

FOCUS ON EXCEPTIONAL CHILDREN

Exploration 1993: The Effects of Future Trends on Services to the Handicapped

Nancy Safer, Jane Burnette, and Barbara Hobbs

The past decade has been characterized by rapid changes in patterns of service to the handicapped. Groups are now being served who were never served before, in ways they were never served, and handicapped persons are participating increasingly in all aspects of society. These changes have resulted from pressures, conditions, and forces within and outside of fields providing services to the handicapped. With change occurring rapidly and on many fronts, we too often find ourselves in a reactive position, trying simply to keep up with events rather than systematically planning for change. This sometimes has resulted in hasty "make-do" policies and service arrangements. A more controlled posture toward change requires both lead time and some perspective as to the future. Thus, for practitioners and policymakers, anticipating change is becoming more and more important.

Anticipatory policy decisions require that certain assumptions, implicit or explicit, be made about conditions in the future. Failure to consider future conditions indicates an implicit assumption either that future years will hold no change or that current trends will continue. The rapid rate of change in the last 50 years, particularly in services and rights for the handicapped, suggests that these assumptions would be short-sighted indeed.

Policymakers' need for information concerning future decisions or practices in various fields has focused increasing attention on forecasting methodologies and the study of the future (Cornish, 1977). Though it is impossible to make highly accurate and specific predictions about the future, it is possible to identify patterns, potential trends, and alternate futures. With this information, policymakers are in a better position to make decisions that will maximize the probability that desirable events or conditions will occur and minimize the probability that undesirable alternatives will occur.

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Currently, a number of forecasting methodologies are available, and several of these have been used to forecast trends in services for the handicapped. For example, Shipper and Kenowitz (1975) used a Delphi procedure to ask special education administrators to forecast developments in the delivery of services to handicapped children. Schiefelbusch and Hoyt (1978) developed a scenario of special education in the year 1984. These efforts, and other previous efforts to forecast trends in the provision of services to the handicapped, although highly interesting, have been limited in that they have not systematically considered the context in which these services would be provided or how that context would affect the provision of services.

Changes in social institutions such as education or social services rarely occur in isolation. Thus, in considering the future in a particular area such as services for the handicapped, we must explore trends and changes in fields that potentially affect that area, and project the implications of such changes for services to the handicapped.

Five fields that have had historical impact on services to the handicapped are *values, economics, social institutions, technology, and medicine*. For example, in the last decade, shifts in values emphasizing civil

and human rights have promoted the acceptance of handicapped persons in all areas of society. Greater acceptance of the handicapped has been facilitated by economic growth which has allowed more funds to be reserved for services to the handicapped without actually taking funds away from previously established programs. The shift in values has affected our social institutions, taking such forms as the movement to educate many handicapped students in regular classes rather than in segregated special education classes and to maintain handicapped persons in community-based placements rather than in residential institutions. Technological developments have enabled handicapped persons to participate more fully in society by providing devices (such as printing machines for braille) that make the performance of occupational and daily living tasks easier for handicapped persons. Medical advances have played a great role in reducing the incidence of handicapping conditions—for example, through development of polio and rubella vaccines and in the amelioration of disabling conditions through treatment.

As part of its continuing effort to anticipate and facilitate changes in provision of services to the handicapped, the Bureau of Education for the Handicapped (BEH) sponsored a project to explore potential future changes in the areas of values, economics, social institutions, technology, and medicine. The project, entitled "Exploration 1993: The Effects of Future Trends on Services for the Handicapped," initially was conceptualized as a two-stage activity. The first stage was to look broadly across the five areas and provide an overview of potential trends in each area, as well as to examine the possible effects of these trends on services to the handicapped. If some trends of particular interest and potential impact were identified during this first stage, they could be explored in greater depth using more sophisticated future methodologies during the second stage.

As part of the first stage, the Newtek Corporation of Reston, Virginia, commissioned experts in the five areas to consider and delineate future trends in those areas, particularly trends that might impact upon services to the handicapped. These experts were selected on the basis of recommendations concerning their broad expertise in their respective fields and their experience in delineating and forecasting trends. They were: Willis W. Harman, Director of the Center of Social Policy, Stanford Research Institute and author of *An Incomplete Guide to the Future*, in the area of values; Robert D. Hamrin, author of *Rethinking Economics: The Reality of the 1980's* and formerly with the Joint Economic Com-

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A panel¹ of individuals representing various aspects of services to the handicapped were asked by BEH to consider the trends projected in the five areas, as delineated by the five experts, and to discuss the impact those trends could have on the provision of services to the handicapped.

The five sections that follow give some of the ideas, reactions, and projections resulting from this interchange. Each section first presents the trends delineated by the respective experts, followed by implications of those trends for the handicapped as discussed by the panel. Table 1 summarizes the trends and implications for each of the five sections. In some instances there were differences as to the interpretation of certain events or patterns of events and the likelihood or implications of trends projected from those patterns.

Alternative trends and their potential impacts can serve as a point of departure for thinking about the future. The Bureau of Education for the Handicapped is carefully considering the impact that particular trends discussed in this article could have on BEH policies and programs. These trends, if realized, also would

affect state and local special education programs, university training programs, the parents of handicapped students, and handicapped persons themselves. Thus, the final section of this article considers some of the impacts that alternative trends could have on various aspects and levels of special education services — with the hope that this will provide stimulus for thoughtful consideration of the future among special educators, parents, and students.

VALUES

Mr. Harman pointed out that our values affect who we define as handicapped, what services we think they are entitled to, and who is responsible for providing services. For example, our definitions of handicaps such as learning disabilities and emotional problems are somewhat loosely defined and could be narrowed or extended according to shifting values. Although language and cultural handicaps presently are limited to ethnic groups, this category could be extended. Currently, our values support the view that the handicapped are entitled to those services that will allow them to participate fully in society. This view could change, however, if circumstances cause us to shift our values. Thus, changes in values are of obvious concern in regard to the handicapped.

Occasionally in human history values have undergone transformations of such magnitude that the effect has been a restructuring of the social order. Mr. Harman suggested that such encompassing transformations take place slowly, over several centuries. The most recent example is the transformation from the religious values of medieval society to the values and beliefs of industrial society. The change started centuries ago with the secularization of values and the growing belief that persons could improve the material environment through their own efforts. These changes were the precursors of the industrial revolution, with its emphasis on economic and technological progress.

Our present society still reflects the values of the industrial revolution — characterized by an emphasis on expanding technological and scientific expertise to facilitate economic growth. Economic productivity is the primary basis for employment and, as such, it is a focal point in the individual's relationship with society and a major source of self-esteem. The criterion for judging the quality of education is its effectiveness in preparing

¹ Panel members included: Betsy Anderson, Massachusetts Federation for Children with Special Needs; Bruce Balow, Department of Education, University of Minnesota; Jane Burnette, Newtek Corporation; Kenneth Cross, Department of Special Education, University of Buffalo; Jerry Gross, LaGrange Area Department of Special Education; Joseph Heinmiller, Youthwork, Inc.; Stanley Herr, Harvard Law School; Martin Kaufman, Bureau of Education for the Handicapped; Edwin Martin, Bureau of Education for the Handicapped; William Mimms, Newtek Corporation; Carson Nolan, American Printing House for the Blind; Nancy Safer, Bureau of Education for the Handicapped; Raphael Simches, Bureau of Education for the Handicapped; Allen Sullivan, Dallas Public Schools, Department of Special Education; and Michael Ward, Council for Exceptional Children.

the student for employment; knowledge is valued for its ability to generate manipulative technology. Ever since the industrial revolution, our primary goals have centered on material growth and our belief system has reflected these goals.

The economic and technological growth of our society has brought an abundance of goods and services that have improved the quality of life; yet, inevitably, negative side effects have resulted from this emphasis on material growth. Environmental damage has adversely affected the quality of air, water, and land; natural resources are being depleted; and society has tended to exclude persons who are unable to contribute to material growth. Reactions against such negative effects may indicate that our value system is changing.

In fact, Mr. Harman suggested that we may be going through a major transformational period, equal in magnitude to the transformation from the middle ages to the industrial age. The following trends discussed by Mr. Harman may be the harbingers of a new system of values.

Trends

1. *Society's standards may be changing, with less emphasis being placed on economic rationality in which social contributions are measured in economic terms, and greater emphasis being placed on the quality of life.*

Concern for maintaining a habitable environment. An effort is being made to protect wildlife, conserve energy and natural resources, reduce pollution, and control population growth. Technological growth without regard to the consequences has been challenged by those who recognize the need to assess the long-range impact of new technologies on the environment.

Self-actualization. There is a growing emphasis on self-actualization, with individuals being valued for more than their economic productivity. Widespread interest is being shown in self-exploration and mind expansion and control through experiences such as individual and group psychotherapy, transcendental meditation, and est.

Focus on the equality of all groups. The past two decades have seen an extension of equality and rights to numerous minority groups. Although the initial impetus for this change often has been court decisions,

such decisions could be made and implemented only when supported by the belief system of the society.

Decentralization. Increasing concern has focused on obtaining more manageable government and social institutions through decentralization and through forming stronger personal ties within smaller communities. Thus, demands are increasing to limit the impact of federal government by strengthening programs and decision making at the community level.

2. *The knowledge system shows signs of being expanded and refocused to include not only objective but also subjective, spiritual, and creative knowledge.*

Research in subjective areas. More scientists are investigating subjective phenomena including the unconscious, creative imagination, psychosomatic illness, and psychic experiences. At one time, persons undertaking research in these areas were viewed with suspicion, but such research is becoming more and more respectable and is being carried out under the auspices of well known and highly regarded institutions.

Wholeness and connectedness of persons. There is a movement toward viewing the person as a whole being rather than as a collection of parts. Evidence of this is seen in the wholistic health movement, which recognizes that the mind and the body function together and that the individual's attitude is an important part of his or her illness and healing. There is also increasing concern about the effects of labeling and classifying, which tend to identify individuals by certain characteristics that are used as a basis to differentiate and separate these persons from the rest of society. In short, there is a greater awareness of the oneness and connectedness of human beings.

Public participation in scientific and technological issues. The general public is less dependent upon and less in awe of the expert than was once the case. Consumers have made it clear that they intend to be involved in decisions related to issues like nuclear safety, hazardous substances, and recombinant DNA. Parents believe they should be included in the educational decision-making process. Thus, issues that formerly were scientific or pedagogical issues are often viewed now as political issues, open to public participation.

An Alternate View

Some panel members felt that many of the trends outlined above were aberrations rather than harbingers of a new value system and would not grow significantly in the future. Instead, they believed that the current belief system would continue into the future, with an even heightened emphasis on the rugged individual and on measuring the individual in economic terms. These participants felt that the increase in self-exploration could be viewed as a preoccupation with the self and a decline of concern for others; they expressed views that the potential economic slowdown (discussed later), combined with self-preoccupation, could result in increased competitiveness and conflict among individuals, less interest in extending rights or equality to groups outside the mainstream (because of fear arising from their economic competitiveness), and continued evaluation of others in terms of actual or potential economic productivity.

Thus, some disagreement was voiced at the panel meeting as to whether or not we are currently in a period of changing values. This is not surprising. Mr. Harman pointed out that during a transition period, there are movements and countermovements, and that as parts of society are changing, other parts are reacting against those changes. Which of the specific trends or movements endure will be determined only by time. Of greater importance is the existence or nonexistence of an overall pattern of changing values and beliefs and whether this pattern will or will not be a continuing thrust.

Implications for the Handicapped

Changes in our overall belief and value system in a direction away from an economic rationality and toward an expanded knowledge system could have a number of implications for handicapped individuals. An emphasis on the self-actualization of individuals rather than on their economic productivity could reinforce the current national policy of educating every handicapped person to his or her maximum potential through appropriate educational programs. Such an emphasis on self-actualization, combined with an expansion of the knowledge system to include the subjective and creative, could mean that educational programs for the handicapped

would place less emphasis on vocational (economically productive) training than in the past, and more emphasis on subjects aimed at enriching the life of the individual, such as art and music.

A value system that would judge individuals on a basis other than economic productivity also could increase the likelihood of handicapped individuals who cannot work being accepted on an equal footing with nonhandicapped individuals. Similarly, societal concern with the equality and rights of groups such as the handicapped who have been discriminated against in the past could cement handicapped persons' access to and full participation in the mainstream of society.

The trend toward decentralization already has affected the handicapped through the normalization movement — that is, the transferring of handicapped persons from large state institutions to community-based facilities. Concern with obtaining more manageable government and social institutions would reinforce the movement toward deinstitutionalization, and the concern with forming stronger community ties could result in less alienation and more normal social relationships for handicapped persons returning to or remaining in communities. Potential problems resulting from decentralization center on less coordination of services and a lack of availability of low-incidence services in smaller communities and more widespread locations.

An expansion of the knowledge system beyond the objective could result in increased attention to the whole individual in planning treatments for the handicapped. Rehabilitative and educational services would attend to the attitudes and spirit of the individual, along with his or her physical and cognitive characteristics. A new orientation would be required for service deliverers, one which would focus on providing wholistic services to the handicapped, with an increased emphasis on feelings and attitudes. In addition, the movement away from labeling the handicapped would be expected to continue as categories and classification schemes would be viewed as too narrowly defining the individual in terms of only one of his or her many characteristics and attributes. Thus, categorical funding systems and programs could be met with increasing resistance.

A feeling of the connectedness of all persons could affect attitudes concerning the separateness and isolation of the handicapped — both the attitudes of the handicapped themselves and the attitudes of others. Not only would a feeling of connectedness increase the acceptance of handicapped persons within the com-

munity, but it would also affect the educational and rehabilitation services they receive. Instead of these services being one-sided, with the therapist or the educator trying to change the attributes of the handicapped person, the two people would become interactive, with changes, particularly attitudinal changes, occurring in both parties.

Finally, greater consumer questioning of the experts and "lay" involvement in decisions previously made by experts suggest that the current trend of increasing involvement of handicapped persons and their families in planning, implementing, and monitoring the appropriateness of programs could be strengthened in the future.

On the other hand, a continuation of the current belief system based on economic rationality, material productivity, and objective knowledge could, if combined with an economic slowdown, lead to increased conflict and competitiveness, with individuals being excessively preoccupied with their own self-interests. This alternative future could have a negative impact on the handicapped. A highly competitive society would seem less likely to extend rights to the handicapped, to support affirmative action programs, or to take steps that might increase the competitive advantage of the handicapped economically.

Similarly, an emphasis on economic productivity in a time of scarce resources could result in programs for the handicapped being evaluated strictly in terms of their ability to produce individuals who would be fully productive economically. This could result in a sharp cutback of programs for handicapped individuals who could be helped to reach their fullest potential but who would be unlikely to be economically independent. Within surviving programs, an economically oriented belief system suggests that programs would become more narrowly focused on vocationally related skills with even less attention given to developing other aspects of the individual.

Either a transformation in the value system or increased competitiveness resulting from an economic slowdown clearly will affect the lives of handicapped persons profoundly. The specific effects, however, could be quite different depending on whether or not a transformation occurs. Thus, trends and movements in upcoming years must be scrutinized not only in terms of their specific implications and effects but also as pieces of a potential pattern indicating a transformation of the value system.

ECONOMICS

Following World War II and through the 1960s, this nation experienced high rates of economic growth. The extension of rights, support, and help to disadvantaged, minority, or other groups outside society's mainstream owes a great deal to that economic abundance. Periods of great economic growth allow a generosity to excluded groups and improvement of their lot in the form of social services, education, and employment opportunities, without taking away from those who are already well fixed. Thus, any changes in the overall economic picture can have important implications for groups seeking to become better assimilated into the social and economic mainstream.² Three economic trends discussed by Mr. Hamrin at the panel meeting seem to have important implications for the handicapped. These are a shift to an information/service economy, changes in employment patterns, and a slowdown in the economic growth rate.

Trends

1. *The shift to an information/service economy is expected to continue.*

The United States economy gradually has been shifting from an industrial to an information/service economy. In the early 1950s for the first time, more than 50 percent of the population was employed in industries that do not produce goods (e.g., transportation, banking, utilities, education, health, communications, and entertainment). It is projected that by 1985, 80 percent of the work force will be employed in information/service jobs and only 20 percent will be employed in producing all of our agricultural and manufactured goods.

Although this trend has been underway for some time, its impact on the economy will be felt increasingly as advances are made in electronic technology. Already computers are dispensing money in banks, recording prices in supermarkets, and monitoring patients in hospitals. Further advances along these lines may transform our whole way of life and certainly will affect employment and economic growth.

² *The relationship between economic growth and the extension of rights and services to excluded groups was discussed by Mr. Klineberg at the panel meeting.*

2. *Employment patterns will change.*

New jobs will be created in the information/service sector of the economy as people continue to want more services, and especially as advances are made in electronic technology. Many information jobs opening up as a result of growth in electronic technology will require high-level skills, particularly stressing facility in manipulating symbols. Other jobs will require lower level skills, such as entering data into and retrieving data from computers, but will allow the upgrading of some clerical and technical workers to positions involving computer operations. The general trend away from working directly with industrial machines to working with computers should reduce the physical demands on factory workers.

Other factors that will affect employment are demographic changes and underemployment.

Demographic changes. As a result of the lower birth rate after the mid-1960s than during the post World War II baby boom years, there will be a dramatic slowdown in the number of new workers entering the work force in the late 1980s. The slower rate of growth, however, is expected to be offset somewhat by an increase in the number of women entering the work force (from 46 percent of all women in 1975 to a projected 51 percent in 1990) and by a decrease in the rate of unemployment. As fewer young workers are entering the work force, the post World War II baby boom generation will be reaching middle age. Thus, the average age of the work force will increase. Fewer young workers will be available to take entry level jobs and more middle-aged workers will be competing for career advances.

Underemployment. The problem of underemployment is expected to increase in the 1980s. Already there are more college graduates than jobs requiring higher order skills. The Bureau of Labor Statistics has estimated that by 1980 there will be an annual excess of 140,000 college graduates. Because of this excess, the educational level required to obtain jobs is increasing. In the 1980s, even more than now, a person will likely need a college degree to obtain a job that does not require college-level skills. College graduates are likely to be dissatisfied with jobs that do not use their higher level skills, and persons who have the skills to do the work but do not have a college degree may have difficulty finding a job at all. One possible outcome of this situation is

that workers may seek changes in the structure of work that would enable them to use their abilities more productively.

3. *The economic growth rate is expected to slow down.*

The steady economic growth rate that characterized the period from 1946 to 1966 has slowed, and this trend will likely continue into the 1980s. The following factors are expected to reduce the growth rate.

Concern for the availability of nature resources. This country is using natural resources at a rapid rate, and although no serious scarcity is expected in the 1980s, fear of future shortages will put constraints on the use of resources. Prices most certainly will increase, as will dependency on foreign sources.

Low level of business investment. The proportion of the Gross National Product going to business investments has been low in recent years. Furthermore, businesses have been required to invest capital that they otherwise might have used to increase productivity to meet environmental standards imposed by the government. If the level of business investment remains at recent low levels, capital expenditures could be insufficient to meet production demands, causing supply bottlenecks and sporadic shortages.

Technological maturity. The rate of technological invention has slowed in such traditionally productive industries as steel, household appliances, clothing, and automobiles. Since inventions in these industries have accounted for much of our growth in the past, this slowdown is expected to affect our overall growth rate negatively.

Worker dissatisfaction. Unless creative solutions are found to the problem of underemployment, many workers are apt to be dissatisfied with their work and, thus, less productive than they would be if they found their work satisfying.

Slower growth rate of the work force. The demographic changes described earlier suggest a potential shortage of new workers entering the work force in the 1980s.

Together, the above five factors are expected to result in a slow rate of economic growth in the 1980s. One factor that is expected to increase growth and, therefore, to offset these negative factors to a certain extent is an increase in labor productivity. Although worker dissatisfaction could negatively affect labor productivity unless solutions are found to the problems of underemployment, two factors are expected to increase productivity. First, slower growth of the labor force is expected to result in an increase in the capital stock per worker, or the capital/labor ratio. Although it has not been established, it is generally believed that the more capital equipment or facilities allocated for the use of a worker, the more productive the worker will be. Second, demographic changes resulting in a greater percentage of mature workers in the labor force are expected to increase productivity.

While the predicted increase in productivity is expected to alleviate an economic slowdown somewhat, there are several factors whose effects on the economy are still unknown. First, resource substitution could lessen the effects of the short supply of some natural resources, but the development of substitution technology is expensive and can take many years. Second, changes needed to meet government-imposed environmental standards will be made by the 1980s for the most part and, thus, more capital will be available for investments to increase productivity.

Third, the slowdown in the rate of invention in the traditionally productive industries may be offset somewhat by the rise of the electronics industry and associated technological innovation in that area. In addition, use of computers in the manufacturing process could increase productivity dramatically, at the same time greatly reducing manufacturing costs. However, because the initial conversion to computer-assisted manufacturing (CAM) is expensive, and accompanied by resistance on the part of labor, it is still unknown how much computer-assisted manufacturing will affect the economy in the 1980s.

Fourth, productivity in the service sector of the economy may be heightened, both through use of better management techniques and through use of new technologies. Fast-food services such as McDonalds are examples of how improved management techniques are being used to increase the reliability and efficiency of services; the automatic car wash and automatic coin receptacles at toll booths demonstrate the use of technology. Again, however, it is unknown how much change

will be instituted and, thus, it is impossible to predict the impact of such change.

Finally, the effect of increasing affluence on the economy is unknown. Once people reach a certain level of affluence, their interest tends to shift from material goods and income security to comfort, leisure, safety, and intrinsic rewards in their jobs, such as being involved in interesting work and having a sense of accomplishment. Such a shift, already underway, is expected to affect the pattern of economic growth in the 1980s, but the extent of the change remains to be seen.

Implications for the Handicapped

The economic trends described here could significantly affect the lives of handicapped individuals and the services provided them. The projected decline in the rate of economic growth will mean a decreased number of federal, state, and local dollars available for new or existing services and programs. Because implementation of concepts such as "appropriate education," "normalization," and "full participation of the handicapped in society" often requires new services and programs, these movements may be curtailed as a result of decreased levels of funding. Also, programs and services for the handicapped may be forced into competition with those of other groups such as the disadvantaged or ethnic minority groups. Thus, the movement to obtain equality for handicapped individuals, though compatible with the changing values and beliefs of the society, could be stalemated by changing economic conditions. This, in turn, could result in more litigation and political pressure on behalf of the handicapped.

Decreased levels of federal funds could be used as a compelling argument for "block funding," or distribution of federal education funds to the states in a lump sum without earmarking them for specific programs. Under such conditions, programs for the handicapped would be in competition with all other educational programs for federal funds, and historical precedent suggests that they would not receive their fair share of funds. Furthermore, when programs have received adequate funding, the comparatively high cost of services for the handicapped has been perceived by other groups at times as more than a fair share, leading to hostility and backlash.

If levels of federal funding for programs and services for the handicapped were to remain constant or be cut

back, state and local agencies would likely be much less willing to submit to increased federal regulation and monitoring of programs in order to qualify for decreasing dollars. Critical initiatives in extending equal rights to the handicapped, such as PL 94-142 or Section 504 of the Vocational Rehabilitation Act of 1973, have come from the federal government and have been supported in large part because of financial incentives (federal dollars to cover a percentage of excess costs) or sanctions (the withholding of HEW funds). Decreased levels of federal funds could make the incentives seem less attractive and the sanctions less damaging, and thus could seriously slow this movement.

On the other hand, decreasing funds for the handicapped may force existing programs and services to become more efficient by reducing redundancy and increasing coordination of service agencies. To date, efforts to coordinate services offered to the handicapped by various agencies have met with resistance and "turf-manship." Decreased dollars could provide the impetus for cooperation among agencies, somewhat mitigating the impact of slower economic growth.

In terms of employment, the projected trends could have a positive impact upon the handicapped. The increasing percentage of information jobs, with their emphasis on manipulation of symbols rather than physical operations, strength, or stamina should mean that physically handicapped individuals will be eligible for and easily able to fill an increasing range of jobs in the labor market. Furthermore, the projected slowdown in the number of workers entering the work force in the 1980s should make employers more willing to adapt facilities and jobs to meet the special needs of handicapped workers. Therefore, the employment picture for the physically and sensorially handicapped in particular should be greatly improved.

Although many information jobs involving direct manipulation of symbols may be beyond the capabilities of the mentally handicapped, other information jobs will be relatively routine and clerical in nature. Too, with the increasing application of management techniques that standardize procedures within the services industry, more service jobs may become relatively routinized and thus more easily carried out by the mentally handicapped.

As more jobs fall into the information and service categories, so will the need grow for vocational and educational programs for the handicapped emphasizing different types of skills. Curricula will need to include skills with electronic devices and computers and will

need to give greater attention to mathematics, engineering, computer programming, data processing, and the information sciences. Similarly, as the range of service jobs expands, vocational programs will need to be updated constantly to include requisite skills.

Overall, employment opportunities for the handicapped should continue to improve. It was suggested, however, that an effect of the disparity between the number of workers attaining higher levels of education and the number of jobs requiring those levels of education was to raise the education requirements of lower level jobs even though the tasks themselves might not require a high educational level. This phenomenon may close some jobs to some handicapped individuals that they otherwise would be perfectly capable of carrying out.

SOCIAL INSTITUTIONS

The values, economic conditions, and technology of a society inevitably are reflected in its social institutions. As changing values and beliefs interact with economic and technological developments, correlative changes can be anticipated in various social institutions. Mr. Klineberg pointed out as an example that prior to the industrial revolution when 80 percent of the nation lived on farms, the family was the economic and productive unit, the center for socialization, and the basis for identity of individuals. Men and women had clear-cut divisions of role and responsibility. Families were large, and divorce rates were kept low by structural bonds of mutual dependency. With industrialization, urbanization, and the passage of child labor laws, children no longer were economic assets, and over a period of years the average size of families has progressively declined. Reduced family size, the invention of work-saving devices, and improvements in health resulting in greater longevity have made it more difficult for women to turn childbearing and homemaking into the lifelong, meaningful occupation they once represented. Women's need to find meaning in new areas, combined with economic conditions, has inevitably resulted in a growing number of women entering the work force. As a result, not only has the structure of the family changed but pressures are increasing for change in the conditions of work.

Mr. Klineberg cited evidence similar to that discussed in the values and economics sections, that economic conditions, as well as many of society's beliefs and values, are changing. People are becoming more and more aware that continuous growth in resource utilization or world population cannot be sustained without seriously straining the environment and threatening the quality of life. At the same time, in response to large bureaucracies and centralized government, many individuals are seeking new modes of freedom in more manageable social units wherein they can attain a sense of personal control over as many areas of their lives as possible. One example of this is the growing focus not just on jobs, but on *meaningful* work roles. Unfortunately, society is having a hard time in meeting the demand for meaningful work, for reasons such as slower economic growth, higher educational levels of the population, and the entry of more women into the work force. At the panel meeting, Mr. Klineberg discussed changes that are occurring in the structure of families, work roles, communities, social services, and education.

Trends

1. *The nature of families is changing rapidly and will continue to change.*

Smaller families. The average size of the family decreased from 3.67 members in 1960 to 3.37 members in 1977; from 1960 to 1977 the percentage of families with three or more children decreased from 20.5 percent to 14.7 percent, whereas the percentage of families with only one child increased from 18.4 percent to 19.6 percent.³ One result of couples having fewer children may be that each child will become the recipient of greater levels of parental attention and resources.

A greater variety of family types. The nuclear family — a working husband, a wife at home, and several children — no longer is the predominant family pattern. The number of two-career families has increased. In fact, in 1975 only 34 percent of husband/wife families were families in which the husband was the sole breadwinner. In addition, single-parent families are becoming

more prevalent because of a rising divorce rate.⁴ In 1960, 9.3 percent of children under eighteen years of age lived in single-parent families; in 1975 the percentage had increased to 17.1.⁵ Finally, an increasing percentage of couples choose to remain childless.

Shifts in the roles of men and women. As women share increasingly in the financial support of the family unit, men are likely to share increasingly in the responsibilities of homemaking and nurturing.

Demand for services. Greater numbers of women in the work force will mean that service delivery patterns that assume someone is home during the day, or when schools are dismissed at 3:00 p.m., are increasingly inappropriate. A demand may arise for new services or for changes in current service delivery systems to accommodate these factors.

2. *The next 15 years will demonstrate a press to expand the number of meaningful jobs and to make work roles and lifetime work cycles more flexible.*

More flexible work schedules. As more women enter the work force, as single-parent families become more common, as men begin sharing in homemaking and nurturance, and as people place a greater emphasis on personal development, they will likely demand more flexible work schedules. This change may include more widespread use of flexible work hours, expanded opportunities for part-time work, new interest in unpaid leaves of absence and in other ways of broadening individual choices and integrating work with other responsibilities.

Lifelong learning. Schooling may become a lifelong activity. More rapid expansion of the knowledge base will create a need for continual re-education and updating of skills. Individuals will need to be able to move back and forth between work and school with greater ease. Sabbatical leaves and radical career or job changes may become much more common.

⁴ *The number of divorces in the U.S. has increased from 393,000 in 1960 to 1,122,000 in 1978 (from the National Center of Health Statistics).*

⁵ *From U.S. Department of Commerce. Social Indicators 1976. Washington, DC, 1977.*

³ *From U.S. Bureau of Census. Statistical Abstract of the United States: 1978. (99th edition). Washington, DC, 1978.*

Worker democracy. A more highly educated work force may press for a greater say in how work is done. Workers may demand a role in decision making in order to make jobs more meaningful and to gain a greater sense of control over that portion of their lives.

3. *Smaller communities may be considered desirable places to live once again.*

The desire for a sense of greater personal control and for more manageable social units also may affect the communities in which people choose to live. Since 1970 a remarkable reversal has taken place in the 200-year-old pattern of urbanization. Until the beginning of this decade, the population in American cities and suburbs was growing rapidly and the population in rural counties was declining. Between 1970 and 1976, the total U.S. population grew by 5.6 percent; the population in metropolitan areas grew by 4.7 percent, and the population in non-metropolitan areas grew by 8.0 percent.⁶ This may indicate that cities have surpassed the limits of manageable size in terms of the amenities they can offer, and that people are seeking work and social settings more "human" in scale. Small towns and rural areas may experience a revitalization because their smaller scale — enhanced by cultural linkage to the outside world through sophisticated, interactive communication systems — will make them more attractive places in which to live.

4. *The cost of social services may increase.*

To date, many social service agencies have relied on a small professional staff supplemented by community volunteers to provide high quality/low budget services to clients. Most often, community volunteers have been non-working women who could devote a day or more a week to the social service agency. As more women enter or return to the work force, a decline in volunteerism can be expected. This will cause problems in the delivery of social services. New paid professional roles may have to be established, and the cost of social services can be expected to increase. This could be miti-

gated somewhat by a movement toward more flexible work schedules that might permit a greater range of individuals — working and non-working men and women — to devote time to human services.

5. *The decline in birth rate will continue to result in declining school enrollments.*

Fewer students resulting from a declining birth rate, combined with technological advances in teaching devices (computer-assisted instruction), could permit educators to pay more attention to individual differences among children and to develop individualized educational programs for all children. On the other hand, deteriorating economic conditions may lead to a growing reaction against monies spent for public needs and welfare. Passage of Proposition 13 in California may be indicative of such a mood. Thus, in the face of declining enrollments, people may choose to maintain the same homogeneous, large-group approach to education and to cut public spending by closing schools and laying off teachers.

Implications for the Handicapped

Trends in the social institutions will have specific effects on the provision of services to the handicapped. As the number of single-parent or two-career families increases, the demand for extended day programs, particularly for severely handicapped students, may become greater. In the past, severely handicapped children who remained at home have required extensive parental care and attention. As family structures change, families may seek assistance in providing this care through extended day programs or summer school programs. Parents also may have less time to participate in activities designed to assure an appropriate education for their handicapped children. With fewer children and more attention focused on each one, though, parents are unlikely to be willing to settle for less than a quality education for their children. Thus, it is likely that there will be a growing demand for paid child advocates who can assume parts of the parental role and responsibilities in activities including due process procedures.

More flexible work schedules should allow jobs to be more easily accommodated to special needs of handicapped individuals. If work cycles and education cycles

⁶ Testimony entitled, "Internal Migration in the United States since 1970," presented to the House Select Committee on Population, February 8, 1978, by Calvin Beale, Department of Agriculture Economic Research Service.

become more interspersed, and if the concepts of life-long learning and mid-life career changes become more common, educational programs will have to be developed and extended to meet the needs of handicapped adults. New curricula and new types of personnel will be needed for such an effort. Declining numbers of school-aged children may facilitate this movement by creating a surplus of school facilities and personnel that could be used for programs for handicapped adults.

Traditionally, rural areas have had inherent problems in providing and coordinating services for the handicapped. If the population is increasingly dispersed, service delivery may become even more difficult. The efforts of various service agencies in rural areas *must* be coordinated to assure comprehensive services. Interactive telecommunications capabilities, as they are developed, may alleviate this problem somewhat by allowing sophisticated linkage systems to connect service providers in rural areas with diagnostic or consultative personnel in metropolitan areas. For example, by using interactive television, a distant diagnostic prescriptive teacher could assist a regular class teacher in a rural area in making curricular adaptations for a handicapped student.

Service agencies for the handicapped, like other service agencies, have relied heavily on volunteer help. The next few years will show an increasing need to fund, recruit, and train a wide variety of auxiliary personnel to supplement a diminishing corp of volunteers, and also to develop certification standards and career ladders for these new kinds of personnel. On the other hand, some service agencies may be able to change or extend their hours of operation, to adapt to single-parent or two-career families and to utilize volunteers who may have full-time careers but also would like to devote some time to human services. This change could alleviate the upcoming personnel shortage somewhat.

Finally, if school systems take advantage of declining enrollments to provide all students with individualized educational programs, more handicapped students could likely receive major portions of their educational programs in regular settings — because classes would be smaller, regular education teachers would be more accustomed to dealing with individual differences among children, and technological advances in teaching devices would facilitate individualized instruction. If, however, communities decide to cut school budgets in the face of declining enrollments and tightening economic conditions, these conditions that would facilitate integration of handicapped students probably would not occur;

instead, a decline in the support system offered to teachers and increasing resistance among regular educators to the integration of handicapped students would likely result.

TECHNOLOGY

Technology pervades our lives. This has been seen in the preceding discussions of values, economics, and social institutions. Technological advances have allowed only a small percentage of the labor force to produce all of our food and material goods. Because as a society our basic needs are well met, for the most part, we have begun to look for new ways to improve the quality of our lives.

One technological innovation that has opened up limitless possibilities for further changes to our way of life is the computer. The recent development of micro-circuitry has made it possible for computer circuitry that used to require a large amount of space to now fit into a space smaller than a dime. The smallness of these new computers allows them to be used in innumerable previously inaccessible places, and it also increases their speed. The new mini-computers, further, are more reliable and considerably cheaper than the previous computers. In fact, technology has progressed so rapidly that computers with the same capabilities as those used by American scientists in 1959 are presently available to the general public for \$700.

Computers and microelectronics can take over or greatly improve many of the routine tasks at home, school, and work, giving us further freedom to explore and enhance other facets of our lives. For example, at home, computers can keep track of family financial and personal records and can regulate appliance usage; at school, they can teach skills such as spelling and addition, match students with appropriate programs, and keep track of the progress of individual students; at work, computers already are handling all kinds of data processing functions for large companies and will be increasingly available to smaller companies in the future.

Because of the computer, many tasks that previously required physical labor can now be accomplished by pushing a button. And in the future, even button pushing may become unnecessary. As computers are made more sensitive, any body movement — a wave of the hand, a stomp of the foot, a wink, a vocal command — will be able to activate a computer or other electronic

device. In addition to taking over many routine tasks, computers will extend our physical abilities and our abilities to communicate. At the panel discussion, Mr. Coates described some of the technological devices available to increase our physical abilities and to facilitate communication. He also discussed problems that interfere with technological advances.

Trends

1. *Technology that will expand our physical abilities and our abilities to communicate will continue to be developed.*

Physical abilities. Many technological devices to increase our physical abilities already exist. Improvements to these devices and development of new devices are expected in the 1980s. Some of these devices and their functions are:

- The *voice chopper*, which compresses tape recorded speech without distortion so a person can obtain information through listening almost as fast as through reading;
- *Radar devices* that can be worn on the body, to increase a person's ability to perceive the environment;
- *Biofeedback devices* that convert physiological responses to a sound or light signal, used in combination with operant conditioning to give persons control over their physiological responses; with these devices, persons have learned, for example, to lower their blood pressure, rid themselves of migraine headaches, and increase their circulation;
- The *hardyman exoskeleton*, developed as part of the space program, which can increase a person's strength tenfold;
- *Electronic devices* such as the pacemaker, implanted in the body to assist in carrying out natural functions.

Ability to communicate. Satellite hookups and interactive television are beginning to broaden the capabilities of our telecommunications systems. People from

various areas of the country or of the world now can hold group discussions over the telephone. By connecting the telephone with television, visual contact becomes available during telephone conversations; by connecting it with a keyboard (Cyberphone), typed messages can be transmitted.

Computer linkages allow even more sophisticated interactions. Wider application of this capability is expected in the 1980s. Systems will begin to bring services available in urban centers to rural areas, link persons with specialized knowledge to those with a need for their knowledge, and bring persons in contact with others who have similar interests, making possible more effective coalitions.

2. *Effective new products that are feasible may be developed.*

Although technological potential is almost limitless, many new products that would better our lives either will not be available or will not be as effective as they could be. Some of the reasons for this are discussed below.

Information. Although technological expertise abounds, we have no systematic way of making that expertise generally available. Often, a need exists and a technological capability or product exists to meet that need, but those with the need are unaware of the technology, and vice versa. Even supposing a broad mutual awareness, persons aware of a need may have difficulty describing the problem in enough detail for technological experts to devise a practical solution.

A communication problem also exists from field to field among the professions. The body of knowledge is so fragmented by specialty area that developments in one area often are unknown in another. Thus, vital connections that would allow technological advances may be overlooked.

Economics. Some technological advances are prevented by economic conditions. If a company is making a profit from an existing product, little incentive exists to improve the product by applying more current technology. Also, new products may not be developed because the market is unproven or because the product's use is limited to a small group of persons. Furthermore, many innovations are conceptualized by individuals who do not have the resources available to test,

evaluate, or market their inventions, and therefore are unable to carry out their concepts. Even when new products are developed, they often are too expensive to be of use to many of the persons they were designed to help.

Standards and certification. No source similar to the Underwriters Laboratory is available to set standards for all new products, so the public has no satisfactory means of knowing if a product is reliable or that it incorporates the best technology available. Additionally, there is no outside incentive for companies with existing products to keep up with technological advances, other than competition from other companies.

One solution to each of these problems would be for the government to become involved in disseminating information and setting standards. It even could provide a guaranteed market for products that would benefit only a small group of users. Unfortunately, according to Mr. Coates, the government, like all bureaucracies, is a fragmented and conservative organization that is afraid of change, has a narrow rather than broad focus, has no structure for rewarding a job well done, and is more likely to play it safe than to take the risks needed to find creative, large-scale solutions to existing problems.

Implications for the Handicapped

Many forces in our society have combined to change our attitude toward the handicapped from one of exclusion to one of inclusion. Handicapped children are being educated in regular classes in schools, and handicapped adults are becoming part of the work force. Technological advances have reinforced this trend toward inclusion of the handicapped.

The movement toward a telecommunications-rich society, less dependent on mobility and more on the ability to operate intellectual machinery, is opening vast job opportunities for the handicapped. Technology is a great democratizer, a great equalizer. Buttons do not care about race, religion, national origin, sex, or handicapping condition.

Technological devices can be used to increase handicapped persons' abilities to participate more fully in the activities of society. The voice chopper can allow blind persons to hear almost as fast as others can read; the Cyberphone can allow deaf persons to communicate

by phone; radar devices can increase the mobility of blind persons; and hardyman armor can increase the strength of persons who are physically weak. Sensitive electronic devices implanted in the body could be used to increase the muscular control and coordination of those whose physical difficulties interfere with their ability to function. These are just a few examples of how technology can be used to aid handicapped persons.

As noted, although many of these devices are available, the technology exists to improve what is available and to develop new devices designed for specific problems. Because the handicapped are a relatively small group with diverse needs, and because their problems are not standard nor easily standardizable, many devices that could be useful to them are not being developed. Development of such devices would require collaboration among persons from various fields. The problems and costs of such collaboration, along with the difficulty in standardizing equipment for the handicapped, make it unprofitable for businesses to develop devices for the handicapped.

Many of the devices that are developed are done so by individuals who have the ingenuity to find solutions to personal problems but who lack the inclination or the resources to make those devices generally available. This situation may improve somewhat in the future if developments in computer-assisted manufacturing allow small-lot manufacturing to be more feasible economically. As was pointed out in the economics section, though, it is not yet clear whether the capital investments necessary to introduce computerization into manufacturing industries will be made.

Another factor that could improve the situation is the increased number of politically active aged persons in America. These persons are likely to have certain needs similar to those of the handicapped. As a combined group, the handicapped and the aged would increase the market for new devices and, therefore, increase the incentive for businesses to develop such devices.

The Bureau of Education for the Handicapped and other government agencies have funded the development of a number of devices for the handicapped but, as Mr. Coates pointed out during the panel discussion, much more could be done. Government agencies could bring together, on a long-term basis, technologists, handicapped persons, and persons involved in providing services to the handicapped, to explore specific problems of the handicapped and technological solutions to those problems. Over a period of time, these persons could develop a satisfactory and productive way of com-

municating with one another. Government agencies also could provide more support for the development and certification of a number of technological devices that would benefit the handicapped, could subsidize the marketing of these devices so they would be available at reasonable cost, and could lobby for funding of these activities. Too, government agencies could serve an important function by disseminating information about products to potential users.

As handicapped persons become more and more politicized, better ways almost certainly will be found to apply technological advances to products for the handicapped. In the past, handicapped persons have been isolated, with few means to make their needs known. But handicapped persons are beginning to move out of isolation. Telecommunications systems can assist in this movement. People with similar problems who are scattered across the country could have the means to communicate with each other, discuss their mutual needs, and collaborate in getting those needs met. Persons with specialized knowledge could be made available to handicapped persons even in remote rural areas. Information and resources could be brought into the homes of handicapped persons who are unable to go out. Finally, increased communications could facilitate the sharing of information vital to development and distribution of needed technological devices.

MEDICINE

In the past, medical progress has done much to reduce the incidence and severity of handicapping conditions. For example, control of rubella has reduced the number of deaf and blind persons; development of the polio vaccine has reduced the incidence of orthopedic handicaps; and treatment of Wilson's disease actually has reversed mental deficiency in individuals who improperly metabolize copper. Severe handicapping conditions probably have more than 4,000 separate causes. The major causes change with medical advances.

New breakthroughs in fields including biochemistry, neurophysiology, and genetics are expected to further reduce the incidence of physical and severe mental handicapping conditions. In addition, medical technology has been aided by electronic/information technology in the production of promising devices and techniques for use in diagnosis, treatment, and prevention of handicapping conditions. Interaction between

these fields has produced computerized x-ray type diagnostic devices and ultrasound applied to diagnosis, as well as computerized laboratory analysis and record-keeping techniques that increase accuracy and shorten time requirements, potentially reducing costs. At the panel meeting, Mr. Moser discussed medical advances in diagnostic techniques, neonatal care, and public health, which are expected to contribute to the reduction of handicaps.

Trends

1. *Dissemination of new diagnostic techniques is expected to contribute to the reduction of many conditions.*

The great need for new diagnostic techniques is indicated by the high percentage of cases in which the cause of severe mental retardation is unknown (40 percent). Widespread use of new diagnostic tools and techniques promises to make a drastic cut in such statistics. For example, it has been estimated that widespread use of the CAT scanner, a computerized device that produces in three dimensions the type of image that traditional x-rays produce in two dimensions, could determine the cause of retardation in as many as 10 percent of the cases in which cause is currently unknown. Other diagnostic procedures that are expected to make major contributions to the reduction of handicapping conditions are amniocentesis and genetic screening programs.

Amniocentesis. The process of amniocentesis allows examination of fetal cells and amniotic fluid before a child is born, enabling the earliest possible diagnosis and treatment for a variety of conditions. Amniotic fluid is extracted from the womb, and fetal cells contained in the fluid are centrifuged and microscopically examined. Nearly 200 different disorders are detectable through amniocentesis; those with highest incidence are Down's syndrome and meningomyelocele (incomplete closure of the spine). Although amniocentesis is considered a relatively safe procedure (complications occur about once in 5,000 cases), it is recommended only in instances of clear risk of a pathological condition. Computer analysis is not yet used for chromosomal studies of the fetal cells, but it is technologically possible and holds promise for reducing the expense and laboratory time required by amniocentesis.

Ethical problems arise, however, when early diagnostic techniques identify a condition that cannot be treated, such as Down's syndrome. Some genetics centers will not perform amniocentesis unless the parents indicate that they would interrupt pregnancy if results are positive. Some people also believe that if parents choose to continue the pregnancy with the foreknowledge that the child has Down's syndrome, the parents should take financial responsibility for meeting the special needs of the child. Mr. Moser expressed repugnance toward this position. Others think that foreknowledge of the child's condition is worthwhile if the parents choose to continue pregnancy, since it will at least allow time to prepare for the child and begin learning ways of caring for the special needs associated with the handicapping condition.

Genetic screening. Reduction of metabolic disorders has been facilitated greatly by newborn screening programs such as those used to detect phenylketonuria (PKU). PKU is characterized by an inability to metabolize phenylalanine, a nutritional substance contained in many foods. Babies found to have PKU are put on a special diet until ages four to six, and then they may go on a normal diet. If the children are not given the special diet, excess phenylalanine in their blood will cause retardation. Screening techniques for diseases like PKU are becoming simpler to use and less expensive, exemplified by the Guthrie technique, which allows tests for as many as 10 disorders to be performed on a single spot of infant's blood sent to the laboratory on a postcard.

2. *Improved neonatal care is expected to continue reducing the incidence of handicapping conditions through better facilities and earlier treatment.*

Armed with the knowledge provided by new diagnostic techniques, the physician is much better prepared to deal with special needs of the newborn infant. It is anticipated that prematurity not complicated by or caused by other health problems will be manageable and that many major lifelong complications will be preventable. Because many forms of cerebral palsy are related to prematurity and difficulties at the time of birth, the incidence of cerebral palsy is anticipated to be materially reduced. Recent reductions in one form of cerebral palsy (cerebral diplegia) support this expectation.

Regional perinatal care centers have established excellent records in reducing the incidence of cerebral palsy and in saving premature babies. As more such centers are established and new technology is disseminated throughout the country, we can expect a drop in problems associated with cerebral palsy and prematurity.

Some concern has been expressed that babies who are saved from death caused by prematurity may be left with handicapping conditions. Recent studies suggest that this is not the case — babies of average weight for their gestational age usually survive prematurity in good health, but babies of small weight for their gestational age, whose small size indicated that they had some health problem *in utero*, are more likely to be left with some disabling condition. Thus, medical treatment can make up for time lost in the womb but cannot yet cure many pathological conditions that begin *in utero*.

3. *The field of public health is expected to contribute to the reduction of handicapping conditions through immunization programs, screening for environmentally related conditions, better record keeping and tracking of potential victims of disease, and dissemination of medical techniques and technology.*

Infectious diseases. Infectious diseases account for about twice as many cases of mental retardation as do genetic causes or inborn errors of metabolism. Various forms of measles (rubella and rubeola), the major handicapping infectious diseases, can be prevented through immunization programs. Rubeola possibly can be entirely eradicated, since it has no animal carrier and immunity is permanent.

Although immunization for many diseases is often free and required by municipal law, many families still neglect to have all their members immunized — possibly because of the logistics involved in obtaining the health care or because of ineffective publicity campaigns. Some such campaigns present immunization as a bureaucratic requirement rather than stress it as a necessary health protection measure. For a variety of reasons, the problem of reaching every citizen who needs immunization is a significant one.

Environmental hazards. Environmental hazards are the cause of a variety of debilitating conditions. Discovering and controlling harmful substances and preventing their disabling effects are major public health tasks. Lead poisoning, for example, accounts for about two percent of the cases of retardation. Screening for

lead poisoning can identify and minimize damage in some cases, but the screening is subject to the same problems as immunization programs in reaching citizenry — too many cases go undetected and untreated.

Record keeping. The importance of record keeping is exemplified by a major public health task facing us: control of maternal PKU. This problem has arisen because a relatively large number of women who were treated successfully in childhood for PKU are now approaching childbearing age. Screening programs that began in the 1950s and 1960s prevented these women from developing PKU retardation, but a recent discovery has been that unless they return to the special diet during pregnancy, their children may be born retarded as a result of the excessive phenylalanine in the mother's blood. Although the child does not have the disease, the mother's excessive phenylalanine will cause the child's retardation. Thus, unless a follow-up to the screening that took place in the 1950s and 1960s is undertaken, the cases of retardation saved by screening will be replaced by cases caused by maternal PKU.

Since computer use greatly facilitates performance of such screening and tracking tasks, the record-keeping function of public health services is expected to be aided increasingly by more efficient computer linkage systems. Thus, in addition to aiding statistical and etiological research, computer technology can increase the capability of the public health system to track potential victims.

Such tracking, as well as the storage of massive data concerning individuals by a centralized (government) source, is complicated by privacy issues including those of individual rights. The seeming incompatibility of keeping such data and at the same time ensuring the individual's privacy may be resolved by new developments in technology that would allow storage of an individual's entire medical history on his or her own portable "floppy disc" (an information storage device similar to a flexible phonograph record). In this way, the individual could have control over who would have access to the information, yet still allow it to be entered (with or without identification) into statistical data bases at his or her discretion.⁷ Although such a system is technically possible, its feasibility for widespread use will depend upon the general availability of computers in medical facilities.

Dissemination of medical technology. As part of its charge to ensure the availability of basic health care,

the public health system performs *de facto* dissemination of medical technology. The success of many of the techniques discussed in regard to reducing handicapping conditions (e.g., neonatal screening programs) will depend upon their availability through the public health system.

Such dissemination of technology, though, usually occurs sporadically, often characterized by clear geographical centers of excellence. In the example of neonatal screening, programs have been successful in some states, while other states have lagged behind. The variety of conditions and problems affecting application of new techniques in various areas led some panel members to question how rapidly public health program improvements actually would occur.

IMPLICATIONS FOR THE FIELD OF SPECIAL EDUCATION

The trends just discussed could impact upon the field of special education in a variety of ways. This section considers some of these implications.

1. *Changes in the Target Population*

Currently, special education programs and projects focus primarily on handicapped infants and children through age twenty-one, encompassing all forms and degrees of handicap. Information presented in this article suggests that changes are possible in the target population for special education programs that would greatly affect those programs.

Educational programs for handicapped adults. The trend toward adult education and lifelong learning is expected to become stronger, particularly if augmented by trends toward midlife career changes, sabbatical leaves, updating of obsolete job skills, and desires for self-actualization. This trend is likely to create a push for educational programs for handicapped adults, both to encourage personal fulfillment and to teach career-related knowledge and skills.

Fewer handicapped students. The decline in the birth rate and in school enrollments will mean fewer handicapped students. Furthermore, technological advances may continually reduce the number of students with handicapping conditions who need special education or related services. New prosthetic devices may allow increasing numbers of students with physical or sensory impairments to function in regular education

⁷ Mr. Coates discussed this idea at the panel meeting.

programs. Advanced information and telecommunication systems might make some skills, such as reading ability, less critical in terms of participation in regular education programs and in society at large. Therefore, for a growing number of students having handicapping conditions, the provision of prosthetic devices or some special materials may constitute the extent of services needed. Also, medical advances may continue to reduce the size of the severely handicapped population. This could be particularly true for certain types of handicapping conditions including Down's syndrome, cerebral palsy, and deaf/blind conditions.

2. *Changes in the Concept of Educational Programs*

With increasing numbers of single-parent and two-career families, the concept of school as a place children go six hours a day, nine months a year for academic instruction is likely to be challenged. Faced with the need for high quality child-care arrangements, parents will likely demand extended day-care programs and programs that operate year-round. These extended programs probably will differ from the traditional academically oriented school programs by emphasizing more recreational, social, artistic, and musical activities. Such programs are as likely to be demanded by parents of nonhandicapped students as by parents of handicapped students.

Additionally, increased concern about treating people as whole entities, combined with budget cuts necessitating careful coordination of services, may mean that new kinds of educational organizations integrating a variety of social, educational, and medical services would emerge. The concept of educational programs as teachers instructing groups of children under the supervision of an educational administrator, then, could change drastically.

3. *Needs for New Curricula, Technological Devices, and Service Delivery Models*

Curricula. Some of the potential future developments would create a need for different types of curricular materials. An increasing focus on the whole person and self-actualization could stimulate an interest in music, the arts, and other nonacademic, nonvocational subjects that often have been deemphasized in programs for the handicapped. This type of interest would create a need for curricular materials in these areas.

The shift to an information/services society will require curricula that emphasize occupational and living skills needed by handicapped individuals to function in that society — curricula that emphasize electronic devices and computer operation. Furthermore, the rapid growth of knowledge in this area will necessitate continual updating of these curricula. Finally, if programs are extended to include the handicapped adult, curricula appropriate to this population will need to be generated.

Technological devices. Technological progress will continue to make possible a whole range of prosthetic and instructional devices that will allow handicapped students to increasingly function in and benefit from less restrictive educational programs. Thus, there will be a continuing demand to develop or adapt and certify such devices. To do this efficiently will require an ongoing dialogue and a way of communicating with technologists in fields such as electronics or telecommunications so that they will be able to understand the individual problems and needs of the handicapped and can offer specific technological solutions to those problems.

Service delivery models. Several of the trends discussed earlier would necessitate new service delivery models. For example, an extension of programs to include handicapped adults would likely create a demand for service delivery models for this population. Traditionally, delivery of services in sparsely populated areas has been problematic, so decentralization and a greater dispersion of the general population would make even more critical the identification of effective service delivery models for low-population areas. Furthermore, given the rate of change in telecommunications, the models explored should make use of sophisticated telecommunication systems to the maximum extent possible. Finally, the potential structural and curricular changes within schools would require service delivery models using new educational techniques and different patterns of staff utilization.

4. *Needs for New Educational Media and Materials, Devices, and Distribution Networks*

Media and materials for use in regular classes. If more handicapped students are enabled to participate in regular education programs because of new prosthetic devices or changes in regular education programs to make them more individualized, the demand for educational media and materials for these students most

likely would increase, particularly for materials that interface with the regular education program.

Telecommunications linkage systems. Advances in telecommunications will enable sophisticated, interactive systems that could link handicapped individuals or service providers with educational services, resources, and information banks at sometimes distant points. As more handicapped students participate in regular programs, and if the greater population dispersion continues as forecast, the importance of such systems would grow. Development and coordination of such linkage systems could be an important function of special education agencies.

Development and marketing of devices. To the extent that technological knowledge is applied to problems of the handicapped and new prosthetic devices are developed, the demand will increase for government agencies such as BEH to market, distribute, and subsidize those devices as well as to disseminate information. This could raise a number of issues concerning the appropriate government role in technological development and marketing.

5. *Need for Different Types of Personnel and Personnel Training*

Child advocates. An increase in single-parent or two-career families may create a greater demand for trained child advocates who could share some of the parents' responsibilities in home/school interactions. Qualifications and training programs would have to be conceived for this advocate designation.

Support personnel. A decline in volunteerism and reduced levels of funding for special education could create a need for more support personnel such as teacher aides, clerical aides, and assistant physical or occupational therapists. Training programs and career ladders would be important in filling these personnel needs. Also, if technological advances are to allow more handicapped students to be educated in regular education programs, the need will arise for more diagnostic/prescriptive teachers, instructional planners, master teachers, and inservice teacher trainers.

Personnel familiar with media and materials. Technological advances that would allow more handicapped students to be educated in regular education programs also would require regular and special education personnel to be more familiar with educational media and materials. Training programs would need to be revised

to add media and materials competencies. A need for increasing numbers of special education media and materials specialists also might occur.

Personnel to work with adults. If special education programs and services are to be extended to include adult handicapped persons, a great need will develop to prepare personnel to work with this population.

Coordinators. As interagency arrangements become more necessary for providing comprehensive services to handicapped students, coordination of services will become critical. Personnel will be needed who are familiar with the range of services provided by various agencies who can coordinate and facilitate the melding of services from various agencies into comprehensive programs for particular students. Though this task logically could fall within the roles of various existing types of personnel such as guidance counselors or social workers, these persons still would need to be afforded the skills and resources to carry it out.

Personnel to serve severely handicapped students. Over a period of years, advances in medicine could decrease the number of personnel needed to serve declining numbers of severely handicapped students. The impact of this development would not be felt for a number of years, particularly in view of existing personnel shortages to serve this population.

Personnel renewal programs. The rapid rate of legislative, legal, technological, and educational developments concerning services to the handicapped may be inspiring a need for retraining or renewal of both regular and special education personnel. Future years may bring a great deal of interest in programs that would update the skills of certified personnel.

6. *Changes and Problems in Programs to Assist States and Local Districts in Assuring Every Handicapped Child a Free, Appropriate Public Education*

Difficulty in obtaining compliance. Slowed economic growth likely will affect the amount of money available for services to the handicapped at local, state, and federal levels. Local and state education agencies may respond to reduced funds by changing regulations in ways that affect the quality of services or the number of students served (e.g., increasing permissible class sizes, allowing nonteaching personnel to provide certain services, allowing greater flexibility in procedures and programs, changing the definitions regarding handicapping conditions, omitting certain expensive services

from individualized education programs). At the same time, reduced levels of federal and state funding may decrease the potency of sanctions (withholding of PL 94-142 and 89-313 funds or of state funds) for failure to comply with the standards set forth in federal legislation. Thus, to forge a partnership among federal, state, and local agencies in assuring handicapped children a free, appropriate public education conceivably may become more difficult.

Need for new monitoring procedures. Federal and state monitoring could become more difficult as a result of the possible greater flexibility among state regulations, greater numbers of handicapped students served in regular programs, and/or expansion of the concept of education to include other types of programs during a lengthened school day and year, or to include other services such as medical or social. A greater breadth of services, with fewer state guidelines to serve as reference points, would cause problems for state and federal monitoring personnel in determining from annual program plans, end-of-year reports, or administrative reviews whether or not all handicapped children in a given state were receiving appropriate educational programs and services. New monitoring procedures may have to be developed, and staff members may have to conduct administrative reviews to become familiar with a range of new programming and service options.

7. *Need for Vigilance and Advocacy to Assure that Progress toward Implementing National Goals for the Education of Handicapped Students is Maintained*

Slower economic growth coupled with fewer dollars for programs for the handicapped could result in a push to "ease up on" or change provisions of federal and state laws and regulations that assure free, appropriate education programs to all handicapped students and equal opportunities to all handicapped persons. If the gains made in recent years by and on behalf of handicapped persons are not to be jeopardized, special education agencies and personnel must join with other organizations and individuals to advocate the maintenance and implementation of national policies related to the handicapped.

8. *Need for Interagency Coordination*

The implementation of legislation promoting comprehensive services for the handicapped has highlighted the

need for coordination and cooperation among agencies serving handicapped persons. In recent years, activities to promote interagency agreements and coordination have been initiated. Information in the previous sections suggests that such activities may become even more important in the future.

Federal, state, and local agencies. A greater degree of population dispersion combined with decreased levels of funding of services for the handicapped would necessitate careful coordination among agencies if comprehensive services are to be provided. It would be critical to develop interagency relationships at the national level and to explore mechanisms that would assure that these relationships would move down and be implemented at state and local levels.

Vocational rehabilitation services. An increasing demand for educational programs and services for the handicapped adult would require careful coordination with agencies dealing with vocational rehabilitation of handicapped persons. The push for services likely will be broader than a demand for vocational training, focusing on self-actualization as well as job skills, and the potential for overlapping programs could be great, making planning and coordination among agencies paramount.

Medical, social services, and education agencies. Increasing recognition of the need for medical screening, follow-up, and immunizations in preventing handicaps, along with the provision of certain medical services to handicapped students, could focus attention on the school as a good interface point for service delivery. Similarly, the schools may increasingly become an interface point for delivery of certain social services. Then, there would be a strong need to encourage cooperation among medical, social services, and education agencies — and to anticipate the possible evolution of new types of multipurpose organizations.

Agencies serving other populations. Many of the prosthetic devices for the handicapped that are or shortly will be technologically feasible will be expensive to develop, certify, manufacture, and market. Many of these devices, though particularly important for the education of handicapped students in terms of permitting better access to programs, will be beneficial to a broader population (handicapped adults, disabled veterans, the aged). It may become increasingly important for agencies serving this broader population to work together in developing joint mechanisms for assuring the development, testing, and marketing of important prosthetic devices.

TABLE 1
RELATIONSHIP OF TRENDS AND IMPLICATIONS

Trends If these trends occur . . .	Implications* We would expect . . .
VALUES**	
1. Individuals no longer judged on the basis of economic productivity	Reinforcement of national policy of educating every handicapped person to maximum potential (2,3)
2. Greater emphasis on self-actualization	Less emphasis on vocational training in educational programs for the handicapped, and greater emphasis on subjects such as art and music (2,7)
3. Continued focus on the equality of all groups	
4. Decentralization	Increased acceptance of handicapped persons who cannot work (1,2)
5. Stronger community ties	Reinforcement of handicapped persons' full participation in society's mainstream (2,3,4)
6. More manageable government and social institutions	More handicapped persons living in the community rather than in institutions (3,4,5,6)
7. Expansion of knowledge system to include spiritual, subjective, and creative knowledge	More normal social relationships for handicapped persons; less alienation (4,5,8)
8. Increased feeling of wholeness and connectedness of all persons	Increased attention to the whole individual, including attitudes and spirit, in service delivery (2,7,8)
9. Public participation in scientific and technological issues	Increased resistance to labeling and categorical funding systems (8)
	Increased interactive approach in service delivery (8)
	Increased involvement of handicapped persons and their families in planning, implementing, and monitoring programs and treatments (9)
ECONOMICS	
10. Continued shift to an information/service economy	Decreased government program funding (16)
11. More information/service jobs, including more jobs involving computer operations	Forced competition for dollars between programs for handicapped and other programs at all levels of government (16)

*Numbers in parentheses following each implication designate the trend(s) from which that implication was inferred.

**Some panel members believed that these trends would not occur, that instead an even greater emphasis would be placed on economic productivity, competitiveness, and individual material success.

TABLE 1 (Continued)

Trends If these trends occur . . .	Implications We would expect . . .
12. Physical demands on factory workers reduced by increasing use of computers	Increased litigation and political pressure on behalf of the handicapped (16)
13. Fewer persons overall entering work force in the 1980s; however, increasing numbers of women entering work force	Increased pressure for federal "block funding" (16) Reduction in the power of federal laws that are enforced by funding incentives and sanctions (16)
14. Decreased unemployment	Need for an increase in efficiency and coordination among service agencies (16)
15. Growing underemployment resulting from increasingly higher educational levels required for jobs	Increased employment opportunities for the handicapped (10,11,12,13,14)
16. Slowed economic growth	Increased number of routine jobs potentially available for the mentally handicapped (17)
17. Application of management techniques and new technologies increasing productivity and reducing costs in the service industries	Curricular changes in educational programs to increase emphasis on information skills (10,11) Unavailability of some jobs to handicapped persons because of spiraling educational requirements (15)
SOCIAL INSTITUTIONS	
18. Greater variety of family types	Greater demand for extended day school programs (18,20,21)
19. Smaller families	Growing demand for paid child advocates (18,19,20,21)
20. More single-parent and two-career families	Easier accommodation of work schedules to meet special needs of handicapped persons (23)
21. Changes in traditional husband/wife roles	Increasing need to develop and extend educational opportunities for handicapped adults (24)
22. Changes in service delivery patterns and demands for new services	Need to develop curricula and to train personnel for the instruction of handicapped adults (24)
23. More flexible work schedules	Use of surplus educational facilities for adult instruction (24,27)
24. Lifelong learning	Need for better coordination and communication among service agencies, particularly in rural areas (25,26)
25. Return to smaller communities	
26. Increased costs for social services/decline in volunteers	

TABLE 1 (Continued)

Trends If these trends occur . . .	Implications We would expect . . .
27. Continued decline in birth rate and school enrollment	<p>Need to fund, recruit, and train a wide variety of auxiliary personnel to supplement a diminishing corps of volunteers (26)</p> <p>Possible opportunity for increased individualization of educational programs, allowing more handicapped students to receive more of their education in regular classes, or decline in support for regular teachers and increased resistance to integration of handicapped students because of school budget cuts (27)</p>
TECHNOLOGY	
28. Continued expansion of human physical abilities through the use of technology	Greater opportunity for handicapped persons to participate in mainstream of society, including school and work force (28,29)
29. Better communications through use of technology	Increased sharing of information vital to the development and dissemination of new assistive devices (29)
30. Continued problems in disseminating information	Continued need for government to disseminate information, coordinate and support research and development, establish standards and quality control (30, 31,32)
31. Continued economic problems in supporting the research and development of new products	<p>Continued increase in politicization of the handicapped (29,30,31,32)</p> <p>Greater opportunity for handicapped persons to obtain information and resources and to communicate with others having similar problems (29)</p>
32. Continued problems with standards and certification of new products	
MEDICINE	
33. Continued dissemination of new diagnostic techniques and medical technology	<p>Decrease in the incidence of cerebral palsy (33,34)</p> <p>Fewer handicaps ascribed to premature birth (33,34)</p>
34. Improved neonatal care	Reduction in genetic disorders through amniocentesis and abortion; continued need to develop treatment for genetic disorders (33)
35. Increased control of disease through immunization, screening, and better record keeping	Reduction in acquired handicapping conditions (35)
36. Continued problems in reaching all citizens with health care service	Continued need to develop better methods of reaching citizenry for immunization and screening (36)

CONCLUSION

Exploration 1993 provides a picture of certain developments that could transpire in five professional areas that impact upon the provision of services to handicapped persons. These developments have been suggested by experts in the five areas who have looked at trends and events in the present and used them as a basis for projecting the future. Many of the projected trends clearly could have significant effects on the handicapped and on the field of special education and provision of services to the handicapped. At the same time, differences sometimes were voiced among the experts or between the experts and panel members as to the likelihood or implications of particular events or trends. Thus, in many instances the projected trends may seem too speculative to guide policymaking in the present or near future.

What this picture can do is give focus to a previously undifferentiated but open future and highlight some potentially important alternative trends. Some of these trends we may wish simply to track, periodically updating their potential implications for policy. Other trends may be of such importance as to warrant further

analyses on delimited trend areas, using more sophisticated and powerful future methodologies.

At a minimum, information from the project shows that we would be short-sighted in making future policies regarding programs and services for handicapped students with an assumption that present trends will continue far into the future.

REFERENCES

- Cornish, E. S. *A study of the future*. Washington, DC: World Future Society, 1977.
- Schiefelbusch, R. L., & Hoyt, R. K., Jr. Three years past 1984. In M. C. Reynolds (Ed.), *Futures of education for exceptional students: Energizing structures*. Minneapolis: National Support System Project, University of Minnesota, 1978.
- Shipper, W. V., & Kenowitz, L. A. *Special education futures: A forecast of events affecting the education of exceptional children, 1975-2000*. Washington, DC: National Association of State Directors of Special Education, 1975.

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