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ABSTRACT

Intended for use by policymakers, program designers, researchers, and others concerned about education and employment outcomes, this collection of papers explores policy-relevant implications of occupational adaptability for the worlds of school and work. The first paper provides an overview of the concepts of change, adaptation, and the American way of work. Next, the adaptive process, adaptive resistance variations in adaptive patterns, adaptive social character and the marketing mentality, depression and other potential consequences of adaptation, and education and adaptation are examined in a paper entitled "Work and the Consequences of Adaptation: a Critique to Inform Policy." The third paper, "Proteus and the Petrified Forest: Improving Adaptive Competencies in Adults," discusses a model of occupational adaptation and its educational policy implications. Such issues as trends affecting U.S. workplaces, forthcoming corporate responses and adaptations, models for the eighties, and on-the-job learning and training are covered in the final paper. A summary and discussion follows. (MN)

OCCUPATIONAL ADAPTABILITY AND EDUCATIONAL POLICY: MISSING LINKS BETWEEN WORKING AND LEARNING

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FOREWORD

Since 1976, the Occupational Adaptability and Transferable Skills Program, sponsored by the National Institute of Education, has explored critical concepts and issues related to how individuals prepare for, select, cope with, and change jobs and careers. The papers appearing here were commissioned specifically to discuss and evaluate policy implications of some of the Program's findings in the area of occupational adaptability—how people deal with, avoid, and/or bring about changes in their jobs and their worklives. The three main papers deal with different aspects of adaptability, and focus on implications for broad educational policy, pedagogy, and work organization policies and practices.

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EXECUTIVE SUMMARY

The purpose of this collection of papers is to explore the policy-relevant implications of occupational adaptability for the worlds of school and work, and to make these ideas available to policymakers, program designers, researchers, and other persons or groups concerned about education and employment outcomes. The first section gives an overview of the concepts and issues of occupational adaptability that were addressed in an earlier Program monograph, *The Worker as Proteus*. The three commissioned papers that comprise the body of the present document focus on policy areas of philosophical bases, pedagogy, and future trends in the work world as they relate to how people learn, invent, and use adaptive strategies. The commissioned papers relate to, but do not necessarily agree with, the premises of the *Proteus* monograph. The final section summarizes the authors' ideas and policy recommendations.

CHANGE, ADAPTATION, AND THE AMERICAN WAY OF WORK

(Introduction)

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Dealing with change is an inescapable part of contemporary American worklife. Changes in technology, the economy, and national social priorities affect not only the content and contexts of jobs, but bring about the eradication of some and the creation of others. Occupational mobility, whether by choice or necessity, is so commonplace that the worker of the 1980s "will have to adjust to the probability of two or three basic changes in job, or even career, in a worklife that will last longer than those of earlier generations" (Raskin, 1979, p. 24).

The problems that people encounter in getting, keeping, advancing in, or changing jobs often entail a good bit more than being able to perform the tasks specified in a job description. For example,

> The 1975 Texas Statewide Employer Survey results showed very clearly that the majority of the problems being experienced by blue-collar workers lie not in the area of technical development but in a more elusive area, that of personality and overall adjustment to the work situation. . . . The obvious conclusion is that, while workers are acquiring their technical or vocational skills, they are not acquiring the other kinds of skills necessary to survive in the current work setting. (Craven, 1977, p. 32)

These kinds of missing worklife skills—occupational adaptive competencies—are enormously important for coping with every kind of change in work, from the relatively modest problem of learning to use a new tool, to the often overwhelming one of changing careers.

What do we mean by occupational adaptability? Obviously, some people are more adept than others are at dealing with the changes and demands of worklife. Some are beaten down, some drop out or hover on the edges—the "marginally employable." Some endure. Some triumph, finding their own niche or series of niches, reaching productive, enjoyable balances in work and life. What accounts for the differences? Are there intrinsic personal characteristics related to successful adaptation, or is there a set of behaviors that some people learn and others do not? What do more adaptable people do that less adaptable people don't do, or don't do as well? Where do they learn their skills, knowledge, and attitudes for adaptation? Not counting strokes of luck, what kinds of factors in the world help or hinder successful occupational adaptability?

These questions have been the driving force behind much of the programmatic research conducted by the Occupational Adaptability and Transferable Skills Program. A monograph prepared as part of the Program's research, *The Worker as Proteus: Understanding Occupational Adaptability* (Faddis, 1979), reviewed and synthesized available literature on the processes and complexities of human adaptive behaviors in worklife, and offered a heuristic framework with which to examine them.

While *Proteus* addressed pertinent conceptual issues of occupational adaptability, it was not within its scope to clarify the implications--particularly those relevant to policymaking--of occupational adaptability for educating people for work in a changing world. This need was the impetus for commissioning the three papers presented in this document.

The next section gives an overview of the findings of the original *Proteus* monograph, upon which the commissioned papers are based.

Overview: The Worker as Proteus

Regardless of the context, the name of the adaptation game is survival and growth. We may say, then, that occupational adaptability is the capacity of individuals to interact with the work world in ways maximally consonant with the attainment of their personal survival and growth goals in work and life--however the individuals define those goals.

This notion of adaptation goes beyond the usual one, where people adapt by "fitting in" or "making the best of things" in their jobs. In that sense, the use of Proteus--a god in Greek mythology who was capable of assuming any shape--in the title of the *Proteus* monograph is misleading. The model offered in the monograph assumes the importance of such strategies as "conforming" and "knuckling under," but it also addresses the adaptive options of bringing about changes in the jobs or work environments themselves, of preventing or avoiding the effects of unwanted changes, and of making moves from one job or career to another (as well as in and out of work itself). Proteus, who could only change *himself,* lacked the resources and the resourcefulness to be "maximally" occupationally adaptive!

The *Proteus* monograph, with its emphasis on the adaptive behaviors of individuals, drew from theory and research in all of the disciplines concerned with human adaptation, regardless of context. In synthesis, the consensus is that adaptation is a lifelong process, composed of short- and long-term problems and attempts at solution.

Adaptation inevitably involves transaction, at some level, between the individual and the environment in which he or she is functioning. Factors affecting adaptation in the work context seem to fall into three major areas (which might be thought of as concentric circles, with the first in the center, the second around that, and the last around the first two):

- *Person dimension*--the person him- or herself, including physical and biographical factors, the person's abilities and knowledge, and his or her subjective and objective perceptions of him- or herself as well as of "reality" (i.e., the external environment, including other people).
- *Work Environment dimension*--all of the factors in the work context itself that affect the worker, including the people (coworkers, clients, managers, unions), the actual content of the job and the occupation, the immediate work environment (physical conditions, work flow, hours, etc.), and the work organization in which the job exists.
- *External Environment dimension*--the broader context in which both the worker and the work environment exist (and whose factors may affect either or both of them), including people or groups (family, friends, teachers, counselors, ethnic groups, peers), government legislation and regulations and policies, economic conditions, sociocultural trends and agendas, educational institutions and practices, climate and geographic location.

People employ a number of basic adaptive approaches when interacting with environmental challenge or threat. Translated to the work world, these strategies become what we call occupational adaptation styles: Reactive (adapting yourself to the environment), Active (adapting the environment to yourself), and Mobile (adapting by moving to another environment). Most people use a mixture of behaviors from among the adaptive styles, and the categories are used to describe only general approaches that people use, not rigid behavioral patterns. Still, within those general approaches, people may not always choose the most effective behaviors to use for their situations.

For example, a person who generally uses Reactive behaviors (adapts *to* the environment) may deal with a new production quota or a time-crunch at work by drinking on the job to "escape" or feel better; or, by taking advantage of breaks and "down time" to relax; or, by working consistently at getting the work done. It is probably impossible to eliminate value judgments entirely from the relative efficacy of these adaptive choices, but the likelihood is that, for most work situations and most people, some of these behaviors will work out better than the others. We may say that some behaviors may usually be expected to be more helpful, or less helpful, though many behaviors in and of themselves are probably ambiguous—they could help, or hinder, or have no effect at all, depending on the person and the circumstances. Even the behaviors that turn out to be maladaptive, however, are still genuine attempts to deal with a situation (even if used without conscious decision or awareness), and seem legitimate to the person using them at the time.

A major challenge in understanding occupational adaptation is determining how and why different people make such different choices in how they deal with change in the work world. What, for instance, is involved in the *process* of adapting? What *competencies* facilitate effective adaptation?

Adaptation itself is a continuing, dynamic cycle of activities by which workers seek to establish, maintain, repair, or improve congruity with their work environment. Adapting involves a sequence of linked occurrences, many of which may take place "automatically"—that is, without deliberate effort on the part of the adaptor. The adaptive cycle, in the process model offered in *Proteus,* involves:

1. *Perception* of a worker-work incongruity (or threat of incongruity, or opportunity to improve extant congruity) that acts as a stimulus to possible adaptive arousal;
2. *Emotional evaluation* (which may not occur on a conscious level) of the adaptive stimulus in terms of the necessity of further response and of the nature of the stimulus as a threat or a challenge;
3. *Adaptive response selection,* a process that may be primarily intuitive or primarily cognitive; if the latter, three activities are involved: (a) situational clarification and analysis, (b) diagnosis and problem-solving, and (c) selection among options;
4. *Implementation of behavioral response(s)* selected from the individual's adaptive response repertoire or invented specifically for the situation;
5. *Evaluation of outcomes* of adaptive behaviors in terms of the individual's perceptions of short-term and long-term efficacy in affecting the worker–work incongruity and in terms of expected and unexpected consequences;
6. *Termination, continuation, or modification of adaptive responses* based on evaluation of outcomes.

Adaptive competencies are used to deal with or bring about changes in worker–work interrelationships, and are composed of certain knowledge, skills, and attitudes that a worker has at his or her disposal. The adaptive skills cluster in the following groups: transfer skills, learning-to-learn

skills, change skills (also known as "unhooking" skills), energizing skills, coping (emotional) skills, self-assessment skills, anticipatory skills, and special mobility skills (e.g., job-seeking and job-getting skills). There is considerable overlap with what are generally thought of as cognitive skills, as can be seen from the information-processing and analyzing abilities needed for anticipating possible future changes in a work environment, or the potential alternate consequences of an adaptive behavior.

Adaptive knowledge includes self-awareness (knowing your personal preferences, tendencies, strengths, and weaknesses) and systems awareness (having "savvy" of the work world). Positive adaptive attitudes include the notions of learning as a lifelong process, of there being more than one way of doing things, and of change as a challenge rather than a threat. Adaptive competencies allow people to select, implement, and evaluate the behaviors that they use to deal with adaptive problems, such as hunting a job, dealing with job pressures, learning new job tasks, getting along with coworkers, or coping with personal problems that affect work performance or attitudes.

No one can survive for long in the work world without having some transferable job skills—math, communication, interpersonal, reasoning, and manipulative skills that can be applied (directly or with modification) to tasks in more than one job or context. So, together with some transferable skills, a profile of a "maximally adaptive worker" would show competence in:

- Adapting yourself to the environment (Reactive behaviors)
- Adapting the environment to yourself (Active behaviors)
- Moving from one environment to another (Mobile behaviors)
- Deciding when to do something and when to do nothing
- Selecting which behaviors from your adaptive repertoire are the "best bets" for your situation
- Inventing new (to you) adaptive responses when appropriate
- Understanding the necessity of occasional trade-offs, delays, and retreats in the process of adapting in work and in life.

Understanding human adaptation in work (as well as in other human contexts) is a step toward improving people's adaptive options and adaptive creativity, as individuals, as coworkers, and for society in general. The three papers that follow examine some of the implications of these ideas, particularly as they relate to consequences of adaptation (Duckles), to pedagogical policies (Woditsch), and to the kinds of broad changes that may occur in work organizations and environments in the future (Brower).

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WORK AND THE CONSEQUENCES OF ADAPTATION: A CRITIQUE TO INFORM POLICY

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Introduction

Education is generally considered to have an important role in preparing people for work. The purpose of this paper is to stimulate thinking on the role of education in adaptation in employment. The conclusion will not prescribe specific educational policy, but will suggest some directions that the search for appropriate policy might take.

How do we evaluate the success or failure of adaptation? Most frequently, we use criteria that gauge how well a person *fits* the situation. Does the person behave in the ways required or expected? In the workplace, does the employee comply without refusal or resistance? For many jobs, an employee is considered to adapt well by arriving on time, by seldom being absent, and by accepting and carrying out assignments without question or resistance. It is adaptive to follow the methods and procedures that are set down by the employer. It is adaptive to dress properly for the particular job, which may involve wearing safety shoes in some situations, or ties and jackets in others. In some jobs it is adaptive to show a certain amount of initiative. In others, initiative is not adaptive.

If, on the other hand, the criteria for successful adaptation are based on the inherent nature and needs of the human organism and the unique characteristics of the individual, complex questions arise. Is it adaptive for an individual to follow methods and procedures that endanger personal safety or the safety of others? Is it adaptive to accept assignments that violate one's ethical principles, such as instructions to falsify records? Is it adaptive to continue working at a job that creates pent-up anger that is later released at home? Is it adaptive to allow oneself to be manipulated or exploited?

It is easy to focus on criteria centered around how well people fit in. One can picture a continuum from maximum adaptation to non-adaptation to work, with gradations of adaptive behavior in between. Technologies can then be designed to extinguish the less adaptive behaviors and increase the more adaptive ones. The educational system can track students toward occupations in which they have been predetermined to be maximally adaptable.

A thrust of such an approach would be to improve the efficiency of some of what the educational system is already doing. As Kanter (1977) describes it,

> Schools, especially, sided with other organizations in their war against particularism and their desire to *fit the workers to the workplace.* Seeking discipline and wanting to legitimate their authority claims, schools removed children from the family, set up a system of authority based on state sanction and expertise (grounds with which few parents, especially the large American immigrant

population, could compete), and *institutionalized a "work" discipline strikingly similar to that of adult organizations.* (p. 12; emphasis added)

Educational policy, however, should be guided by a concern for the well-being of citizens. Criteria that focus only on a good fit to the workplace and to employment are not sufficient to meet that concern. The human consequences of adaptive processes need to be taken into account.

This paper develops an approach to understanding the human consequences of adaptation, and explores the ways in which differences in people's interests, developmental needs, and patterns of deeply held emotional attitudes shape how they adapt. A major premise is that dispositions to adapt, which are rooted in people's character, are not absolutely rigid, but that there are limits to the extent to which they can change. People may *behave* in ways that appear to be adaptive, but which go "against their nature." Such conflicts can lead to anger, anxiety, and depression, though the conflicts themselves may go on at an unconscious level. The relations of the symptoms to the adaptive responses are often not recognized.

As a second focus, the paper will relate the problems of adaptive consequences to aspects of education, and will suggest a number of policy implications.

It should be noted that the formulations offered in this paper are shaped by my experiences since 1973 in working with cooperative labor-management efforts to improve work according to both economic-technical and human-social criteria in public and private organizations. Under Michael Maccoby's leadership, Margaret Molinari Duckles and I, along with others, have served as educator-researchers to help companies and government agencies, together with unions and employees, study their own work to discover the possibilities for and the limitations and obstacles to change. In these efforts, my understanding of work and character has been influenced by Erich Fromm's psychoanalytic theory, and by the socio-psychoanalytic methods developed by Fromm and Maccoby (1970).

The Adaptive Process

Lower organisms are genetically programmed to respond adaptively to the normal contingencies of their environments. Among insects, for example, adaptation is practically entirely instinctive, with little or no learning. The human organism has *dispositions* that are genetically expressed as constitutional or endowed potentials. Human beings, though, learn a much larger portion of their adaptive responses than any other organism. A great many adaptive responses become as automatic as they would be if they were instinctive. The ability to respond and act automatically is necessary for life. There is a minimal level of adaptation that must be taken for granted.

The automatic response is shaped by a system of emotional attitudes that have been learned through the process of socialization. Fromm (1941, 1947, 1964, 1973) offers a dynamic model that helps us understand the patterns of adaptive response organized in an individual's character. Character is the system of deep-seated and relatively permanent emotional attitudes that dispose a person to a pattern of responses, shaping what is seen, heard, accepted, rejected, and what actions are taken or not taken. Character provides an underlying consistency in the adaptations that a person makes in a variety of situations.

Just as children are born with a potential to learn to crawl, stand, walk, and to hold and manipulate things with their hands, they have constitutional potentials to develop a variety of character orientations. These potentials vary in different individuals. Some potentials may be stronger;

others weaker. Strong qualities may be forceful enough to prevail over the inhibiting forces of family and society. They may also be attenuated by the nurturance and encouragement of other potential orientations. Some potentials may not be strong enough to prevail in the face of inhibiting forces, and so fail to be realized. If they do not have an opportunity to develop over a long period of time, they may wither away (Fromm & Maccoby, 1970).

The character that an individual develops depends on a wide variety of factors, which combine dynamically. They include constitutional potentials and their relative strengths, the extent to which particular orientations are encouraged or discouraged by the environment, and the consistency with which this happens (Ibid.).

As noted earlier, a certain amount of automatic adaptive response is necessary for any organism to survive. Society (or culture) and its institutions also require *"that people want to act as they have to act"* (Fromm, 1949). Fromm calls the shared characteristics of the individuals in a society, culture, or institution, the *social character*. Social character defines what is normal in the particular human environment. It puts boundaries on the variability allowed within a social pattern and it defines that pattern.

Particular types of individual and social character are highly adaptive in particular situations. If the situation changes suddenly or the individual is put into a very different situation, where his or her character is less adaptive, considerable stress may result. This stress can affect the individual in one of several ways. Manifest behavior may appear to be adaptive because often the individual really has no choice but to comply, yet unconsciously the new circumstances are deeply resented. If avenues for expression are available and the character of the individual disposes the person to use them, rebellion may be expressed openly and consciously. Some situations may bring out the negative side of a person's character, such as arrogance instead of self-confidence, or suspiciousness in place of more natural caution. Beyond a certain point, particularly if the person is predisposed by other circumstances, he or she may be pushed into psychopathology (Maccoby, Duckles, & Duckles, 1980).

Fromm and Maccoby (1970) suggest that, contrary to what Freud believed, character does not necessarily become fixed at an early age. It can evolve and change in response to environmental change, or through hard, purposeful work such as takes place in psychotherapy.[1] The appearance that character becomes fixed at an early age may be the result of a consistency in the culture or society's requirements and expectations, which try to channel character development from birth into a family, through educational institutions, and throughout life in society and work. Adaptive requirements that are met in adulthood tend to follow trends along the lines of those that went before.

The orientation rooted in an individual's character may not be altered quickly or easily, however, regardless of what educational or training techniques may attempt. I have found, in my research in the federal government, that many managers and supervisors (as well as their subordinates) believe that training programs aimed at changing basic attitudes and approaches toward management's role have transitory effects, at best. Usually, managers returned to the old work environment go back rather quickly to their old adaptive responses.[2]

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[1] Ed. note: Vaillant's report on longitudinal adaptive development in adult males (Vaillant, 1977) also suggests that character—or at least its behavioral expression—continues to evolve as adults move through different life stages.

[2] On the other hand, participatively designed changes in work methods and procedures in both government and private industry, where workers and supervisors cooperate to invent changes that they feel are consistent with their real needs, can have lasting effects. In projects in which I have participated as educator-researcher, I have seen deep mistrust replaced by a measure of trust; egocentricity, jealousy, and hostility replaced by a measure of compassion, acceptance of differences, and cooperation; and, apathy replaced by interest and enthusiasm. Such changes do not happen to the same extent in every case, of course, and they frequently take a long time to develop.

Such training efforts often focus on replacing existing behavior and opinions with new, "better" behavior and opinions. The process may include simulation (experiential) exercises, rational or theoretical arguments of why the changes are desirable, or a combination of both. If, for example, a trainee is fundamentally a supervisor who needs to control subordinates through fear, and this orientation is adaptive to the way work is organized in the workplace to which the trainee will return, training techniques designed to help the supervisor encourage more autonomy among subordinates stand little chance of resulting in any change.

Adaptive Resistance

We tend to think of adaptation as a process in which people accept and/or accommodate to changing circumstances. We think of resistance to change as non-adaptive and even irrational. From this perspective, adaptation connotes "overcoming" resistance or "selling" change. On closer inspection, though, resistance to change may be adaptive and rational in some cases, and non-adaptive and irrational in others.[3]

As an example, Margaret Molinari Duckles and I were consultants to a project in which nine women formed an experimental group to improve work in a factory. With their supervisor they were given the opportunity to study their work and its methods and to experiment with innovations that might improve it. We explained the concept of job rotation to them and asked if they would be interested in trying it. They agreed, but no real job rotation ever took place. They resisted the idea.

In exploring the reasons for the resistance, we discovered that they took pride in being able to achieve their production goals and in even reaching them before the end of the shift. To slow down in order to learn unfamiliar jobs would mean to risk not reaching production. Some of the group had become so familiar with their tasks that the tasks had become virtually automatic. Members of the group did not have to think about what they were doing, and so were able to talk with each other as they worked. Also, a couple of employees had acquired a unique expertise, and could perform a particular task better than anyone else in the work group. If others gained the same expertise, their uniqueness and their individuality—their importance to the overall process—would be diminished.

To resist the implementation of job rotation was adaptive for that group of employees in those circumstances. It was not a part of a general resistance to change. The group, in fact, initiated their own changes. They were able to develop and implement innovations in the production process that improved the work from their perspective. Some of the innovations increased efficiency and were later adopted by other assembly work groups. For example, they developed a new way to pack components for assembly, which made it easier and faster to pick up the parts during the assembly process.

In the same project, a joint labor-management committee considered acquiring some video-recording equipment for training and orientation purposes. One member of the committee opposed the idea every time it came up. At first it was not clear why she resisted the idea. It later became

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[3] In regards to resisting change, Michel Crozier (1964) points out that many bureaucrats are ambivalent about participating in decision making. On the one hand they see the promise of gaining control over their environment; on the other, participation can mean a loss of rights and privileges (e.g., they could be controlled by co-participants and lose independence and integrity). Maccoby, Duckles, and Duckles (1980) have found resistance to participation in government work-improvement programs, where one of the concerns is that the right to have a say can be withdrawn unilaterally at any time. Resistance to participation can be quite rational if there are no guarantees of the rights of minorities and individuals.

clear that she was having delusions that she was being followed, spied upon, and that she was being secretly recorded. The video-recording equipment, she believed, would only add to her persecution.

The latter example is clearly a case of irrational resistance. In the former, while no one clearly and concisely articulated it, there was a reasonable basis for not wanting to rotate jobs, particularly when the project was supposed to be one that sought ways of making work more satisfying for employees.

All cases are not clear-cut. Resistance may combine rational and irrational motives. Generally speaking, however, such distinctions are not considered. Resistance is treated as a problem to be overcome, or, in some cases, as a monolithic obstacle about which nothing can be done.

Overgeneralizations are made that resistance is irrational, without taking into account that a person's character may be cautious, even to the point of being suspicious, without being paranoid or irrational. Such a character can develop in a person who has grown up in an environment of exploitation or potential exploitation, where suspiciousness is adaptive. Further, one may learn to be careful in particular situations where experience has shown that others cannot be trusted, without the person being suspicious by nature.

Variations in Adaptive Patterns

Basic adaptive orientations are brought into the work world by individuals, and seem to express themselves in general patterns of behaviors and attitudes. Using a socio-psychoanalytic method that he developed with Erich Fromm to study Mexican peasants (Fromm & Maccoby, 1970), Michael Maccoby (1976) studied adaptive orientations of 250 managers in 12 major American corporations. The social characters of these managers can be described in terms of four types of orientations to work: craftsmen, jungle fighters, company men, and gamesmen [sic].

Each of the orientations has a positive and a negative side that can be brought out and enhanced by the circumstances in workplaces. Over a period of time, the positive or negative side of the orientation may become dominant. Of course, no individual fits perfectly into one orientation, positive *or* negative, yet each of the managers Maccoby studied was found to fit dominantly into one of the four orientations. They can be summarized as follows:

Craftsmen [sic] are people who are quiet, sincere, and practical. On the positive side they can respect others and have a concern for quality. They are thrifty and self-contained. They are independent and exacting, tending toward perfectionism. On the negative side, they can be uncooperative and inflexible, their thrift developing more into stinginess, and their perfectionism leading them to find no one else who is good enough to be worthy of respect.

Jungle fighters see life and work as a jungle where one must have power in order to survive. The fundamental principle is "eat or be eaten." Peers are seen as either allies or enemies. Subordinates are to be used for one's own ends. On the positive side, a jungle fighter can be brave and protective of those who are loyal to him or her. On the negative side, the jungle fighter is ruthless, dominating, and Machiavellian.

Company men [sic] derive their identity from being a part of a powerful, protective company. They can have a high level of concern for others and be a force for maintaining the corporation's integrity. Loyalty, prudence and caring are the company man's [or woman's] positive side, but the company man is also more interested in security than in success, and the negative side can include servility and fearfulness.

The *gamesmen* [sic] respond to life as if it were a game in which they have a strong desire to win. Gamesmen are interested in challenge, competition, and taking risks, and they will encourage others to get behind the team effort, to push themselves, to share the gamesmen's own enthusiasm. Gamesmen are constantly thinking of strategies needed to win the corporate game. Daring, risk-taking, fairness, flexibility, and the ability to inspire others are qualities of the gamesmen's positive side. On the negative side, gamesmen can be gamblers, and can manipulate and seduce others without having any real feelings for them, or even having any real principles.

Less thorough studies using Fromm and Maccoby's socio-psychoanalytic method have been conducted as part of work improvement programs in a variety of settings. In an auto parts plant in Bolivar, Tennessee, six orientations toward work were discovered among the employees: ambitious craftsmen, traditional craftsmen, sociable craftsmen, receptive craftsmen, unionists, and farmer-workers (Maccoby, 1976; Duckles, 1976). Margaret Molinari Duckles found, in a later study, that auditors in the Department of Commerce could be described as, variously, teacher/helpers, management consultants, monitors, systems analysts, policemen/detectives, and crusaders. (The distinctions among such types have been presented in detail elsewhere; see Maccoby, 1974; Duckles, 1976; M.M. Duckles, 1978). The following briefly illustrates these orientations.

Ambitious craftsmen in the factory are very interested in advancing in the organization, and believe in advancement by merit. They are interested and involved in production processes. In many ways, they are more modern than others.

In contrast, *farmer-workers* would prefer to be on the farm, but it is no longer possible for them to make a living there. Their values are those of traditional, small-scale, rural farmers. They are cautious about taking risks, yet have been self-sufficient and independent. The factory is a very different environment for them. They expect to be treated with respect, but they do not get very interested in what goes on in the factory. They do their jobs and enjoy opportunities to increase their time spent at home.

Auditor types, such as *management consultants* and *helper/teachers,* share a concern for serving and being helpful. The former are more systems-oriented, while the latter focus more on individuals and details.

Crusaders and *policemen/detectives* tend to approach their auditing work with an aim to finding and exposing violations, illegalities, or inefficiencies. Once again, the distinction between the two is the extent to which they look at systems (the crusaders) or individuals and details (policemen/detectives).

Monitors and *systems analysts* focus on gathering and reporting facts—a neutral approach to auditing work.

Whether we consider the factory workers, the auditors at the U.S. Department of Commerce, or the managers that Maccoby studied, the attitudinal patterns correspond in varying degrees to the different functions of the workplace. Ambitious craftsmen in the factory tend to be most adaptive in supervisory and management positions. There are roles for craftsmen, company men, and gamesmen in the corporations that Maccoby studied.[4]

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[4] Maccoby suggests that, in most cases, corporations today could do without jungle fighters (1976, p. 41).

In the case of the auditors, the orientations of the different kinds of auditors seem to be more or less adaptive depending on the environment or the purpose of the audit. For example, if the auditor's role in a particular audit is to help a minority business receiving government contracts to set up a financial and management system to avoid business failure, the teacher/helper and management consultant orientations are most adaptive to the audit task. If the audit is initiated in response to suspected fraud, a policeman-detective orientation is most adaptive. Both types of audits are needed. Understanding the different attitude patterns helps us understand why an auditor may excel in one audit and fail in another of a different type.

The general environment surrounding a type of work may have differing effects on workers with different orientations, as well. The Office of Audits of the Department of Commerce has undergone changes in leadership, for example, that have affected the way its employees adapt. A new Director gave top priority to audits that were intended to help the organizations being audited (this was a shift in focus for the Office). While there was no open rebellion among the auditors, the manager found the resistance palpable. The Director's inclination was to explain the resistance in terms of a general lack of responsiveness to his leadership style. Some auditors, however, did respond favorably because the new direction was consistent with their own emotional attitudes toward work.

Later, another new Director placed the emphasis of audits on finding fraud, waste, and abuse. Policemen/detectives and crusaders were more adaptive to this leadership, but now the rest of the auditors—monitors, systems analysts, teacher/helpers, and management consultants—became resentful and dissatisfied. In both situations, one adaptive response for the unhappy auditors was to leave the organization.

Of what value are such studies? Do they merely categorize people? The more common practice in evaluating employees, though, is to have only two categories: the "good" people who "fit in" and the "bad" people who do not. In some cases, the "good" people are those who are most similar to the evaluator. Developing descriptive typologies such as those presented here gives everyone a basis for more fully understanding adaptation in work. As important, the typologies are phrased so that in each case, the descriptions and statements make sense to the people being described, rather than being couched in technical jargon to which the workers cannot relate. Especially in the case of the auditors (but true to some extent in all of the studies), the people being described were participants in the study, not merely objects being studied.

With this understanding, a manager and an employee should have a basis for entering into a dialogue about the tasks that should be undertaken and the ways in which they can be approached. Both the employees and the supervisors are able to make clearer judgments about whether, for example, the individual auditor is suited to lead an audit focusing on suspected fraud, or one that focuses on helping to develop the necessary financial and management systems in an organization. In the factory, management acquires a basis for understanding why some technically competent employees either refuse or are unsuited for promotion to supervisory positions. In both government and private organizations, promotions are more likely to be based on technical performance on tasks, along with a record of being hard-working and reliable.

Adaptive Social Character and the "Marketing" Mentality

There is, in our society, what can be called an *adaptive social character.* In America, it generally includes a system of attitudes that has as its aim "complete adaptation, so as to be desirable under all conditions of the personality market" (Fromm, 1976, p. 136). This *marketing character,* as Fromm calls it, is a product of the contemporary socio-economic nature of our society.

In an earlier age, when the majority of Americans were self-employed, small-scale capitalists, it was adaptive to be thrifty and to have an "obsessive-hoarding" character (Ibid.). The situation today is different. Less than eight percent of Americans are self-employed. The market—the exchange of commodities—has come to have an increasing function in shaping social character:

> ... the regulatory function of the market has been, and still is, predominant enough to have a profound influence on the character formation of the urban middle class and, through the latter's social and cultural influence, on the whole population. The market concept of value, the emphasis on exchange value rather than on use value, has led to a similar concept of value with regard to people and particularly to oneself. The character orientation which is rooted in the experience of oneself as a commodity and one's value as exchange value I call the marketing orientation. (Fromm, 1947, p. 68)

Consider the following excerpts from a column giving advice to job applicants who are to be interviewed by a potential employer. The advice comes under the heading, "How to Sell Yourself."

> The hiring managers will undoubtedly consider your ability to work, your appearance, enthusiasm, initiative, maturity, grades, course work, previous employment, and campus leadership activities in determining if she or he will give you an employment offer. However, *creating the best total impression, being the most professionally personable, and having the greatest "personal chemistry"* with the manager are probably the prime factors. ...
>
> Here are some suggestions:
>
> – Keep an optimistic attitude. Be positive. Underplay your job needs and *use a soft-sell approach.*
>
> – Be well-groomed, neat, clean, and appropriately dressed *for the image you want to project.*
>
> – Be on time for the interview.
>
> – Have a firm handshake to project a *self-assured image.*
>
> – Be honest and sincere. *Sound modestly confident* instead of boastful. *Show warmth and stability.*
>
> – *Project confidence and ability.* Comment on your concern for growth, cost control, and company profits. (Himes, 1980; emphasis added)

The focus of this advice is to sell yourself, project the right image, give the right impression, and present the right appearance. Few people would question the wisdom of this advice. This in itself indicates the extent to which we all share a marketing "adaptive" orientation. It seems natural to us that we should sell ourselves and that managers should *buy* the images and impressions we create.

The same column advises the job applicant to "appear attentive and interested." At no point is the applicant advised to apply for jobs that *are* interesting. Appearance is what counts.

A government manager told me about a course that she was taking that she hated. I asked her why she was taking it if she found it so repugnant. "It gets my ticket punched" was her reply, meaning that it would help advance her career. The people who are most strongly marketing-oriented have little concern for the nature of the job or its content. The opportunity to advance is paramount. The career path chosen is the one that promises the fastest advancement.

> Those with the marketing character structure are without goals, except moving, doing things with the greatest efficiency; if asked *why* they must move so fast, why things have to be done with the greatest efficiency, they have no genuine answer, but offer rationalizations, such as, "in order to create more jobs," or "in order to keep the company growing." They have little interest (at least consciously) in philosophical or religious questions, such as *why* one lives, and *why* one is going in this direction rather than another. They have their big, ever-changing egos, but none has a self, a core, a sense of identity. (Fromm, 1976, p. 137)

Since this kind of adaptive character strives to be whatever others want, the challenge becomes figuring out how to present oneself to those important others. Emotions and feelings get in the way of this challenge. If it is adaptive—as in many cases it is—to be able to move geographically for the sake of one's career, then it is not adaptive to form emotional ties to people or places. It is not adaptive to become too attached to an employer or coworkers, if one can "get ahead" by changing employers and coworkers.

If the rationalization of work and the bureaucratization of organizations require people to be standardized, interchangeable parts of the enterprise—that is, commodities—then it is adaptive to be a commodity. The image that "sells" is not the image of a passionate, deeply feeling person, but an image of being self-assured, modestly confident, warm and stable, and having good "personal chemistry." Caring deeply is a handicap; feelings have no place at work, and outside feelings must never come along with the worker to the workplace. Practical, expedient, detached, and unfeeling, focusing on presenting the right image to "get ahead," this kind of adaptive character generally winds up empty, uninterested and undiscriminating, unrelated, with little sense of self, and often doubting his or her own real worth.

Depression and Other Potential Consequences of Adaptation

Depression is one of the most common emotional problems in our society. Depressive disorders are second only to schizophrenia in the number of admissions to hospitals for psychiatric care, and exceeds the rate of admissions for alcoholism (Schuyler, 1976). Depression underlies the eleventh leading cause of death in our society, suicide. In addition to the more than a quarter million who are admitted to psychiatric hospitals for depressive disorders, an estimated 50,000 commit suicide each year (Ibid.). It has been estimated that depression is also a leading reason that people seek therapy as outpatients (Ibid.).

At least in its milder forms, most of us have probably experienced depression. This fact makes it seem normal. Fromm (1973) argues that there is a pervasive "unconscious depression" in our society (pp. 242-252). The normality and the fact that we "know what depression is" prevents us from examining its characteristics as we might if we were trying to understand a disorder that is foreign to us. We are often not even aware that we are depressed.

Clinical descriptions of depression are quite consistent. There is passivity. The individual feels impotent and ineffective. There is a deep sense of being alone and unable to be in contact with others. Concentration, the ability to focus on something, and the ability to take initiative, are impaired. Self-esteem is lowered. We feel bored.[5]

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[5] See, for example, Fenichel, 1945; Fromm, 1973; Goldson, 1975; Greenson, 1967; Schachtel, 1959; Solomon & Patch, 1971.

Descriptions tend to be consistent. The explanations of the causes of the disposition to depression and the precipitating factors vary to a great extent. There is evidence that some depressive disorders have an organic and even a genetic basis.

Obviously, there are many approaches to understanding depression, and the discussion that follows is not meant to imply that all depression is the result of consequences of adaptation to employment. There are ways, however, in which persons who adapt in work by assuming the marketing character seem particularly disposed to depression. Where the focus of the marketing character is on building an image and projecting impressions as opposed to developing real capabilities, the feeling of impotence that comes with depression may be based on real ineffectiveness and lack of capability —capabilities that, in fact, have never been developed (or have been developed minimally) because all attention has been focused on the marketing of images.

Of course, one does not survive in many occupations on the basis of image alone. A professional or skilled occupation does require real skills. Even where an individual has developed a certain mastery of a body of skills and competencies, though, the continual need to sell oneself can raise deep, troubling, though often unconscious doubts about whether one is truly competent or a fraud, or is creating impressions that are not backed up by real substance.

Depression also involves a process of *disillusionment*. To become *dis*illusioned, one must first have illusions. When one markets oneself by creating illusions, it is likely that the person will come to believe at least some of the illusions. Inevitably, such illusions will be challenged by reality (unless the person is completely out of touch with reality). Once again, it is a question of discovering emptiness where there was an illusion of substance.

The feeling of aloneness and the inability to relate to others that characterizes the depressive state has its counterpart in the detachment and unrelatedness that is part of the marketing character. A person who lacks a sense of personal substance cannot relate to another person who also lacks substance. Relations between images are, at best, highly superficial.

The depressive state is one in which there is lowered self-esteem. The marketing character obtains self-esteem not from an awareness of real qualities and capacities of self, but from the proof of his or her marketability; that is, the ability to sell oneself again and again to an employer. This kind of adaptive character projects images that contribute to advancement, which comes through promotions, "better" jobs, and increases in pay. These are the bases by which the adaptive character is able to assess his or her worth.

Self-esteem that relies heavily on such indicators as promotion and getting ahead is bound to lead to casualties in the form of depression. The pyramid structure of most organizations precludes advancement beyond a certain point for all but a few. Merely being paid for one's work is not a sufficient indicator of worth. Being advanced becomes the indicator to an employee that he or she is valued.

Depression, and its component, boredom, are emotional states that the adaptive character seeks to escape. The escape mechanisms are suited to the fact that the adaptive character views the world as a myriad of consumable commodities. There is a disposition to find the right commodity to consume to solve any problem. Consumption becomes the means to fill the void one feels in oneself—to *feel something* where there is no feeling.

> ... addiction may also serve as an escape from a life that is experienced as *empty* because of a failure to turn toward the world in the process of self-realization. Then to feel anything at all, in order thereby to feel alive vicariously, becomes an end in itself. As in all addictions, however, the obtaining of this end is increasingly self-defeating because larger and larger "doses" are required for the rapidly blunted sensation, whether the sensation is produced by the kind of tasting for tasting's sake that Apuleius describes in the time of Roman decadence, by drugs, by compulsive sexual activity, or by the seeking of thrills and excitement per se. (Shachtel, 1959, p. 211)

Where boredom and the inability to feel reach pathological proportions, the vicarious excitement of seeing violence and danger as a spectator can spill over into thrill-seeking that comes from engaging in violent and/or dangerous acts. Fromm (1973, pp. 249-251) describes several cases of violent youth in which the monotony and dullness of everyday life lead to acts of violence against self or others who are not motivated by malice or hate, but by an overwhelming desire to feel *something*. One girl who slashed her wrists explained that she did it to see if she would bleed, which would be evidence that she was alive.

Without attributing all such cases to the disposition to adapt by marketing oneself, it would seem that in our society the dominant social adaptive character does contribute significantly to such human and social problems as depression, suicide, a variety of addictions, and tragedies that result from engaging in thrill-seeking activities that take the place of deep emotional feelings.

While the marketing orientation in our society touches us all, to some extent, the descriptions given here have been idealized. The *pure* marketing character is rare. Most people have at least *some* productive capacities, and their marketing orientation is blended with other character orientations. They may find limited opportunities, though, for developing and expressing other capacities; or their circumstances, including their work situation, may stifle and inhibit their productive dispositions.

There is evidence that such capacities exist widely. The evidence emerges in programs to improve work in which my colleagues and I were engaged in the 1970s. These programs involved deliberate efforts to create a climate at work in which there was security, fairness, a respect for differences among people (an understanding that people have different needs for creative development), and where participative and consultative processes through which employees could have a say in the decision making at the workplace were implemented.

Management, unions, and employees together engaged in participative study of their work, workplaces, work methods, production processes, and the policies and procedures of the workplace. They implemented changes in all of these as a result of their participative study. Many individuals had opportunities that were not previously available to them to explore and develop their real interests. Not all became involved to the same extent, and participation took a variety of forms, but the capacity to be interested and productive given the right circumstances was clearly demonstrated (Duckles, Duckles, & Maccoby, 1977; Maccoby, Duckles, & Duckles, 1980).

In addition to the disposition to adapt by self-marketing, the American social character also contains strong elements of craftsmanship, sociability, hard work, and a desire for equity. Some people are fortunate enough to become employed in jobs that match their dominant character orientation quite well and that bring out the best in them. They not only adapt to their occupations, but in the process they become creative in their own lives, in their work, and in their relations to others.

The notion of adapting to the outside world is not the only ideal that our society holds up for its members. There are also ideals of self-realization and activeness, of mastery over one's own life as opposed to passive acceptance of one's fate. There are ideals of winning; ideals of dominating or controlling. The ideals can clash with one another. The usual adaptive ideal leads people to feel that they must sacrifice their "real selves," their integrity, their values, in order to do what is expected of them, but the conflict is not fully resolved. Instead it is generally avoided or rationalized.

One employee whom I interviewed described himself as a "prostitute." For him, compromise with his own ideals is "the price you have to pay." He reported that he was "once idealistic, but I learned real quick that you can't have integrity and get ahead." Yet he found the same type of behavior in others despicable. Unhappy and bitter, he projected his anger at his own betrayal of himself onto others around him. When a task requires it, he could be faultlessly polite and proper in his client contacts. He believes that the solution to all his problems will come through promotion and increased income.

The ideals of adaptation, self-realization, activeness, and mastery of one's own life are incorporated to varying degrees in the individual through the process of socialization. In some situations, when ideals conflict, they create conflict within the individual. Adaptation is *not* necessarily the removal of conflict, and in many cases it is not aimed at achieving some kind of balance or reduction in tension. Going against our conscience does not make the conflict go away (and going *with* our conscience does not, of course, eliminate outside consequences, either). The awareness of conflict can be removed through rationalization, but it is still there unconsciously and manifests itself in anger, anxiety, neurotic symptoms, and depression.

Studying adaptation only from the perspective of behavior makes it impossible to recognize this dynamic. Milgram's (1963) laboratory experiment in obedience, for example, reveals from a behavioral point of view that nearly two-thirds of the experimental subjects continued to administer what they believed to be punishing electrical shocks to a "learner" who was making errors. They continued to obey, despite indications that they were torturing the "learner" severely. The study is cited as indicating a strong disposition to obey commands of an authority, even in circumstances where there was no special way to enforce such commands. An "unanticipated" finding was that the situation created extraordinary stress and emotional strain—inner conflict—in both subjects who obeyed and those who did not follow the experimenter's commands to the end.

> I believe that the most important finding of Milgram's study is the strength of the reactions *against* the cruel behavior. To be sure, 65 percent of the subjects could be "conditioned" to *behave* cruelly, but a reaction of indignation or horror against this sadistic behavior was clearly present in most of them. (Fromm, 1973, p. 51)

One of the goals of educational policy regarding adaptation in general—including in employment—might be the following: How can we help people distinguish between adaptation which is necessary and not against their own best interests, and that which constitutes a betrayal of themselves? Having made the distinction, how can people then be aided in finding the courage (for it does take courage) to make the choices that are in *their* best interests, when there are profound pressures to choose expediency, ease, and instant gratification?

Education and Adaptation

The socialization that takes place in our educational systems is shaped as much by the culture of our society (in microcosm as well as macrocosm) as it is by the knowledge and skills that are "delivered" via the content of classroom teaching. Schools, in our society, mimic the organization of work: the "work" of schools is scheduled, controlled, supervised, and evaluated by authorities of the school, in much the same way work is organized at most places of employment. Similarly, in both schools and in the workplace are established rules that govern the incidental behavior of the students and employees. There are parallels between teachers and supervisors, between principals and foremen or plant managers.

In both settings, there are pressures to do what is necessary to get ahead. A school that stresses grades and the ranking of students according to externally determined, standardized criteria is nurturing the marketing orientation. For example, in college classrooms, students' first questions usually concern the *requirements* of the course: How many exams will there be? Will there be a term paper required? Will the exams be essay or multiple choice? Will the class be graded "on the curve"? Before even attending the first session, the student wants to know whether the course is required for the student's major. Does it *count* toward graduation? How much *credit* does it carry?

The subject matter offered in schools is frequently offered as a consumable commodity. The teacher lectures, tells, explains. In Friere's (1970) terms, it is a "banking" approach to education in which the teacher deposits knowledge in the student:

(a) The teacher teaches and the students are taught;
(b) the teacher knows everything and the student knows nothing; and
(c) the teacher thinks and the students are thought about. (p. 59)

Critics of conventional education see schools as "socializing children to fit into bureaucracies at the cost of independence and joy of life" (Maccoby, 1971). Maccoby has found in his clinical work as a psychoanalyst that the absence of discipline (developed in oneself), concentration, a critical attitude, and communication are closely related to boredom and feelings of impotence in students, even among those who are very bright and can achieve high scores on intelligence and achievement tests (Ibid.). To help students develop these presents a considerable challenge.

Concentration requires the repression of distraction in a society that bombards us with constant distractions. Passive consumption interferes with concentration, but we are daily exhorted to consume for all our needs (Ibid.).

Criticism involves penetrating surface appearances to get at underlying truth. It involves questioning popular interpretations or those that are given to us by authorities. Developing critical abilities in students requires teachers who are themselves critical and who can avoid the pitfalls of equating criticism with destructive negativism and cynicism on the one hand, and null criticism on the other out of fear of hurting students' feelings or not being popular.

Communication is often seen as a mechanical process, where in its deepest sense it is dynamic, involving both communicating to another in a penetrating way and being able to listen to another; not only the words that are spoken, but the feelings and meanings that are "between the lines," expressed in posture, facial expressions, and tone of voice.

Both Freire (1970) and Piaget (1976) have developed active approaches to education that address discipline, concentration, criticism, and communication. The approach developed by

Montessori (1972) starts from the perspective of understanding the student and his or her needs and building on the student's existing interests. The teacher's role, in any approach, must be an intensely active one, where the strategy is of learning from the student as the student is learning—the opposite of the notion that "the teacher knows everything and the student knows nothing."

There is a shared view that real knowledge and understanding comes not from memorizing and repeating, but by discovering for oneself:

> In short, the basic principle of active methods will have to draw its inspiration from the history of science and may be expressed as follows: to understand is to discover, or reconstruct by rediscovery, and such conditions must be complied with if in the future individuals are to be formed who are capable of production and creativity and not simple repetition. (Piaget, 1976, p. 20)

Such active approaches to education do not end when one "finishes" school, but, if developed in their fullest sense involve a lifetime of discovery and rediscovery, invention and reinvention. Active learning would not logically stop when one enters the workplace, but would continue in the workplace, nor would it be limited to the directly programmatic. In one of the work improvement programs in which I participated, the human need for continuing education was demonstrated when the factory employees invented a school in cooperation with management. The school offered classes —the more popular and long-running ones—in art appreciation, music appreciation, arts and crafts, piano, and ceramics.

Conclusions: Adaptation and Policy

Strategies aimed at changing and evolving the nature of work have more promise for improving the consequences of adaptation in work than strategies that are aimed at changing education. By turning out graduates with certain qualities, education systems respond to employer needs far more than they shape the nature of employment. The training of people in technical skills (around data processing, for example) responds to the new directions in which business and industry are moving and the specialized positions that they are creating in the process. Overwhelmingly, schools set out to fit the worker to the workplace. In the process, to varying degrees and with varying degrees of success, they *may* address the intellectual and emotional needs of students.

Policies that are directly aimed at improving general adaptability to employment or that focus on a particular subgroup are likely to emphasize making people fit work, without addressing the kinds of human consequences that have been discussed in this paper. On the other hand, there would be real merit to deepening our understanding of people's developmental needs and experimenting with ways of discovering interests and nurturing the development of critical thinking, communication, concentration, and internally directed discipline.

It would contradict the discoveries and approaches of active education for such policies to be prescriptive and directive. The policies need to be developed in the same spirit of discovery, rediscovery, and invention. If teachers are expected to bring out the best in students, the strategies need to involve bringing out the best in teachers. One avenue that could be explored is for the federal or state governments to sponsor workshops for teachers at all teaching levels to explore the kinds of issues and concerns that have been raised here, and to help them explore alternative approaches that they could use in their classrooms to encourage maximum human development.

Facilitators for such workshops would necessarily need to be people who are sensitive and knowledgeable about the processes of individuation and development. There is a danger, given most governmental procurement processes, that an effort in this direction would attract consultants with neatly packaged programs to "solve the problems in your school," offering easy formulas where what is needed far more is exploration—struggling with strategic questions.

Workshops of this type could lead to experimental efforts in schools throughout the country. Some might be constrained by scarce resources in the school system, and the federal or state governments might find it valuable to offer funding support for such efforts. The ideal would be for practicing teachers themselves to take the leadership, with experts assuming resource roles.

What kinds of experiments might be developed? The following are offered as suggestions, not as prescriptions.

Raskin has developed an approach to encouraging a thoughtful critical attitude in children by having them conduct first-hand studies of institutions such as hospitals, museums, and government agencies (Maccoby, 1971). Pearl (Ibid.) worked with a group of teachers who led grade school students in a critical examination of the federal budget. This effort also became an education for some of the children's parents, who called the teachers to say that they could not believe some of the things their sons and daughters were saying about government spending. Relating critical thinking abilities to preparation for work, students could be encouraged to formulate their ideas and fantasies about different occupations and then study those occupations critically by visiting the workplaces and interviewing people in the occupations.

In each of these approaches, there is an extremely active role for the teacher in drawing out the students' assumptions and in helping them to formulate questions that penetrate the facade of conventional assumptions. The process can be very alive and interesting for the students, as I saw when I sat in on a high school class in which a creative teacher had helped students analyze their parents' work in social and human terms.

We are living in a world where change is accelerating, population is increasing, and resources and commodities are becoming more scarce. It is quite likely that the majority of less affluent societies will *never* reach the extravagant level of consumption that Americans have been able to achieve. Our own consumption may already be diminishing out of necessity. These conditions, combined with the staggering supply of armaments in the world, can fuel the sparks of resentment against inequity and touch off a global war. The risk is the greatest it has ever been and is growing. The very survival of the species may *require* more people who can see clearly, analyze critically, and relate compassionately to others, in the workplace and in their lives in general.

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PROTEUS AND THE PETRIFIED FOREST: IMPROVING ADAPTIVE COMPETENCIES IN ADULTS

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Prologue: Poor Proteus

Imagination is an indispensible companion of the inquiring mind. We find its fabrications even in the deep reaches of physical science. With his terse *Gedankenexperimenten,* Einstein used it to conjure physically impossible vignettes to help us comprehend a relative universe. And in a spirit of not too distant kinship, Constance Faddis asks our imaginations to bring Proteus, a mythological god capable of changing into any shape, with us on a quest to understand occupational adaptability (see Faddis, 1979).

At first, with his dazzling ability to assume any form of his choice, Proteus seems a most fitting symbol. But then on second thought—as Ms. Faddis herself suggests—Proteus' showy capacity for change is a rather attenuated image of real adaptability. The legend is a mere shade of the much more protean creature who is a shaper of worlds as well as of itself.

So there is an impulse to leave Proteus behind. If we look a third time, though, we see that he cannot be so easily dismissed. In many subtle ways he is an apt myth, as poignant in his contradictions as the adaptive capacities he represents.

When we meet Proteus, it appears that he merely wants to be left alone. Perhaps in his youth he had exhausted the novelty of donning myriad shapes, but as the old antisocial man of the sea that he has become, he uses his gift of change solely to fend off intrusion. In Greek mythology, Aristaeus and Menelaus had to grapple his whirlwind metamorphoses simply to get some information out of him. The all-knowing god, it seems, was a champion of the status quo.

Pry back the lid of myth a bit farther, and perhaps we can understand why. Imagine Proteus struggling with his gift of infinite adaptability in his early years, before he'd quite got the hang of it. An ordinary fit of temper, a mild spat with a friend, and there stood a slavering beast. After calling out a chore, his mother might find a strange bush in the yard, or catch a glimpse of a departing bird. He was never what you wanted, when you wanted. People came to shun him: you couldn't count on Proteus.

The fooling around took its toll, and finally Proteus was drawn, as many of us seem to be, toward his antithesis. He sought stability. Slowly he came to use his mercurial gift to secure—of all things—a predictable world. He grew to resent strangers. They introduced new variables.

It is in this paradox of the protean bent on permanence that the myth comes closest to us. Like Proteus, humanity is a vulnerable artificer. Humans are creators—imposers of shape, choosers of what will or will not become—and in this we are like the god. Sad to say, though, we have to live

with our choices. Once made, they impose an implacable logic of their own on human affairs—a logic not always foreseen and sometimes devastating. We, too, are gods vulnerable to our own creations. Not surprisingly, we grow timorous. The peculiar blend of dominance and helplessness we share with Proteus brews a kind of *Urangst:* a primal dread of the full implications of our capabilities.

Proteus takes the key to unlimited alternatives—he could be anything—and uses it to lock his world tight. In a sense, so do we. With much pain and anthropological labor we can force ourselves to see that the principal firmament of our world is human artifact. Most of us seldom deal with the raw furnishings of nature. We live in a world of things that are, most often, as we have optionally fashioned them to be. Yet even as we shape our artifacts, we treat them as givens, because that is the most comforting myth of all. When we deny authorship, we limit occasion to be terrified of ourselves. Not even Proteus could fully face being Proteus.

Still, there may come a time when Proteus grows fitful, and things as they are seem to press on him. Prodded by the aggravations and disharmonies of constraint, he might begin to wonder how to avoid the set patterns, or how to change them, or ponder some other way to adapt.

Poor Proteus. . . .

From Model to Policy

Itinerary

Leaving Proteus behind, we move on toward an appraisal of what we know about the core human adaptive agency: cognition. In consequence of this analysis, the paper will show how adaptive capabilities are—or could be—within the reach of pedagogical policy.

In addition to an excellent survey of the far-flung literature that touches occupational adaptability, *The Worker as Proteus* (Faddis, 1979)[1] provides us with a descriptive model of the process of occupational adaptation (see Figure 1). The model encompasses and neatly organizes the vast array of factors that impinge on adaptability—other kinds as well as "occupational," if the truth be told. It identifies the personal and environmental dimensions that stimulate and condition adaptive behavior. The perceptive and reactive capabilities of the adapting individual, together with the processes involved in shaping an adaptive response, are placed within the model's "Black Box." Behavioral responses are taxonimized, types of adaptive outcomes schematized, and the feedback loops that inform the process with its own outcomes are identified.

Our task is to move from the model toward a consideration of the kinds of policies that should prevail in the local educational and occupational environment if we want to enhance adult adaptive capabilities. It's a long trip from model to pedagogical policy. To conclude it at all, we'll have to fly, settling only here and there for fuel.

We will begin at the engine room of the model—the "Black Box" in which individual choice processes occur. To be impartially descriptive, Ms. Faddis had to leave the box closed. There are simply too many psychologies and philosophies of human agency standing in line for tenancy. But we will have to supply *some* furniture—some observation about the character of the human adaptive repertoire—if the model is to relinquish its descriptive status and start working toward policy.

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[1] Ed. note: A synopsis of the *Proteus* monograph appears in the introductory paper, "Change, Adaptation, and the American Way of Work," in this collection.

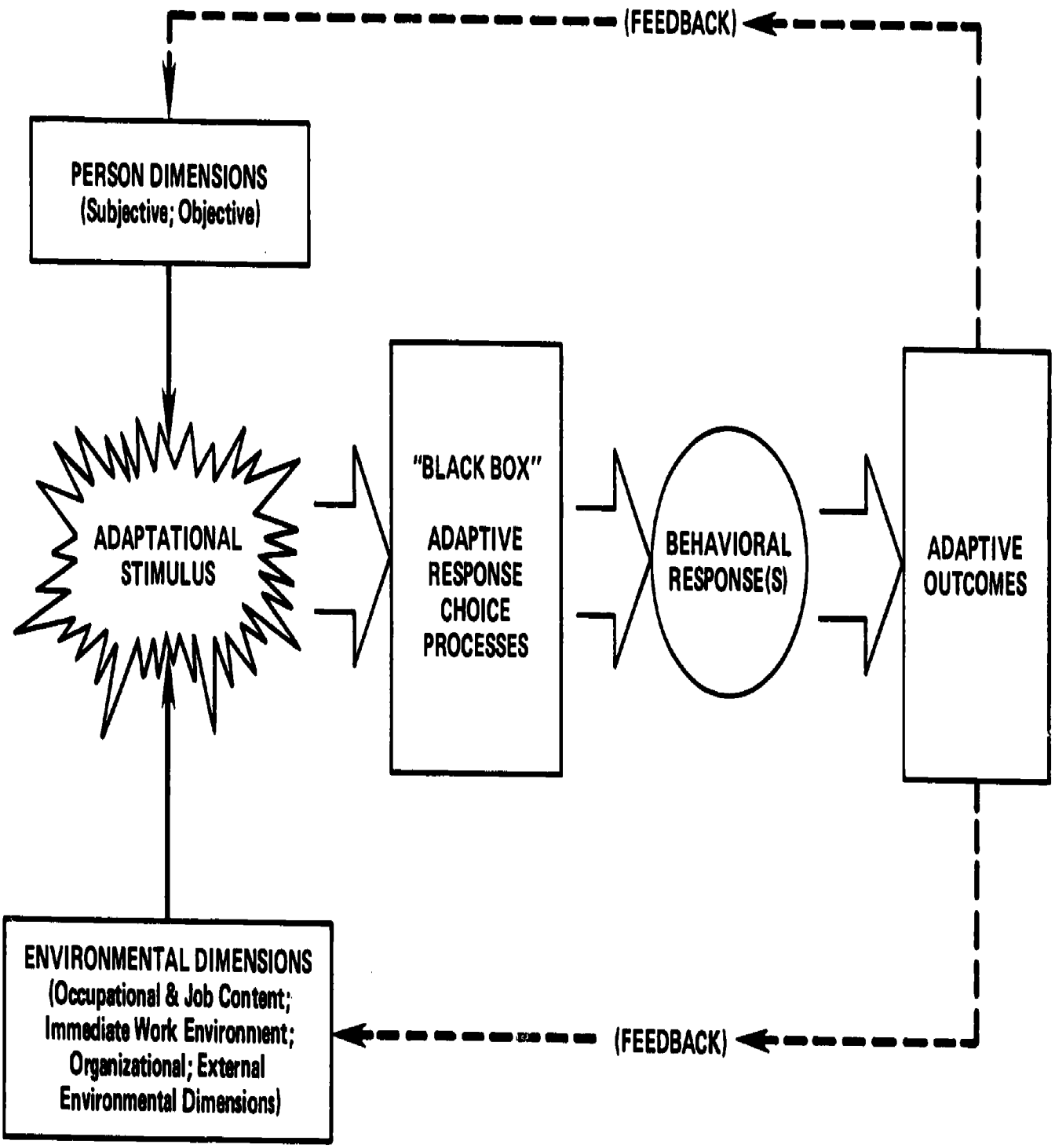

FIGURE 1. Outline of model of occupational adaptation (Faddis, 1979, p. 106).

After we've tinkered with the Black Box, it will help us establish some aims for policy on the local educational and occupational scene. With the aims in hand, we can then set about considering the policies.

Dynamics in the Black Box

Instructive as it might be, we haven't time to equip our Black Box of adaptive processes with an entire theory of human agency. Fortunately, we can move some distance without detailing one, because dominant policy and practice in the educational and occupational arena will, if squeezed carefully, produce a set of dominant assumptions about the ways and wherewithalls of human adaptation. If we insert just a few assumptions not now dominant, the Black Box may behave quite differently. We will impose only two, both of which are largely ignored by current educational and workplace policies. In order to take those two assumptions seriously, though, we will have to view with some care the fabric of the principal human adaptive mechanism: cognition.

All sentient life exhibits a capacity that appears to be irreducible to any other, and that is the capacity to detect similarities and in some fashion discriminate among stimuli (Quine, 1969). From microbe to the verge of humankind, the physiological mechanisms that sustain this capacity and the range of discrimination grow increasingly complex. With *homo sapiens* we are surprised to note something of a devolution of the peripheral capabilities (sight, smell, hearing, taste). In effect, we suffer a reduced capacity to discern like and unlike. But the loss has a radical compensation in a new capacity to distinguish and even construe regularities beyond the proximately sensory—cognition. Physiology takes a quantum leap. Now there is a creature that can wield other than biologically determined constructs in gauging and interpreting its world. We need to understand something about just what those new constructs are.

In his effort to trace the genesis of concept formation, Vygotsky (1962) identifies several classes of pre-conceptual constructs with which the young make do on the way to their full cognitive inheritance. These constructs serve as concept *surrogates*. They lack the concept's capacity to sustain logical relationships and to reference univocally, but they are nonetheless *selective* representations of experience, and the child uses them for purposive communication and action. The child binds together disparate objects and sensations solely on the ground of their co-occurrence in immediate perception. The bonds of these conglomerates are highly subjective and unstable (the gauge of similarity here is simply *co*-incidence), but the child nonetheless employs these "heaps" (to use Vygotsky's term) in organizing his or her affairs. "Mother" for the young child may signal a wavering construct comprised of sensations of touch, smell, security, food, caress, and satisfaction, while for the adult it signifies maternal agency. The two may coincide somewhat in their referent but not in their meaning.

Beyond *heaps* there emerge various levels of "complexes" by means of which the child identifies groupings in terms of discrete similarities shared by objects. For example, toy blocks, spheres, and triangles are treated as one kind because they share the same color. Since various types of complexes identified by Vygotsky are built of relationships perceived by the adolescent mind to be inherent to a world outside itself, complexes mark a giant stride toward objectivity in thought. But the referent bonds (similarity criteria) that cement lower-order complexes are themselves haphazard and fragile, and hence these complexes organize experience only transiently.

As youthful thought evolves through the various types of complexes, and as adult language ratifies some as more useful than others, the bonds increase in stability. The child comes finally to associate certain experiential objects under one unwavering criterion, and arrives at the highest form of complex thinking. Vygotsky labels it the "pseudo-concept" because it appears to exhibit an

abstract specifying characteristic (similarity standard) that enables us to tell which things in experience it applies to and which things it does not. Unfortunately, appearance in this case is only skin-deep; in employing the pseudo-concept, the child reveals that the bond is inextricably associated with its concrete objects, and cannot sustain activities involving generalization.

As the child moves from *heap* to *pseudo-concept,* he or she in effect articulates new ways of making connections between discrete events in experience. Simultaneously, there is growth in the child's capacity to attend selectively to some characteristics of experience and ignore others. When a stable and functional connection between things in the child's experience encounters a well-formed capacity for selective attention, the seed for full-fledged abstraction and *bona fide* concept formation germinates.

Before we look at this ultimate cognitive construct—the concept—let us make a few notes on our minicourse in concept formation. It is an axiom of the dominant theory of developmental psychology that the stages of cognitive development unfold in necessary sequence from simple to most complex. First comes facility with heaps, then complexes and pseudo-concepts, and finally with concepts. Unfortunately, there is a tacit but still overwhelming tendency to adopt an unwarranted corollary: *once concepts, no more pseudo-concepts, no more complexes, no more heaps.* And that corollary sustains the pervasive and damaging myth of the homogeneity of adult thought—the presumption that we can consider all adult thought conceptual.

This is a damnably tough myth to penetrate, because it is so well screened. Cognitive constructs of all sorts share a common currency of exchange in language. Since the vast majority of uses to which language is put in day-to-day human affairs is ostensive—merely pointing to this, directing attention to that, or extending this or that call for action—the quality of the underlying construct is unimportant. One sometimes suspects that perhaps 10 percent of all social utterance is comprised of the one peculiar nod-grunt combination that signifies "Change the channel." This surface similarity and parallel utility for ordinary purposes, engendered so well by language, *obscures* the deep-rooted ways in which cognitive constructs differ.

It happens that the various cognitive forms are not metamorphic phases in the mind's progression toward uniform conceptuality. We do not begin with heaps and end with the space from cranial wall to cranial wall serenely aswim with concepts. The elements of thought are *constructs.* Each element is shaped not as well as it *might* be, but as well as it *need* be, given the abilities and purposes of the cognizer and the vicissitudes of his or her interactions with his or her world. Where a complex suffices, the complex remains. Hence heap, complex, and concept coexist, and cognition is best seen as a business of rearing and managing a heterogeneous stable of cognitive forms.

What is important is that different denizens of the stable do different work. Complexes, for instance, let us tidy up the exceedingly cluttered world of experience. We point to two hundred disparate enterprises underway in forty square blocks and call them "university." It gives us a convenient referent, but the labeling doesn't carry us much further. One facet of the complex encourages an assertion that another immediately contradicts. The primitive Bororo of Brazil formed a construct of their own social membership that happened to include a species of red parrot. The Bororo's use of a common inclusive term for both themselves and the bird had anthropologists perplexed until it was seen that a binding of two such disparate creatures did not require a conceptual assertion of identity. Nor was the usage whimsical. The Bororo, for reasons of their own, had simply joined themselves with the bird in an abiding complex (Vygotsky, 1962, p. 72).

But to view the real powerhouse of human agency, we need to look at "concept" and to note two things about it. First, concepts take shape as a result of intense *social* interaction, and they are not passively acquired in that process; they are actively formed. Second, the concept's primary role is to vastly expand the range and repertoire of human agency.

Piaget (1968) helps us understand the first point:

> At about the age of seven the child becomes capable of cooperation because he [sic] no longer confuses his point of view with that of others. He is able both to dissociate his point of view from that of others and to coordinate these different points of view. ... True discussions are now possible in that the children show comprehension with respect to the other's point of view and search for justification or proof with respect to their own statements. (p. 39)
>
> It is only *vis-á-vis* others that we are led to seek evidence for our statements. We always believe ourselves without further ado until we learn to consider the objections of others and to internalize such discussions in the form of reflection. (p. 29)
>
> Logic constitutes the system of relationships which permit the coordination of points of view corresponding to different individuals, as well as those which correspond to the successive percepts or intuitions of the same individual. (p. 41)

Our need for more durable constructs about ourselves and our world is stimulated by the abrasive pressure of social interaction with its consequent revelation that one must come to terms with others beyond an egocentric self. They will have to be constructs capable of sustaining new kinds of relationships between themselves: bonds that transcend what Piaget calls the "irreversibility" characteristic of ties between intuitive, pre-conceptual constructs.

> Primary intuitions are always characterized by rigidity and irreversibility. They are comparable to perceptual schemata and habits which unfold in a definite sequence that cannot be reversed. (Ibid., p. 32)

Concepts in fact do bring with them a whole new galaxy of relationships and operations, among them the full panoply of logical functions: addition, multiplication, classification, seriation, correspondence, identity, inversion, reciprocity, correlativity, and so forth. All these represent new ways of manipulating our constructs about the world, and hence the things they represent. At base, the logico-mathematical operations are new patterns for *action*. We might suspect as much, since they do not derive from some arcane corner of abstract thought, but precisely *from* action.

> The logico-mathematical operations derive from actions themselves, because they are the product of an abstraction which proceeds from the coordination of actions and not from the objects themselves. For example, the operations of "order" derive from the coordination of actions. To discern a certain order in a series of objects or events one must be capable of registering this order through actions (from ocular movements to manual reconstitution) which must themselves be ordered. Objective order is learned only through an order inherent in the actions themselves. (Ibid., p. 81)

The prepotent characteristic that enables these conceptually-rooted operations to open new realms of human agency is their reversibility. A logical operation is, so to speak, comprehensible from both ends. It can be decomposed into its invariant elements and recomposed in a sequence that is the precise inverse of the first (Ibid., p. 121). The inherent reversibility of such operations is the source of their great virtue in expediting people's commerce with their world. Without that quality, for

example, causal sequences could not be traced back, and the lack of that ability would deprive a person of the capacity to project and predict events, or to deduce the consequences of an out-of-phase or altered sequence of events. Because conceptual thought is reversible, and hence composable, we are able to detect anomalies in our interactions with our world. We are able to modify, evolve, and perfect our grasp and our direction of experience.

Here lies the key to the utility of conceptual thought. It is the root of adaptive competence because it enables us actively to take apart experience and creatively reassemble it. When we take one look at the wondrous shapes that capacity has wrought in culture and society, we must send Proteus with his display to a carnival booth.

The Dynamics of Adaptability: Two Assertions

The perennial bugaboo of any effort to deal with adaptive competencies is the task of identifying them. Prompted by his or her purposes and theoretical framework, the researcher confronts the complex skein of human behavior and begins to log those components that seem focal. "Mathematical Skills," "Critical Thinking," "Interpersonal Skills," "Dependability," "Decision-making Skills," ... The lists roll on and on, citing items at various levels of specificity and generality. Quite often the lists contain overlapping items within themselves. Humankind seems fairly to prickle with notable skills, and our taxonomies truly become an embarrassment of riches. For instance, as Faddis notes, "The problems of deciding *how many* of *which* skills, et al., should be crammed into already-bulging school curricula are very real ones" (1979, p. 145). If the lists intimidate the educational planner, what must they do to the aspirant contemplating self-improvement? Fortunately, the adaptive person is not an arithmetic sum of taxonomized skills, and so to our first assertion: *Adaptive capabilities evolve recursively, from a relatively limited set of generic skills.*

By "generic" skills we mean skills that are more basic because th[illegible] are ubiquitous: they show up again and again as components of successful behavior through the v[illegible]e hierarchy of human agency.

When we call an operation "recursive," we mean that if applied to its own output, it will produce new output, *ad infinitum.* Recursion explains how a language, with its finite components and rules of combination, can nonetheless produce an infinity of discrete sentences. Or it explains how a relatively small set of mental operations can produce an infinite variety of cognitions.

Our assertion suggests that it is the same with human capabilities. There is a detectable set of capabilities, each of which functions on its own output and on the output of the other capabilities in the set, so as to produce a higher order of capabilities. Take, for example, the generic skill of selective attention.

Selective attention is simply the capacity to attend selectively to some characteristics of experience and ignore others. When we first encounter it, it is

> ... a species of isolating abstraction of such a primitive nature that it is present to some degree not only in very young children but even in animals. Hens can be trained to respond to one distinct attribute in different objects, such as color or shape, if it indicates accessible food. ... (Vygotsky, 1962, p. 77)

We saw it hard at work earlier in Piaget's description (1968) of the child achieving cooperation. A capacity for selective attention enabled the child to "dissociate his [sic] point of view" from that of the other children. Without it, the child could not bracket him- or herself out and consider other views on their own merits.

Imagine that the child has sat through several cooperative sessions with other children. *It is now possible for the child to attend selectively to his or her prior employments of selective attention.* If the child does, he or she might now resist violations of its employment on the part of other children, or begin to deal selectively with elements of experience not circumscribed by the cooperative sessions. The skill begins to address its own outputs and to function in stable ways with other capabilities, thus enhancing its prepotency for new employments.

As we progress through more mature successful behaviors, we note that selective attention is omnipresent. No effective analytic act is possible without it. Furthermore, it comes to modulate (as do all cognitive skills) the individual's affective repertoire, employing its control of focus to do such things as sustain, subdue, or redirect emotion. Finally, we see its handiwork in the fabric of complex, work-related strings of behavior, as did Dill, Hilton, and Reitman (1962) in their quest to understand the capabilities of highly competent managers. Central among the attributes of success, they nominated a complex of behaviors they chose to call "sensitivity skills," which enable an outstanding manager to identify real opportunities and constraints in the work environment that distorting assumptions and preconceptions hide from the less capable. We see selective attention again in the phenomenon of "unhooking," as noted by Ashley and Faddis (1979):

> The ability to detach or "unhook" oneself from previous mental or psychomotor frames of reference, and quickly adopt new ones as the situation requires, is one example of flexibility. (p. 183)

Contrariwise, we could note that a variety of failure-prone behaviors reveal an absence of selective attention. As a matter of fact, it is not a bad idea in general to note failure-prone behavior. Psychometricians who analyze item failures in various IQ tests provide a valuable route to the identification of generic skills. In a realm of highly transferable performance, and after analyzing thousands of instances of behavior, they can tell us what kinds of voids in skill are most debilitating. Here are some of the more recurrent forms of *behavior* that accompany problem-solving failure:

1) Subject exhibits random attention. Unable to sustain focus on the critical variables of the problem.
2) Subject scans compulsively and haphazardly. Does not probe a complex problem until all its components are identified.
3) Subject fails to test known relationships (prior knowledge) against potential relationships in the problem. Does not analogize.
4) Subject guesses chronically. Does not prioritize regularities sensed in the problem, but follows the first 'lead' that occurs.
5) Subject fails to check solution. Does not review problem to see if the solution constructed (a) works and (b) is the best alternative.

These failure-prone behaviors appear again and again across a broad range of problem types. They are exhibited by subjects of all ages. They are strikingly isomorphic with the kinds of behaviors Vygotsky and his colleagues clinically observed in pre-conceptual children who think in *heaps* and *complexes.* The lack of focused attention and chronic guessing are hallmarks of thinking in heaps. Incomplete scanning, disuse of prior knowledge, and no review impulse characterize various modes of thinking in *complexes.* The converse behaviors, on the other hand, characterize both the adept employment of conceptual thought and what psychometricians have come to call "high IQ." They include:

1) Selective attention: ability to control the class of stimuli that receive conscious focus.
2) Sustained analysis: a capacity to probe a complex situation until all of its components are identified.

3) Analogizing: a capacity to test known relationships for similarity with those potential to a new situation.
4) Suspension of closure: prioritizing (synthesizing) factors before shaping solution.
5) Autocensorship: testing a solution covertly, before affirmation.[2]

These five may be considered *generic cognitive skills,* and that means our considerations are still centered on the adaptive process model's Black Box. But the Box does more than command a host of adaptive behaviors. It gauges the personal and environmental dimensions that trigger the adaptive stimulus. It decides which interpretive construct of self and occupational environment it will treat as the real article, and hence what kind of adaptive outcomes are desirable. In light of this, it makes its choice of behavioral response with qualified anticipations of the consequences, and finally it evaluates outcomes, perhaps combing the whole process to see what might account for any discrepancies. From this perspective, the capabilities of the Black Box are clearly central to successful adaptation. The behavioral responses are discrete fingers; the Black Box is the controlling hand.

My point about the recursive nature of human capabilities is this: If adaptive capabilities are not acquired through a process of discrete addition—first you learn this one, then you master that one—but rather evolve from a small stable of prepotent generic skills, what happens to the individual for whom some of the stalls are empty, or the occupants lame? Generic skill shortcomings and weaknesses will tend to recurse as well. A person with a flawed capacity for sustained analysis, for instance, would suffer more than just embarrassment when facing math story problems. His or her entire adaptive repertoire will be distorted. Where others would employ sustained analysis, he or she must cobble up a surrogate response. A common one in this instance would be guessing or, when possible, mimicking the behavior or sequestering the output of those who *can* sustain analysis.

If we want to insure better adaptive capabilities, the generic cognitive skills are the place to start. The second assertion shows us why more clearly: *Adaptive capabilities are both more radically educable and more difficult to develop than current practice allows.*

To grasp this point, we need to see that humanity is energically frugal. Biological batteries have severely restricted storage capacities, and living things cope by employing behaviors that conserve energy. Given our psychophysical make-up, survival—let alone efficiency—favors the least energy-consuming means to a given end.

Perhaps this seems an obvious assertion, but we regularly fail to apply it in our efforts to encourage human development. When confronted with a stimulus to adapt, the individual's first reaction is not that of galvanizing his or her arsenal of adaptive capabilities. The exasperating, though conservatively wise, response is to *do nothing:* to ignore the stimulus. Perhaps it will go away. But if the stimulus persists (often it does not), the next strategy is for the individual to produce the least discommoding response in his or her repertoire that stands a chance of quelling the stimulus. *Only when a stimulus is uncommonly obtuse do we bring out the full arsenal of conscious analysis, evaluation, and reflection, and then shape our response in accord with their dictates.*

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[2] I cannot point to a single source for such a list. The behaviors included pervade the IQ/psychometric literature. Clearly, the component skills could be assembled from Whimbey and Whimbey's (1975) treatment. There exists an expansive literature of research that attempts to probe the emergence, development, and susceptibility to cultivation of such basic capabilities. It is devoted almost exclusively to exploring them as exhibited by the very young. See, for instance, the extensive series of Technical and Field Test Reports, now numbering in the hundreds, published by the Wisconsin Research and Development Center for Cognitive Learning. The two Woditsch references (1977, 1978) touch on the development of such skills in the collegiate context.

Full-blown adaptive behavior is intrinsically far more demanding than repetitive, or copying, or directed behavior. We do our best to avoid it. Just as with our cognitive constructs, we tend to shape our behavior as well as it *need* be, not as well as it *might* be. When we can, we respond habitually, follow an existing example, or do what we are told. That much carries us through most of life's exigencies. The problem is that for many people the adaptive repertoire stops here. The generic skills lie in the Black Box, feeble from disuse or otherwise inoperative.

In passing, it is worth noticing an oversight in the great bulk of literature dealing with skill analysis and development. It is simply that the skills required to perform any task vary with the incidence of the task. Externally, the same task is being performed with the same measurable quality and efficiency. Internally, the performing agent deploys his or her capabilities in decreasingly demanding ways, collapsing some into rote sequences and eventually leaving some out. In terms of demand on our performance repertoire, we hardly ever do the same thing the same way. It is only the first time we fully address a new task—the time of initial adaptation—that we mobilize the full roster of relevant skills. And it is at this instant, when stimulus for the new behavior has to be scrutinized and assessed, the environmental context mapped, our personal capabilities weighed, and the consequences of alternative responses foreseen, that the outcome is most dependent on the condition of our generic conceptual skills.

Unfortunately, our society and our educational system levy precious few demands on the maturing adult that can *only* be met by an intensive employment of generic adaptive capabilities. When considered in the context of our radically changing, complex world and the incessant pressure to keep up with it, this at first sounds like heresy. The word "only" here is the operable qualifier. Precisely because our world is so complex and so crammed with social, economic, and cultural enterprise, it spawns in its workings endless patterns and cues to guide individual behavior. By and large, all we need to do is mimic, copy, or obey to get by, the primary skill being a certain shrewdness in knowing what cues to follow.

The problem can easily be seen in the educational arena. Dill, Hilton, and Reitman (1962), while dealing with another issue, draw back the curtain on an environment that is constantly telling us how to adapt:

> College students and young graduates are misled into passivity by a variety of influences. Not the least of these is the college environment itself. In many institutions, the student programs his [sic] life according to class schedules, assignment sheets, lecture notes, and final examinations. His performance is evaluated on a regular basis, and he is told how well he is doing. Some professors will even allege that their ratings are entirely "objective" and "fair." He usually has access to a variety of advisors and counselors. He is protected against a great deal of the uncertainty, irregularity, instability, and vagueness that he will meet in his first industrial assignments. (p. 78)

If we concentrate on the typical class in session, precollegiate or collegiate, the view does not improve. There is much material to cover and much knowledge to disseminate. It is conveniently organized, previewed, and prepackaged to facilitate reception and retention. Where the rare demands for active student response do arise, the character and quality of the desired response is carefully prespecified. The math and science courses are tough, because the algorithms that need to be retained and used are complex and not easy to memorize. Where it hasn't been watered down, English composition can be tough because the product requires conformity to many rules of syntax and usage if the student is to get by, and the task requires sustained effort. But by and large, the performance cues are not too demanding, and the *real* three Rs of the system—Reception, Retention, and Reiteration—are, skillwise, easy to master.

It is a truism that our capabilities elaborate through constant exchanges with our environment, but only to the degree that the environment presses for elaboration. If we reach back to our earlier treatment of cognitive forms, complex thought coupled with short-range memory will easily handle the great bulk of formal schooling as currently practiced. Recall that conceptual thought is an *active* capability, shaped to be used when the human agent has cause to grapple with the unclear, the anomalous, the problematic. The mere passive reception of concepts couched in disciplinary systems is of no avail. Unless the student actively deploys them to resolve what is for him or her unclear and troublesome, they will lie briefly in the mind, as still and functionless as an inoperable complex or heap, and then quickly fade away.

It is no surprise, then, that freshmen with good secondary credentials can arrive at a college campus without ever having engaged in the sustained employment of conceptual abilities. And, beyond sporadic alarm at their limited ability to read and write, their arrival will cause no lasting tremors. The students are there for more of the same and the faculty, by and large, will provide it.

They will provide it not because they are malicious, or intentionally derelict, but because the task of developing generic adaptive abilities has never—save for a very few—been their focal concern. Higher education has assumed that the basic competencies either are or ought to be in place when the student arrives. Mechanistic learning theories that continue to dominate educational thought and practice have us fairly well convinced that the generic skills we've touched upon are ineducable: they are somehow, the position goes, genetically fixed at an early age. Besides, it is only recently that higher education has had to concern itself to any extent with maladapted student skills. Before maintenance of a certain equity balance in the student body became a survival issue, undeveloped abilities and developed inabilities constituted a "natural" and very handy selection mechanism. They also conveniently determined who would return for their sophomore year. When "bringing 'em back alive" grew important, a profession well versed in exercising available student capabilities (but with little understanding of how to develop them) found it easier simply to lower standards.

However, we needn't harp on formal education. In our world, it is possible for people to achieve not only the early twenties, but even the late eighties with no more than an occasional flourish of conceptual effort because mimicry, in most cases, serves the purpose. That statement is not meant to denigrate mimicking and copying behaviors, which are in fact superbly adaptive; we could not learn without them and we gain most of our adaptive behaviors through them. They are sturdy, dependable and above all economical tools for living. But save us from being poor in generically adaptive conceptual skills, which help us determine when it's safe to mimic and copy and do as the cues suggest, and when, contrariwise, it's disastrous.

Pedagogical Imperatives

Are the generic skills educable? Yes, as research by Klaus and Grey, Bereiter and Englemann, Karnes, Blank and Solomon, Heber, Kagan, Marron, Bloom and Broder, the Whimbeys, and many others have shown. Whimbey and Whimbey (1975) examined the works of those cited in Chapter 3 of their book, *Intelligence Can Be Taught*. The populations in these studies varied from pre-school through adult, and in some cases they exhibited stable IQ score gains of as much as thirty points in comparison to carefully adjusted control groups. Many of the studies dealt with subjects from desultory socioeconomic backgrounds, where skills of the kind we have been considering may not always be used or valued. The Whimbeys observed that gains were "... directly related to the amount of training undertaken—which is exactly what we should expect if intelligence is basically a learned capacity" (1975, p. 43).

The adaptive capabilities we've singled out are educable, but to develop them successfully requires a quite different pedagogy from that which currently dominates instruction. Three things have to be done. First, the instructional treatment has to be such that a student literally *cannot* employ some inferior or surrogate skill in place of the one targeted for development. Second, the instructional treatment has to raise employment of the targeted skill to a level of explicit consciousness, thereby making it amenable to student/instructor control. Third, the skill has to be extensively employed by the student on material requiring its deliberated use. It isn't sufficient simply to say, "practice, practice, practice," because that conjures images of doing different items from the same item pool. The skill must be challenged by variety and a grading upward of demand and complexity if it is not to switch off and leave things to the autopilot of rote behavior.

Extending the work of Bloom and Broder (1950), Upton and Samson (1963) and others, the Whimbeys have employed a pedagogy that successfully meets all three requirements. The course compels students to verbalize their thinking as they solve problems, thereby alerting students to their own otherwise covert and unrecognized thinking patterns. The discussion component of each class session—10 to 15 of the 50 minutes—is devoted to contrasting inadequate problem-solving strategies with good ones, sometimes in the form of taped "model" responses by students or other exemplars. The heart of the course involves students, now working with each other in pairs, alternately verbalizing and actively monitoring solutions to a wide variety of problems. With the pairs working, the amount of passive classroom time is dramatically reduced. Students now *experience* the difference between adequate and inadequate skill in problem solving, and they shift quickly from the need to have the right answer toward a concern for examining and improving their own problem-solving ability.

Our view of Proteus, then, is that his *true adaptive potential is not founded on a galaxy of discrete adaptive behaviors, but on a relatively small set of generic skills that recurse into increasingly powerful ways of directing human behavior.*

That small set of skills is educable, but Proteus lets you get at them only grudgingly: he resists their nurture by conjuring with lesser capabilities whenever you release the pressure. He will dazzle you with a myriad glittering surrogates, copies, and regurgitations in hopes that you will let go, and not disturb his true creative power.

The problem, if you really want to enhance adaptive capabilities, is how to keep up the pressure.

Developing Adaptive Competencies on the Local Scene

Aims

I would nominate four among a number of possible aims as warranting priority attention. We can simply state them, and let the implications emerge in our discussion of the policies required.

A. The first aim is perhaps obvious. We need to insure that each adult has a functional command of the generic skills, so that there are no basic deficiencies in his or her adaptive potential.
B. We need to optimize utilization of the generic skills throughout the adult's periods of occupational preparation.
C. We need to acquaint each adult with the range and consequences of adaptive priorities in the work world.
D. We need to increase scope in the occupational environment for the exercise of adaptive skills.

Policies: Aims A and B

We can handle aims A and B—development and utilization of generic skills—together, since both deal primarily with modifications in the domain of formal education. Oddly enough, the modifications required to achieve aim A will seem more difficult than those required to achieve aim B, while in fact A is easier and B is harder.

To insure that each adult has a functional command of the generic skills, curriculum at the primary, secondary, and collegiate levels needs a new front-end. Elementary education is already doing a fairly admirable job. However, for higher educational levels, courses and course sequences *explicitly targeting the generic skills* and shaped in accord with the three pedagogic principles outlined earlier are needed to place those skills under the student's conscious control. It is functionally and strategically important to place such courses at the head of each major educational phase, so as to establish at the beginning what modes of student performance the phase will encourage and prize. Practically, such generic skill courses need not spell an extension of the curriculum. They can take the place of, or represent thoroughgoing revisions of, introductory and general education offerings currently on line. But they must be compulsory.

Developing the courses themselves—courses that effectively address the formation of generic skills—is the least of our problems.[3] Much more difficult is meeting aim B—the task of providing *lebensraum* for such skills in the remaining curriculum. If we did nothing to alter established curricula save insist that each course was taught in such a way as to elicit the use of selective attention, sustained analysis, analogizing, suspension of closure, and autocensorship, we would be closer than we have ever been to a competently adaptive citizenry.

As a result of critical incidence studies fostered at Bowling Green State University, Ohio, to determine the kinds of demands upon student skill levied by the typical college course (Keeley, Browne, & Haas, 1976), it can be said that wherever else our five generic skills may be in demand, their absence will not likely be detected in the classroom. Yet content—any content—can be taught in such a way as to demand active conceptualization. An introductory Spanish course for developmental students, designed with Whimbey's assistance, has demonstrated an incredible degree of initial success because it applies a problem-solving paradigm to the business, say, of identifying correct pronomial endings (Whimbey & Barberena, 1977). Students who have previously failed in Spanish come to exhibit good Spanish as a consequence of good thinking. If we have any hope that enhanced adaptive capabilities should characterize the adult's post-educational behavior, his or her educational experience must be heavily larded with demands for their exercise.

There is a principle that should dominate the massive curricular reform that these remarks suggest. It flies in the face of much current curricular reform. Simply stated, the rule is, "Diminish prepackaging. Augment student productivity and product assessment." An introductory sociology

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[3] It is not appropriate here to canvass the growing instructional program efforts to develop generic skills. A few hundred exist that make the claim, and of these a few score are worth careful exploration. I will risk mentioning one that is especially well executed and expresses a strong institutional commitment to the tie between generic skills and the world of work. The College of Management and Professional Studies, at the University of Massachusetts, Boston, has established critical thinking and writing proficiency criteria that must be met in addition to coursework for graduation. It offers a required course in Expression of Critical Thought, a Communications Seminar, and essential skills "labs" in support of the management curriculum. These and other efforts are administered by an established Department of Essential Skills (Dr. Mark Schlesinger, Chairman).

course spends several sessions telling mute students what sociology is. Strike those sessions. Ask the students to tell you. Then carefully examine the answers together. I once asked a group of freshmen to tell me what English literature was. In three weeks their comprehension of the field, its extent, its topography, where our understanding of it was dense and where sparse, excelled that of the average English graduate student. In the process, they ran head on into problems of defining, inspecting, organizing, and taxonomizing complex phenomena. The principle is simple and can be applied in countless ways. Don't preview the three most important points in Chapter 4. Ask the students to find them, and then explore their search strategies and justifications.

Application of this principle is perhaps less uncommon in the domain of vocational and professional education, where the shade of apprenticeship still tenuously abides. Even there, though, it is seldom wielded as well as it could be. When started, the infant engineering program at Oakland University, Michigan, was taught by a handful of physicists. That is, the theoretical coursework was. The rest of the program required the student to engineer, in the fullest occupational sense. Each student had literally to design a complete, mature, functioning product, and then see it through construction and testing. Moreover, he or she had to beg, borrow, and just-short-of-steal the required raw material, fabrication, and assistance, none of which was available on campus. The students penetrated the engineering and manufacturing divisions of local corporations and themselves located, wheedled, and harnessed the required resources. The few graduating classes I witnessed were an astonishingly capable bunch, wise to the fact that engineering is at least as much a profession of people-managing as it is one of manipulating objects.

What the principle achieves when properly applied are individuals who know from experience that the world and its artifacts are malleable and responsive to their best efforts. An excellent primer in adaptability.

There is, of course, a catch. The catch is that the principle requires very much more work on the part of both students and faculty. Attempts to resolve that dilemma technologically through modularized and computerized instruction largely miss the point. The performance they engender is so heavily conditioned and channeled by structured cues that the higher-order adaptive capabilities —meant to deal with ambiguity—have no chance. So there it is. A society that wants enhanced adaptive capabilities will have to work harder to get them. Perhaps that one observation is all three strikes, but adaptive societies, like adaptive individuals, simply require more energy.

Policies: Aim C

Each adult needs to face the profound consequences of varying adaptive criteria. Perhaps this technically should not be at issue here, since we are concerned with enhancing a capability, not with determining what ends it should serve; but random adaptation in an organism is disfunctional. When it happens in cells we call it cancer. If we produce supremely adaptive adults whose prime imperative is short-range *self* service, we turn cancer loose in the land. If, on the other hand, the imperative is to adapt so as to enhance the full occupational context—and ultimately the society in which that context is embedded—we are not many steps from utopia.

By what set of policies can we lead people to adapt in ways that preserve and even enhance the interests of all? There are socio-cultural pressures abroad that attempt to do that, as well as counter-pressures that resist. It is not always easy to distinguish which is which. Short of thoroughly reprehensible strategies that would smack of social engineering, I can think of only one approach. It is simply to double our insistence on the development of generic skills.

If we want a citizenry not only capable, but inclined to act in the best interests of its occupational and even broader social contexts, it must be able to grasp what occupational and social contexts *are,* let alone what optimizes them. If we want *real* grasp, and not just rote feedback, that citizenry will have to wield the generic skills proficiently. Good thinking is even more important than showing up at the polls.

There is a sublime connection between social reality and conceptual ability, a connection we barely grazed earlier. Remember that the premier instant for the emergence of conceptual thought is a social instant: the instant the child perceives the durability and vantage of others. Conceptual thought arises from a need to account for and with others. Eventually we turn our new-found capacity for plotting relationships to other things, but we begin with *a need to conceive society.* If a small gathering of children presses us beyond heaps and complexes to some initial conceptual adroitness, what kind of conceptual mastery suits full-fledged contemporary society?

As one climbs through the order of skills from lower to higher, there is this often unnoticed but profound shift in the basis of the skills' utility. The lower-order cognitive and perceptual abilities deliver immediate—even instantaneous—survival pay-offs to the individual. Slightly higher skills begin to involve social mediation. The highest are completely useless outside of a social matrix. And that is to be expected when we realize that the achievement of any of our most intense personal aspirations requires communal negotiation. But to achieve that realization, to grasp our reciprocal dependence on society, to understand that society is vulnerable, fragile, and that its needs have to be incubated deep in our own private purposes—all this takes generic conceptual skill.

So I would increase the pressure to insure that adults have the generic cognitive skills in good repair, on the grounds that those more capable of prizing the reality of their occupational and social context will be more inclined to act in its interests.

Policies: Aim D

How do we increase scope in the occupational environment for the exercise of adaptive skills? I'm reminded of a conversation: An engineering friend and I were discussing the design of an automotive component. He turned the small, stepped cylinder in his hand and said, "See this ridge and that eccentric shoulder? Foolproof. Any idiot could assemble it."

The statement triggered a thought, and I asked him how much of the engineering time was consumed in designing a component beyond the point of function, to the point where it was foolproof; where any idiot could assemble it. He thought a moment and said, "Oh, I'd say fully 50 percent."

I'm not prepared to accept my friend's estimate—I'm not certain he would be if pressed. And with engineering background of my own, I certainly appreciate the efficiencies of the design and the economies of its foolproof aspect. Still, I wonder about the scene of my friend bending his considerable intelligence to insure that others need not exercise theirs.

How extensively in the work (and in the broader) environment do we strive to engineer things so that any idiot could do them? And if we do it a good deal, and the tendency to do it increases, what adaptive options will remain? Should we make those foolproof as well?

I'm also reminded of a conference that was dedicated to developing criteria for doctoral programs in adult counseling. It opened with a position paper whose introductory proposition was that contemporary adult life is now far too complex to be left in the hands of the individual, who

could not be expected to command the necessary range of expertise to handle all the key decision points. There would have to be expert adult counselors stationed along the way. I remember the statement well, thanks to the image it conjured of half the population of the United States employed in counseling the other half. I also remember it because it expressed so aptly the kind of social ideal that stands as antithesis to my own, and says, "Don't worry. We'll get you by." Mine, contrariwise, keeps saying, "Fine, now what the hell are you going to do about this?"

There are, as the *Proteus* paper (Faddis, 1979) amply noted, a number of movements dedicated to improving the work environment, and presumably to expanding the worker's adaptive options. Some of these approaches desperately need to be magnified and could well serve as patterns for many work settings. Excellent advances have been made, for example, in participatory management. But most efforts are cut from the same cloth that wove the adult counseling position paper. A few areas are set aside for participatory decision making and, coupled with other cosmetic improvements in the work context, a "play-management-pen" is established. The way to tell the real from the bogus advances is to see which ones accompany expanded worker discretion with expanded worker accountability. Those are for real. The others belong in the company brochure under "Employee Benefits." Only if I act in an environment where there is potential for *both gain and loss as a consequence of my act* can I consider my act truly adaptive. Otherwise it is a conditioned act.

We should pursue participatory management on the local scene, but we should pursue a multitude of other work environment configurations as well, always keeping in mind commensurate accountability—no "freebies." Hardly enough has been done with multiple role employment, shifting team employment, and on and on through hundreds of options. This leads us to the only sure-fire, tenable, overall policy. It will work in the occupational environment, and it also needs to be carried back to the educational domain if we expect that domain to evolve better generic, general, vocational, and professional education. But it aims at a fool-free rather than foolproof solution. The general form of the policy is this: *Encourage whoever owns the problem to address it experimentally.*

Employee and manager—*if* they really want to increase options for worker adaptability—should sit down and map out an experimental approach. What is it we really want? What are our ideas on getting there? Are there any better ideas? Okay, then we'll try the following things, with these anticipated outcomes. We'll check the outcomes and if they've deviated from what we hoped for, we'll try to trace the deviation and make adjustments. Or now that we've gone through it once, maybe we don't want quite the same results anymore. Let's just change our aim a bit, on the basis of what we've learned, and . . . No, the suggestion isn't frivolous, and it can be done without a consultant from the Harvard Business School.

The *first* and quintessential requirement is that the participants own the problem. The teacher who believes that pedagogical innovation belongs to the curriculum director or the academic council will take education nowhere, unless perhaps backwards. Nor will the work environment gain much from the employee who sees it exclusively as a managerial province. It has to be *my* problem—not the organization's or someone else's—if I'm to supply the sustained energy and interest an experimental approach demands.

Second, the participants have to be convinced it is a real problem. They may have hunches about the solution, but the individual who is convinced that he or she already has the answer cannot sustain experimentation.

Third, you simply couch your work—your on-line laboring and managing—in a socialized form of the process of inquiry. You experiment. At first subtly and then more pervasively the environment changes, as the previously unspeakable and unalterable gradually succumb to exploratory thought

and deliberated action. Not only the problem begins to give way, but so do many of the false postures required by an inhibited-inquiry environment. In the field of generic skill pedagogy, the bulk of contributors to new and effective method have been those teaching faculty who made the addictive mistake of viewing instruction as inherently problematic. It would take several more papers to explore the experimental dynamic fully, but a kind of talisman of this adaptive group is the insistent way they involve others in exploring their own pedagogical missteps and shortcomings. They are too busy becoming professional educators to pose as finished ones. When you work with a mystery like learning, to be a professional means to experiment. Work and its environment are no less a mystery.

My policy recommendation is to set a process underway, to take an *experimental* direction, but there are some who would prefer an explicit directive: Do these things and the problem will be solved. Reflect, though, what the work environment would have to be if we could set it right with an explicit directive. It would have to be capable of some uniform, final, best possible form, with just these characteristics related in just those ways. There is no such form: no best work environment or educational system. There are only better ones. We uncover those experimentally.

An unfortunate delusion is the notion that only people who command graduate students ought to do experimentation. Yet, experimentation is precisely what the maximally adaptive adult does; the dynamics are indistinguishable.

First we must come to see work and the work environment as inherently problematic, which means that solving one problem there simply makes room for another. That (in my opinion, thank God) is life. Then we must see that when we take up our work with *any* kind of motive for improvement, we are at the same time assuming a commission to behave experimentally. Those with operable generic skills who accept that commission assume the archetypal human role. They are, in the fullest sense of the word, adapting.

Postscript

Poor Proteus, indeed. He has forgotten that the fixed furnishings, the permanence, are from his own hand. I wonder if he'll realize . . .

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OCCUPATIONAL ADAPTABILITY AND EDUCATION FOR THE FUTURE OF WORK

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Introduction

Examining the interrelationships among occupational adaptability, education, and the future of work is an extremely ambitious task. Every social institution such as a workplace, every social system or set of institutions such as "education," and every description of human collective behavior such as "occupational adaptability" occur as subsystems within larger systems of institutions and values, which are themselves subsystems within larger systems. It is therefore important to understand something of the broader vision before attempting to focus downward on the specific elements suggested by the above interrelationships.

In order to understand the future of work, the paper will begin by examining, in some detail, fourteen current trends that seem likely to continue in the United States (and in the world as a whole) for some time. These trends may have important effects on what the future of work will be.

A second section discusses the kinds of corporate responses that are now under way that appear likely to continue and increase in the next few years.

A third section includes an analysis of a number of the most successful pioneering programs conducted by corporations to change workplaces and workers' roles over the past few years. These are programs that I believe both should be broadly adopted (from my personal ethical standpoint) and will be broadly adopted (from a predictive standpoint) in the decade ahead. The section does not deal with the public sector, though it is worth mentioning that programs similar to the corporate efforts have been undertaken in a handful of municipalities over the last three to five years and, more recently, many federal agencies have also begun to develop their own versions.

The final section summarizes what I believe the trends and programs discussed may mean for the concept of occupational adaptability and for educational efforts inside and outside of workplaces that relate to it.

Major Trends Affecting U.S. Workplaces

In order to understand the future of work in the United States, we need to understand the probable future of workplaces and work organizations. The list of trends, which follows, seems those most likely to have significant impacts on our workplaces over the next few years. Some will probably stay major factors into the 1990s. Other trends may be neutralized or reversed by forces (at present unforeseen or underrated) that will emerge to intrude and perhaps dominate the directions that work and workplaces may take within a decade (or perhaps sooner). It is vital to appreciate the almost whimsical way in which History intervenes to alter even the most thoughtful attempt to plot probable futures. To illustrate, let us look at two 20-year periods, the first from 1928-1948, and the second from 1960-1980.

Futurists of 1928 saw Calvin Coolidge finishing his Presidency. Government was tiny by today's standards, and held limited functions. Business was booming and "everyone" was "getting rich" in

the stock market. In Europe, Hitler was visible but World War II was on the far, far horizon. Keynes had warned of the economic consequences of the peace that then reigned in Europe, but few listened.

Then, in 1929, came the crash. By 1932, the U.S. unemployment rate was 25 percent, and Roosevelt's New Deal government took office. By 1948, the world had gone through the most destructive war in history, the atom bomb had become reality, Europe and Japan were in ruins, and American industry—now stronger than ever before—had virtually no international competition. Ten to twenty million Americans had been pulled away from rural areas to serve in the armed forces, and were then integrated into the industrial labor force following the war. Meanwhile, the long domination of New Deal philosophy had changed federal government both in size and in scope of functions, particularly in relation to the national economy.

It could be argued that the decades of the Great Depression and World War II were the exception in history, and that social-economic-technological predictions in the three decades since have been more reliable. I submit, though, that predicting 20 years ahead from 1948 was just about as difficult.

Let us consider the 20-year span from 1960-1980. In 1960, the cost of energy was low, inflation was low, and productivity was primarily a concern of academicians. American industry still dominated most world markets. Japan had begun to solve its problems of quality production and its national productivity was climbing, but the Japanese economy was far behind that of the U.S. European industry was also rebuilding, but it continued to lag far behind American productivity.

At home in the U.S. in 1960, it was fashionable to believe in human and American progress, to accept traditional values, and to believe in the traditional work ethic. Computers had been invented, but they took up whole rooms and cost hundreds of thousands of dollars. The Space Age was only beginning, and space-age electronics, ceramics, and cryogenics were either as yet unknown, or at best still mostly on the drawing board. Conservation and ecological soundness were concerns of a tiny minority, and were practiced by an even smaller minority.

Who, in 1960, could have predicted the Vietnam war, or the decline of America's self-confidence and role as policeman of the world? Who would have predicted the rise of inflation to double digits, or the change in social and work values, or the tremendous challenge of Europe's and Japan's sky-rocketing productivity? Or the microchip revolution that reduced computer size and cost by factors of many thousands? Or the overwhelming and rapid entry of great numbers of women into the labor force? Or the emergence of ecological and conservationist viewpoints as major national forces with which the nation must now deal?

True, some futurists did forecast developments along these lines, but for the most part they came about at a rate or in ways that were a total revelation for Americans, including most governmental and industrial leaders. The predictability of such phenomena as the rise of OPEC and its massive influence on world economy was vanishingly small. The list of major forces and trends that follows (factors that I believe are now influencing our workplaces and which seem to me likely to continue having important effects over the next five to ten years) must therefore be viewed from the perspective suggested by our own past history: the unexpected or underrated factor may arise at almost any time and negate even the most careful, thoughtful forecast about American workplaces.

1. American Productivity and Economic Growth

From 1948 to 1968 the annual rate of increase of U.S. output per hour worked was 3.2 percent. From 1968 to 1973, it was only 1.9 percent. And, from 1973 to 1979 it dropped to only 0.7 percent. During most of the past year, it has been zero. Part of this slide is apparently caused by the increasing

share of American output and employment in the government and service sectors, where productivity growth is ordinarily less than in manufacturing. Even in manufacturing, though, output per person-hour dropped from 2.9 percent per year over 1967–1973, to only 1.6 percent per year over 1973–1979.

Not only Japan, but also Germany, France, and most other industrialized nations have sustained manufacturing productivity growth rates that are double or triple the U.S. rates. In the 1950s, the U.S. Gross National Product grew on an average of 3.9 percent per year, and in the 1960s the growth averaged 4.1 percent annually. By the 1970s it was averaging only 2.9 percent annually. In 1972, the U.S. output-per-capita was the highest in the world. Today, we rank fifth. If current trends continue, at least Japan, Germany, and France are likely to outstrip U.S. productivity sometime during the 1980s.

These trends will probably continue for a few years, if not longer. Efforts to reverse American productivity decline will be major concerns of government, management, and increasingly of union leadership, as well.

2. Stagflation

From the 1930s until the early 1970s, Keynesian economic theory taught (and U.S. experience on the whole supported) that when prices rise too much, throwing on the brakes and bringing on a recession will raise unemployment a few percentage points and bring prices back down. Upon recovery from the recession, output and employment will then go up, and after a period of stability, the prices might begin to creep up again.

Structural and attitudinal changes affecting the U.S. economy over the past years have since destroyed the workability of this trade-off (called the Phillips curve). In recent years we have experienced high (and still rising) unemployment, a major recession, and the continuing rapid rise of prices into double-digit percentages of inflation. We have also seen apparent contradiction of supply and demand: some major corporations have exercised their market power by raising prices in the face of falling demand for their products. We have seen the major U.S. oil companies and the OPEC nations apparently cooperate in doubling and redoubling oil prices. We have seen the costs of medical care, housing, and food increasing dramatically, in each case influenced by economic structure, market power, and other causes, more than by the ebb and flow of consumer demand. Because these structural causes are not being addressed by those involved, I expect to see double-digit inflation continue, and this is likely to have impact on corporate policies and practices (as will be discussed later).

3. Rapidly Growing Foreign Competition Even in the U.S. Market

U.S. home stereo producers have been displaced by Japanese producers, and the same is true for many other lines of consumer electronics, where foreign firms now supply over half of the U.S. market. Large segments of the U.S. camera industry have been driven out of business by German and Japanese firms. Foreign firms now supply most of our office copiers, one-half of our textile machinery and calculating and adding machines, over one-third of our footwear, one-quarter of our metal-forming machine tools, and on and on. Japan has recently targeted the computer industry for an organized assault on that market, and we can expect to see the results soon. American firms, meanwhile, are struggling to match foreign suppliers in price and quality of products.

4. High Interest Rates

In the last year or so, interest rates have soared so that the prime rate charged to banks' best customers have recently been as high as 16 percent, and the rates charged to others may be two or even more points higher. As this is written, rates are rising again. Indications are they will stay high for some time. This has an impact not only on the cost of borrowing for capital investment and inventories, it also drives up the cost of working capital to finance the purchase of raw materials and cover payrolls for thousands of small, medium, and large corporations.

5. Low Savings and Investment

During the 1970s, personal savings had been running about seven percent of disposable income in the U.S. This is one-half the rate of West Germany and one-third the rate in Japan. In later 1979 and early 1980, the American savings rate plummeted to 3.4 percent. Savings, personal plus corporate and governmental, are the sources for new capital investments. During the 1970s, U.S. investment in plants and equipment averaged about 7.5 percent of the GNP, compared to Germany's 8.8 percent, and Japan's 17 percent. I expect major efforts and policies of government and corporations to try to raise the American rates.

6. Energy Costs

For the next 5–15 years, energy costs will probably continue to escalate, putting more and more pressure on industry to conserve. Wide availability of low-cost solar cells in the late 1980s or early 1990s may, in my opinion, interact with other energy-efficient technology to bring the cost of energy down again, so that it becomes a cheap resource compared to raw materials, capital, and labor.

7. Microchips and Microcomputers

A microchip costing a few dollars can do the work of a computer that cost a million dollars only two or three decades ago. The price is still falling rapidly, making computer applications economical in almost every conceivable aspect of business, industry, government, and home life. Miniaturization continues, as well, making the computerization of practically everything feasible, at least in regard to size. The Japanese have entered the race to lead the world in microcomputation applications, as have the West Germans and other European manufacturers. American industry, while still in the lead, will have to redouble its efforts to retain that lead. In any case, U.S. producers of virtually all manufactured products will run the risk of being left behind in the international market if computerization/innovation of either their product or their manufacturing processes is left to someone else.

8. Lack of Confidence in Government and Authority

Since the Vietnam War and the Watergate period, the majority of Americans responding to public opinion polls have expressed very low faith not only in the Presidency but also in the Congress. Many times in recent years, only a small minority has given either body of officials a high vote of confidence. This challenge to traditional authority carries over into plants and offices across the country.

9. Ecological Crisis and Pressures

The problem of nuclear waste disposal has not been solved and solutions do not appear to be in sight. The news media now bring us daily reports of perhaps equally serious and far more widespread problems with disposal of chemical wastes from hundreds of toxic or carcinogenic chemicals. The Love Canal tragedy is apparently only the tip of the iceberg. In Massachusetts alone, three cities have recently reported similar problems.

Industry, already under legal and community pressure to control air and water pollution, will meet increasing attacks by better informed and more outraged citizens who are concerned with issues of ecological impact, some of which we are now only dimly aware. This will continue whether or not the incoming administration in Washington relaxes national regulation. People at all levels of work organizations—managers not only at the top but also in middle levels and even production workers—will increasingly be drawn into efforts to solve these problems, and will increasingly cross boundaries between plant and community in the process.

10. Changing Composition and Education of the Workforce

Over half of all working-age women are now in the workforce, and we are nearing the time when half of all workers will be women. Almost unheard of until recently, special shorter working days or work-weeks for mothers are now being permitted in a growing number of companies, and flexitime is well on the way to becoming established practice in many firms.

From 1959-1979, the proportion of people in the workforce with elementary education or less dropped from 30 percent to 10 percent. At the same time, those with high school diplomas rose from 30 percent to 40 percent, and those with college degrees rose from 10 percent to 17 percent. As the 1970s ended, almost 60 percent of the workforce had twelve or more years of formal schooling (Yankelovich, 1979a).

11. Changing Attitudes, Values, and the "New Breed" of Workers

Much has been written about changing social values and attitudes of workers in recent years (see Fritz, 1979; Yankelovich, 1979a,b). While there is some dispute about the percentages, degree, or distribution of the changes, in general it can be said that a very large and growing body of workers, especially younger workers, are:

- looking less to work than to leisure as a source of satisfaction;
- losing faith in the old adage that "hard work always pays off";
- coming to believe that those who work hard and live by the rules end up with "the short end of the stick," while those who flaunt the rules seem to make out all right;
- rejecting (or finding inadequate) the traditional measures of success: marriage, 2-3 children, a house of their own, living in the right suburb, a new car, education for their children, and modest and steady increases in standard of living;
- seeking continuing personal growth, fulfillment of their potential, or self-fulfillment;
- paying more attention to their own needs and desires than to what other people expect of them;
- speaking more about obligations to themselves than obligations to others;
- insisting on paid employment outside the home (speaking primarily of women) rather than being "just a housewife," as a necessity for self-esteem;

- refusing to subordinate their personalities to their work roles;
- insisting on being recognized as an individual person at work, and on being with pleasant people at work;
- less interested than former generations in economic incentives at work;
- more interested than former generations of workers in having jobs where the substance of the work itself is inherently interesting and challenging;
- rejecting arbitrary or even traditionally accepted forms of authority at work, as in society as a whole;
- feeling overqualified for their present jobs;
- in general, developing a whole new set of ideas about employee rights and employee entitlements.

12. Safety and Health in the Workplace

Increased worker and union awareness about safety and health hazards in the workplace, and increased pressure on employers to eliminate or reduce the hazards, seem likely to continue. I believe that the trend will continue even though the new federal administration may reduce enforcement of federal regulations.

At least two new developments could create additional pressures on management for change in these areas. First, although an employee receiving workers' compensation for a work-related injury must give up his or her right to sue for additional damages, relatives of injured or killed workers have had some success in courts against allegedly negligent employers, and have received considerable damages. Second, some recent court decisions have provided damages as compensation for mental illness and suffering induced by stress in the workplace.

13. Growing Discontent among Managers

While reports of dissatisfactions among workers have been widespread, there are also signs of discontent among managers. Recently, Opinion Research Corporation (Cooper, Gelfond, & Foley, 1980) documented some of the indicators. For example, in recent surveys only one-half of the managers (down from 70 percent in 1960) and one-third of the hourly workers rated their companies as "good" or "very good" on doing something about their problems or complaints. Sixty-two percent of managers (down from 83 percent in 1960) and only 41 percent of hourly people rated their companies "good" or "very good" on treating them with respect as individuals. Perhaps most surprising of the data is that only 35 percent of managers (down from 54 percent just two to three years ago!) rated their companies as "good" or "very good" on letting them know what is going on in the company. Hourly employees actually gave higher ratings (43 percent saying "good" or "very good") to their companies on that question.

On opportunity for advancement, only 47 percent of managers and only one-quarter of the hourly people gave a "good" or "very good" rating to their companies (down from 55 percent average for managers over the 1960s and most of the 1970s). In rating their companies on pay, 50 percent of the managers and 42 percent of the hourly workers (down from 69 percent and 50 percent respectively) rated their companies as "good" or "very good."

14. Worker Involvement and Industrial Democracy

More and more workers and their unions are gaining experience in various forms of involvement in decisions affecting the work organization, the flow and pacing of their work, and their immediate work environment. I expect to see a dramatic increase in these programs in the years ahead.

This increased worker involvement is one of the adaptations to changing conditions chosen by a growing number of corporations, especially in Europe. In Western Europe, there is also increasing legislation requiring real steps toward industrial democracy (including representation of workers on corporate Boards of Directors). Co-determination started in Germany in the coal and steel industries and has since spread over the last decade to all corporations above a certain size in many sectors of West German industry. It is also being tried in Scandinavia. Sweden, meanwhile, has legislated worker participation in improvement of working conditions, including work pace, job design, and other potential sources of worker stress.

In the U.S., Chrysler Corporation recently acceded to a demand to add UAW President Douglas Fraser to its Board of Directors. Other companies may come under similar union pressure to add workers to their Boards. In my view, these developments in democraticization of work are coming into the U.S. very, very slowly, and will probably become major factors here only in 10-15 years--barring more rapid development due to unforeseeable major events such as the rapid bankruptcy and government bail-out of many major corporations.

Beyond these 14 factors there are many others that will have an effect on shaping our work world in the decade ahead. I have not included them in the discussion, because it is not clear at this point in what ways they will influence workplaces. Among these probable factors are:

- the continuing and escalating nuclear arms race;
- the introduction of lasers into the arms race;
- the development of lasers as major industrial tools;
- the continuing and even widening gap between rich countries and poor ones;
- continued changes in the structure and values of our marriages and families;
- the biological revolution, with genetic engineering and cloning techniques here or right around the corner;
- significant shifts in world climate patterns;
- the possibility that clean water may become a much scarcer resource with much higher value and cost;
- the possibility--or probability?--that other poor countries may band together in the OPEC model to force the export prices of certain scarce but essential minerals up dramatically;
- the probability that solar power costs will drop even more rapidly and farther than its proponents now dare to predict, unleashing a whole new era of cheap and decentralized energy beyond the control of any cartel.

Of course, there are also the various possible catastrophic alternatives, one or more of which may affect the otherwise relatively orderly progression of trends: intercontinental nuclear, chemical, biological, or laser warfare; significant world climate shifts; worldwide long-lasting droughts exterminating millions and driving up the price of food far beyond present levels; melting of the polar ice caps enough to inundate all coastal cities; etc.

Forthcoming Corporate Responses and Adaptations

Many corporations, large and small, will probably have to make significant changes in their policies, planning, and operations if they are to survive in the changing national and world environments. A number of these adaptive changes are already under way, and seem likely to continue and expand. Those of greatest vitality, in my opinion, are discussed below. Separately and collectively, they will require whole new approaches to management, to leadership, to labor-management relations, to worker involvement, and to the kinds of education and training offered to employees at all levels. (The implications are discussed in the final section.)

1. Utilization of New and More Efficient Production Technologies

In industry after industry, American firms are no longer the leaders in the technologies they use. With energy, transportation, and labor costs shooting up, but information storage, computation, and automatic control costs dropping, new technology is called for in practically every line of industry. To develop much of this will require greatly expanded industrial and governmental non-military research and development expenditures. In addition, it will require innovative management, developmentally-oriented organizations, greatly expanded training, more labor-management cooperation, and the involvement of workers in planning and introducing the new technology, as well as new forms of job security guarantees to avoid the otherwise probable obstructionism from workers and unions.

2. Widespread Investment in Building New Plants and Purchasing New Equipment

In many cases, new technology can only be introduced by building whole new plants, or by adding major new equipment to existing plants. This will require higher rates of corporate investment, and higher rates of savings and investment, than those to which our society as a whole is accustomed. Also, to gain the maximum benefit will require the wholesale application of the socio-technical or open-systems planning and design philosophies and methodologies already proven in scores of recently built plants by a dozen major U.S. companies. (See examples in the next section.)

3. New Product and Market Development

Firms that stick to the production of their traditional product will, in many cases, eventually go under in a world of rapid change and fierce competition. New consumer and industrial needs must be analyzed and new products developed to meet them. Companies will need to develop new definitions of their corporate missions every few years.

4. Better Quality

In many cases, U.S. corporations are losing the international marketing competition in terms of quality more than of price. Japanese management in particular, with its widespread use of job security, corporate loyalty to workers, and Quality Control Circles, have turned their products into quality leaders of the world. Most of our American companies are just beginning to learn of some of these approaches.

5. Changing Inventory and Production Policies

In response to the sharply higher interest rates and resulting higher cost of short-term borrowing, U.S. companies are being forced to take a hard look at their traditional inventory policies (or lack of same). Where possible, they are sharply reducing the amount of finished goods in inventory waiting to be shipped and/or the amount of raw material and semi-finished goods and inventory waiting to be processed. Smaller inventories mean shorter production runs. This, together with more frequent product and style changes to meet competition, means more machinery stops, changeovers, and start-ups on the production lines. This in turn requires better trained, more competent, cooperative, and better thinking workers, as well as a new style of first-line supervisors able to cultivate such behavior.

6. Doing Business Overseas

Many more U.S. companies will have to learn how to expand their exports rapidly as foreign firms take up bigger and bigger shares of the U.S. market. The new product and new market development mentioned above (Item 3) will have to take place at least as much overseas as in this country. In addition, our firms will need to become much more adept than they now are at investing in the productive capacity of foreign countries. Often this will need to be in partnership with foreign national investors, and often in mixed enterprises with public corporations (as required by host governments).

7. Cultural Sensitivity and Knowledge of Foreign Languages

Americans, traditionally illiterate in foreign languages, have in recent years taken to studying them even less than before. Yet without a knowledge of the language one can have only a shallow understanding of a culture. Without an understanding of both, a businessman loses effectiveness. To compete successfully overseas, thousands of our companies will have to develop much higher levels of corporate knowledge and sensitivity about foreign languages and cultures. Again, Japan and European nations are far, far ahead of us in this regard.

Such increased cultural sensitivity is now taking a higher priority for a number of American companies whose U.S. labor force includes large numbers of people from other cultures who speak little or no English. Faced with losses of older workers and increased difficulty in attracting young ones, some firms are moving to increase their knowledge, sensitivity, and ability to hold and attract workers from foreign cultural groups.

8. Sensitivity to Ecological Issues

As mentioned earlier, one major change in the national (and international) scene with which corporations must deal is increasing public awareness and pressure on ecological issues. Opinion Research Corporation (1980) recently conducted interviews on these issues with 1004 Americans, and found that the following percentages of the respondents were concerned about the various ecological problems:

- Water pollution -- 54 percent very concerned, 34 percent somewhat concerned (88 percent total)
- Hazardous or dangerous wastes -- 54 percent very concerned, 32 percent somewhat concerned (86 percent total)

- Air pollution – 41 percent very concerned, 42 percent somewhat concerned (83 percent total)
- Pesticides used to control pests – 28 percent very concerned, 42 percent somewhat concerned (71 percent total)
- Herbicides used to control weeds – 25 percent very concerned, 42 percent somewhat concerned (67 percent total)

The interview respondents were the customers, workers, and neighbors of our corporations. It therefore seems likely that corporations will have to be much more sensitive to these and other ecological issues in the years ahead, and will have to integrate ecological thinking and planning into their regular corporate decision making to a much greater degree than they have been.

9. Employee Safety and Health Concerns

As mentioned earlier, corporations are under increasing social and economic pressures to increase their sensitivity to, as well as success in handling, issues of employee safety and health, including mental health. Many of these issues are being successfully dealt with in the comprehensive programs that will be discussed in the next section.

10. Value Sensitivity

In the recent past it was possible for American citizens and corporations to imagine that there was only one mainstream set of "normal" American values, plus a few malcontents or peculiar types that could be safely ignored. Today, corporations need to be increasingly successful in selling and investing overseas, in dealing with ecological and other environmental issues, and in dealing intelligently with the new generation of workers, many of whom appear to hold markedly different values from their parents and grandparents. Corporations will have to find new and effective ways to sensitize their personnel, and especially their managers, to the nature of values and value differences, and to the importance of open acceptance of people and institutions with some degree of value differences from their own.

11. Reward Systems

More and more companies will be following the lead of innovators who introduced new systems in the 1960s and 1970s to make company rewards more fully cultivate desired employee behaviors. Innovative systems now in use include those that give special rewards to employees (collectively, not individually) for new ideas that are found useful, or for monthly increases in certain productivity or effectiveness measures. Some examples are discussed in the next section, and literature on the Scanlon Plan is instructive (see, for example, Donnelly, 1977; *Iron Age,* 1976; Lesieur, 1968). Others reward successful efforts by employees to continue broadening or extending their skills (see, for example, Jenkins, 1973; Ketchum, 1971; Massachusetts Quality of Working Life Center, 1977; Walton, 1972, 1979).

12. Reduced Overhead Staff

Cost reductions can come not only from new machinery, work methods, and ways of motivating workers. They can also come through reductions in managerial and technical staff and in the size and costs of layers upon layers of management between the hourly-wage worker and the top manager. In

some of the more innovative plants opened in the last decade (see next section) the number of layers of management and the number of staff people have both been dramatically reduced from traditional levels, with increased responsibility carried by workers as individuals and as teams.

13. Decisions Made Near the Source of Information

In traditional, heavily bureaucratized companies, a tremendous amount of time, energy, and resources are spent in shipping information up the hierarchy to a handful of key decision makers at or near the top, as well as then shipping information about the decisions back down to persons at the bottom of the organization who (hopefully) carry them out. This is very inefficient. It costs money to move information. It costs still more money to check up on the quality of the information that is moved, to replace missing pieces, and to correct for mistakes.

Innovative firms have learned this and have discovered ways to move many kinds of decisions downward in the organization into the hands of those who generate the information needed to make the decisions. The result is greatly increased efficiency and morale. This way of thinking and managing will spread as a result of economic pressures, and it should become cheaper and cheaper to do with reductions in costs of mini-computers.

14. New Attitudes toward Workers

As "scientific management" or "Taylorism" (after Frederick Lewis Taylor) developed and spread over the last seven decades, workers came to be seen and treated more and more as interchangeable, discardable, sub-human parts of the organization. Machinery was designed first, and workers were hired afterward to fit in. If one worker left, or a hundred, or a thousand, replacements were hired.

Today, and increasingly in the future, companies that survive will do so by recognizing a different reality. Workers can think in addition to doing: "Nobody knows the job better than the man or woman who has been doing it for *x* years." As capital intensity increases, the costs of a mistake by an untrained, bored, or angry worker rise from a few dollars to hundreds of dollars to thousands and even hundreds of thousands of dollars. From the risk side alone, this justifies major changes in corporate attitudes and behaviors toward production workers. In addition, implementation of changes in reducing overhead staff (Item 12) and moving decisions downward (Item 13) both depend on greatly enhanced responsibilities for production workers.

15. Management Training

Some firms have long invested highly in training their managers, at top levels, as well as at middle and first line. Many others have ignored this almost completely. Today, stepped-up management training at all levels is rapidly emerging as essential to survival and success for many companies. This includes traditional managerial skills training, training in better ways of organizing and motivating workers, and training in process skills similar to those used by consultants to help increase organizational effectiveness. It also includes training in how to think more creatively and more effectively. This increased management training is a prerequisite for the implementation of virtually every one of the changes and new developments discussed here.

16. Human Development as a Basic Goal

As companies come to rely more and more on workers to use their minds as well as their routine job skills, all employees need more training. So a new attitude slowly develops: people in the company come to be seen as basic and valuable resources and their development becomes a basic corporate strategy. In some cases this has also led to efforts to quantify the amount of dollars the company has invested in "human capital." In a few cases it has resulted in a whole new set of books on human capital investment that corporations use in making decisions about hire-fire-promote policies, and in creating policies about how much to encourage or tolerate turnover versus how much to strive to reduce it.

17. New Approaches to Union-Management Relations

A handful of companies have already discovered that poor labor relations, with ongoing tensions between unions and management, high levels of grievances, and occasional work stoppages, walkouts, strikes, etc., are luxuries that can no longer be afforded in the modern, highly competitive world. Such companies have taken steps to develop positive labor relations based on openness, respect, sharing of information, advance consultation, or even full partnership on changes. In some cases the economic rewards have been enormous. (See next section.)

18. Long-range Planning

Virtually all of the changes in the national and world scene discussed earlier, and virtually all of the changes in corporate attitudes and behaviors required in response (discussed in this section) demand more, better, and longer-range corporate planning. Some companies with high demand for stable products and with little competition in a stable price economy have been able to get away with little or very poor long-range planning. Now, these and other companies are struggling to keep ahead of competitors from a dozen countries. To keep abreast of all these changing conditions, companies must plan far ahead on markets, financial resources, new technology, physical capital, accounting systems, training needs, new plant design, workforce projections, and a hundred other factors, all of which must be related together in an overall plan and set of implementation strategies.

19. Conscious Organizational Design and Redesign

Organizations sometimes seem just to grow, like living organisms. But unlike living organisms they don't have inner genes to guide them into healthy, organic, functional wholes. In a former, relatively static world with little competition this seemed to matter little; in a rapidly changing world of great competition it is one more cause of inefficiency, ineffectuality, and ultimate failure. Managers must learn how to analyze the basic organization and how to make changes repeatedly over time to adapt to the changing demands of external and internal forces.

20. Systems Thinking

In the systems mentality or way of looking at the world, the nation and the corporation will become increasingly essential pieces of the human survival puzzle. Among other things, systems thinking means taking more frequent and more competent scans of the environment outside the

corporation, and making farther-sighted, more sweeping, and more intelligent responses to the changes sensed "out there." It means striving to understand the interrelatedness of many separate facts, values, and goals. It also means looking for second-order and third-order side effects of actions, before and during the action phase.

21. Systems Development

Corporations that not only survive but thrive in this new world environment will most likely be those committed both to looking at themselves as total systems and to continuing to improve themselves as systems. This applies to the overall system that is the company, to the many different subsystems within the company, and to the individual micro-systems that are the individual managers and workers. A small but increasing number of corporations are now also applying these concepts outward to the larger systems that are the communities, regions, and countries in which the company or its subsystems are physically located and within which they must survive.

Changing Workplaces of the Seventies: Models for the Eighties

In order to adapt in positive ways and to achieve success in the face of the many growing pressures and challenges, a number (although still a small minority) of American corporations have already developed new pilot programs and then based new corporate policies on the results of the pilot programs. The rest of this section discusses a few of the more noteworthy examples.

Proctor and Gamble

During the late 1950s and early 1960s, Proctor and Gamble began to develop what became called an open system design for two new plants, first in Augusta, Georgia, then in Lima, Ohio. Charles Krone, then the internal design consultant, led this effort. When the Augusta plant started up, in Krone's words, "They discovered that it was operating about 50 percent cheaper than other plants, because of a different organization. We really did a lot of shifting in the design of work, the design of work groups, the role of managers, the role of people. It is an involvement process, with the sorts of information systems that can support those sorts of things, and with new ways of payment, that tend to reward learning different skills rather than just a single job" (Krone, 1977).

This success led to even more fundamental thinking about what was needed and what worked best, and this thinking was applied to the design of the Lima, Ohio, detergent plant, which opened in the late 1960s. David Jenkins, reporting on the new plant, wrote:

> The technology—the location of instruments, for example—was designed to stimulate relationships between people, to bring about autonomous group behavior, and to allow people to affect their own environment. ... The basic principle, as enunciated by Krone, is that the human being has "growthful potential." And a key to the design and operation of the plant is that no barriers should be placed to hinder that growth. ... In an orthodox plant of this type, there might be sixteen to twenty job classifications—at Lima there are none. Not everybody can do every job, but every member of "the community" (as Krone refers to the employees) is constantly adding to his [sic] own skills in some specialized field. Krone says, "Each individual defines the direction in which he wants to grow." The community decided, however,

> that every member must continue to share responsibility for day-to-day operations. ... No matter where you go, you always have to go back to the operation—you cannot become exclusively a specialist. ... This system grew up naturally at the wish of the members—it was not imposed. ...
>
> After the plant has been in operation for three years, they are by now probably among the most highly skilled people in the company. One man who was a farmer would now be called a very highly skilled instrument specialist. He designed the plant's whole instrument control system, and did it entirely on his own initiative, working with manufacturers.
>
> Even though the pay scale is considerably higher than is customary, overall costs are approximately half those of a conventional plant. Much of that is because of the advanced technology. But this technology could not function properly if there were not, at the same time, an advanced social system. Quality is also affected. Krone told me: "It has the most outstanding quality record of any plant we have—it is virtually perfect quality." (Jenkins, 1973)

This Lima plant became the pilot for most of the other new plants designed by Proctor and Gamble since then, and it has served as the pilot for many other corporate experimental plants of the 1970s. Unfortunately, Proctor and Gamble found these plants so profitable that they regard these developments as proprietary information and they now maintain as much secrecy about them as possible.

Gaines Pet Food Plant of General Foods, Topeka, Kansas

In 1969, Lyman Ketchum and Edward Dulworth set up a design team for a new dog-food plant to be built in Topeka. With the help of Harvard Professor Richard Walton, they went back to basics on human needs and motivations, on business objectives, and on the technology of dog-food production, and then designed a plant to meet all those basic objectives. Opened in February, 1971, it was staffed with about two-thirds the normal complement of workers and with very few managers. Workers are organized into three teams: processing, packaging and shipping, and office. Workers rotate through the duties of one team, learning all of the skills needed. As they advance in skill levels, they move up the pay scale. When they have mastered the skills of one team, they can apply to transfer to another team. The young production worker who showed me through the plant in 1974 was extremely proud of the plant and of his own growing skill in using the complicated laboratory instruments for quality testing. At the same time, every team member is responsible for sharing in the sweeping up and the maintenance of equipment.

The results: Costs in the early period were from 10-40 percent less than in comparable operations, while 30 percent of every employee's time was scheduled for job training, communication experience, and rest breaks. Quality was uniformly high. Absenteeism was only 1 percent (General Foods Corporation, 1971; Jenkins, 1973; Ketchum, 1971; Walton, 1972).

Six years after start-up, Walton went back to visit. He found the system with some problems, but still thriving, despite turnover in managers and press reports to the contrary. "Nobody says they would want to work someplace else. People say 'it's a damn good system.' And they are paid very well relative to the community. It has also been enormously successful from a business point of view. Corporate analysts have come in and can attribute $1 million additional profits per year to that

work system, above and beyond what you would expect given a new technology. This comes from less overhead, less manpower [sic], and much more reliability in the system. ... It is an additional profit of $10,000 generated by each person there each year" (Walton, 1977).

General Motors

The largest corporation in the world began to develop new approaches to managing in the early 1970s, under the direction of Vice President Steven Fuller and Director of Organizational Research and Development Delmar Landen. In some divisions they began to use a survey for salaried people and began to find what was working and not working well. They developed the team concept among managers. The teams learned how to set goals jointly and how to develop inter-functional business plans (Ault, 1980; Walfish, 1977). Gradually, different divisions of the company began to set up a few experimental work groups and teams, using volunteers from among production workers, and to survey the workers about their quality of work life (QWL). Under the 1973 negotiations, General Motors and the United Auto Workers union agreed to set up a joint National Committee to Improve the Quality of Work Life.

From these modest beginnings seven to ten years ago, General Motors now has under way 90 joint Labor-Management Committees in the U.S. alone, plus others in West Germany, Holland, Spain, Austria, and Mexico. Top corporate involvement is pushed by the top executives, who hold a meeting of all top management every six to twelve months and ask them for reports on their Quality of Work Life Programs (General Motors, 1980). Top union involvement has been led by Irving Bluestone, for many years UAW Vice President and Director of the union's General Motors Department. Union people are now involved in training managers in team building, communications, and cooperative approaches. The annual QWL survey is now jointly administered and there are negotiated joint Employee Assistance and Health and Safety programs. Soon a joint national program on absenteeism will be under way. Many plants now have underway the General Motors version of Quality Control Circles, called Employee Participation Groups.

One overall impact on labor-management cooperation can be seen by the fact that of about 150 local unions, in 1970, only one had reached an agreement with General Motors on local contract issues at the time the national contract was signed. The other 149 still had to negotiate, and many went out on strike. By the time the 1973 national contract was signed, two locals had already settled. In 1976, eight locals signed by the time the national agreement was reached. But in 1979, 54 locals reached agreement before the national settlement, and of these, 40 were locals with joint labor-management committees (Landen, 1980).

The most famous case of the new social technology in a General Motors plant is at Tarrytown, New York. In 1970 it was one of the worst General Motors assembly plants. During the late 1960s, it had a strike or threat of strike every six months on the average. There were 3.7 open grievances per each employee at that time. With a plant of 2-3,000 people, this meant 7-10,000 grievances in process. It ranked at or near the bottom on every General Motors indicator of performance: quality, productivity, job tenure, attendance, etc. It was scheduled to be closed. Instead, the plant was reorganized, new management came in, and an experimental program of Participative Problem Solving was tried in the glass-installation area where quality, waste, discipline, morale, and absenteeism problems were unusually high even for Tarrytown. In the words of UAW Vice President Bluestone:

> The workers were brought off the job during working hours and paid for the time, learning problem-solving techniques, and engaging in various psychological exercises and game playing, and so on. By the time they had gone through this rather brief course, they had learned for the first time that their brain power

> was to be respected by management. And one of the great emphases in this whole exercise was that the worker is equal to his [sic] supervisor, that he ought to be respected for his ideas, and that he ought to be given the opportunity to be involved with decisions that concern his job.
>
> In a period of eight months, scrap was almost totally eliminated in this area, repairs were down below the norm for that particular work area in assembly plants throughout General Motors, absenteeism was below the norm for the plant, no one had been disciplined, the number of grievances in that particular area had declined, and altogether there was a much happier situation. (Bluestone, 1979)

The auto industry recession of 1974 and 1975 hit Tarrytown, causing a major layoff and elimination of the whole second shift, but it did not kill the program. In 1976, when sales and hiring came back up, the decision was made to offer voluntary problem-solving training for five days, on paid time, to every single employee—around 3,500 in all. Fifty extra workers were hired to cover for the fifty volunteers who took the training each week. Worker-supervisor pairs were chosen from among volunteers and trained to be trainers. By early 1979, this training had reached virtually every employee. Said Bluestone, after a November, 1978, visit to Tarrytown:

> It was heartening to see the change that had taken place in this plant in terms of the working climate, the attitude of supervisors towards their workers and workers towards their supervisors. The cleanliness of that plant will match anything I've ever seen in any assembly plant, and I've been in lots of them. The work pace is reasonable. It will compare favorably with any other assembly plant that we have in General Motors. And there is a goodwill feeling that one senses as one talks to the workers. Also, when I was there they had a total of only 37 grievances in the plant at all steps of the procedure—37 grievances from 3600 workers. That compares with 9,000 in another General Motors assembly plant. (Bluestone, 1979)

Another outcome was that instead of being closed, Tarrytown, now at the top of the list of General Motors assembly plants on all their performance indicators, was chosen as a site for the manufacture of the new X-cars two years ago—the first time that a plant outside of Michigan was trusted with this responsibility by General Motors.

General Motors also began in the early 1970s to apply socio-technical systems planning[1] to new plant design. At a new battery plant opened in Fitzgerald, Georgia, in 1974, the pay system was set up to reward knowledge and skills acquisition. According to Walton (1979):

> After four years, almost all workers there have become familiar with a wide range of jobs and have detailed knowledge of the production process. Initially inspectors evaluated the workers' performance, but eventually the production teams themselves acquired the responsibility to ensure high quality performance. Since 1977, work teams have prepared their own departmental budgets for materials and supplies. Managers provide workers with information such as cost data, which is traditionally not shown to them. The sparse and functional offices reveal the prevailing attitude about status symbols.

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[1] On socio-technical systems design and its history, see Davis and Taylor (1972).

> The pay system, self-supervision, and other design techniques have been combined at the Fitzgerald plant to create a work culture characterized by flexibility, mutual trust, informality, equity, and commitment. Reportedly, the Fitzgerald plant's performance has been very favorable, compared both with other plants and with its own plant. Those familiar with the plant attribute much of its superior performance to the work structure and to the fact that workers take pride in establishing new levels of output and quality.

At the 1980 annual General Motors QWL Executive Conference (General Motors, 1980), Group Vice-President Paul Bender reported that since the 1979 QWL conference, at least seven new plants had embarked on the process of developing their own philosophy and goals according to these design principles. General Motors Vice President Stephen Fuller (1980) describes the process this way:

> Each new plant has provided a unique opportunity to design from a blank sheet and to design an organization that's responsive to people and their needs, while also being responsive to the objectives of business.
>
> The key to our new plants is planning. It is to begin the planning process on the idea that this plant does not have to look like any other plant in General Motors. The only real consideration has been how the plant can be designed to make it the most effective organization in the corporation.
>
> A few examples of the innovations that have been developed in our new plants include: production teams of hourly employees function without direct supervision; team members have far more responsibility than do employees in traditional plants; for example, they help select new team members, they are responsible for training new team members, they forecast efficiency, scrap, and manpower requirements, and they are responsible for evaluating their operation performance and the performance of other team members.

In some companies these new approaches to plant design and to team responsibilities among production workers have been used as tools for blocking union organization. Despite their seven years of cooperation with the UAW in older northern plants, there was some suspicion that union blockage might be the motivation with General Motors too, with regard to their new southern plants. General Motors recently put that concern to rest by agreeing on advance recognition of the UAW as the bargaining agent in all these new plants, and by agreeing that all new General Motors plants in the future will be jointly designed by General Motors and the UAW. Pioneered by Volvo in Sweden, this approach represents something of a breakthrough in the U.S.

Says General Motors President Pete Estes:

> I believe in the Quality of Work Life concept . . . and in our efforts to apply it. They pay off in improved employee morale, and this can be reflected in improved effectiveness, improved quality, reduced scrap rates, lower absenteeism, lower costs and a more stable work force. You can say these programs pay off because they promote the greater involvement of an employee—more of his [sic] skill, more of his know-how. (Estes, 1980)

Harman International
at Boliver, Tennessee

In this plant, which manufactures outside rearview mirrors for cars, a pioneering "work improvement project" was initiated in 1972-73 by President Sidney Harman, and Irving Bluestone, Vice

President of the UAW, with assistance from Michael Maccoby as the professional third-party consultant-researcher.

Mr. Bluestone personally wrote a letter to all the workers, which said, in part:

> We are at that point in time where workers should have more to say about their job and how it should be run. They should participate in a meaningful way in making decisions about the job and the workplace—decisions which in the past were made pretty much exclusively by management.

In-depth interviews were conducted with 60 workers, and then shorter interviews were conducted with 300 workers. A Working Committee of five members each from both management and union was set up to guide the program. Dr. Maccoby suggested and the Committee agreed that the program should seek four kinds of goals:

- *Security* of job and income and protection against loss of health and limb
- *Equality,* or fairness in dealing with people and assuring proper rewards
- *Individuation,* or the attempt to satisfy the needs and aspirations of each individual in self-development
- *Democracy,* or workers participating in the decision-making process.

Core groups of volunteer workers and their supervisors were set up in a few pilot areas and then expanded to cover most work areas in the plant. As workers discussed how to do their jobs better and how to help each other, production standards began to be met for the first time. In fact they were met before the end of the shift. By prior agreement the existing production standards were not raised, so workers who finished early were free to leave their machines. First they went to the cafeteria, and then after some discussion it was agreed that they could go home early. Thus was born the concept of Earned Idle Time, which spread to many, but not all, of the hourly workers. As a way of utilizing the proceeds of increased productivity it had the positive effect of strongly motivating the workers, and the negative effects of causing some quality problems and some internal divisiveness and jealousy, since some workers and the salaried staff had no way of meeting a preset production standard and going home early.

An interesting outgrowth was the development of a school inside the plant in which many workers took courses, and some taught courses, during their earned free time. The course list included welding, home economics, black studies (half the workers are black), guitar playing, business economics, ceramics, and basic education to get a high school diploma.

Overall, this pioneering project in an old plant accomplished a great deal in improving union-management relations, in raising productivity to (but not beyond) the pre-set standards levels, in providing workers with a better climate at work and more leisure time, in supporting a doubling of the plant size and the development of new products (e.g., electric auto mirrors), and in serving as a laboratory from which many other QWL programs have learned.

Some of the lessons learned there were the importance of developing strong ownership of a QWL program among local managers and union leaders, the crucial role played by middle managers and supervisors, the importance of their receiving training before and during the start-up of a QWL program, and the difficulties involved in any program that uses the fruits of productivity gains to allow some (but not all) employees to go home early. (See Bluestone, 1977; Maccoby, 1975; Maccoby & Ramsay, 1979.)

Scanlon Plans at Donnelly, Dana, Herman Miller, and One Hundred Other Companies

The Scanlon Plan was created by steelworker Joe Scanlon in the 1930s as a way of bringing workers and management together to help save failing companies. It was tested and proven workable in the 1940s and 1950s in a handful of pioneering companies. The number expanded in the 1960s to include several dozen, and in the 1970s, its use expanded even more rapidly, so that now some of the plants of many major industrial corporations are involved. The number is likely to expand even more rapidly in the 1980s, as more and more companies look for proven productivity improvement methods.

The plan includes three basic elements. The first is a positive management philosophy and style about union-management relations and about production workers' willingness to work and their capability to contribute ideas and knowledge and not just sweat. The second element is a system of worker participation, starting with production committees in each work area who meet regularly to create and analyze ideas for improvement, and one or more upper-level screening committees to handle suggestions that cut across departmental lines or that are costly to implement. The last element is a system of monthly bonus checks to everybody in the plant to share any and all improvements in overall plant productivity with everyone. This is a total group (not an individual) incentive system.

The Donnelly Corporation attributes to the Scanlon Plan its remarkable growth in market share (over 70 percent of the domestic market in inside auto mirrors, plus other new products), with sales multiplied six times in ten years, as well as Donnelly's ability actually to cut prices during many inflationary years. Herman Miller executives believe the plan is responsible, among other benefits, for its very low turnover and absenteeism, also found at many other Scanlon companies.

The Dana Corporation began trying the plan in 1969 and now has upwards of two dozen plants involved. One Dana plant manager, Lee Hess, says: "Management must be good listeners and management must keep people informed and continue education. There must be honesty and integrity. As a result, we have better relations (teamwork), increased efficiency, increasing earnings for our people, and better utilization of our capital equipment." Hess says the plan will make believers out of the young people who enter business today with a great deal of cynicism about industry and "it also reaches the older worker who may have spent many years under a system of alienation."

Another Dana executive says, "We're pushing decision making to the lowest possible level." One example is the involvement in some plants of production workers in decisions when the plant is looking for new capital equipment. Overall, Dana productivity (measured as sales per worker-hour in constant dollars) has more than doubled in the last eight years. (See Donnelly, 1977; *Iron Age*, 1976; Lesieur, 1968; Lesieur & Puckett, 1969.)

Other Corporations

Several dozen other major American corporations have under way one or more programs in pilot plants, or are already well past that stage and, like Proctor and Gamble, General Motors, and the Dana Corporation, they have already adopted a total corporate philosophy and commitment to a new way of managing and involving their people. Some of the most interesting are the Eaton Corporation, QYX (an Exxon subsidiary), TRW, Meade Paper, Sherwin-Williams, Dupont, over a

dozen companies in Jamestown, N.Y., and (here in Massachusetts) Polaroid, Gemini Corporation, and Malden Mills.[2]

A New Look at Occupational Adaptability and Education for Future Work

If I am roughly correct in my earlier assessment of the major world and national trends affecting U.S. workplaces in the years ahead, and of the responses that will be forthcoming from our corporations, and if the pioneering programs of the 1960s and 1970s are appropriate models for the 1980s, what are the implications for education for occupational adaptability?

Drawing on a thorough review of the literature of general as well as occupational adaptability, Faddis (1979) proposed four categories of occupational adaptive behaviors and styles:

1. Reactive – Adapting yourself to the work environment
2. Active – Adapting the work environment to yourself
3. Mobile – Adapting by changing the site of the work environment (i.e., moving yourself to a different one)
4. Flexible – Includes some of each of the first three. (p. 118)

Faddis follows this with a very useful discussion of the *quality* of different behaviors within each of the first three styles and a long table listing behaviors as Less Helpful, Ambiguous, and More Helpful under each of the three. Certainly there is little to criticize in her selections of "more helpful" behaviors on the part of individuals, since the individuals who utilize them will most likely find more sanity and healthfulness in their mental outlook at work, and there may also be some positive impacts on their workplaces. My concern, rather, is an overall emphasis on *individual* adaptability to the workplace plus the *individual* adapting of the workplace to himself/herself (or leaving the scene, in the Mobile Adaptive style) implicit in the three styles and in the overall concept of occupational adaptability. For their own survival, and for the health of our society, I would like to see more emphasis on *corporations* adapting to their environment and to their workers.

In planning how to spend our society's money and human resources to improve occupational adaptability, I believe that we need to back up a few steps and develop a new concept of *mutual adaptation of each of the levels* of subsystems within our global system. This paper has chosen to put most of its attention on the American corporation. The corporation is the middle-range actor (or subsystem) between individual employees (and customers) and the larger and (once at least) more powerful political communities at the city, state, national, and international levels. Corporations are extremely powerful systems for socializing, influencing, and directing individual behavior of employees and customers, powerful economic systems for shaping many aspects of our economic life, and powerful political systems with major political effects in this country and abroad.

Yet powerful as they are, many corporations' success and even survival is now threatened by their changing national and world environments. Because our Western economic system is based upon them, they must survive and thrive (not each or any individual corporation, but as a group) for our individual wellbeing, unless and until we are ready to replace corporations with some other

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[2] Many of these companies have not encouraged publicity about their efforts, which can be learned about only from conferences and working papers. On others, there is some written documentation. See for example "Humanize, then enrich factory environment," (1974) on Eaton; Poza and Markus (1980) on Sherwin-Williams; QYX Corporation (1978) on that company; the Jamestown Area Labor–Management Committee (1975, 1977); on Malden Mills, the December 1980 *Newsletter* of the Massachusetts Labor-Management Center; and in general, Walton (1979).

vehicle for organizing production and distribution. To survive and thrive, though, corporations must adapt, more deeply and more rapidly, than most of them are now doing. Other corporate adaptations are called for to meet our individual and collective ethical, social, environmental, and other needs. At the level above the corporation some of our state and national policies also need adaptation to support corporate effectiveness on the one hand, and to promote corporate adaptiveness on the other hand. And, of course, there must also be some degree of individual adaptation to the needs of the collective organizations, including both our corporations and our other social institutions. So what is needed is some concept of *mutual adaptation and adaptability at all levels of the system.*

Educational efforts aimed at adaptability should be supportive of adaptation of all levels, not just of individuals. If we start by looking only at the individual adaptability, even defining it as broadly as Faddis does, I believe that some important criteria and ingredients are left out.

I am especially concerned that our educational efforts be directed at developing leadership skills and people for leadership, at all levels of organizations. Leadership used to be thought of as primarily or solely a function for the top levels of organizations, or possibly top and middle. Certainly we will not get the kind of organizational change described above without strong leadership from the top. Increasingly, though, the innovative models described earlier are providing opportunities for, and even depending upon, the willingness and ability of production workers and first-line supervisors to exercise some of the classic functions of good leaders. These require skills, including learning how to improve communications, analyzing problems, seeking more information, setting goals and priorities, making decisions, delegating responsibility, building good teamwork, analyzing costs and benefits, seeking feedback, and, in general, taking responsibility. Other skills that are being developed and utilized at all levels of these organizations, top, middle, and bottom, and which are needed for the organizational adaptations described earlier, include: understanding that learning is never over; appreciating and utilizing value differences; understanding cultural differences; analyzing ethical issues and conflicts; learning to think more conceptually; learning to think more in total-systems terms; seeing the interrelationships between various subsystems and between an action and its various multiple effects; looking for second-order and third-order effects of actions or changes; and utilizing a problem-solving rather than a right-wrong or win-lose outlook and orientation.

On-the-Job Learning and Training

To a considerable extent these skills are being developed in training programs and learning workshops in the innovative corporations discussed in the preceding section. The heart of the successful new plant start-ups of Proctor and Gamble, General Foods, and General Motors are pay systems that reward production workers for increased skills, plus a great deal of formal and informal skill training, often by their peers, as well as more general workshops and learning experiences to develop such capabilities as communications, team building, problem analysis and problem solving, and how to analyze the full flow of a product through a complex chemical or other system.

Sheldon Davis, then Vice President of Organization Development at TRW, spoke of their programs to develop a new and better work culture in their new plants, including the use of work teams and a great deal of training:

> We have identified the four kinds of training necessary so people can really accept these vastly increased responsibilities. The first is traditional technical training in how to run the machines, except ... now it must be done more broadly and include, for example, machine set-up. The others are nontraditional: really going through the plant and understanding what happens at each

station; the economics of the business, the plant, and the work station; and finally, team skill training.

The training in economics includes the company offering much more open books. Not just in bad times when you want to show the union how bad things are. ... When you have good years, you have to show those numbers too. ... In some of these plants after a while the workers are starting to know more about the economics of the business than typical middle-level managers.

There should be training in the economics of the work station: what does the equipment cost? What are the depreciation schedules? Why is the tolerance important on that product? What does it cost if we don't stick to tolerance? What does waste cost us? Why are we pushing for machine utilization?

These teams are not fully autonomous: there are supervisors; people do get fired; they do get instructions. But they are relatively self-managed. So we give them team skill training in conducting meetings, in interpersonal communications, in problem solving, and so on. And everyone gets it, including the plant manager. (Davis, 1976)

In the older plant program at Tarrytown, a great deal of advanced training was given to managers and supervisors. The core of the change effort in the glass installation area was intensive production-worker training in team (participative) problem solving. Elements of this were then included, along with more general concepts of quality of working life, of labor-management cooperation, and of positive communications, in the training program offered the whole workforce.

In the Labor-Management and QWL programs we (Massachusetts Labor-Management Center) assist in Massachusetts, we have built in a great deal of workshop experience and more formal training programs. We start with workshops for a large joint labor-management group, or with each side separately. These workshops are designed to help people identify common areas of concern as well as to understand their disagreements. They train people to understand that differences in perception are normal and inevitable, and to utilize such differences as assets. They help people to learn how to communicate better, and especially how to listen carefully and to practice active listening. We help people learn how to build an agenda of problems to solve, how to use various techniques to prioritize, and then how to focus their energies. We train people in brainstorming techniques (also called "green-lighting"), and how to set up criteria to examine and decide which ideas are going to be more and which less useful. We help them find or learn what additional information they need and how to analyze and present it. Delegation, time management, and follow-through are also covered. Value differences are experienced in various little games, and then discussed.

Not all of these skills or concepts are taught to any one group in any prescribed order. Rather, with whatever group we are working with, we use a needs assessment with them, and let them guide us as to what kinds of problems they are facing, what kinds of skills they would like to increase, and what kinds of skills they already possess. We provide more structure and guidance for initial sessions, and as time goes on we initiate or suggest topics and skills, but the basic motivation and direction must come from the people in the workplace.

In varying degrees and ways these same kinds of skills are offered to everyone from the president of the company and the president of the union down to first-line supervisors and hourly production people, in groups as they are involved in the programs. With each different group there is also a great deal of attention paid to the specific roles that they are expected to fill and the skills that they need to perform their duties well. Thus a recent program for union stewards, within a broader corporate

labor-management program, included sessions on handling a grievance, checking contracts, fact-finding, negotiating, listening, and leading, plus more generally on human relations and communications. That steward training, incidentally, led to requests by the stewards' supervisors for supervisory training, which is now in its second round. Some of their topics are: the roles of the supervisor; the supervisor as motivator; introduction to problem solving; and the supervisor as problem solver. Meanwhile, in that same company, the very top executive group is holding its own monthly workshops on such topics as how to utilize their human talent better for productivity, long-range planning, and communications. Simultaneously, workshops are being held for middle managers in three divisions, and for internal facilitators, small-group training sessions are being held in how to lead and facilitate a group of production workers. Meanwhile the Human Resource Director is making plans for how to introduce workshops on cultural differences to various levels within the company, since there are very large minority populations there.

In our high schools and colleges it seems to me that four kinds of initiatives might be pursued to help prepare young people better for this new world of work. First, classes could be directed more toward these same topics already mentioned above. Second, the whole educational experience and our educational institutions could be structured more like participatory workplaces, with students seen as the real production workers, producing the learning that is going on. In this view, the "teachers" become resource people, team leaders, counselors, guides as it were. Too often in many of our more traditional institutions even today, the teacher is seen as the producer of learning and the student's role is to receive learning, accepting or resisting it more or less depending on the person and the day. Third, we could use more learning around the roles and functions of leaders.

Finally, there could be expansion of existing programs that mix education and work. Co-op programs work at the college level. I know, for I was a co-op student too many years ago. Experiential education programs could and should be expanded. Something between a traditional high school, a co-op college, and a school without walls seems to be the kind of secondary institution that would best prepare young people for the kind of workplaces that should evolve in the 1980s.

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THE CHALLENGE OF THE MISSING LINK
(Summary and Discussion)

A number of common themes emerge from the papers in this collection that address conceptual issues of occupational adaptability as well as policy implications of those themes. In addition, each author introduces unique insights that extend our understanding of the interrelated systems of the work world, education, and human needs and behaviors. This summary highlights and briefly discusses the authors' ideas, each of which should be considered by any person, organization, or institution concerned with improving the adaptability of workers, of work organizations, of the American economic system, or of American society as a whole.

The following insights emerged, in one form or another, in each of the three major papers in this collection. They are presented with no implication as to their importance or priority.

1. The traditional notion of adaptation to work—i.e., successful adaptation is when workers fit themselves to the workplaces—is no longer sufficient to meet modern human *or* business needs. It will probably become an even less appropriate assumption in the future. The consequences of inducing workers to fit themselves to the marketing mentality ("selling themselves" in order to get or keep jobs) are costly in terms of physical and mental stress, worker productivity, and the overall efficiency and adaptability of work organizations (for example, the high cost of moving information for decision making through channels of a bureaucratized work organization—see Brower). Inevitably, these costs affect the efficiency and effectiveness of the American economy and American society in meeting the complex challenges of our changing world.

2. Because the consequences of adaptation in work fall on the human workers, work organizations, and on society in general, it is incumbent on individuals, businesses and industries, unions, and on society (through its governmental and educational systems) to seek ways, cooperatively, to enhance each others' adaptability. Organizational or societal decision makers cannot safely ignore—or pay mere lip service to—worker needs and desires, nor can workers ignore the realities of the work world. Participation of all parties is vital.

3. Contrary to a common assumption, the character and the adaptive skills of human beings are not necessarily fixed at an early age. Adaptability seems to depend on acquiring and using certain generic skills—selective attention, sustained analysis, analogizing, suspension of closure, and autocensorship (see Woditsch), or self-discipline, concentration, criticism, and communication (see Duckles)—which can be learned by adults as well as by children.

4. In order to develop the generic skills so essential to effective adaptive potential in individuals, the authors suggest that educational policies eliminate or minimize the "marketing mentality" that permeates educational philosophies and pedagogies, that school curricula involve the students and teachers in cooperative educational discovery that develops generic skills and adaptive innovation, and that educational experiences demand the exercise of those skills in ways that challenge the students and that relate what is learned to the real world.

5. While the educational system needs to reconsider its philosophies, policies, and pedagogies, changing the nature of work in work organizations may hold more immediate promise for improving the adaptiveness of all. Numerous businesses and industries in the United States, Europe, and Japan have made successful, innovative adaptations to improve the quality of work life, in cooperation with employees and unions, with considerable benefits both to workers and to the businesses. Brower suggests that work organizations "are extremely powerful systems for socializing, influencing, and directing individual behavior of employees and customers," and that it is within the interests of work organizations to cultivate the adaptive skills of their employees at all levels. Such workers are able to cooperate with each other and with the organization to shape the workplace and the work itself to everyone's benefit.

6. The quality of work life is everyone's concern. It is vital, though, that the people who "own" the problem be the ones who address it and who become involved in devising and implementing the solutions. In workplaces, this may mean participative management or some form of industrial democracy, but prepackaged solutions are less likely to meet across-the-board cooperation and success than solutions that are experimentally devised and implemented by the persons or groups who must live with the results. To enable workers at all levels to participate in such adaptive problem solving, work organizations must be prepared to develop or enhance the adaptive skills of workers at all levels, through on-the-job training, workshops, or other educational strategies devised by workers and management together.

The individual authors took different perspectives on the interrelationships of education and work. Robert Duckles concerned himself primarily with the individual human consequences of the traditional concept of occupational adaptability—where conformity to the requirements of the work world is considered successful adaptation. Gary Woditsch examined the conserving nature of adaptation, and what it means for improving adult adaptive competencies in life as well as in work. Michael Brower explored the adaptive problems and needs of the work world, both from the perspective of business and industry, and that of the changing workforce. The unique insights of the individual authors are summarized below.

Robert Duckles discussed the destructiveness of the "marketing" social character that pervades American society and that is cultivated primarily via the educational system. Since society requires "that people want to act as they have to act" (Fromm, 1949), the schools inculcate the belief that individuals must fit themselves *to* schools and *to* work, that they must think of themselves and present themselves as commodities, and that appearances or credentials are more important for getting ahead than actual abilities or quality of work. Duckles then cites work by Maccoby and others that suggest adaptive patterns ("orientations") by which different kinds of people attempt to reconcile their personal needs to the marketing mentality of the work world: craftsmen [sic], jungle fighters, company men, and gamesmen. Despite these kinds of attempts at adapting, Duckles claims that the consequences in terms of human suffering—primarily through emotional depression and related symptoms—are profound, for individuals, for work organizations, and for society.

Duckles recommends that educational policies be re-examined, and that philosophies and practices which cultivate the marketing mentality be ferreted out. To do this, he recommends that workshops or other participative problem-solving activities involve teachers—the "front line" of education—in inventing and implementing teaching approaches that will promote "active" education, student self-discovery and group learning, and the development of critical thinking, communication, concentration, and internally directed discipline.

Gary Woditsch addresses the essential nature of adaptation, and discusses the implications for pedagogies to develop greater adaptiveness (in an active, inventive sense) in individuals. According

to Woditsch, adaptive capabilities evolve recursively, from a relatively limited set of generic skills: selective attention, sustained analysis, analogizing, suspension of closure, and autocensorship. (As can be seen, these are virtually identical to the essential skills discussed by Duckles.) Adaptation is by nature energy-conserving; that is, in any given situation, "survival—let alone efficiency—favors the least energy-consumptive means to an end." Since cognition is the primary means of human adaptation, people tend to use the simplest, easiest cognitive approach to situations requiring an adaptive response—approaches usually invented once and repeated by rote ever after. Woditsch believes that adaptive capabilities are "both more radically educable and more difficult to develop than current practice allows," the latter because full-blown adaptive behavior is so demanding, and the former because experimentation (e.g., Whimbey & Whimbey, 1975) has shown that inventive pedagogies can cultivate the development and innovative use of the generic (adaptive) skills, in adults as well as in children.

Woditsch makes four recommendations for developing adaptive competencies:

- Insuring that each adult has a functional command of generic skills, so that there are no basic deficiencies in his or her adaptive potential;
- Optimizing utilization of the generic skills throughout the adult's periods of occupational preparation;
- Acquainting each adult with the range and consequences of adaptive priorities in the work world; and
- Increasing scope in the occupational environment for the exercise of adaptive skills.

To accomplish these goals, Woditsch suggests that education explicitly target the generic skills, that curricula diminish prepackaging and involve students and teachers in direct and active learning, that the social/societal context of adaptation be tied to the development of the higher cognitive abilities growing out of the generic skills, and that work organizations resist making cosmetic improvements in the quality of work life and instead combine expanded worker discretion with expanded worker accountability.

Michael Brower examines the broad contexts affecting occupational adaptability and the future of work, taking a systems approach to understanding how the adaptive potential of both work and workers inevitably involves such macro-trends as national productivity and economic growth, foreign competition, energy costs and availability, technology, composition and values of the work force, and so on. He discusses the probable responses that business and industry will be making to meet the demands imposed by those trends, and then surveys a number of exemplary programs already in use by some major corporations. These programs depend on mutual adaptations between workers and the work organizations.

Brower believes that an emphasis on improving the adaptability of individual workers is not sufficient to meet the adaptive needs of workers or of work—all are parts of mutually dependent systems or subsystems. Work organizations themselves must look for ways to meet the adaptive needs of workers in order to meet some of the adaptive needs of the companies. The most effective ways of accomplishing this seem to require that employees at *all* levels share in decisions (and in the consequences of those decisions) affecting their workplace.

Brower recommends that businesses and industries cooperate with workers (and unions) in active, experimental programs to improve the quality of work life. He emphasizes the importance of developing leadership abilities in all workers, not just in management. On-the-job training or workshops should be provided for all workers to help develop skills in communications, good listening, prioritizing, brainstorming, finding and analyzing information, delegating responsibility,

managing time, and so forth, but "the basic motivation and direction must come from the people in the workplace." Finally, Brower recommends that high schools and postsecondary educational institutions focus on developing these same skills, that curricula be structured (as workplaces should increasingly be structured in the future) as participatory experiences, that leadership abilities be cultivated, and that school programs involve experiential, cooperative education that mixes classroom learning with real-world work experiences.

The authors of these papers are clearly calling for a re-evaluation of some traditional notions about education and work. The importance of increasing the skilled participation of workers at all levels in problem solving and decision making at work has strong implications for the quality of life for all workers, for the survival and growth of businesses and industries, and for the economic and social interests of the nation as a whole. The adaptiveness—and thus inventiveness—of all components of the "system" depend on expanding and improving the abilities and insights of everyone involved. Education, wherever it occurs, is intimately linked to the total adaptiveness of the American way of life. The papers in this collection will we hope, provide some ideas and directions with which policy makers, educators, and other human resource developers may begin to rethink what is being done or needs to be done to cultivate better occupational adaptability at all levels.