . . .

Part of each class during the remainder of the course was devoted to short lectures on whatever seemed relevant at the time, war stories from my own experience, war stories that students told from their experience, and dealing with student questions on their projects. In dealing with questions I shifted my role increasingly to being a process consultant to the class and to the projects to highlight the importance of this role.

Monitoring and Grading

The monitoring role was most salient in how I dealt with the papers. For example, if a paper stated a goal of losing 30 pounds by the end of the semester, I might ask whether

or not that was realistic, how much weight loss that would mean per week or per day, and how the person would monitor his or her own progress. If the goal was to overcome shyness, I might ask the person to translate that into something concrete and measurable such as how many new contacts were made per week at parties, etc. I gave relatively few hints or suggestions unless the person specifically requested that kind of help, but concentrated on "process" monitoring: "How will you measure your progress toward your goal?" "Have you thought about how you will know at the end of the week whether you have made any progress?" "What will this mean for your daily behavior?" etc. Suggestions were always couched as questions: "Have you done a force-field analysis relative to your change target?" "Who are the people in your role set and how will they react?" "Have you thought of involving your spouse in your project?" etc. If the logic of what was in the paper did not hold up, I would question it or point out inconsistencies or lack of realism.

I made it clear at the outset that I expected everyone to do all the work, attend all of the classes, and submit all of the papers, and that would result in a grade of A for every student. The only way to get a poor grade would be to shirk on the work or to put in obviously substandard papers. If students were absent or did not hand in papers for 2 weeks running, I put notes in their boxes reminding them of their commitment. My goal was to create a climate where everyone would learn to the maximum of their own potential and would, therefore, merit the grade of A. I did not require that every project had to meet its change targets, but I did require that every project maximize its own learning.

Consulting and Coaching

These roles came up most often when I was asked questions about "what to do if . . . ," usually in relationship to some "impossible" situation that the class member had experienced. Implicit in these questions was the assumption that, since I was an expert on change, I would be able to advise anyone on anything having to do with change. It is on these occasions that I found myself having to shift my role subtly to that of process consultant by asking inquiry types of questions to learn more about the reason for the question, the context, and what the questioner had already thought of. Sometimes I discussed the process directly by noting that the question was putting me into an expert role that I was not prepared to fulfill.

If team members asked me what to do in relation to some aspect of their specific project, I attempted to get them to think it out with my help rather than giving them an "expert" answer. Or I would provide a number of alternatives instead of a single solution if it was clear that I had to provide some level of expertise. The best way to get this across was to think of myself as a "coach" who would help with the projects but could not do the actual work.

The best setting for coaching was when one group was asked to consult to another group, an activity that I started midway into the course. Sometimes I would role-play the consultant before asking class members to do it, but the best learning actually arose when groups consulted with each other. Inevitably the consultants would make ineffective comments, or ask confrontive questions, or in some other way create a tense rather than a helping relationship. Once this happened I had two choices. I could let the interaction run its course and then get a reconstruction. A more effective intervention was to jump in immediately when something happened that seemed not to be optimally effective and provide an alternative or actually "role model" the alternative. This was direct coaching and was deemed by class members to be the situation in which they learned the most. In these settings I became the "process expert" because we were working on real situations in which I did indeed have more experience.

Dialogue

During the last 2 years I changed the structure of the class sessions by arranging us all in a circle, introducing the concept of dialogue, and starting each class with a "check-in" which involved asking each student in turn to say something about "where you are at right now" at the beginning of each class (Bohm, 1989; Isaacs, 1993; Schein, 1993). Though this was at times cumbersome because it took quite a while for 30 people to check in, the ritual itself became very meaningful and important to the class. The circle format and the dia-

logue assumptions made each session much more interactive and comfortable. It allowed me, from time to time, to also ask for a checkout by going around the room near the end of class to see where people were at. If we were short of time, we used a truncated version of check-in asking each person just to say two or three words such as "anxious but motivated," "tired and sleepy," "comfortable and eager," "distracted," and so on.

The check-in guaranteed that all would have a voice without having to raise their hand or figure out how to get in, a process that was especially important for the foreign students with language problems. One could see week by week how they become more comfortable during the check-in and how this generalized to comfort in the remainder of the class session. Check-in also revealed the class mood, things that were going on in the students' lives that were a distraction, fatigue levels, and other factors that enabled us all to start classwork on a more "realistic" level. It reinforced the dictums I had espoused—"Always deal with the reality as you find it" and "Go with the flow."

The Empathy Walk

At roughly 8 to 9 weeks into the semester I asked each class to form itself into pairs and to do the following exercise developed by Richard Walton and me at a workshop in the 1960s.

1. Talk with your partner to identify someone in the greater Boston area whom the two of you consider to be *most different* from the two of you. This will require you to think about how you are similar and along what dimensions someone would be really different.
2. Locate someone who fits your definition of someone most different and *establish a relationship with that person so that you can spend a few hours getting into that person's world*.
3. Be prepared to *report back* to the class what you learned.

We typically devoted one whole class session to the "war stories" students brought back and pulled out insights about the process of developing empathy. In addition, each student wrote up his or her individual experience in the weekly paper that week.

Postclass feedback consistently confirms that this is one of the most potent exercises of the semester because it forces confrontation of self and others at multiple levels. I assigned readings from Erving Goffman (1959, 1967) during these weeks to provide some conceptual handles. The ingenuity and cleverness of students that this exercise releases are dramatic. Students have found and built relationships with homeless people, street musicians, prostitutes, go-go dancers, trappist monks, convicted murderers, blind people, dying AIDS patients, successful celebrities, fishermen, Hare Krishnas, and so on. They discover, among other things, that the difference between them and their target is often less than their difference from each other. They realize how insulated their lives are from many real-world problems, and how narrow their own perspectives are. They come face to face with social status and the dilemmas of having a privileged position in society, usually in the form of anxiety and guilt when they contemplate how one approaches homeless people without "talking down to them." The discovery that some of these people have had or still have rich lives comes as a shock. In every case it opens the student up to becoming more inquiring and more sensitive to others, an essential step in becoming a successful change agent or manager.

Project Reviews and Final Reports

Toward the latter third of the course I began a series of project reviews by inviting any groups that wanted some help to present their issues and have other groups or individual students be consultants. After a half-hour or so of the group and their helpers operating in a fishbowl, I would open it up to the floor to get other comments. As unhelpful comments were made, such as unsolicited advice or even punishment for mistakes that the group was perceived to have made, I would intervene in a coaching mode to examine what was happening. As pointed out above, these turned out to be some of the most salient learning experiences.

During the last two class sessions, usually accompanied by cookies and drinks, each group reported their final outcomes, salient points about their process, and the major

things they had learned from doing the project. It was at this point that many students revealed the importance of doing both a personal and a group change project because their struggles with themselves in the personal project gave them real insights into the problems of resistance to change in the group projects. Different groups reported different kinds of learning, but a common theme that ran through all of them was the importance of making a commitment to the change, having an audience in the form of faculty and fellow team members, and having weekly reports that forced constant planning and replanning and provided opportunities to get feedback.

The real payoff to the students is to discover that they can actually produce changes that have an impact. To see the Sloan School adopt a new faculty feedback form, to see actual changes in the student cafeteria menu offerings, to be thanked by the MIT Housing Office for improving the system of dealing with applicants, to create a new physical space and student lounge, to create events that increase the interaction between faculty and students and have those events become regular annual events, and, most importantly, to hear the Dean's office make reference to future student projects as a positive force for change are the best feedback possible. My own assessment is that student teams well trained in planned change methods can accomplish more than powerful committees of faculty and administrators who do not understand how change can and should be managed. Finally, what surprises us all most is that change can happen fairly rapidly. Fourteen weeks is enough to make fairly substantial changes happen. But the conceptual core must be the right one.

The Conceptual Core of the Course: Diagnosis as Initial Intervention and Process Consultation as a Change Strategy

The most important and most difficult concept to get across early in the course is that diagnosis is intervention and, in fact, that *everything that involves the target system in any way is intervention*. The discovery by students that diagnosis is intervention is paradoxical. To figure out what we need to change and discover where there is already some motivation to change that we can link with, we have to find out things about the present state of the system that we cannot know without inquiring. To gather such information we have to talk to people in the system and ask them questions or conduct surveys. What is especially important to discover is where there is already motivation to change, where there is already survival anxiety that can be harnessed, because for many kinds of projects, students are not likely to be able to disconfirm or induce survival anxiety or guilt. On the other hand, if the change project involves organizational structures where the students are the recipients, they can often marshal potent disconfirming data and induce considerable survival anxiety.

The mental model at this stage that they are "just gathering preliminary diagnostic data" overlooks that the very people whom they have involved in the question asking may later be the prime targets whom they are ultimately trying to change. And, by asking those people various kinds of questions, they have (1) influenced their thinking by raising certain issues; (2) created an image in their minds of our own style and approach, and (3) created a degree of awareness and self-consciousness (possibly even defensiveness) because the targets now know that "there is a game afoot" and they are, in some unknown way, part of it.

Furthermore, as change agents, students often assume that they must remain fairly private about just exactly what they are trying to do, so they ask very broad inquiry-type questions, never once considering that the very vagueness of their questions may produce tension and anxiety in the interviewee precisely because he or she does not know what the change agents are after. How, then, do we gather the data necessary to determine what the present state of the system is without creating anxiety, misrepresenting ourselves, and unduly influencing the interviewee prematurely?

The answer lies in working from several assumptions that underlie process consultation (Schein, 1987, 1988) and what has more recently been called appreciative inquiry (Cooperrider & Srivastva, 1987; Bushe & Pitman, 1991). From process consultation one derives the assumption that one must always work in the present reality and must understand the ebb and flow of that reality moment to moment, shifting roles as necessary. If a student is going to gather data from a faculty member, the student must understand

that there are already strong role expectations on both sides and one must work initially within that set of expectations. For example, some amount of deference is expected and must initially be honored. The faculty member would expect to be asked questions that draw on his or her field of expertise and the student would be expected to listen politely.

On the other hand, if the student knows that the faculty member knows that the student is part of a team that has been set up to redesign portions of the curriculum, the student can assume that the faculty member would be curious, possibly anxious, and would prefer to find out first from the student what this was all about before revealing his or her own information. In that case the student might open the discussion by volunteering a description of the project in terms that are informative and minimally threatening.

Alternatively, the faculty interviewee might seize the initiative and ask a bunch of questions about the project. In those preliminary questions, the student would have to assess how much anxiety is present and vary his or her tactics accordingly. It is in the design of those tactics where "appreciative inquiry" plays a role. One of the core assumptions of appreciative inquiry is to focus initially on what is working well and avoid criticism or problem foci. The interview might well start with what the faculty member is most proud of or what works best in the curriculum. If the interviewer focuses on success and what works well, he or she is creating psychological safety that will make it easier for both parties later in the interview to discuss problem areas, difficulties, things that need improvement. The prime data that the interviewer needs and wants are where the faculty member sees problems or has motivation to change, but the initial assumption has to be that he or she will not be ready to talk about problems until he or she feels safe with the interviewer, and he or she will feel safe only if the interviewer displays appreciation of what works well.

As the interview or interaction proceeds, the change agent must be constantly alert for changes in mood or feeling on the part of the interviewee, being especially sensitive to issues that may be threatening to the interviewee, leading to a shutting down of the flow of information. It is in that ongoing interaction that the tactical use of inquiry questions, diagnostic questions, action oriented questions, and confrontive questions comes into play (Schein, 1987, p. 146).

The goal should be to create an interaction that will provide information to the change agent, begin to build trust with the potential change target, and begin to get the change target to think diagnostically and positively about the change project such that he or she will welcome another interview or interaction because his or her curiosity or own energy for change has been aroused. In a sense, the concept of "change target" has to become transformed in the change agent's mind into a "client" who seeks some help or into a "learner." The change agent has to become a facilitator of the learning process and the desired change has to be embedded in a "helping process" that makes sense to the learner.

In thinking this way we have come full circle once again to Lewin's original concept of involving the change target in the change process, but I have tried to elaborate and deepen our understanding of the issues involved in making that happen, especially when the change agent operates from a position of low status and minimal formal power.

Summary and Conclusions

As I reflect on the material in this essay I am struck once again by the depth of Lewin's insight and the seminal nature of his concepts and methods. I have reflected only on some aspects of Lewin's theory, but even those few aspects have deeply enriched our understanding of how change happens and what role change agents can and must play if they are to be successful. Lewin probably saw such issues more clearly because he was able to view US culture from a European perspective. Important changes inevitably involve deep cultural and subcultural assumptions. The ability to perceive and appreciate the meaning of such tacit cultural assumptions is enhanced by working across several cultures. If we want to enrich our understanding of these dynamics further, we also should become cross-cultural learners, to expose ourselves to different cultures and begin to reflect on what it means to try to change cultural assumptions. We may then discover why "change" is better defined as "learning," why cultures change through enlarging and broadening, not through destruction of elements, and why the involvement of the learner is so crucial to any kind of planned change or, as we might better conceptualize it—"managed learning."

Notes

1. I have deliberately avoided giving specific references to Lewin's work because it is his basic philosophy and concepts that have influenced me, and these run through all of his work as well as the work of so many others who have founded the field of group dynamics and organization development.
2. I am indebted to Colleen Lannon for these terms. I had originally used *Anxiety 1* and *Anxiety 2*. She helpfully put some useful labels on them.

References

Argyris, C. *Overcoming Organizational Defenses* (Boston: Allyn & Bacon; 1990).

Bettelheim, B. "Individual and Mass Behavior in Extreme Situations." *Journal of Abnormal Social Psychology* 38 (1943): 417–452.

Bohm, D. *On Dialogue* (Ojai, CA: Ojai Seminars, 1989).

Bushe, G., and T. Pitman. "Appreciative Process: A Method for Transformational Change." *OD Pract.* (Sept. 1991): 1–4.

Cooperrider, D., and S. Srivastava. "Appreciative Inquiry," *Research in Organizational Change and Development,* vol. 1, eds. R. W. Woodman and W. A. Pasmore (New York: JAI Press, 1987), 129–169.

Goffman, E. *The Presentation of Self in Everyday Life* (New York: Doubleday, 1959).

Goffman, E. *Interaction Ritual* (New York: Aldine, 1967).

Hirschhorn, L. *The Workplace Within* (Cambridge, MA: MIT Press, 1988).

Isaacs, W.N. "Taking Flight: Dialogue, Collective Thinking, and Organizational Learning." *Organizational Dynamics* (Winter, 1993: 2439.

Michael, D.N. *On Learning to Plan and Planning to Learn* (San Francisco: Jossey Bass, 1973).

Michael, D.N. *"Governing by Learning in an Information Society,"* (Montreal, Quebec: Institute for Research on Public Policy, 1992.

Schein, E.H. "The Chinese Indoctrination Program for Prisoners of War." *Psychiatry* 19 (1956): 149–172.

Schein, E.H., with I. Schneier and C.H. Barker. *Coercive Persuasion* (New York: Norton, 1961).

Schein, E.H. "Personal Change Through Interpersonal Relationships." *Interpersonal Dynamics,* rev. ed., eds. W.G. Bennis, E.H. Schein, F.I. Steele, and D. Berlew (Homewood, Il: Dosey Press, 1968).

Schein, E.H. *Process Consultation,* vol. 2 (Reading, MA: Addison-Wesley, 1987).

Schein, E.H. *Process Consultation,* vol. 1, rev. ed. (Reading, MA: Addison-Wesley, 1988).

Schein, E.H. "On Dialogue, Culture, and Organizational Learning." *Organizational Dynamics* (Winter 1993): 40–51.

Senge, P. *The Fifth Discipline* (New York: Doubleday, 1990).

Van Maanen, J., and E.H. Schein. "Toward a Theory of Organizational Socialization, *Research in Organizational Behavior, Vol. 1,* M.B. Staw and L.L. Cummings, eds. (Greenwich, CT: JAI Press, 1979).

Schein in the Field and in the Classroom: Reflections on a Model of Managed Learning

Commentary by Karen Ayas

Here is an essay that clearly illustrates Schein as a role model of his own philosophy. Why should one read this essay? To understand Lewin's basic change model; to get a better sense of his insights; to reflect on the implications; to see the applications. These reasons may be compelling enough to engage the readers, but they are not what makes this essay stand out for me. It is the way Schein interweaves theory and practice; the way he shares his wisdom, knowledge, data, and information. His many voices (e.g., an expert process consultant, a professor) merge into an effective harmony as he reveals the dynamics underlying change and learning and makes it accessible and manageable for all three communities: consultants, researchers, and practicing managers.

> Schein's review and enrichment of Lewin's theory on change is powerful. It puts theory, language, and context around what I seem to be discovering in my own work.
>
> *Michele Hunt*

> Professor Schein provides the OD practitioner and/or line manager with a practical roadmap for enabling managed learning to occur.
>
> *Tim Savino*

This essay illustrates how action research and process consultancy can dissolve the barriers we have created between these communities. Typically, little academic influence is found in the resolution of real and important issues in practice. Typically, little allowance for reflection is seen in the practitioner world. Typically again, consultants do not share their toolboxes. No community gives enough credit to the unique capabilities of the other or genuinely tries to understand the other's language. One may preserve this, or one may preserve Lewin's tradition, challenging both the scientific model and the consulting model, as Schein does.

Despite Lewin's considerable impact on the theory and practice of social sciences and his seminal concept of action research, management science still gives more credibility to "objective" criteria and encourages separation between the researcher and the researched. Similarly, traditional consultants continue to commit the same conceptual error as they claim to collect "objective" data with diagnostic activities.

According to Schein, Lewin's insight, that human systems cannot be treated with objectivity, is all too often ignored in our change and consultation literature. If Lewin, as a physicist, had that insight, why did we ignore it? Why did we refuse to learn? Schein's model can provide some explanations but no answers. Do the three communities genuinely understand the problem? Can we have joint ownership of the change process and manage the deep shifts in both theory and action that may result?

Professor Schein reminds us that change is a "profound psychological dynamic process that involves painful unlearning." Entering into a change process is, in essence, entering into a learning process. Understanding this helps bridge classic theory and popular literature and challenges each of us in change agent roles to "access our ignorance" before we begin the journey.

Tim Savino

Schein stresses the importance of involving the learners in all aspects of the intervention, and debunks separating the notion of diagnosis from the notion of intervention. There is no such thing as a "passive" intervention. This insight alone is significant for most change agents who continue to believe that they can "objectively" assess a system without changing it. Being in this role requires that the agents join in the learning process.

Tim Savino

Schein's way of unpacking Lewin's theory and insights to change helps articulate and design change processes in organizations. I realize now that the most I can be is a catalyst. The process of change in organizations happens when unfreezing, changing, and refreezing is allowed to occur. Consultants cannot do this or drive it. The solutions and the relationships belong to the people in the organization.

Michele Hunt

Can we access our ignorance? Can we provide enough psychological safety for others to do so? Professor Schein demonstrates that this is possible in a classroom. Reading his essay, you can become his student or a participant observer and imagine him in his classroom with his students as he progressively shifts into his role of process consultant. You learn that to build the "helping relationship," you need to involve the learner in the process. You cannot possibly make an adequate diagnosis without intervening. You manage learning as a flow of continuous diagnosis, as one is intervening continuously. Schein has described and elaborated these principles in his many books about process consultancy, drawn from more than four decades of practice. Here, he explains both how he gets these insights across to his students and the shifts in their mental models as they began to discover them for themselves.

So what will it take to transform our organizations into a classroom in which everyone and every project maximizes its own learning?

Listening deeply to what Ed Schein has to offer might be a start. However, a most important reminder might be that we all have an equal shot at being helpful to learners—ourselves or others—whether we are researchers, teachers, managers, or consultants, novice or experienced, provided that we genuinely want to help, that we understand how we can help, and that we stay the course by reminding ourselves constantly of what it is we are trying to do.

Commentary by C. Otto Scharmer

"There is nothing so practical as good theory" is one of Kurt Lewin's most famous dictums. "There is nothing so practical as a good teaching methodology" may best describe Ed Schein's essay on Lewin.

I took Ed Schein's course, Managing Change, at the MIT Sloan School in 1994. Today, as a result of taking that course, I find myself acting differently both as a university teacher and as a process consultant. Rereading this article caused me to realize that three of his main concepts have influenced my behavior profoundly: the *core principles* for process consultants; the use of *real-time learning structures*; and the *empathy walk*. I explain how these concepts have shaped my current work. Schein's paper outlines five fundamental principles that I have found most useful in acting as process consultant. They are:

1. *Always be helpful:* Building a helping relationship with your client is the axis around which all process consultation revolves.[1]
2. *Always deal with reality:* Schein frequently drives home this point. Learn to see reality as it is rather than as you may wish it were.
3. *Access your ignorance:* This principle embodies my single most important learning from work-

C. Otto Scharmer

ing with Ed Schein. For example, if I am talking to a client and suddenly think I may have missed or misunderstood some explanation, I pay attention to that and say, "Excuse me but I'm not sure I understood . . ." If I wanted to come across as smart, I would bypass this situation by just saying "interesting," knowing the client would continue talking. If I operate on the principle of accessing my ignorance, I use my *not knowing* as navigator for steering the conversation. The less afraid I am of looking like a fool, the more effective I am in acting as a process consultant.

4. *Go with the flow:* Try to get in touch with the unfolding stream of events and actions—and move with it.
5. *Everything you do is an intervention:* Understand that no separation exists between diagnosis and intervention. All diagnosis is an intervention; conversely, all your experience is a source of data.

When I took Schein's course on change, he turned the classroom into a parallel learning structure (Bushe & Shani, 1991) that allowed students to help one another *on-line* with their various projects. Schein taught us different tools and methods as they applied to those projects at different stages. This sounds simple but is profound. Usually, we operate the other way 'round: We have a bunch of training courses and capacity-building offerings that are disconnected from what really is going on in our organizations. At the end of these programs, people often ask, "And now what do we do with all of this on Monday morning?" Teaching tools and concepts "just in time" (only on request and as required to understand and succeed in real-time ongoing projects) completely circumvents this problem.

My third take-away from Schein's course was a unique educational experience that he introduced and described as the "empathy walk." The empathy walk helps people to learn to see the world through someone else's eyes. We've used this in the case of the aforementioned company (e.g., by having network leaders take "learning journeys" to both their front-line employees and their customers). Only when leaders get away from their headquarters can they learn to see and experience the world through the eyes of their front-line employees and customers and, subsequently, creatively use that information and experience to reinvent their business.

What struck me in reading Schein's article is that it took him more than two decades to turn his original innovation (coinvented with Richard Beckhard) into the teaching methodology he uses at MIT today. How long may it take us to learn from Ed Schein's experience in cogenerating the future of SoL? I believe that his experience has some deep implications for the future of our SoL community. I close by posing three questions that illustrate that belief.

1. How can we enhance the quality of our work—as consultants, managers, and teachers—by learning to access not only our ignorance (thinking) but our less conscious realms of feeling and will? How can we access our deep layers of intent more consciously and more effectively?
2. How can we turn the current SoL structure of capacity building, which largely revolves around programs and training courses, into real-time learning infrastructures? How can we build a fluid web of helping relationships wrapped around real-world, real-time projects within and across companies? How can we reinvent our learning work so that the agenda is driven by practitioners who own the projects, not by consultants or trainers who teach their program?
3. How can we create learning journeys that allow leaders and companies to go beyond their current boundaries of experience and see themselves through the eyes of their front-line employees and customers? Though we do have some knowledge of how to do this on a local level, we know very little about how to do this more "globally." How can we create a space that allows us to see ourselves through the eyes of the entire *field* of emergent relationships that surrounds each company and each individual?

References

Bushe, G.R., and A.B. Shani. *Parallel Learning Structures. Increasing Innovation in Bureaucracies* (Reading, MA: Addison-Wesley, 1991).

Schein, E.H. *Process Consultation Revisited. Building the Helping Relationship* (Reading MA: Addison-Wesley, 1999).

Notes

1. This is the only principle that is not stated explicitly in the Lewin article, but it is described in *Process Consultation Revisted* and defines the underlying philosophical orientation of process consultation (Schein, 1999).

Strategy and Learning

FEATURE

Arie de Geus

In the oil industry, the 1950s and 1960s were relatively easy periods to manage. Demand grew every year, more or less equal to GNP growth, with little variation in the price of crude oil. Developments as well as management decisions were predictable. In the 1970s the world of the oil industry changed considerably. Nowadays, the demand growth and the price of crude oil vary significantly. The turbulent changes in the environment affected the oil industry. Of the top 30 US oil companies in the mid-70s, there were 18 left in the early 80s.

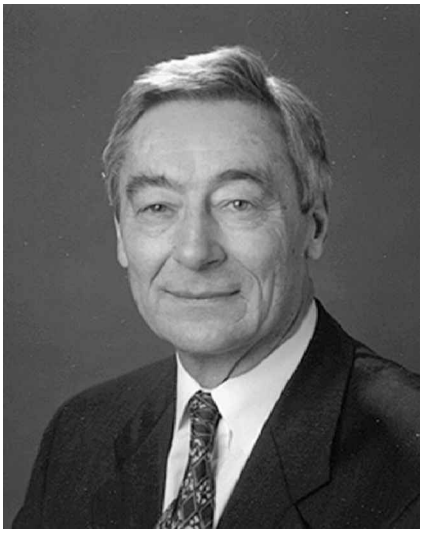
Is the oil industry unique? Not according to the Fortune '500' list of industrials. A full one-third of the companies listed in 1970 had vanished by 1983. Other statistics point in the same direction. The demographics of companies, their birth and death rates, seem to indicate that their average life expectancy is no more than 40–50 years. This finding seems to be valid in countries as wide apart as the USA, Europe and Japan.

If so, companies have a shorter life span than a human being. The mortality rate of companies is high. Obviously, a lot of it is infant mortality. Many companies fail to develop succession rules. They remain too dependent on certain individuals. They are like puddles of rainwater, which dry up by evaporation. Long-lasting companies provide for a continuous succession of new water drops, by which the puddle transforms into a river. A river is a permanent feature in the landscape, even though the water drops which constitute it are different at any moment in time. Ownership becomes stewardship. Nevertheless, also long established companies die or weaken to the point that they become easy prey for the predators. Few companies give up life voluntarily—corporate suicide is uncommon. So, what is it that causes their decease?

In the oil industry the explanation is quite clear: the environment changed. Since the early 70s we have seen three major crises in the industry. There was the supply crisis in 1973 with the Arab oil embargoes, the Iranian crisis of 1979, and the demand reduction which led to the sharp fall in price down to $10/bbl in 1986. Nowadays, the world has a growing concern for its ecology, in which the oil industry is in a sensitive position. These major shifts in the world around the oil companies over a 20-year time period, have produced many victims and have shortened their average life expectancy.

Is the oil industry really unique? Does not the environment change for all of us? In the last twenty years, most economic and social indicators have fluctuated wildly and have shown trend-breaks. Whether one looks at foreign currency rates, inflation and interest rates, at social values ever since the student revolutions of 1968, or at shortening product life times, such as in the electronics industry, shareholder attitudes have changed from docile to demanding, and most recently we have seen political changes which spell the end of an era. Since the early 70s, the environment in which all companies work has shown oscillations of increasing frequency and amplitude.

That must have important consequences for the way we run our companies. If the environmental change is of a fundamental enough nature, when the environment really gets into disharmony, then fundamental changes in



Arie de Geus

From "The Learning Organization and Organizational Learning," Karan Ayas and J. Wil Foppen, eds., 1996, Rotterdam School of Management. Reprinted with Permission.

Karen Ayas

Commentary
by Karen Ayas

This article was Arie de Geus's contribution to the Organizational Learning Forum held in the Rotterdam School of Management to celebrate its tenth anniversary. I remember listening to Arie so intently, with such fascination. Being in this forum with him as he shared his knowledge and wisdom—the product of his long career with Royal Dutch Shell—was a remarkable experience, one for which I am ever grateful.

Arie de Geus wrote this article prior to his now well-known book, *The Living Company*. If you have not had a chance to read this book, you certainly will want to read this article. It will give you a flavor of the book: the lessons learned from the corporate survivors and habits for survival, longevity, and prosperity. If you *have* read the book, you still will want to read this article, as Arie's simple yet profound message is one that must be heard again and again, until it becomes our theory-in-use, whether we are researchers, consultants, or practicing managers—until we own it and we live by it.

Arie de Geus reminds us that organizations are living systems, not machines, that a company is not just an economic entity or a machine-with-assets, that profitability should not be the only purpose of an organization. A company is a community of human beings; a company is a living being. In the ever-increasing turbulence, pace, and craze of corporate environment, we tend to forget that.

Why is it that so few companies manage to survive? Why are disease and death so common in the corporate world? Why do companies fail to see the signals of change until they slip into crisis or it is too late? Can we manage by foresight rather than by crisis? What is needed to create a healthy, long-living company? These are some of the many intriguing questions Arie de Geus invites us to explore.

management are required. When a company's know-how, when its product range, when its labor relations, are in harmony with its environment at a particular moment, the purpose of management is to try to have that company grow as much as it can or wants. The essence of management becomes the job of allocation of resources. The resources of capital and human talent will go to those parts of the organization which are best placed to benefit from the converging harmonious environment.

The other side of the picture is that the environment can also diverge, that it can become disharmonious. When that happens, you need to change quickly the managerial policy: Policies for growth will have to be replaced, without delay, by policies for survival.

The switch from growth to survival policy goes wrong quite often. In the euphoria of expansion, the changes in the environment are not seen, or are not seen for what they are. Also, in the previous period of good fortune, the substructure of the company which benefitted most from the benevolent climate, has become more independent and more powerful. Companies pursue for too long their previously successful policies of expansion and drift into a crisis. Why does this happen?

Seeing the Signals of Change

Why do companies not see the signals of change? This is an intriguing question, to which it is important to find the answer. Psychologists provide as an explanation that there is a human resistance to change. This is basically a good thing for both the individual and for society. One should not change for the sake of change. However, when change is demanded for survival, the resistance must be overcome and the only way it can be done is through "pain." The corporate equivalent of pain is a crisis, which lasts long enough for most people in the organization to feel it and to become convinced that something should be done about it. In crisis situations, the deeper you are in it, the more you run out of options and time. Sure enough, crisis management is one way to manage for change, but it is a dangerous one.

Also, this explanation provides little hope for improvement, comparing business life to a Greek tragedy. Yet, there is enormous scope for improvement. This became evident when the Shell planning group conducted a study of "the corporate survivors"—companies which should inspire Shell, which were older than Shell, and relatively as important in their industry as Shell is in the oil industry. One of several interesting findings of this study is that these companies vary in age from 100 to 700 years. In other words, the maximum life expectancy of some companies is several times that of a human being. Compared to the average life expectancy of 40 to 50 years, it appears that there is considerable scope for improvement. Each of these companies had gone through some fundamental environmental change and had survived with their corporate identity in tact. For example, the Suez Canal company had its main asset being nationalized. Some of the older companies like the Swedish Stora have had their ups and downs as a result of changes in the world over its 700 years of existence, but, remarkably, most of the time they had picked up the signals of major change and had acted on them before it had become an un-manageable crisis.

Managing internal change by foresight, rather than by crisis, is only possible if the change in the environment is seen on time. Long-term corporate survivors show that it is possible to see the signals of change earlier than most other companies. Why then do so many companies not see what is happening around them?

I can offer you two further explanations which, if true, have important implications for the way in which we should be organizing the decision-taking processes in our companies.

The first explanation is an old one which can be found in handbooks of psychology:

> You cannot see what your mind has not experienced before, you will not see what calls forth unpleasant emotions.

The story of the British explorers at the beginning of this century in Malaysia is a good illustration. This group of explorers, in a high, isolated mountain valley, discovered a small tribe which was literally still in the Stone Age. They had not even invented the wheel. The explorers established contact with the chief of this tribe who was a highly intelligent man, with a deep understanding of his own world. They decided on an interesting experiment: to take the tribal chief to Singapore, which at the beginning of this century was already quite a sophisticated society, both technologically and economically. They walked the chief through this sophisticated world for twenty-four hours, submitting him to thousands of signals of potential change for his own society, and then brought him back to his mountain valley. After de-briefing, to their amazement, they came to the conclusion that this intelligent man had seen only one thing of importance for his own world—a man carrying more bananas than he had ever seen. In his own world, men carried bananas on their back. He had seen a market vendor pushing a cart laden with bananas. All other signals, he had missed. What the mind has not experienced before, it cannot see.

This cannot be the only explanation why companies fail to see signals of change in the environment which are relevant to their future. Old and experienced companies which have seen quite a lot also miss signals, as the death statistics show.

Another, more recent, explanation is contained in an article by the Swedish neurobiologist David Ingvar, called "The memory of the future." Ingvar reports on research in the way in which the human brain handles the future. It appears that part of the brain is constantly occupied with making up action plans and programs for the future. These plans are sequentially organized (i.e. they are time paths into the future). The healthier the brain, the more of these alternative time paths it makes with both favorable and unfavorable conditions. Most amazingly, the brain also stores these alternative time paths. It may sound as a contradiction in terms, but we have not only a memory of the past—we also have a memory of the future.

Ingvar makes a hypothesis that this memory of the future has several functions. Obviously, it helps in taking decisions as and when the moment of deciding arrives, but its main function is to filter out irrelevant information. Too much information of a random nature reaches the brain via the sensory organs (in companies we call this an information overload), much of which must be ignored for the brain to function properly. However, if there is a correspondence between incoming information and one of the stored alternative time paths, the input is not ignored, its "meaning" is perceived. The message from this research is clear: *We will not perceive a signal from the outside world, unless it is relevant for an option for the future which we have worked out.*

In many companies, there is usually only one time path which has been worked out, the operating plan or the strategy and, mostly, it covers only a rather short future. We could call this *the corporate one-track mind*. In Ingvar's world, having a one-track mind means that you will see very little, if one option is all that you have thought out for the future.

One should not change for the sake of change.

1985 was the year leading up to the fall in the price of crude oil. In December the price started to crack and proceeded to fall from $30/bbl to $10/bbl in April 1986. A well-connected energy consultant in the USA, Dan Yergin, told me that quite clearly the potential fall of the oil price was a matter of frequent concern in oil company board rooms during 1985. However, he does not know of any company which addressed the question of what they would do if the price would fall. The question that was addressed at great length, was the classical one "whether the price would fall." To answer the latter question you

Challenging conventional management thinking, Arie refers to strategy as "the art of management," an art that can be mastered by accelerating the learning process and learning to deal with multiple futures. He provides many practical insights—not just those based on the Shell study of those companies that have survived for more than a century but those that are the product of his 40 years of experience.

This piece demonstrates the unique contribution of practical wisdom to management thinking and speaks to all those who want to contribute to creating and sustaining healthy, living companies.

can spend comfortably many hours without arriving at any conclusion. It is only when you switch the discussion from "whether something will happen" to "what would we do, if it happened" that you start making a time path into the future.

Decision Taking Is Learning

At this point the solution could sound simple: Let us create more corporate options and we will hear the relevant signals on which to act long before a crisis develops. This would be so, if receiving the relevant signals was the only element of the decision making process.

Between reception of the signals and action there are two more intermediate steps. We have to figure out what the signal means for our company, and arrive at some conclusions. We also have to muster enough courage to act on our conclusions.

Preferably, this process should not only take place in the mind of one individual manager, but jointly between all those managers and Board members which together have the power to act. The company as an institution must arrive at its new conclusions. One manager on his or her own, even the general manager, cannot be expected to see everything and to come up with the best conclusion at all times. When it comes to acting (i.e. the implementation of the conclusion), delay and chaos will result unless all those involved in the action have gone through the same process of seeing the signal and drawing the conclusion. This, they will have to do for themselves in a group process. No amount of telling them, explaining or "consultation" will yield a speedy and high-quality implementation. In most cases, any tie gained by excluding relevant people from the decision making is royally lost in the implementation.

We have to figure out what the signal means for our company, and arrive at some conclusions. We also have to muster enough courage to act on our conclusions.

Receiving a signal, embedding it into the mental picture which we have of our internal and external world, drawing conclusions and acting on those conclusions are the four major elements of the decision making process. This sounds remarkably equal to the four elements which many psychologists include in the definition of *learning*.

If this is so; if, indeed, managerial decision taking is a learning process, it raises all sorts of interesting questions like, "How does learning take place," "What is the best way of *learning*?"

The dominant way of learning in our management teams and Boards is by the discussions in their meetings. First, people spend some time explaining to each other "how they see the situation." The finance man sees the situation differently from the manufacturing director; the marketing manager sees different aspects which he adds to the emerging picture of the situation as a whole. In the psychologist's language they make their internal mental model explicit, calibrate it and begin to share it between them. Then, at some point in the discussion, somebody is bound to ask, "What would happen, if . . . ," and the group starts to make simulations with the model they now share. This usually leads to some conclusions which, if the matter is really important, are being checked in one way or another (e.g. by having the experts do some studies). Once the Board have convinced themselves that the conclusions drawn are probably valid, they will take the decisions for specific action and proceed to implementation.

This Natural Learning Process Is Slow

For the sort of decisions that we are discussing here (i.e. decisions to make changes in the internal structure of the company), its product range, its organization, closing a manufacturing site), we have measured time lapses of 18

months between the reception of the signal and the implementation. There were also cases where it took five years or more.

The Natural Learning Process Also Closes Options

Discussions on new business opportunities or painful decisions on cutting parts of the business always carry elements of reallocation of resources. For example, if you want to close a manufacturing site, or move it to another country, there are lots of people who feel threatened or who believe genuinely that they are asked to make a sacrifice. This brings strong elements of negotiation into the decision taking process and negotiations, normally, have only one outcome. This outcome becomes the one option for which the company makes a time path into the future (i.e., makes the "plan").

The Natural Learning Process Is Learning by Experience

In other words it is experimenting with reality. In a way, this is quite remarkable. British Airways would never allow any of their pilots to fly a 747 without making him spend a considerable time in a flight simulator. Yet, we find it often acceptable to let managers fly our companies by trial and error. In a way, there are as many human fates linked to the decisions of our manager as there are linked to the decisions of the BA pilot.

Most of the managers I know are intelligent people. When asked to tackle a change situation of undoubted importance, their minds race ahead of the discussions and they start thinking of the consequences of the decision which is beginning to shape up in the negotiations going on in the meeting. Fear for these consequences begins to permeate the thought processes. This fear produces some well known results:

- It cramps imagination; imaginative or adventurous options are often not seriously considered.
- Somebody is bound to say, "Hey, this reminds me of the situation we encountered twenty years ago and at that time we did the following;" repetition of previous success formulas.
- There develops a preference for accommodation, rather than real change, in the hope that the original distortion will only be a temporary aberration.

The latter can be, by far, the most serious outcome of the natural learning process. If, indeed, there is a fundamental change in the world around us, and we sit there, reassuring ourselves that, "Yes, it is a change, but if we can sing it out for a year, then, surely, the situation will return to 'normal' and we will be leaner and meaner to benefit from it," the risks are mounting rapidly.

Accommodation in corporate terms are decisions like cutting costs, cutting capital expenditure, cutting recruitment, reducing the specifications of the products we sell, not because our competitive position is bad (when these are perfectly good decisions), but because something is going wrong in the market (e.g., total demand has fallen away). Accommodation, if prolonged, weakens the internal systems: Cash flow reduces, employees walk away, so do customers and, at some stage, so do shareholders. If the original distortion was not an aberration and does not go away, then the company will slide into a crisis with its internal systems weakened. In short, the natural learning process tends to limit the number of options, and it is slow. Being slow is especially dangerous in a world of frequent oscillations, in which we run the risk that we are still reacting to the last disturbance when the next one is already round the corner—"fighting the last war."

Can Learning Be Accelerated?

If you look up the literature, you will find abundant evidence that learning can be accelerated. The Tavistock Institute in London which has done impressive work in this area, demonstrates the role of "play" in learning processes. Playing is done with a transitional object (e.g., a doll) which helps the child to transit from one phase into a new one (i.e., it helps the child to make fundamental changes in its life in the most effective way). The doll is at the same time a model with which the child can experiment without disastrous

consequences—the mother will not let the child experiment with her baby brother.

It is only since the early 80s that we have both the hardware and the software to make transitional objects for business life. Pioneering work has been done by the MIT Professor Seymour Papert who has demonstrated that transitional objects which he calls "micro worlds" can be created on computers using special modeling techniques or languages. These micro worlds are representations of reality in the same way as the doll is a representation of reality for a child. Nowadays, it is possible to make micro worlds of a company, or of its market, its competition, etc. with which management can experiment without having to fear the consequences. Like the pilot in the flight simulator they can take the company through extreme situations to find out in the process the existence of options which they would normally have avoided in the classical Board room situation.

In separating this option creation from the actual decision taking, we have found an acceleration of a factor three between signal and action in addition to the larger number of options which were being explored. At the same time the sensitivity of the company to pick up signals of change in the outside world has been increased.

What Is Strategy?

Up to this point, I have been arguing that a company which (1) "sees" more, is more "open" to what happens in its outside world, and, (2) in a group process, develops a wide range of options well before, in a separate second stage, implements the decisions it takes, is a company which is more likely to survive fundamental change in its environment.

By talking about decision taking as a learning process, I have by implication talked about strategy as the art of management.

Fundamental change in a company's environment will occur more often if that company has less control over it (i.e., when it operates in an international environment, rather than a national one) and when it faces more competition (think of the consequences of having to operate on a wider European market, rather than on a national market with a little export on the side, or of the consequences of breaking up national [state] monopolies). This leads me to the third argument: A more open company which involves everybody needed for action in the option and decision making process is more successful in a world which it does not control.

At this point, one may wonder where the word *strategy* should come in. So far, I have hardly used it. In the Concise Oxford dictionary, strategy is "the art of war—the management of an army." By talking about decision taking as a learning process, I have by implication talked about strategy as the art of management.

Group learning will give a greater mastery of the art and better management of the company. However, in the literature on business administration the word *strategy* is used as "a picture or a vision" of what top management would like their company to be or to become, as a "goal," "target," or a "place to which to set out a course." Commensurate with this latter view, there are the people who think about strategy as "a road map."

The Spanish poet, Machado, would whole-heartedly disagree with any of these opinions. According to him, "Life is a path that you beat while you walk it." Only on looking back can you see the path that you have beaten; ahead there is only uncharted terrain. Every step forward is a step into uncertainty.

So, how does a company beat its path? In a company, like on a ship, there is a defined command structure, a hierarchy with a boss at the top and with everyone else in some sort of specialized activity, like steering it, dropping the anchor or making the coffee. Commands travel down and communications up.

A ship, like a company, has an owner or many owners who have the legally embedded right to send it where they want it and sell it, if they want to—for their own private purposes. In short, the ship is a machine—with people an asset, and the people are subordinated to the asset. History is full of much-admired examples of people who were sacrificed or sacrificed themselves to save the ship.

What is wrong with the ship metaphor is that for a company there are no Admiralty charts of the sea ahead and the port of destination is unknowable. You do not navigate a company to a pre-defined destination. You take steps, one at a time, into an unknowable future.

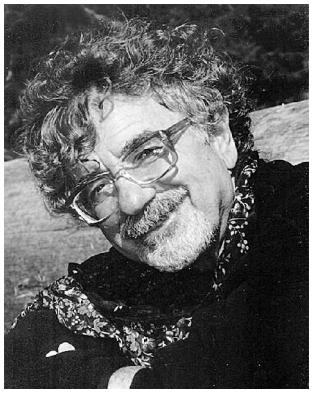
A company is not a machine-with-people. It is actually the inverse: a self-perpetuating work community of people-with-machines who, if necessary, would sacrifice assets to save the work community. The company legislation in most of the countries, continuee to reflect the nineteenth century concept of companies being assets with people and are in this respect as accurate a reflection of modern society as Marxism.

If we continue to think about companies in this way, rather than as work communities of people-with-assets, we run a serious risk that we will not be able to improve that abysmal performance of an average life expectancy of 40 to 50 years and that we cannot hope to move closer to the potential maximum life expectancy.

FEATURE

The Biology of Business: Transformation Through Conservation

Humberto Maturana and Pille Bunnell



Humberto Maturana

Pille Bunnell

In this series of essays, I reflect on the biological background on which rests the concern for how we conduct our business affairs. In doing so, I show how we may avoid the kind of blindness that makes even the best management systems fail. I do not offer solutions; I offer vision. To evoke reflection and vision, I speak about human history and the history of the earth, about living systems and human organizations. I speak about language, emotions, freedom, ethics, and beauty. You will see that all these factors indeed have to do with business.

In this first essay, I look at how conservation has to do with change. Usually, we see conservation as a polar opposite to progress and change; we do not see that these two dynamics are inextricably linked. We do not see that what we choose to conserve determines what is free to change. Thus, conservation also has to do with preferences: Evolution and change have to do with preferences. This concept does not mean that we can control what will happen, but that is the topic of another essay. However, what we choose to conserve makes possible one kind of future—or another.

History Explains the Present

Everything that we do occurs now. Although we speak about the past and the future and live in the ideas of past and future, we exist in the present. We belong to a history that runs in a continuous changing present. Thus, history is something that happens in the present, so what we call *history* has to do with how we live in the present.

We can claim that everything began with the Big Bang. However, notice that this Big Bang is an invention of a history to explain the present. We use the coherences of the present to invent a Big Bang such that if it had taken place, the present that we live now would be the case.

I propose an image that conveys this notion of inventing a history to explain the present. Consider what happens when a pebble is dropped in a still pool and a wave begins to expand. The expanding wave-front occurs wherever it is: It is a continuous "now." If a couple of points are selected on the wave-front, an origin for it can be invented, but the wave-front itself exists now. Similarly, an origin for the universe can be invented from observations we make now. In the same way, when we propose an origin for the living systems on earth, what we are proposing is the origin of the historical wave-front of living beings that is the biosphere now.

What is interesting is that we do find coherences that are adequate for inventing an origin in a way that remains consistent with other observations we make now. The image of the little pool helps to explain this, too. Consider various bits—leaves, little sticks, seeds—floating here and there on the surface of the water, some of them touching one another. If we look at the movements of these floating bits, we shall find that they have two kinds of coherences, some of which are historical, others that have to do with nearness, and still others that have to do with other influences. When the pebble makes a

This article is part of a series based on a presentation made by Humberto Maturana at the Society for Organizational Learning Members' Meeting, Amherst, MA, in June 1998. The presentation is available on the web site of the Society for Organizational Learning at http://www.sol-ne.org/res/wp/maturana/

wave, all the little bits that the wave encounters move simultaneously. They are coherent because the movements on the wave-front have to do with the history of the wave-front, in the sense that the wave-front has a coherence that has to do with its history. Other coherences have to do with nearness (e.g., when one leaf touches another). Still other coherences have to do with other wave-fronts that intercross the original wave-front. Imagine, for example, what would happen if the wave-front from the pebble triggered a floating seed to pop so that it started a new wave-front.

What we have in this image of a pool is not only an evocation of our existence in the present but an image of the coherences among ourselves and in the world in which we exist. Some coherences are of a historical nature (i.e., they exist because we belong to the same history). Others exist because we are making this history of a changing present through the interactions we have now with what we encounter (i.e., through nearness).

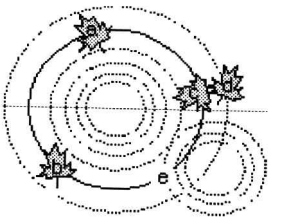


Figure 1 The expanding wave-front made by a pebble dropped into a pool represents the present moment. If we see a picture of such a wave, we can invent an origin. Further, all the floating leaves encountered by the wave move coherently; either because all are connected to the same history—in this case, of a pebble dropping (a, b, and c)—or because they are touching each other (c and d). This image can become rich as one expands it with the notion of intersecting wave-fronts (e).

Transformation Through Conservation

Whenever we want to explain the origin of something, we make a computation according to the coherences of the present. We propose what happened such that this is so. We propose a history. And what is history? History is a process of transformation through conservation: History is a process of transformation based on what is being conserved, Noticing this is interesting because usually we do not pay attention to what is conserved, only to what changes.

We can speak about anything being historical precisely because it is a story of conservation. If conservation stops, history ends. If we want to make a historical connection through a change, we have to show that something has been conserved through the hiatus and did not end when something else ended. We may wish to say that a process, an idea, or a relation was conserved, such that although something ended, something fundamental was conserved. The story has to contain a continuity.

When in a collection of elements some configuration of relations begins to be conserved, a space is opened for everything to change around what is conserved. All systems arise in this way: Something begins in the moment a configuration of relations begins to be conserved and ends in the moment that the configuration of relations that defines it stops being conserved. We know this in our daily life; yet, stating it explicitly is interesting. For example, when we say that a particular company has existed since 1893, we mean that something has been conserved; it could be the name, or it could be a particular configuration of relationships of how people interact with each other, or it might be what the company produces: whatever we claim constitutes the identity of the company. The same is true in the history of living systems: Some life forms disappear, others go on, and new forms arise. What is conserved in this history? Living. How did living begin? Any explanation of the origin of life is based on the coherences of the present that allow us to invent an origin and a progression of happenings from that origin.

We are one of these millions of life forms living on the wave-front that is the present of a history of the conservation of living. We call this wave-front the *biosphere* and, because we are part of it, we find ourselves coherent with it. Indeed, we find it beautiful because we are coherent with it. Further, we are coherent with it because we belong to the same history and to many local coherences.

© Emily Sper

Conservation and Preferences

If you think about your personal history, you will discover that everything in your life has happened so that you are here, right where you are in this moment, reading this article. Everything—where you were born, who your parents and friends are, where you went to school, what language you speak—everything leads to this moment. You can make a trace from now into the past in a way that shows that ev-

ery turn you took, every choice you made, brought you here. So, it seems that you were destined to read this article today.

The beauty of this silly little exercise is that it shows us that if one looks at a history this way, it appears that everything is predetermined or fated; but it is not. Your entire life was not directed at reading this article; you resulted here. That is the nature of biological history, the way any living being lives. What happens is constructed moment by moment by the character of one's living, always going in the path of well-being, a choice of comfort, desire, or preference. An animal may prefer to go one way and, in doing so, it happens to be eaten by a predator. If it had chosen another way, it might not have been eaten. Did it choose based on the consequences? No, it chose according to its desires in the present, because living is in the present. Even when our desires include the future, we live them in the present.

What we choose to conserve has different consequences. No particular way mandates where we are supposed to go with this. In this process of evolution, nothing matters; no direction, purpose, or intention prevails. The cosmos does not care, the earth does not care, the biosphere does not care what we do. The entire history of the biosphere is a history of tremendous alterations and massive waves of extinctions. Much has disappeared, and new things have appeared. In this sense, if we modify the earth so that we create total ecologic disaster and disappear as a species, it does not matter. However, for us it matters; rather, for us it may matter.

A History of Preferences

If we want to invent a human history, we will have to show a path of conservation that would lead to the path we follow now. And what path do we follow? We follow the path of our desires, because desires define what we conserve. This point is not trivial, and fundamentally we all know this. When we are concerned about what we are doing, we are concerned with conserving that which we desire.

Human history does not follow the path of resources or opportunities; rather, it follows the path of desires or, in more general terms, the path of emotions. In the history of living, every moment, every change, whether it resulted in survival or extinction, has arisen along a path of preferences. This is how the course of evolution has taken place. Usually, we speak of evolution as a process of natural selection and, in so doing, confuse the outcome with the process. The outcome of following different paths of preferences is differential survival. When we call this differential survival *selection*, we evoke the notion of a force as the active agent doing the selecting; but this is not what happens. Selection is the result of a differential survival generated through preferences, not the process that generates differential survival.

We move around seeing different things, wanting different things and, according to our desires, we consider these things resources, or opportunities, or something else that has to do with what we want. If we do not want to have them or use them, things are just there, being whatever they are for themselves. Something is a resource if one wants it, if one desires it. Similarly, something is only an opportunity if one desires it. So, it is our desires that define what becomes what: what is conserved and what disappears in our living.

Businesses for Finite Backgrounds

In our businesses, usually we wish to conserve production, efficiency, and success. All these entities rest on a background at which we usually do not look but which sooner or later appears in front of our nose. This is the background in which what we do is possible: the systems in which we are embedded.

Whenever we identify a system of some kind, it is embedded in another system. If we think of ourselves as a system, we see that we are embedded in a community or a family or an organization in which we work. This system then is embedded in another system. That outcome does not mean that each system acts as a passive container for those inside it but that the smaller system is embedded in a flow of interactions and modulations between itself and the larger systems. The larger system determines what can and what cannot happen in the embedded system.

The background in which we humans are embedded and with which all human activities are eventually involved has no presence in human concerns unless we consider it as being there. As we humans live in language, we are different from other living systems because we can be aware of the element in which we are embedded and of what we wish to conserve. Our awareness changes what we do conserve. Thus, although we are embedded in the biosphere, the biosphere exists for us only if we see it, and only if we see it can we conserve it.

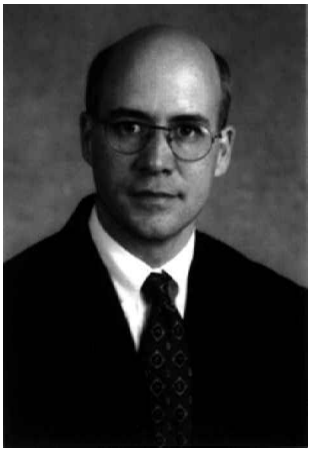
We have lived long in the assumption that the background in which we are embedded is infinite. This attitude has resulted in many losses of what we call "resource depletions" because we wanted what was lost: wood, minerals, or fish. Most businesses live in the assumption that the background of consumers is infinite. As long as consumers remain an infinite possibility, a company can prosper through growing on an expanding base of consumers. However, what happens if consumers are not infinite? What will happen depends on what has happened with our desires by the time we become aware that the system that contains us is not infinite.

The main problem that we face as business persons—if we wish to face it—is that of creating activities for finite backgrounds.

So What Does Biology Have to Do with Business?

Commentary by David Meador

Dr. Maturana's works, including *The Tree of Knowledge*, are not on the required reading list for most of the nation's MBA programs. Why should we, as business people, pay attention to a biological approach to handling business dilemmas?



David Meador

Business today is changing faster than ever before. Competition is fierce. What is the common business response? We reorganize, redesign, reengineer, and ultimately reimplement. We try over and over again to implement new ideas and methods because prior efforts failed. Why is it that a high percentage of change initiatives, such as reengineering and activity-based costing, fail in American business? Usually, the answer is linked to the challenges of dealing with organizational transformation. The bind is that if we as business people do not try the new tools and methods, we will not become more competitive and, on the other hand, many of the initiatives fail.

I believe that Dr. Maturana's paper is rich with applications for the business community. If you compare any business to its competitors, what makes one organization different from another? Many buy their equipment, tools, supplies, and raw materials from the same supply base. Usually, the difference is in the people.

Dr. Maturana's thoughts on conservation versus change speak to current reality in business. If you go into any company, you will find it's share of "change initiatives" led by "change agents." I wonder, if we had a conservation department, what its focus might be? One example might be on maintaining core beliefs and values.

Another area that requires more exploration is that of implications of language in business. To remain competitive, we constantly are looking for innovation, process improvements, and quality enhancements. Again, what is at the core of that activity? Usually, people are. Dr. Maturana's thoughts on the coordinations of coordinations of coordinations of behaviors is relevant. Sometimes, I wonder whether the business community has focused on the high leverage point of the system. All of us are aware of failed initiatives, quality failure rates, rework, and marketing fiascoes. We also can find examples of extraordinary results in teams and business units. What is the difference? I would advocate that the latter included effective coordinated action and that language played a large role.

In business, we continue to look for ways in which to create environments wherein people can be inspired, motivated, excited, and passionate about their contribution to the organization. Dr. Maturana helps to explain some of the elements required to move in that direction. These elements include respect, lack of aggression, reflection, emotional intelligence, acknowledging the intelligence of others, and relaxation.

For me, Dr. Maturana reconfirms some of my learning journey. I am reminded that if I want to lead transformational change in an organization, it happens one person at a time, but it starts with me. Tools and such skills as inquiry, deep listening, and reflection are relevant leadership skills. If I am to lead transformational change, I must hold deep respect for the individuals in the company and must honor diversity. I realize that in doing so, I can expand the creativity of the organization.

What does biology have to do with business? Everything!

What Do I Wish to Conserve?

Commentary by Dennis Sandow

Dennis Sandow

In this first article of the Biology of Business series, Maturana and Bunnell have offered us a vision. This vision invites us to consider our history as an unfolding conservation of those things, relations, and emotions that we desire. The clarity of this vision is not enhanced by the creation of an abstract model but instead by how we see the living of our daily lives. I am very honored to have been asked to comment on this article and will offer my personal history as an example.

Maturana's biological theory of cognition fundamentally changed my perspective on the world. As a research assistant at the University of Oregon, I had compartmentalized my life. These were tidy organizers. My work had been to view others from a detached point of view based on hypotheses generated by other researchers in other universities. At NEC America in Hillsboro, Oregon, my colleagues and I studied a group of workers supporting a co-worker named Karen with developmental disabilities. While working, the NEC workers would talk about how they might help Karen. Supportive social interactions created a support network, which created new support interactions, and so on. This network of support for Karen was self-producing. The social support network not only created support—it created itself. From the process of supporting Karen, a support network was created.

This experience at NEC was personally disturbing. I realized that while doing the business of NEC, employees simultaneously supported disabled employees. This situation led to my questioning what I was creating while doing the business of the University of Oregon. This question led me to reflect on my own social network of coordination of activities and, as a result, I called on a close friend at Wacker Siltronic in Portland. Through my relations with Wacker Siltronic employees and others, Ken was hired in 1990.

Ken also was a person with a developmental disability. Unlike Karen, he had spent most of his life locked in a state institution. He was told that he could not survive socially outside the institution. Once again, Wacker employees created a support network that supported Ken in his new job. Ken now lives in Portland in his own condominium. He no longer is on welfare or public subsidies but instead is a taxpayer. The State of Oregon has saved hundreds of thousands of dollars. All of this came from a group of employees who not only did the business of Wacker Siltronic but also wished to support Ken.

Maturana's vision has caused me to reflect on how I do what I do from day to day. What is it that I wish to conserve, and how do I go about doing so? What is being conserved in my network of networks? I have studied the social conservation of support for children, people with disabilities, and wetland prairies. The ordinary daily life in business has become extraordinary, as in the examples of Karen and Ken. Is the conservation of these and other desires to serve people and the earth transformative, as claimed by Maturana? I can answer only for my own life: Yes!

On Language as a Mirror

FEATURE

Stella Humphries

I awoke to the power of language only a few years ago. Working as an ecologist and environmental analyst, I found that I no longer could tailor what I needed to convey within the language patterns and style of my profession. Not without trepidation I gradually began to stray and, in the process, inadvertently began a journey of self-awareness, a journey that continues today. Three years ago, I transitioned into working with social scientists(theorists and practitioners of organizational learning and related disciplines. The challenge of navigating the barriers of language continues. What follows are some reflections from my experience in science about language and what it can reveal about ourselves.

My career has involved both pure and applied science. My graduate and postgraduate training concerned the interface between physics and biology, studying how primary production is affected by the structure and mixing patterns of water bodies. Over two decades, my work evolved from the narrowly technical toward broadly based environmental issues of regional and national concern. Most recently, I assumed leadership of interdisciplinary scientific teams and, in that role, needed to analyze information from different disciplines and cultural perspectives and to synthesize them into practical frameworks for action. My reading audience spanned the technical and academic communities, policy makers, and natural-resource managers. My writing had to be rigorous enough to satisfy my professional colleagues, yet sufficiently revealing for decision makers to understand the issues.

The normative language of science is intended to communicate descriptions and interpretations of the phenomenal world derived through the application of rigorous procedures of observation and measurement that have been established by an internally referencing community of specialists. The conceptual ideal is impartiality (i.e., to be a neutral voice that reports "objective reality" without bias toward a particular outcome). The striving for "objectivity" leads to a minimalist style devoid of personal comment or affect, what I call *writing in a disembodied voice*. Parsimony of expression is imposed further by several cultural phenomena. A premium is placed on space in journals, mostly for reasons of cost. Intense pressure mandates publishing because of a relentless competition for limited grant funding or research positions and advancement (or both), so content is pruned to the minimum, and only lip service is paid to context or rationale. The speeding up of information dissemination with the rise in information technology generates an expectation of faster turn-around for papers. All in all, more and more papers are being produced in shorter and shorter intervals. Not unexpectedly, this combination of factors leads to increasing specialization, narrowing the readership to those who already are familiar with the subject matter. This atmosphere, in turn, creates conditions for highly specific terminology within specialized subgroupings, and the language becomes deeply encoded—and incomprehensible to most of us.

Incomprehension is not discussed readily, especially among the "intellectual elite." I know from personal experience how often colleagues would rather not comment than admit they did not understand something. Moreover, if a subject is not within their area of interest, they do not have the time to spend trying to

Stella Humphries

Commentary
by Edgar H. Schein

One of the goals of *Reflections* is to help to connect different communities that ordinarily have a hard time in paying attention to one another. In fact, researchers, consultants, and practicing managers quite often are impatient with one another: Researchers are seen as airheads who never have met a payroll, consultants are seen as oversimplifying complex ideas into salable products and tools, and practitioners are seen as too busy and too anchored in their daily affairs to take the time needed to grasp new ideas and concepts.

Stella Humphries shows us, in her short brilliant essay, how such stereotypes come about and how dangerous they are. In fact, each of these communities develops its own language suitable to the tasks it must perform, and that language then creates images that become realities. What Humphries

This article originally was published in P. Master, ed., "Issues in ESP," *TESOL Matters* 8, no. 1 (1998): 9.

confronts courageously is how the language of science has come to reflect the deeper problems that can arise within cultures—a loss of objectivity about themselves. Thus, scientists who claim objectivity may have become very subjective about the nature of science itself, and this is captured in their linguistic style.

The critical implication for the Society for Organizational Learning is that each of our communities has its own objectivity and subjectivity. Knowledge is generated not just in academia or among those who define themselves as researchers. Knowledge and skill are generated in each of these communities but get lost because we do not have a common language that permits communication across the cultural boundaries. Just imagine the potential.

Similarly, values are implicit in each of the communities, though often scientists are the last to recognize them in their own work. Years ago, I had the painful experience of discovering that my "objective" analysis of Chinese Communist methods of coercive persuasion was viewed by a prisoner's coalition in the US Federal Prison at Marion, IL, as having "handed the prison wardens a loaded gun with which to brainwash prisoners in the US prison system" because I had given a talk to prison wardens on this subject. The political implications of my "objective" analysis were fairly invisible to me until the accusing letter came.

Humphries reminds us that such surprises can be avoided if we get in touch with our values in the first place and try to be articulate about them rather than hiding in an impersonal "objective" language.

understand. A recent article in *Science*, entitled "Cut the Communications Fog," concurred with the inadmissability of "obscure, techie writing" by which "the readers are made to feel like idiots." No one wants to admit feeling like an idiot, so we perpetuate the ruse that knowledge is being communicated to anyone outside a narrow field of specialists.

I contend that the increasing incomprehensibility of the language is symptomatic of deeper systemic issues that we as a society need to address. The space here does not permit developing these ideas fully, but I am placing at least a few on the table for discussion. I address the key issues under three interrelated topics: accountability, relevance, and meaning.

Accountability

The highly specialized nature of current activity in science means that disciplines are fragmented. Only the exceptional researcher reads widely. The narrowness of interest is expressed not only in encoded language but in assumptions, methods, and a body of work accepted and referenced mostly without critical examination in subsequent work. I remember, during preparation for my dissertation, being greatly disturbed on discovering an entire school of thought that had been built on unexamined conclusions from previous work that was essentially incorrect. (In my case, the behavior of algal particles in nature was inferred from laboratory studies wherein the effect of turbulent mixing was ignored.) I was disturbed not so much by the fact that wrong conclusions were drawn about productivity in the first place (that is part of empirical science) but by the extensive body of literature that evolved out of unexamined premises for more than two decades afterwards! This systemic problem goes far deeper than language, but writing in a style that leaves other professionals unable to understand your work compounds the problems. The fragmentation that leads to a narrowing readership also means that papers are reviewed, funds are distributed, and (to a lesser extent) research positions are awarded by a self-referencing group. On what basis can accountability to a broader society be judged if outsiders are unable to understand the work to assess its quality and its relevance?

Relevance

Closely allied to accountability is the issue of the relevance of work that is undertaken in the name of science, especially science that is supported directly or indirectly by the public purse. In my work as "translator" of scientific findings for application to a wide range of specific problems, I have found a recurring theme. Very little of the work that is done as "pure science" is relevant to applied problems, at least in the field of ecology. Two examples (for which I carried out exhaustive literature reviews) concerned the effect of logging on the ecology of forests and the effect of nonindigenous plant species on indigenous ecosystems. In both cases, studies that actually could be used comprised only a handful of papers (fewer than half a dozen) of several hundred. One could argue that these studies were not done to answer specific applied questions, but I would ask what questions they set out to answer that are relevant to anyone but the ecologists themselves? Reading dry scientific prose about the ecology of species "X" is not of interest to many people, yet the topic is. (I am often met with delighted anticipation of further conversation when someone discovers I am an ecologist.) People do want to know, and decision makers need to know, yet what the literature has to offer serves the needs of neither group.

The combined effect of self-referencing systems of funding and weak lines of accountability can lead to research that can be absurdly abstract. In one of my projects, I had to review the literature on temperature regulation in reptiles and amphibians. I discovered a body of work on "critical thermal maxima and minima" in which specimens of many species were subjected to progressive increases or decreases in temperature (under laboratory conditions) until the

animal died. Leaving aside the ethics of such work, which spanned almost 20 years, the real tragedy was that it had dubious relevance to any understanding of the animal's physiology in natural conditions. Interest in the area ceased, finally, with a series of ecological studies that supplemented the laboratory studies for one species of snake. The work showed that, under natural conditions, the species will use behavioral mechanisms to protect itself from severe temperatures and therefore is extremely unlikely to experience temperatures that would lead to its death.

Meaning

The most important issue for scientists and for the larger society, I believe, is loss of meaning. Central to the practice of modern science is the belief that scientists are objective observers. Although this premise is the subject of extensive discussion and writing in other intellectual circles, most practicing scientists even today do not spend any time reflecting on the truth, falsehood, or implications of this assumption. The pursuit of objectivity has given rise to the style of writing and speaking to which I have already referred: the disembodied voice (e.g., "It was found that… Smith and Jones' data showed … the results obtained indicated …").

The view that science is objective is wholly false, and to create an illusion of objectivity through language is deception. Apart from the esoteric (but relevant) arguments deduced from quantum physics (i.e., that the observer and the observed are inextricably linked), I argue the point on a more mundane plane. The question on which researchers work is a subjective choice, and the choice they make will be congruent with their world view either of what they think is an important area to study or what they "like" to study.

The question thus asked skews the answer, as became evident in my work on applied problems. For example, I had to review a grant for the control of a widely spreading and ecologically destructive weed, a weed on which scientists planned to test various herbicide regimens. I declined to support the application because the writer did not address the real issue: Why was the weed there in the first place? He showed no evidence of having considered its systemic causes. The occurrence of the weed was related to land degradation due to overgrazing. A restoration ecologist might have asked how the grazing process should be changed. The problem went deeper still. Why was overgrazing occurring? It turned out that the land subdivisions in the regions were too small to sustain a family during years of drought; in such years, the mortgage payments on land improvement, therefore, could not be met. The banks would foreclose because the financial system failed to consider the climatic cycles. To deal with the problem at the level of the weed—the symptom—would exacerbate the damage because it would give an illusion of short-term improvement. The illusion would prevent looking at the causal factors. To deal with the weed at the level of land degradation also was not enough, but to deal with it at the level of the banks was to go against a deeply ingrained cultural norm (i.e., banks cannot change). So, we retreat to dealing with the technical, the ecological domain; we try to find scientific "fixes" and avoid changing anything about our human systems.

Thus, our perception of a problem depends on our cultural background and training (e.g., weed science or land management), our predilections (e.g., I like to work with plants but not with animals), and our pragmatism (e.g., the chemical company would provide a 3-year grant to do this work, and dealing with the banks is too difficult).

However, to have biases and make choices is not only normal but necessary. Where the problems begin is at an illusion of the sacredness of objectivity and a lack of awareness of how we apportion problems within a larger context.

Sinister consequences arise when scientists work on weapons or chemicals or other means of potential destruction of life. The typical rationalization is to argue that they are acquiring objective knowledge and do not have responsibil-

ity for its use, or if they did not do it, someone else would do it with much less regard for the consequences. Although many scientists today speak out forcefully against gross and obvious uses of scientific knowledge for destructive purposes, the lines are fine and subtle between what is destructive and what is not.

I finally resigned 3 years ago from leading scientific studies when I was asked to participate in an international project to develop rapid assessment of biodiversity capability for developing countries. The request was to develop surveying and analytical tools that would allow a country to be assessed in 3 months for the purposes of apportioning land suitable for conservation and development. Objectively, this was sensible: to ensure conservation of land of high conservation value. However, in reality, this was collusion with a system that asked scientists to give an imprimatur by default on land that was to be developed. As scientists, we had jurisdiction over the technical tools and knowledge, but the uses to which these would be put were not under our control.

As a result of this study, I finally concluded that the real problems with which we were dealing were so complex that to stand back and give technical solutions to the scientific aspects of a problem was to abrogate my responsibility as a member of society. My voice as a scientist was confined to the narrow window of giving and interpreting technical knowledge. Often, the questions asked were those that another body had determined that we scientists should answer. We were confined to seeking technical solutions to symptoms of deeper problems. The questions being posed by either pure or applied scientists seemed too narrow to address causal factors, which were always social in nature.

I came to the conclusion that to ask or answer these questions, I had to speak in a voice imbued with my own commitment. The disembodied voice of science had no power to engage anyone except a handful of people whose interests happened to coincide with mine.

I began to write with conviction on these issues and was surprised to see how well this style was received by both my colleagues and by the decision makers (managers). I was willing to take a stand on the basis of the evidence so that both my reason and my heart were engaged in what I wrote. The last piece of work I did before leaving science to pursue social issues was to write a book about the devastating ecological impact of nonindigenous plant species and the need for changing outdated land management practices in Australia (Humphries et al., 1991). The book influenced national policy on import legislation, the focus of academic research programs, and the distribution of grants to land management agencies. I wrote it by engaging myself as a whole person, a person with reasoning ability and a person who cared about the uses to which her work was put.

In conclusion, we falsely assume that research is objective. It has its internally consistent logic but, in the context of the choices scientists make to do their work, it is highly subjective. To support the maintenance of a language that deludes us into believing that only reason is at play, is to deceive ourselves. To allow incomprehensibility to masquerade as knowledge is to disempower ourselves. What is worth saying is worth saying clearly, with personal conviction and in a style accessible to all whose interests it is meant to serve and who directly or indirectly have supported the research that it describes.

References

Humphries, S.E., R.H. Groves, and D.S. Mitchell. *Plant Invasions of Australian Ecosystems: A Status Report and Management Directions* (Kowari 2: Australian National Parks and Wildlife Service, 1991).

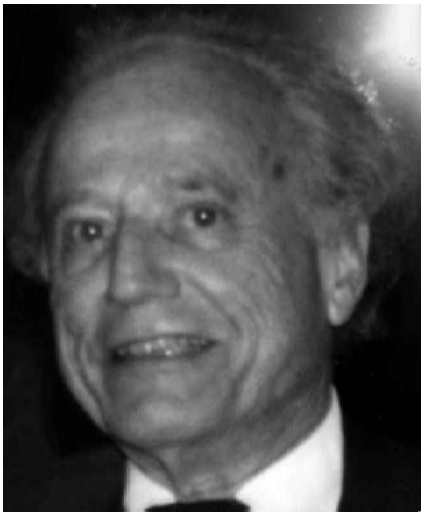
James, G. "Cut the Communications Fog." *Science* 277 (1997): 895–896.

Weltanschauung Change

Conversation with Donald N. Michael

C. Otto Scharmer

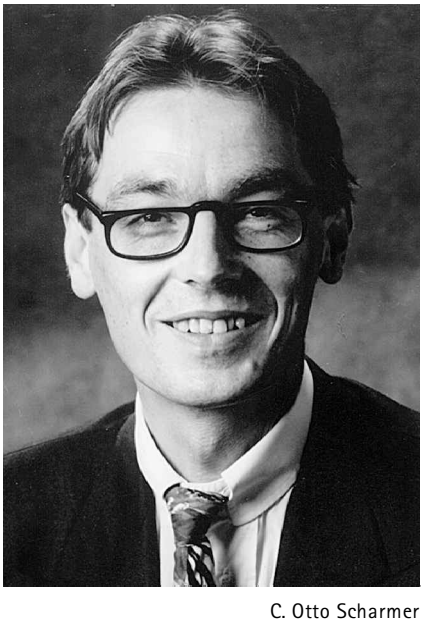
Dr. Donald N. Michael, professor of planning and public policy emeritus at the University of Michigan, is a member of the founding board of Meridian International Institute and is the author of the seminal Learning to Plan and Planning to Learn, *originally published in 1973 and revised in 1997. This conversation took place in 1995 in San Francisco as part of an interview series with 20 eminent thinkers in the area of mental models. The interview project was conducted by Dr. C. Otto Scharmer and was sponsored by McKinsey & Company and will continue to be published in future issues of* Reflections. *The conversation with Professor Michael revolves around our fundamental notions of mental models and change and how the methodology of scenario planning connects to personal mastery.*



Donald N. Michael

C. Otto Scharmer (COS): Professor Don Michael, looking at the scenario planning technique, which primarily refers to images of how the world is, how can this scenario planning be related to personal mastery and aspirations, which refers to how we want to reshape the world and ourselves?

Don Michael: First, I must tell you that given my background and the work I've done in this field, I pay a lot of attention to unconscious factors, which may be more an American way. But you come from Germany, with Freud et al., and I pay a lot more attention to the unconscious factors in mental models and in personal mastery than is typical. And I think a major reason the unconscious isn't made part of this is because there's always the implication we aren't that much our masters: That there are always forces operating over which we don't have a great deal of control, or that we aren't aware of them. There's the optimistic belief in progress, in the ability to control, in the belief in the good nature of human beings. And, it ain't so!



C. Otto Scharmer

And one of the rationales, increasingly, for scenarios, is that *we're not much in control,* so we'd better have a better sense of what kind of factors can come in from different directions and upset plans, right? Now, what Peter [Senge] is calling *personal mastery* I'm calling *personal competence*: the ability to listen to another person, to understand the way groups operate; the defensive tactics which arise in groups; ego needs, etc., and to be able to appreciate them, and their role. Because, even in scenario making, scenarios are supposed to be an exercise in logically going through a series of sets. That's part of how we protect ourselves from the illogical. So, it's important in doing and using scenarios, to be aware of these unconscious forces that are operating to interfere with that process.

COS: So how do you bring them in?

Don Michael: Well, the problem with scenarios is, here are these scenarios, but you're putting them into an organizational culture which isn't designed to accept the scenarios. An organizational culture has a mind-set, and a learning organization is trying to open up

those mind-sets, to be open to questions about them. So, when you do scenarios, generally you're not taking the whole organization and involving them in doing the scenarios; you have a group that does this. They, through that exercise, begin to change their mind-set about the world out there. They haven't changed their mind-set, entirely, about the world in here, the culture they're in. So they get all through designing these scenarios. Now there's the task of making those part of the activity of other people in the organization. In most organizations, most people don't want to hear about that! They've got a way of doing things! They have a belief, which is important, because it tells them who they are! If it's a rewarding job they have, it's a rewarding way of being in the world. It's a habit of perceiving and of responding. Now, along comes this scenario stuff, which requires operating and thinking and doing differently—or at least being aware of that possibility—and they're not prepared for that. Unless you've designed the situation to prepare them for that.

COS: Do you mean that, for instance, one group can make a change effectively but then encounter resistance from the larger group within which it exists?

Don Michael: Yes. For each of us, if we're at all comfortable in our setting, it's the result of learned successful behavior. It becomes a habit. If you're in an organization, it's not only my personal way of being in the world but is also a collective way of relating to one another based on a common belief about ourselves and the world. And, giving that up is risky because it prompts the question, Who am I? It is very threatening to do that. A corporate executive who's gotten to the top by being who he or she has been confronts the scenarios that say you've got to behave differently: That's a deep threat! Because it means asking who am I, what do I count on in life, who are my friends and enemies? A lot of this is unconscious.

Now, along comes this little group that's been working on scenarios and it says the world could be very, very different, meaning we as an organization have to operate differently, to restructure the roles and statuses people have. I don't want to hear about that! It means I have to face those threats! I don't want to! So, those people are troublemakers, or nuts, or kooks. So, it's hard to get an organization to use those scenarios and make them the basis for strategic thinking about where the organization is going and why, if it means changing the way we've been.

And there's another important piece of this: All the people you've been meeting with and interviewing, we've been rewarded being open minded. That's been our definition of who we are. Those people have *not* been rewarded for that; quite the contrary: 99% of the people I talk to this way would say, "What are you talking about?" because they've never been rewarded for thinking differently. So, when we talk about learning organizations, we're talking about projecting onto other people our own ability to learn. Which is not what most people have any ability or desire to do. Change the way I do things? Why? I'm successful, or at least safe, as I am! I'm not going to change! That's my whole being! So, a learning organization model is very difficult to implement. You might find conceptual receptivity to it, from a CEO, perhaps, but do you know of a big organization which has accepted one? Not even Shell. I've been involved with it for a long time—they still struggle with this. Human beings aren't designed to move away from behavior that's been successful. That's our substitute for instinct, to find a way that's safe, 'cause it's a dangerous world out there.

An organizational culture has a mindset. And a learning organization is trying to open up those mindsets, to be open to questions about them.

COS: So then, if I must redesign my basic assumptions, this is a real threat to me.

Don Michael: Yes.

COS: And I am going to react defensively.

Don Michael: Yes, exactly. It is an existential threat. One part of the threat is rational; another part relates to this question, who am I? And that's profoundly threatening; so

much so that people who consider themselves rational don't want to think about that at all. There's a concept in psychology called *denial*. Denial is designed in humans so that matters too threatening can remain unconscious: They just don't exist, to us. A good example of that, in this country, is how we treat the homeless: on one level, we say, "Well, they could get a job." But that's a form of denial, because, you know, the jobs aren't there. On a deeper level, we think, "That could happen to me." That level of denial is not conscious to us, so those are both levels of denial. So, this resistance to scenarios exists at both levels, too, conscious and unconscious.

COS: Let's shift now. What is your working definition of mental models? And, what is going on, when our mental models change?

Don Michael: First off, that is a profound question, and nobody knows the answer. Second, I think one of the reasons we don't understand it is because the whole idea of mental models is blurry. It's a comfortable metaphor for rational people used to thinking in terms of models, but it's mainly just a metaphor. The other metaphor which is, I think, more appropriate is *Weltanschauungen*. Now, as soon as you say *Weltanschauung*, you've moved into a realm with feeling, conscious stuff, unconscious stuff, symbolism—it's richer. And I think that's what we're dealing with when we consider mental models.

So, having said that, how does it change? You know, the great power of the poet is to connect the poet's words and patterns and pacing with the reader. Now, you have persons who say, "I am open to change." Someone with that image of him- or herself is going to be more receptive to change since that function is part of his self image already. Now, add to that, for someone like me, that I live in an environment that supports changing my own mental models. So that's two things supporting my capacity to change, right?

Now, let's look at the poetry. Part of your task in bringing new mental models to me is finding metaphors which somehow link with ways of being in the world which you have. So, let's say music is important to me. I'm not much interested in sports, and I think war is horrible. If you're bringing me some new thoughts, and you're wise about this, you're not going to use combat metaphors; you're going to bring images to me of, say, composition, counterpoint, so that I have a way of hearing those new thoughts which already fit my understanding of the world. This is the poetry of it. Right now, so many of the metaphors used in corporations are combative—win-lose—but they don't map onto useful realities because we don't live in a win-lose world! Things go on! They're sort of gray! So, if you present to me some ideas in terms of, say, an ecology of growth, then I can begin to shift my thinking to take in your ideas and make them mine. I think that's part of how these changes occur.

Now, another part of this changing process is: There's a belief, especially in the US, that—and this comes out of the Enlightenment—knowledge will make us free. If you give people thoughts and ideas, they'll then act on those. All the data and evidence and research indicate it is exactly the opposite. If you put people in a situation where they must act differently, then they will think differently in order to be compatible with the action. For example, the first real implementation of integration was in the military, and their change in ideas followed that change in behavior. Eventually, their ideas changed as a result of their behavior change, in order to make sense of, and give meaning to, that change in behavior.

Now, in some organizational settings, the scenario results in a change in behavior because they have to talk differently, and they have to emphasize different things. That then reinforces their change in beliefs. So, I think it's later that people who are involved in scenario design really come to believe that. They have to act on them first, so their action fits the scenario; then gradually their beliefs come to fit their actions. And they believe their scenarios, and the change occurs in that way.

I don't think mental models flip, generally. They do for some people for the reasons we just discussed; but a lot of times it's only partial. Does this make sense?

COS: You're saying, regarding the primacy of ideas or of actions, it's evident we have the primacy of actions. Now, with scenario planning, you're saying we still have the primacy of action, but because the change in thinking induces change in action. That seems paradoxical.

Don Michael: Yes. Two things on this: Sometimes these actions occur because the context requires the organization to change. It has to do things differently, and it says we'd better have a strategic plan, because we now have a different market. We didn't choose it; we're stuck with it. It happened to GM, in the US. They had to act differently, and then out of that built a strategy, and a belief system about what they were doing. It's paradoxical, I think, only because we think of human behavior as linear, rather than circular. It's ongoing.

Now, add one other piece to this: gaming simulation. And what do you do in gaming simulation? You talk to one another, you have wild cards come into it, to change the situation. So, you're embodied in it; you're acting in it, you're doing things.

COS: And the other situation involved role playing. And in this context, the threat is not that big, because we make a game out of the process, right?

Don Michael: Yes, I completely agree. Now, I would add that somewhere, deep, even in us, there's a limit to how open we really are. And it's a question of discovering that, as a way, perhaps to keep open even more or to appreciate where our limits are.

For instance, when I hear someone who's ideas annoy me, that is a cue to me to question my own defenses. Each of us has limits, right? And I am not proposing we eliminate them. But, part of our comfort comes from being part of a community that rewards and respects being open, whereas other people's comfort comes from having a community with one fixed way of being. You go to church, you do this, etc. So ours is another way of dealing with that need for assurity and comfort. Ours we find by finding others who are searching, and sharing, and the like but there's always an existential limit to that.

I would argue, in the social world, we have no theory of social change under conditions of turbulence that's reliable. Connecting the micro and the macro, for example: They don't know how that works. So, in the scenario realm, there are implicit theories about social change, but they're not demonstrably valid. Even the theories of economic development are up for grabs. The data are precarious because they depend on the values you use to pay attention to the world, and the values are usually tacit, and you have to be self-conscious about them and about seeing which values are operating that draw attention to which data.

What's core here, to me, is: We do not know how the world works. And we know less and less as it gets more complex.

Some of that happens in the process of designing multiple scenarios, not by attending to theory, values, and data but by talking in terms of driving forces and arguing about them and what their consequences are, until you reach a point where you can say, "Well, that gives us a new insight." And then you have your matrix of alternative scenarios. Because, in a way, those scenarios represent different selections of data and interpretations of how they're interacting with social change to produce it, and maybe different valuings, in the process.

What's core here, to me, is: We do not know how the world works. And we know less and less as it gets more complex. And one consequence of that is: You have more and more people grabbing onto something, whether a religion or philosophy or management technique, on the one hand, and a few of us finding meaning in the world by sharing a community of learners and seekers, who know we don't know. And that's my kind of way I get meaning from what I do. So, I never present myself as someone who knows the answer. I'm working on trying to understand, trying to stir the pot, and trying to keep it open, because if it closes, then we'll have no chance of having a humane world. But I think forces are mainly in the direction of closing down, by religion or politically, or because it's too uncomfortable the other way. People aren't built for that. Even we have limits on that, and most people are not rewarded for it.

COS: About the whole spectrum we've just covered today: What are your views on the most important questions for future research?

Don Michael: Connected with what?

COS: With the field of mental models and organizational learning.

Don Michael: One would be the role of the unconscious in maintaining and changing mental models. A second one is one you raised: What do we really mean by a mental model, and how do we use it? And, what is the process by which mental models are shifted and changed? What are the necessary and sufficient conditions for doing that? How does it really work, in both a cognitive and affective sense?

The third area would be how to transfer the perceptions a person or a group could come to, by scenarios, by gaming, and so forth, to others who haven't had that experience. And a fourth one is: What are the appropriate metaphors for helping not only the organizations but the supporting contexts, for understanding that we live in a problematic world? I think part of what we're dealing with certainly in the US is that people have grown up in affluent societies expecting things to go well, that things can be in place, and for a while it looked like they could. Things had improved for people, and you could depend on technology, progress. Now, we've created a world that is so complex, that it doesn't work that way anymore, and people are furious about it! They want things to be the way they want them to be. And they haven't yet learned, you can't have it all.

Now, part of the problem here is the capitalist market advertising economy depends on convincing people you *can* have it all: Just buy this car, upscale to this, and you'll have it all. But I think the rage and frustration grows out of a belief system, a mental model, if you will, held by a lot of western Europeans, and those who have had it all for a couple of generations, a belief that the world really could be nice and stable if we had the right people in government, and I think part of one of the big research topics you're asking about is, how to convey to others that that isn't the way the world is.

There was a time when the world was just as problematic, but people counted on God: God's inscrutable ways, didn't matter; you had God's reasons. We don't have God now; God is dead, in that sense. And government was supposed to do it; well, government can't do it either. Now the capitalist market is supposed to do it. Well, it can't do it either. So, we have people saying, "Goddammit, somebody's not doing it right!" And you get the kind of turmoil we're talking about. I think one of the big research tasks is somehow finding out how to convey to people in an acceptable way that this is a problematic world, and it's going to stay that way.

I guess another way to say this is: We need research on how to keep the system open to learning, to expand the environment of learning. That in turn leads to going back to dealing with these unconscious factors, with the dynamics of model change, of Weltanschauung change. I prefer that word, because it embraces more.

COS: Thank you for this conversation.

Don Michael: Well, I have enjoyed this!

Book Review

How Organizations Learn, A.J. DiBella and E.C. Nevis, Jossey-Bass Publishing 1998

Reviewer: Edgar H. Schein, Professor Emeritus and Senior Lecturer, MIT Sloan School of Management

Most books about organizational learning really are about how individuals in organizational roles learn. The DiBella and Nevis book is one of the first to treat the entire organization as a unit of learning and to develop some concepts and methodologies that are organizational instead of individual. An excellent review of the general literature of this field is followed by a useful classification of the various theories into (1) normative, driven by leader values; (2) developmental, driven by intrinsic and extrinsic evolutionary forces; and (3) capability enhancement, driven by a diagnosis of the organization's current learning capabilities and a managerially driven plan to enhance them as needed.

The authors remind us that all organizations learn all the time or they would not survive, but that their learning capabilities must be identified and enhanced. They identify learning orientations and facilitating factors that help an organization to acquire, disseminate, and use new knowledge. The strength of this approach is that it invites the organization to look at itself as a total system and to examine the learning process from a systemic perspective. What remains unclear until many organizations have tried this approach is whether these categories are the most useful for assessing orientations and facilitating factors. Though the authors acknowledge the importance of organizational culture, what is not clear is whether the survey-rating assessment approach will reveal enough about any given organization's culture to determine how culture will aid or constrain learning in that organization and how culture itself will change.

The book is well written and full of useful examples and illustrations and should, therefore, be of immediate use to practitioners.

Announcements

Upcoming Event

The 1999 *Systems Thinking in Action* Conference
Learning Communities: Meeting the Challenges of a Global Enterprise, November 3–5, 1999, Atlanta, GA

The world is at the beginning of a new era—one marked by increased openness, accessibility, and connectivity. Organizations are redefining themselves by stepping beyond the limitations of traditional management processes and mind-sets. To adapt and thrive in this exciting new environment, we must build a capability for learning that transcends barriers of distance and culture.

- How can we create vital learning communities when the constituents are worlds apart?
- What can localized organizations gain from understanding the global context in which they operate?
- How can we apply strategically what we already know about organizational learning to spur the success of our global enterprises?
- In what ways might virtual learning communities replicate the benefits and strengths of real-life communities?
- How can the way we approach cultural differences become a source of competitive advantage?

Whether we are going global or the world is coming to our own backyard, the wave of change is bringing new challenges to the way in which we work together.

Five keynote speakers, six forums, and more than 30 concurrent sessions will offer case studies, applications, tools, and strategies. Preconference courses will be offered on November 1 and 2. Keynote speakers include: Arie de Geus, Hazel Henderson, Michele Hunt, David Marsing, and Peter Senge.

Join the global learning community at the premier international conference in systems thinking and organizational learning. Connect with colleagues who are using innovative tools and concepts to meet workplace challenges and achieve real business results.

For registration information, please call Pegasus Communications, Inc., 781-398-9700, or visit our web site at www.pegasuscom.com

Book Announcement

The Dance of Change: The Challenges of Sustaining Momentum in Learning Organizations, by Peter Senge, Art Kleiner, Charlotte Roberts, Richard Ross, George Roth, and Bryan Smith

Why is it so hard to sustain change initiatives, even those that hold much promise and enjoy widespread support? In *The Dance of Change*, the new fifth discipline fieldbook, the authors argue that, to ensure lasting change, we must work with the universal forces that influence the spread of new ideas. All growth—including the spread of ideas, efforts to innovate, and attempts to realize new organizational cultures—arises from an interplay between reinforcing and limiting processes. Leaders who understand this appreciate the "dance of change" and know that true leverage for change lies in dealing with the forces that limit growth rather than in trying to "drive change."

The Dance of Change focuses on 10 challenges that recur in diverse change efforts, especially in those meant to shift both the external landscape (systems, processes, practices) and the internal landscape (beliefs, assumptions, habits).

For more information on *The Dance of Change* visit www.fieldbook.com.