APPLYING KNOWLEDGE OF HUMAN DEVELOPMENT: NEW DIMENSIONS IN PARENT AND TEACHER EDUCATION

Daniel C. Jordan, Ph.D.

The eminent philosopher, logician, and mathematician, Alfred North Whitehead, wrote an entire book in protest against inert ideas and dead knowledge. The death of knowledge, he says, comes when it is not connected to life—when it is only talked about and written down, but never acted on. To be alive, thoughts must inform action (Whitehead, 1950).

Suppose for one moment that the information presented in the preceding chapters, and all currently available knowledge about human development from other disciplines for that matter, could be made alive for everyone by applying it systematically in every child's home and school. What would be the consequences of such an effort? There is little doubt that we would begin to see the emergence of new generations of healthy, stable, and responsible human beings whose undreamed of potentialities, when fully actualized, would stagger the imagination.

What stands in the way of such an undertaking? Among the most difficult obstacles is lack of agreement among basic institutions of society on the purpose and methods of socialization and education, on the values and priorities which determine how resources will be allocated, and above all on what institutions should assume which responsibilities. Most social institutions of the past had a working agreement

on such issues because they were integrated by virtue of their shared traditions, values, beliefs, and expectations. The remarkable advances of science and technology have caused these integrating forces to undergo various degrees of modification or sometimes even extinction. Social insitutions today thus manifest the stresses and strains of these changes. The charter document of the Committee on Science and Values of the American Academy of Arts and Sciences affirms this perspective.

> We believe that the sudden changing of man's physical and mental climate brought about by science and technology in the last century has *rendered inadequate* ancient institutional structures and educational forms, and the survival of human society depends on a re-formation of man's world view and ethics, by grounding them in the revelations of modern science as well as on tradition and intuition.... It is our hope that the fragmentary sketches of the cosmos and man made by the various scholarly and scientific disciplines, when pieced together and looked upon as a whole, may reveal a picture of the situation on the basis of which *one can make sounder judgments for the ordering of individual and social life* (Some Roots of Zygon, Zygon, p. 119). (Emphasis mine.)

Institutions whose structures have been "rendered inadequate" by the accumulation of new knowledge and the changing times must either create new structures to accommodate the new knowledge or face dissolution. The family and the school, the two key institutions which have the most profound influence in shaping the human personality, are now confronted with this challenge.

There is evidence that the family, particularly in the western world, is, in fact, agonizing in the face of dissolution and many today believe it has been "rendered inadequate." Yet, outside of a few experiments in a limited number of cultures, no permanent replacement for the family has been devised. There is ample cause for deep concern over this state of affairs because without a socializing agent for the next generation, mankind won't even be able to maintain the current level of civilization, let alone make new progress. In the absence of any successful alternative to the family, we are compelled to consider means of saving it.

Though not so ancient as the family, educational institutions have existed throughout the time of recorded history. They, too, have been subject to many stresses and, although a variety of innovations has been tried out in recent times, the institutional structures of present-day schools are still considered by many educators to be inadequate and in need of reformation. A large part of the modern school's problem is related to its inability to deal with the deleterious effects of the family's dissolution on children of school age. An even greater part is due to the lack of sound philosophical, theoretical, and scientific foundations for the approaches used.

The above considerations make it abundantly clear that if the family can be restored and the school renewed by dealing successfully

with these problems, new and extraordinary progress can be made. Present knowledge of human development indicates that the most effective means of enabling mankind to derive the maximum benefit from such knowledge—particularly in the areas of nutrition, attitudes toward food, and the values that underlie preventive medicine and the maintenance of both physical and mental health—is through the institutions that are in charge of the formative years of each new generation —the family and the school. In other words, the science of human development itself speaks to the issue of when and how such a science can best be applied to maximum advantage. It has demonstrated, for instance, that the formative years are the most important because during this time the major critical periods of development occur. If the special requirements of these periods are not met, irreversible damage may be done—damage which not only affects a given generation, but is also felt in subsequent generations (Dubos, 1969; Birch, 1971; and Scott, 1974). Thus, parents and teachers, the principle mainstays of families and schools, are the most effective agents through which mankind may benefit from the systematic application of human development knowledge.

Most anthropologists agree that the family is the basic social unit of society and the primary means of socializing and educating each new generation. Its dissolution would not only precipitate an unmanageable crisis in the schools but very likely hail the collapse of civilization. A regression to primitive states of survival where the family would again assume its basic life-maintaining functions would then be inevitable and the evolution of society would begin all over again on top of the rubble of our great cities. If, however, the family and the school can be rebuilt on new foundations that make systematic use of human development knowledge, mankind will have two powerful instruments for improving the quality of life and taking charge of its own evolution.

The previous chapters of this volume address different aspects of applied human nutrition. The general purpose of this chapter is to set forth the propositions (1) that nutrition is best understood as an integral part of a science of human development, and (2) that the application of human development knowledge only makes sense in the even wider context of long-range planning for socio-cultural advancement. The specific purpose is to show how a program of applied human nutrition can have significant impact on biological, social, and cultural evolution if it is integrated with a comprehensive system of education which is based on a science of human development, and if it is implemented through two of society's most basic institutions, the family and the school. To do this, I will present the case for restoring the family and reforming the school by tracing recent history, explaining how increases in knowledge of the material world dislodged them

from their traditional foundations bringing them to a state of crisis; offer a conceptual scheme for organizing and making usable the extensive knowledge of human development required to establish a new foundation for the family and the school; and, propose a new kind of social-scientific institution powerful enough to guide and direct the remaking of the family and school by systematically applying human development knowledge in the training of parents and the preparation of teachers as a part of one coherent system. The two latter notions are mutually interdependent, for if we are to accomplish what the Academy's Committee on Science and Values hopes for in its charter document, we need both *a new conceptual scheme* piecing together the "fragmentary sketches of the cosmos and man made by the various scholarly and scientific disciplines" and *a new institution* that will help society make "sounder judgments for the ordering of individual and human life."[1]

The Family and School in Retrospect

The case for remaking the family and renewing the school and for understanding how such changes can be brought about requires an appreciation of related social trends and their historical antecedents. Without an historical perspective, data on the present state of the family and its relationship to the school cannot be responsibly interpreted nor can recommendations for the future be formulated with any confidence. Furthermore, the historical perspective is necessary to counter the current tendency to believe that significant social changes can be brought about overnight and with meagre resources. It is therefore worthwhile to examine some of the relevant historical background of both family and school.

The Family. In our effort to understand the requirements of institutional renewal, we have found particularly useful Edward Shorter's book, *The Making of the Modern Family,* which provides both an historical perspective on changes in the family as an institution, and a frame of reference for determining the needs of contemporary families. Shorter documents, analyzes, and interprets the changes which have taken place within the western family over the past 300 years. He shows how the structure of the family in traditional society was kept stable by virtue of its ties to a complex network of relatives: grandparents, aunts, uncles, cousins, nieces, nephews, and in-laws. The extensive network surrounding each family was tightly integrated with a larger network—the community. Both of these networks were tied to generations past, information about which was passed on to each subsequent generation. All children born into a family were socialized to be a part of and to conserve the network for the future. Carefully passed on from adult to youth, ancestral traditions spoke to every aspect of their lives and influenced the ways they lived

them. In fact, the purpose of life itself was "preparing coming generations to do as past ones had done" by following "clear rules for shaping relations in the family, for deciding what was essential and what not."

During the last three centuries, at least in the west, the rules began to erode and it became less and less clear how relations in the family should be shaped, and the traditional source of authority for deciding what was essential was no longer fixed. It became detached from considerations of gender and heredity. As we shall see, the dislodging of traditional sources of authority from its ancestral moorings cut the family loose, and put it to sea without a captain clearly in charge. While, on the one hand, this made the family highly vulnerable, it has, on the other hand, made it possible to consider the science of human development as a legitimate source of authority in a reconstituted family of the future.

What caused the erosion of the relations within the family? Shorter believes that the main force that dislodged the traditional western family from its foundations was "a willingness to rearrange the objectives in one's life so that emotional ties to other people go to the top of the list, and more traditional objectives get ranged farther down (p. 17)." This rearrangement of objectives, termed the "onrush of sentiment" by Shorter, was precipitated by the rise of market capitalism, which provided the economic independence that enabled individuals to free themselves from family ties and the traditional sources of authority. Achieving independence and the onrush of sentiment were two sides of the same coin. With money in their pockets, young men and women could do what they felt like rather than what their parents or community elders thought they should do. Market capitalism was made possible by the accumulation of knowledge about the material world that led to many technological innovations, which in the hands of the capitalist entrepreneur made it possible to open up the network of regional and national markets that made available sources of income to people outside their families and gave them economic independence.

There were two salient features in the development of the modern western family: (1) a shift in the authority relationships among members of the extended family and between it and the surrounding community; and, (2) loss of many of the family's primary functions.

The shift in relationships was closely related to the onrush of sentiment. Meaningful emotional life outside of the home was severely reduced and marital relations became more intense—relations which today are becoming more and more unstable. The eroticization of the couple's life both before and after marriage dissolved any strong sense of family lineage and therefore left the family rootless. In addition, the industrial revolution and urbanization facilitiated the breakdown of the extended family and the emergence of the nuclear family, which

was far more mobile and adaptable. But, as other scholars have shown, many traditional functions of the family were lost in the process, and this made it more vulnerable.

William Ogburn's analysis of the status of the 20th century family showed how its current dilemma is due to its loss of function (Ogburn, 1938). In former times, for instance, the family functioned as a labor unit with all members working to sustain the family economically. By and large, families were self-sufficient; they consumed only what they produced. Thus, money, banks, wholesalers, retailers, manufacturing agencies, and other commercial institutions were not needed. With the rise of market capitalism, this economic function of the family was largely usurped. Because of the economic nature of the traditional household, the home was inevitably a center for education. As children grew up, they learned from other family members as they worked together. Again, with the expansion of market capitalism and the breakdown of the home as an economic unit, the education of children began to be delegated to schools. Other important functions, such as protection against external threats and insurance against the liabilities of old age were assumed by the traditional family. Today, the function of protection has been delegated to the police, and insurance companies, retirement plans of corporations, and welfare organizations take care of the aging. Formerly, the family had an important religious function, now largely delegated to the church, parochial schools, and religious organizations. Husbands and wives used to belong to the same faith, and their children were inevitably socialized into that faith. Today, the family has become secularized and its religious function has been greatly weakened. In former times, families organized their own recreation as a unit, often in collaboration with other families. Nowadays, there is very little recreation organized and enjoyed by the family as a unit. Different members of the family go to agencies outside of the home for their recreation.

These functions—economic, educational, protective, religious, and recreational—were like bonds that held married couples and families together. One other function, that of providing intimacy, affection, and companionship, has alway been an important one, and it is perhaps the primary one still present in the modern family. When the family provided this function in combination with all of the other ones as well, the bonds were strong and the family was stable. With so many other agencies assuming responsibility for so many of the functions of the family, it cannot be expected to be as strong as it was formerly. Furthermore, the quality of the function of providing affection and intimacy has also changed and made the family more vulnerable. Over the years, the affectional basis for the husband and wife relationship has been largely romanticized. Shorter's effort concentrates largely on the assembling of evidence which shows how in the

western world the romantic basis for both mate selection and the husband and wife relationship in the family emerged over the years. Romance as the basis for mate selection and marital union, with all of its ecstasy, joy, pain, and despair, is still the predominant theme of literature and the dramatic arts whether presented through the theatre, cinema, or over television. There is no doubt that it is a powerful force, and when it is not tempered by other functions, the family is in jeopardy. When romance fades—and it almost inevitably does—and no other basis for the marital union is found to replace it, the marriage collapses. When the marriage collapses, the structural foundation of the family as an institution caves in.

Extraordinary changes in the institution of the family such as those described above have continued right up to the present and have left us with a post-modern family in deep trouble. Shorter concludes his book with a prediction which is very alarming:

> The nuclear family is crumbling—to be replaced, I think, by the free-floating couple, a marital dyad subject to dramatic fissions and fusions, and without the orbiting satellites of pubertal children, close friends, or neighbors—just the relatives, hovering in the background, friendly smiles on their faces (p. 280).

This is alarming because in the light of what we know about human developmnet, it is extremely doubtful that the "free-floating couple, a marital dyad" with its "dramatic fissions and fusions" can ever bring forth a new generation free from numerous biological and psychological pathologies.

The School. The rise of market capitalism and the industrial revolution also had enormous effects on education and the school as an institution. During this period, there was a great number of changes in educational philosophies which had direct impact on curriculum, educational administration, and sources of support for education. In spite of great differences among the educational institutions of different countries, a number of basic and common trends are evident: (1) a shift away from religious institutions as the main source of educational sponsorship outside the family; (2) a move away from notions of fixed intelligence with an acceptance of the idea that the environment plays a greater role in producing educational outcomes; (3) the emergence of the idea of life-long education and the need for a variety of institutions to collaborate in the educational process; and, (4) a growing conviction that educational institutions cannot neglect the physical and mental health of their students—that the whole person must be dealt with. Although many of these trends resulted from efforts that were aimed at remedying situations thought to be harmful or non-productive for children, by the time they were organized and supported well enough to have an effect, social change introduced new pressures and problems that required further reform.

Contemporary educators are not unaware of such pressures and problems faced by educational institutions. While there is some agreement on the diagnosis of the problem, there is little agreement on what prescriptions are required to remedy the situation, and hence no confident prognosis about the future (Daedalus, 1974).

An analysis of the literature on contemporary educational issues reveals three basic sources of problems, aside from general political and financial troubles:

(a) a too rigid adherence to the "authoritarian, teacher-dominated, abstract curriculum" view of education; or,
(b) an uncritical acceptance of child-centered approach to educa- too broadly conceived; and,
(c) the extreme discontinuities of experience the child faces as he moves from home to school to community and the injustices involved when no provision is made to accommodate cultural differences.

Many writers have addressed the problems of the rigid, authoritarian approach. Jacques Barzun (1959) documents how "drudgery, discipline, and conformity" constitute the basic syndrome of traditional education. George Leonard (1968) condenses a complex diagnosis into one simple statement: "The ecstacy has gone out of education." Paul Goodman (1964) describes education as a system of brainwashing which leads to "spiritual destruction." Carl Rogers (1969) views the educational system as a kind of prison where children are not free to learn; John Holt (1964) outlines the many ways in which the system programs a guaranteed failure for significant numbers of children. Kozol (1967) details how education brings psychological "death at an early age." Weinstein (1970) and those interested in humanistic education view the current system as one which often punishes an expression of feeling and renders the process of acquiring knowledge a sterile, mostly irrelevant, and even destructive experience. Silberman's efforts (1970) at diagnosis indicate that education is in a period of serious crisis. As a system, it does not address the development of the whole person; rather it fragments, compartmentalizes, and precipitates self-alientation. Herbert Kohl (1967) points to the authoritarian atmosphere of the traditional school and how it snuffs out the life of learning. Caleb Gattegno (1970) argues that learning is the life of education and in order to sustain that life, teaching must be "subordinated to learning." Yet, in many schools, learning is subordinate to everything else. William Glasser (1969) illustrates how education's ill health is directly correlated with "a philosophy of non-involvement, non-relevance, and a limited emphasis on thinking."

Other educators, particularly those directing or working in many of the alternative or free schools have gone to the other extreme. They have been criticized for taking an excessively child-centered ap-

proach to education. In these schools, children are simply encouraged to "do their own thing," presumably on the grounds that each child will work consistently at his own developmental level. Individualization of instruction is supposed to take care of itself by virtue of the child's being able to choose what he wants to do and when he wants to do it for as long as he likes. But under such circumstances, most children have not learned to read, write, or compute—skills essential for subsequent development. Instead, according to Kozol (1972:33), they "make clay vases, weave Indian head bands, play with polaroid cameras, and climb over geodesic domes." This approach has led to many undesirable consequences: the erosion of academic standards; the proliferation of courses on the upper levels to include not only such time-consuming activities as driver's education, but also courses with no more substance than can be gleaned from an exchange of uninformed opinion among class members; fragmentation and dilution of the curriculum; a disinclination to take a moral stand on several important issues on the grounds that no values should be "imposed" on any child; and a toleration of abuse of the body through poor nutrition and the use of drugs within the schools.

Since the publicly supported school reflects the dominant culture, children from minority and/or economically disadvantaged backgrounds have borne the brunt of discontinuities of experience between home and their school community. A vast literature now exists which documents the conflict a child experiences when his family has one set of values and his school and community another. Such conditions have become particularly explosive when differences become unjustifiably classified as superior and inferior, and policies are created which perpetuate injustices.

These conditions are exacerbated by two other deficiencies which are not so frequently discussed in the literature but which I have come to regard as fundamental concerns: (a) a general ignorance on the part of educators and policy makers of the role biological integrity plays in the child's ability to learn, and (b) the lack of a coherent body of theory that could organize scientific knowledge of human development and address all of the conditions cited above in a comprehensive way.

Although recent history is filled with many attempts to diagnose the problems of schools, make prescriptions, and try out new approaches, the last quarter of the 20th century has arrived and the school, like its sister institution, the family, finds itself confronting problems that are deep and complex and admit of no easy or short-term solution.

Institutional Renewal and the Use of Knowledge. What are the major points to be gleaned from this review of the recent history of the family and the school? I believe there are at least two important insights which this retrospective glance at the family and the school af-

fords. In the first instance, we can see that institutions based on tradition are likely to lack institutional self-awareness. Although the people who comprise them learn and apply knowledge bound up in the tradition, they remain relatively unaware of the knowledge they have and why the do what they do. Hence, such insitutions tend to have things "happen" to them rather than make things happen in accorddance with some intentional scheme. These institutions thus "react" rather than initiate and direct the action. The idea of intentional planned change is not a part of the life of such institutions.

Secondly, we can see that institutions based, at least in part, on science and the scientific method are more conscious of the knowledge they have and are therefore able to be intentional about its use. Such institutions can initiate action and make things happen. Since science focussed initially on the accumulation of information about means-ends and cause-effect relationships among phenomena of the physical world, it was almost inevitable that institutions to make use of such knowledge would find themselves making new material things—products which people needed or wanted, and making them faster and more economically. Commercial institutions thus became active; traditional ones remaind reactive. The former were based in large part on the development and use of scientific knowledge while the latter were based on custom and mores.

The review shows how the application of knowledge in one area—the material world—led to the development of technology which forced many changes in tradition-based social institutions such as the family, while lack of knowledge in another area—human growth, development, and the formation of values—left people without a rational basis for planning and directing changes in their lives to counterbalane the effects of technological advancement. In the absence of scientific knowledge about human development, particularly as it relates to the basic requirements of socialization and education, reactions to pressures from the rise of capitalism were primarily on an emotional level—hence, the "onrush of sentiment" about which Shorter speaks. Although it may have had some short-term beneficial consequences, the onrush of sentiment has gone unchecked to the point where today hundreds of thousands of families lie shattered and schools remain paralyzed—both unable to perform the basic functions of socializing and educating the new generation.

These insights compel us to reflect on one extraordinary possibility: that if commercial institutions can use scientific knowledge of the material world to direct their affairs so can a science of human development be used to recreate the family and the school, endow them with institutional self-awareness and give them the capacity to manage perpetual self-renewal intentionally, in ways that guarantee survival and continually improve the quality of life. The current costs of

the failure of the family and school clearly indicate that not to consider this possibility is to jeopardize survival itself.

The Cost of Institutional Failure

Because both school and family are not being successful in solving their problems, the children they are responsible for rearing are bearing the brunt of their failure and the price they are paying is high. The following statistics tell just how high the price is (Bowen, 1976). The infant mortality rate of the United States ranks fifteenth internationally. In 1974, it was 16.5 infant deaths per 1,000 live births (U.S. Health, 1975). The rate for minorities remains about two-thirds again as high as that for whites. Some 30% of all pregnant women do not begin prenatal care before the end of the first trimester, a particularly significant issue since many studies show that high infant mortality rates are associated with inadequate prenatal care. Furthermore, it is during the early phase of pregnancy that the baby's brain begins to form, and the brain's most critical period of development takes place during the first three months. In 1974, almost 500,000 teenage girls became pregnant. Over a quarter of a million of these adolescents had abortions. Both teenage mothers and their children suffer increased incidences of mortality, toxemia, veneral disease, and other complications; the children have higher rates of mental subnormality and other kinds of neurological deficiencies.

Large numbers of pregnant women consume drugs which have a potentially deleterious effect on their children. Use of LSD or marijuana increases the child's risk of malformation and death. Since there are an estimated 4 million female alcoholics in the country, the effect of alcohol on the fetus is a significant matter.

Twelve million Americans have some form of inheritable disease, and an additional 20 million have genetically determined enzyme abnormalities. Over 100,000 mentally retarded babies are born yearly. Approximately one-fourth of the cases of mental retardation can be directly attributed to particular infections, birth traumas, or genetic causes. There is a very high probability that the remaining cases are caused by inadequate prenatal and perinatal care, inadequate nutrition, and severe social and environmental deprivation. Since mental retardation afflicts some 3 million persons under the age of 20 and around 6 million in the total population, this is obviously no small problem.

In spite of the affluence of the United States, malnutrition is still a problem. Many of the estimated 27 million persons living in poverty in the United States are not able to purchase the kinds of foods that would constitute an adequate diet, and since inadequate nutrition undermines physical health and impairs the ability to learn, this serious condition needs attention.

Nutritional problems not only stem from not having enough food of the right kinds, but also from eating too much of the wrong things, such as too much sugar and certain food additives or pollutants. Pollutants also enter the body through means other than food. For instance, 40% of community water supplies in the United States do not meet Public Health Service drinking water standards. An estimated 225,000 children each year are affected by lead poisoning which in severe cases may lead to irreversible mental retardation. High blood levels of lead occur in 10% of children ages 1-5, a condition which has been correlated with emotional, perceptual, and learning disabilities (Kline, 1974).

Accidents account for more than 40% of the deaths of the age group 1-4. Motor vehicle accidents, drowning, fires, inhalation and ingestion of food and other objects, poisoning, falling, and accidents from firearms represent the rank ordering of causes of death by accidents. Many children, of course, are not killed by the accidents but suffer serious injuries some of which may permanently disable them. Somewhere betwen 7-10 million children under six require medical attention due to accidents each year. Two-thirds of the non-fatal injuries occur in the home. Fifty percent of all infant deaths are caused by suffocation resulting from obstruction of air passages by liquid foods, objects such as safety pins, buttons, small toys, or smothering from bed clothes, plastic materials, or strangulation related to structural defects in cribs, playpens, and highchairs. Since most accidents are preventable, their salience as a cause of death and disability among children and the fact that they mostly occur around the home, indicates the need for parental education pertaining to making the environment safe, and providing adequate supervision. Obviously, a comprehensive approach to accident prevention is possible only through systematic educational efforts.

Children do not escape the suffering of emotional and mental illness. Approximately 30% of all children have adjustment problems. Less than half of the children needing attention are receiving it, and only an estimated 5% of the children who need psychiatric care are receiving it. Approximately 18 million adults have some form of mental disturbance needing professional treatment, and yet only 10% of this number are receiving assistance. Since a large number of these adults are both parents and teachers who are in charge of the care of children, the problem is compounded.

Such disturbances on the personality level are inevitably associated with social pathologies involving groups. The breakdown of the family is the chief case in point. Out of every five divorces in the U.S. today, three of them affect children. Given the present rates, one child in six will lose a parent through divorce by the time he is 18. As of 1974, over 7 million children were in the process of learning to live

with new stepparents. Approximately 10% of all children under six are living in single-parent families with no father in the home. Nearly half of all poor children under six are living in single-parent households.

Neglecting children seems criminal enough, but the truth is that a large number of children are severely abused. A 1970 survey projects a nation wide total of around 3 million battered children. A large number of these children are permanently damaged and many of them die. Not counting accidents, homicide is the fourth leading cause of death among children under 15.

The picture is depressing enough; yet, what has been presented is only the briefest of reviews, and it concerns the United States almost exclusively. Statistics on the same items reflecting conditions in all other nations would be more distressing. Any sane person can see that the cost in human terms of not dealing with these problems preventively is too high, particularly when vast resources are available and expended on hundreds of foolish and insignificant enterprises. In actual dollar amounts, it costs untold billions—enough to sustain the program we are recommending many times over. A few examples will make the point clear. The total cost of care for individuals with major disorders stemming from prenatal and perinatal damage was estimated in 1971 by the U.S. Department of Health, Education, and Welfare to be $13 billion annually. The yearly loss of income due to fetal and neonatal deaths was estimated to be an additional $15.5 billion (Wallace, 1974). At the present time, the federal government spends 50 times more money on remedial efforts as it does on preventive ones. We spend $2 billion annually treating decayed teeth and would spend $8 billion if everyone were to have his dental needs taken care of (Jacobsen, 1975). The annual cost of environmentally induced diseases in the United States (cost of health services, loss of wages, compensation, and rehabilitiation) is estimated at $35 billion (Kotin, 1974). It is not difficult to see that if the annual dollar amount expended were given for every item discussed, the total would be in the hundreds of billions. Add to this the cost of juvenile delinquency and crime, and the figure reaches levels that are mind boggling.

The Case for Institutional Renewal

As the remarkable changes leading up to all of these problems were taking place in schools and in the family, psychology, sociology, anthropology, and the biomedical sciences were just beginning to emerge. There was no body of tested knowledge about human development adequate and reliable enough to use as the basis for enlightened social policy by agencies of government or other social institutions such as the family and school. Thus, when the traditional foundations of the family began to crumble, there was no knowledge of a

scientific nature to replace the folk wisdom of tradition. A void was created and sentiment rushed in to fill the vacuum.

Today, however, there is a great deal of knowledge about how human being grow, develop, and learn. We no longer have any exuse for continuing to deal with these problems with only our feelings and emotions. Our minds must now be engaged to deal with them, and the best knowledge possible must be organized and applied. It appears that if a sound knowledge base is not adopted for reconstituting the family and renewing the school, the onrush of sentiment of the 19th century will have added to it "an onrush of superstition" in the late 20th century, and the family and school will have very little hope of restoration without first going through a long period of trail and error that is almost certain to be regressive. Larger and larger numbers of people are turning to fortune-tellers, tarot cards, horoscopes, commercially motivated gurus, palmistry, phrenology, occultism, and a variety of other dubious sources of advice and guidance in making critical decisions about their lives. Because superstitions destroy the ability to "make sounder judgments for the ordering of individual and social life," the family and the school should be helping to counteract them.

It seems imperative, then, that society make a deliberate effort to create a new foundation for the family and the school as two of its basic social institutions and to provide the means for the systematic education of parents and the preparation of teachers in accordance with the new foundation. It seems equally imperative that this foundation be one that uses human development knowledge as a means of determining what of the past shall be retained and what new approaches should be tried out.

Such an idea may seem an impossible one to realize. There are, however, many evidences of trends in that direction. Over the last several decades, governments have provided more and more services to schools and families. Aid to children through a variety of welfare measures and educational reforms has increased markedly during the past quarter century. Hundreds of organizations—local, state, federal, and international[2]—have come into being to advocate assistance to children, families, and schools and to initiate programs to serve them. For example, the 1975 report of the Education Commission of the States makes this recommendation:

> A coordinated comprehensive program of services to young children and their parents should be preventive in orientation and provide services on a continuous, not solely on an emergency, basis. It should utilize to the greatest extent possible the family's own child-rearing and child caring capabilities (Education Commission of the States Early Education Project, 1975:4).

Such reports reflect a growing awareness that the family and school do need extensive, systematic help on a wide scale. Without assistance,

each succesive generation will become progressively less capable of assuming the responsibility for the care of itself and its offspring.

Obviously, families in a state of collapse cannot very well meet the needs of their members, particularly the children. That these needs are not currently being met is evident in the variety of grim statistics already presented. However, if the family is ruled out as the institution with the primary responsibility for socializing and taking care of the oncoming generations, what alternatives can be considered? It is not outside the realm of possibility, for example, that thousands of chilren's homes could be established, much like orphanages. But they would have to be fully staffed with three shifts of personnel to provide around-the-clock care—a costly prospect in itself, not even considering the expenses of room, board, clothing, supplies, and educational materials. In addition, there is a significant psychological cost as well. Paid personnel rarely develop the kinds of love, trust, and commitment required for the healthy psychological development of children. Discontinuity of experience and conflicts in values caused by the differences among shifts of supervising adults take their toll on the personality formation of the children being cared for. Furthermore, staff members tend to change jobs frequently, and children who might be able to form healthy attachments are traumatized by one separation after another.

I believe that all alternatives to the institution of the family are too costly, inefficient, and very likely even detrimental. There is hardly any reasonable choice but to set about reconstructing it.

Likewise, schools in a state of crisis can hardly succeed in meeting developmental needs of children. Yet, it is difficult to imagine modern, industrial, democratic societies surviving without schools. Alternative approaches such a Ivan Illich's proposal to "deschool"[3] society are naive and unfeasible. Again, the more reasonable course seems to be that of reconstituting the school through a new system for preparing teachers.

If the conclusion that we should remake the family and renew the school is accepted, then the next step is to create the new foundation and design the means for reformation.

In spite of their precarious state, the family and the school are still the most ubiquitous of social institutions. Almost everyone belongs to a family and nearly everyone in North America has gone or is going to a school. Thus, if there is to be any significant impact on the modern family and school, collaborative action on a very wide scale is ultimately required. However, massive collaborative action will be inefficient at best, if not impossible, unless there is a unifying framework which can be used to organize knowledge from all relevant disciplines in such a way that its application through coherent program planning, personnel training, program implementation, and evaluation can be

institutionalized. Julian Huxley states the case succinctly:

> I would go so far as to say that the lack of a common frame of reference, the absence of any unifying set of concepts and principles, is now, if not the world's major disease, at least its most serious symptom (Huxley, 1960:88).

We need both the unifying concepts and an institution to use them in organizing and applying the considerable knowledge of human development now available.

A Conceptual Base for Organizing Human Development Knowledge

While the plight of the family and school is an extremely serious problem, it appears that most of the pieces to a solution of the problem are available. There just seem to be too many pieces to cope with and few parents or teachers see how to fit them all together in a way that would enable these basic institutions to be restructured so that they can "make sounder judgments" and respond successfully to the critical demands that will be placed upon them during the years ahead. Up to this time, no systematic effort has been made to pull togehter all of the pieces for want of the kind of unifying principle Huxley advocates—one which will enable all of the pieces to cohere in an organized whole—a Gestalt that will make sense of the parts and not only shed light on the problems, but will also enable us to establish priorities that will guide the use of resources effectively. Until such a set of unifying concepts is articulated, tried out, and justified, it is doubtful that the kind of foundation for the family and school as I am envisaging will be possible.

What are the criteria for a set of unifying concepts powerful enough to pull all of the pieces together? First, it must embody propositions about the nature of man of such ultimate generality that they may be regarded as first principles.[4] Second, the concepts must show how man's relationship to his environment and, indeed, to the cosmos, influences development and behavior, i.e., account for changes over time. Third, they must be, in Huxley's terms, "suitable for our present stage of cultural evolution," and "consonant with the structure and the trends of man's present system of knowledge (Huxley, 1960:53)." Fourth, again using Huxley's phrase, they must "help to secure a pattern and direction of cultural evolution which will most effectively enable man to perform his evolutionary role in nature (Huxley, 1960:53)."

In our efforts to formulate a set of unifying principles for all the sciences dealing with human development which would meet the four criteria stated above, my colleagues and I reviewed 2,500 years of philosophical thought about the nature of man (Radhakrishnan, 1960). We examined history and the basic themes of man's literary, religious, and aesthetic heritage. Because it is a synthesis of both Eastern and

Western streams of philosophical thought, we found Alfred North Whitehead's cosmology, *Process and Reality,* the most appealing system of ideas against which to test the power, coherence, and comprehensiveness of the concepts we have adopted to unify the vast amount of knowledge about human development now available.[5]

Whitehead affirmed an ancient ontological principle, namely, that everything in the universe is connected to everything else and that nothing can be understood apart from its relationships to all things it is connected to. This means that the nature of man cannot be grasped unless we understand how he is related to everything around him. Because of consciousness, memory, and the capacity for forming and using sysbols, man connects himself to everything imaginable, including ultimate unknowables. Thus, no real progress can be made in trying to understand the nature of man without considering the universe of which he is a part. Hence the search for first principles around which human development knowledge can be organized necessarily entails metaphysical thought.

Whitehead, like so many philosophers before him, cited change as the fundamental characteristic of the universe. Change means process and process presupposes potentiality. Whitehead thus set forth the basic proposition that the reality of being inheres in the process whereby potentiality is translated into actuality—a process he identifies with creativity, the "universal of universals." We drew on these basic ideas to formulate the unifying concepts around which we can organize and apply human development knowledge. They meet the four criteria specified and have provided us with the generative base for deducing a coherent body of theory which can serve as an effective guide to practice as we set about the task of educating parents and preparing teachers to teach.

From these fundamental notions, we have generated several propositions about the nature of man: that because there is no evidence to suggest that there is a limit to his ability to learn, we may assume that man is a creature of unlimited potential; that his capacity for symbolization makes his memory limitless and renders him conscious so that he knows that he knows and knows when he doesn't know; that his capacity for love and trust makes him inevitably a social and moral being naturally equipped to assume responsibility for socializing the oncoming generations; that his awareness of knowing and not knowing and his need to love and be loved make him yearn to find his place in the cosmos and give rise to his art, religion, philosophy, and science; that the knowing and loving capacities when used to unify man in service to man are the most effective instruments of evolution; and, that he is a purposeful being able to formulate ideals, plans, hypotheses, and consciously pursue them, thereby perpetually actualizing new potentialities compatable with them. All of these qualities enable him to

live at the forefront of evolutionary forces and assume some control over them.

There are those who may object that this conception of man, which reflects the noblest visions and passions that have animated philosophy, science, art, and religion throughout history, has no place in a scheme for establishing a scientific enterprise, even if its purpose is to safeguard the development of man. Yet, any set of concepts which ignores these expressions of man's highest aspirations will be out of touch with the reality of man. Certainly, nothing we know from the biological and behavioral sciences would enable us to define limits to man's capacity for knowing and loving and the full range of potentialities we associate with man evolving. The pervasiveness of this view of man in literature, art, and religion confirms it as a legitimate concern of scientific inquiry, and I submit that any science of man that ignores it or refuses to deal with it is in need of overhauling. Science will, in fact, have no integrating power in human affairs as it has had in technological matters, until it addresses the distinctive characteristics of man and his ultimate concerns: emotion, value, purpose, intention, consciousness, faith, beauty, aspiration, love, art, meaning, morality, and his cosmic yearing to find out how he fits into the universe.

From these philosophical first principles which describe the fundamental nature of man, we deductively derived a comprehensive epigenetic theory of human development which can account for every developmental need at any point in the life cycle, whether biological, psychological, sociological, technological, moral, aesthetic, religious, or philosophical. The theory is therefore capable of generating ways to understand and meet any developmental need in any setting at any time. These ways can then be tried out, evaluated for their efficacy, and perpetually refined.

The theory of development defines development as the translation of potentiality into actuality; it sets forth two basic categories of potentialities, biological and psychological; fixes nutrition as the key factor in the actualization of biological potentialities; and, identifies learning as the essential factor in the actualization of psychological potentialities. The theory establishes interaction with the environment as the means by which the translation of the organism's potentiality into actuality is sustained. Facilitating the actualization of human potential then depends on knowing how to arrange the environment and guide interactions with it in order to actualize given potentialities. The theory also accounts for the varieties of two major pathologies that come in the wake of the suppression of human potential, namely, delinquency and crime on the one hand and mental illness on the other.

We propose that such a comprehensive theory of human development, all of the empirical research that it organizes into a coherent

whole, and the effective guide to practice it affords can provide the scientific basis on which deliberate efforts may be expended to reconstruct a durable foundation for the family and the school as the basic institutions of society. Since the home and the family constitute the primary matrix within which each succeeding generation is nurtured and shaped, parents who are in charge of the home and the family should have their actions fully informed by the knowledge we have about human growth, development, and learning. Likewise, since schools are a powerful force which helps to shape each generation, teachers and administrators must also be informed of the principles of human development. Of course, it is not reasonable to expect every parent or teacher to have the combined knowledge of an anthropologist, biologist, pediatrician, nutritionist, educator, recreation specialist, and moral philosopher. What is reasonable, though, is the creation of a social system in which the family and the school are fully supported by other institutions whose obligation it is (1) to further develope the knowledge we have about man, and (2) to provide means for the continuing education and support of parents and teachers in their efforts to maintain the kinds of environments and guidance children require to actualize their potentialities fully.

Since the development of children is heavily influenced by the school, it would be unreasonable for it not to operate on the same principles of human development knowledge being proposed for the family. Placing both institutions on the same foundation will have the effect of bringing coherence to the experience of growing children while avoiding the damaging conflicts among values and the deleterious effects of discontinuities of experience between home and school. If parents, teachers, families, and schools are animated by the same purpose and operate on the same principles, maximum diversity of a growth fostering nature can be maintained but within a unified system. Understanding the nature of human development makes it possible to suppy whatever is required for the optimum development of children while avoiding all of those things which retard or permanently impair development. As scientific knowledge about human development increases and is systematically applied in home and school, it is not difficult to envision the possibility that placing these two fundamental institutions on the same scientific foundation would quickly make them the chief instruments of human evolution, both biological and socio-cultural.

Unfortunately, the family and the school cannot be expected to reorganize themselves. The major question, then, is who will do it—what agency will help to stabilize the family and reconstitute the school?

Proposal for an Institution to Renew the Family and the School

What I have in mind is in essence a simple idea: assemble all of the knowledge about human development from the books and journals stored in libraries, organize it according to the general conceptual scheme just presented, and make it active in the reconsitution of the family and the school. It is unlikely that these things can happen unless some agency is created with a mandate to accomplish them. A new institution is required, one which is itself based on the same foundations and devoted to the management of institutional change by making the knowledge of human development alive through the programs it promulgates and through the actions of those it educates. We therefore propose the establishment of a Human Development Center which can be designed to serve as a prototype experiment in planned social change, the potential consequences of which could well signal a reversal in some of the most harmful trends in contemporary society.

A growing body of literature on intentional social change identifies a number of pitfalls which are avoided by this proposal (Sarason, 1974; Havelock, 1973). Most efforts at intentional change are doomed to fail for the following reasons:

(a) Insufficient or no time or budget for careful advance planning prior to implementation.

(b) No adequate time or budget to train personnel thoroughly before the operation begins. Thus, the incompetence of the staff becomes one of the primary sources of difficulty that is practically impossible to overcome once implementation has begun.

(c) No provision for institutionalizing the change in one place and for establishing the means of transporting the innovation to other localities, thereby achieving a multiplier effect. Without institutionalization, operations will revert to previous forms when budgets run out or key people leave; without means for transporting the innovation, its benefits cannot be extended to ever-increasing numbers of people.

There are many other causes of failure, but these are among the most common. The Center we are proposing would be in a position, however, to apply its knowledge of human behavior in dealing with these problems, all of which can be taken into account as part of the advance planning.

The Center would establish and maintain a model school and a parent-teacher training center both of which would exemplify human development knowledge made active. These functions are of primary

importance because the exemplification of ideas in action is the most powerful means of attracting interest, support, and a willingness to participate. In short, they are the chief means of dealing, in some ultimate way, with the general problems of undercapitalization and political nonviability.

The parent training function would be integrated with the operation of the school.[6] The central idea underlying this new approach to education is to help children become competent learners so that they can take charge of the actualization of their own potentialities. In the new system, child-rearing practices, the organization of family life, teaching, curriculum development, educational administration, and program evaluation are all organized around the comprehensive theory of development, thereby ensuring that what everyone in the system does will facilitate the actualization of potentialities of the students.

It is beyond the scope of this article to present details on all aspects of such a system. Only those objectives of the proposed Center's program which primarily concern nutrition will be discussed. Although other kinds of objectives will not be examined, it is important to realize that all of the potential benefits of an applied nutrition program, whether preventive or remedial, may be minimized or lost if the program is not an integral part of a comprehensive plan such as the one presented.

One of the most important objectives of the Center is to ensure that parents and teachers grasp the necessity for maintaining the biological integrity of children through proper nutrition and understand the relationship between nutrition and the capacity to learn—the means of actualizing the categories of potentially specified by the theory of development (Raman, 1975). Learning to perceive, think, feel, attend, and act at optimum levels depends on the availability of energy sources free from toxins that impair functioning, and this can only be done through proper nutrition. Thus, the school itself will serve only the most wholesome foods, free as possible from additives and excessive amounts of sugar. Furthermore, no "junk" foods will be made available through vending machines or snack bars. Students who have particular problems such as biologically-based learning disabilities will have them diagnosed and remediation provided through prescription of individualized nutritional regimens whenever warranted. In other worlds, the applied nutritional program of both school and home will be based on a recognition of the biochemical individuality of human beings and will be directly evident in what is served and eaten. Diets, like instruction, need to be individualized.

A related objective, equally importnat, is the nutrition education of the children themselves. The program to achieve this objective has

three aspects: (1) the development of the right attitudes toward nutrition; (2) the development of good eating habits including acquiring a taste for the right foods; and, (3) acquisition of factual knowledge about nutrition, the preparation of food, proper eating habits and their relationship to learning and the prevention of disease. Experience has shown time and again that acquiring factual knowledge about nutrition rarely changes eating habits. A comprehensive nutrition education program therefore has to include provisions for motivating changes in eating habits and food preferences in a direction consistent with knowledge of nutrition and human development. Without home and school collaboration, it is not possible to ensure the development of proper eating habits and food preference. If home and school do not work together, one will undermine the other and the children will pay the price for the failure.

Given the fact that changing eating habits and attitudes is so much more difficult than memorizing information about nutrition, it is essential that opportunity for change be introduced at times when success is most likely. When a child is conceived and people know they are going to become parents, great and inescapable changes on many levels are introduced into their lives, and they are predisposed to modifying their own behavior to provide the best they can for their offspring. Thus, a point of maximum leverage for remaking the family is at this time. The Center would therefore train educators of parents —persons who are well versed in all of the knowledge about good nutrition and its role in conception, gestation, birth, and post-natal development of children and who are able to work with parents and parents-to-be so that they can make use of this knowledge in caring for their own children. Since adults tend to pattern their own homes and family life after the models provided by their parents, the rearing of children in the new system is the surest way to remake the family as a social institution. This is a long-term approach, but it is the only one that will ultimately accomplish the objective.

Another kind of professional to be trained at the proposed Center is youth counselors. At the time of puberty, the identity of the maturing youngster and his value system begin to take shape. This time is therefore also propitious for introducing change and stabilizing values. Because young people entering pubescence try to establish their independence from parents, they tend, particularly in the western world, to effect their independence by rejecting parental values and guidance. This leads to more stress than is necessary and in some cases to grave mistakes which are difficult to undo. Living through this stressful period can be greatly facilitated by good nutrition. Yet, the eating habits and food preferences of adolescents are notorious. Furthermore, during the period of the growth spurt, when the rate of growth doubles, good nutrition is essential. The millions of new cells

added each day during this period can only be made out of the foods consumed. Poor nutrition means less than optimum growth. Oftentimes is spells trouble—the development of skin problems such as acne, the deterioration in the quality of hair and nails, or any number of other difficulties due to unwise dieting, e.g., fatigue, lassitude, anxiety, restlessness, and inability to pay attention. For these reasons, a community needs youth counselors who can guide youth in the ways of good nutrition, and whose own lives, because they are based on human development principles, can serve as alternative models that are consistent with what most parents would want for their sons and daughters.

Another important function of the Center would be to educate the general public about the Center and its work using all available media. At the present time, there is an excessive amount of advertising of junk foods, soft drinks, tobacco, alcohol, cereals that are mostly sugar, drugs, and any number of other commodities not suitable for human consumption. This kind of information is unrelentingly piped into each home through television. The Center would be in a good position to counterbalance the effects of such advertising by providing public service programs to increase general awareness of human development knowledge and how it can be applied in the home. As parents begin to apply their knowledge of human nutrition, the demands in the market place will change and business will be stimulated to provide what consumers need rather than what industry wants to sell.

As the benevolent consequences of such applications of human development knowledge within the home and school are observed, more and more parents, teachers, and school boards will want to participate in the effort to shift both institutions on to a scientific foundation that will guarantee the perpetual self-renewal of family and school.

Families and schools made stable because they have a foundation in human development knowledge will help to make a stable community. Since a single family cannot provide all of the resources required for its own full development, it is clear that families can exist only within a larger unit—the community, and, through the creation of appropriate social institutions, make certain the collective need is served. Medical clinics, recreational centers, and other social service agencies are primary examples. Thus, families whose lives are organized in accordance with human development principles will naturally feel the necessity for participation in community life. They can then make certain that the general services required are provided and that the moral tenor of the community is maintained in a way that will insure the unimpaired development of its children.

The community, of course, has to govern itself. If it applied human development knowledge in the formation of social policy and law, individuals as well as commercial enterprises would be prohibited from producing and selling things that impair human development, and every attempt would be made to provide whatever is needed to guarantee an opportunity for everyone in the community to develop fully. As things stand now, commercial success is given a higher priority than the promotion of human welfare. Because of this, the public tolerates poisonous food additives, the pollution of the air and water, and the general deterioration of the environment on which depend our lives. As a case in point, less than $1 million was spent during one year by the federal government on educational campaigns concerning the dangers of smoking. Yet it spent some $50 million in subsidies to tobacco growers and permitted cigarette manufacturers to spend upwards of $250 million in advertising—an amount more than one-third of the entire federal budget for cancer research (Gonzales, 1976).

It is not difficult to see how families and schools, reconstituted as suggested, could not only reverse a number of harmful trends, but could be the chief means by which an international renaissance in civilication might be brought about. While I believe that what we are proposing is ultimately attainable, I recognize that there is a great contrast between what we have now and what we could have if the family, school, and community were reconstituted on a foundation of human development knowledge. But the contrast has to be felt if the idea is to function as a lure and we are to move forward and apply the knowledge to improve the quality of our lives. Whitehead[7] makes this point:

> A race preserves its vigour so long as it harbours a real contrast between what has been and what may be; and so long as it is nerved by the vigour to adventure beyond the safeties of the past. Without adventure civilization is in full decay.

The problem has been analyzed. Its history has been reviewed. A means for solving it has been proposed; the knowledge required is largely available; a scheme for organizing the knowledge and making it usable has been suggested; and, a new social institution to apply the knowledge to improve our lives has been proposed. I believe the stage is now set for the adventure Whitehead says is required to preserve civilization from full decay. In essence, it is the adventure of making human development knowledge active in homes and schools, alive in the behavior of parents and teachers, and munificent in its long-range impact on human biological, sociological, and cultural evolution.

FOOTNOTES

[1]This article draws directly on the work of my colleagues at the Center for the Study of Human Potential at the University of Massachusetts, where our main effort in recent years has been to develop a new conceptual scheme and design a new institution of the family (through parental education) and renewing education (through a new comprehensive system for preparing teachers and administrators, and improving the operations of school boards, accreditation and certifying organizations, and other educational agencies of the government).

[2]M. Miller (Ed.), *The Neglected Years: Early Childhood,* published by UNICEF.

[3]Illich, Ivan. *Deschooling Society.* New York: Harper and Row, 1971.

[4]Throughout this discussion, I use the term *man* in its generic sense. Those who prefer may substitute any number of alternative words: people, human beings, humankind, humanity.

[5]Whitehead, A. N. *Process and Reality.* New York: Macmillan and Company, 1929.

[6]Such a model school and parent training progam has been developed and various parts of it experimentally tried out over the past three years. For further information, see Daniel C. Jordan, "Early Childhood Education: It's a Science," *Proceedings from the NAEYC National Conference,* Dallas, Texas, November, 1975. Washington, D.C.: National Association for the Education of Young Children, 1976; and Daniel C. Jordan, "The Process Approach," in *Curriculum for the Preschool, Primary Child: A Review of the Research,* edited by Carol Seefeldt. Columbus, Ohio: Charles E. Merrill, 1975.

[7]Alfred North Whitehead, *Adventures of Ideas.* New York: The Free Press, 1961.

REFERENCES

American higher education: Toward an uncertain future. Volume I. *Daedalus,* 1974, *10*, (4).

Aries, Philippe. *Centuries of Childhood: A Social History of Family Life.* Translation by Robert Baldick. New York: Vintage, 1962.

Arman, Fran. Not yet grown, but she's pregnant. *The National Observer,* March 27, 1976.

Barzun, Jacques. *The House of Intellect.* New York: Harper, 1959.

Birch, Herbert G. Health and the education of socially disadvantaged children. *Developmental Medicine and Child Neurology,* 1968, *10,* 580-599.

Bowen, Elizabeth. *A comprehensive approach to child health through parent and teacher education.* Unpublished doctoral dissertation, University of Massachusetts, Amherst, 1976.

Bronfenbrenner, Urie. *Influences on Human Development.* Hinsdale, Illinois: Holt, Rinehart, & Winston, 1972.

Burhoe, Ralph W. Some roots of Zygon, Editorial. *Zygon,* 1966, *1*(1), 117.

Dubos, Rene. Lasting biological effects of early influences. *Perspectives in Biology and Medicine,* 1969, *12*,(4), 479-491.

Folsom, Joseph K. *The Family and Democratic Society.* New York: John Wiley and Sons, Inc. 1934.

Gattegno, Caleb. The subordination of teaching to learning. *What We Owe Children.* New York: Outerbridge & Dienstfrey, Distributed by Dutton, 1970.

Glasser, William. *Schools Without Failure.* New York: Harper and Row, 1969.

Goodman, Paul. *Compulsory Mis-Education.* New York: Horizon Press, 1964.

Gonzales, Nicholas. Preventing cancer. *Family Health-Today's Health.* 1976, *8*(5), 30.

Guttmacher, Alan F. Family planning. In H. M. Wallace (Ed.), *Maternal and Child Health Practices.* Springfield, Ill.: Charles C. Thomas, 1973.

Havelock, R. G. *The Change Agent's Guide to Innovations in Education.* Englewood Cliffs: Educational Technology Publications, 1973.

Holt, John. Why Children Fail. New York: Pitman Publishing Company, 1964.

Huxley, Julian. *Knowledge, Morality, and Destiny.* New York: Harper and Brothers, 1960.

Illich, Ivan. *Deschooling Society.* New York: Harper and Row, 1971.

Jacobson, Michael. Our diets have changed but not for the best. *Smithsonian,* 1975, *6*(1), 96-102.

Jelliffe, Derrick B. & Jelliffe, E. F. Patrice (Eds.) The uniqueness of human milk. *The American Journal of Clinical Nutrition,* 1971, *24*,(8), 967-1024.

Jordan, Daniel C. Early childhood education: It's a science. *Proceedings from the NAEYC National Conference,* Dallas, Texas, November, 1975. Washington, D.C.: National Association for the Education of Young Children, 1976.

Jordan, Daniel C. The process approach. In Carol Seefeldt (Ed.), *Curriculum for the Preschool, Primary Child: A Review of the Research.* Columbus, Ohio: Charles E. Merrill, 1975.

Klein, Robert. The pediatrician and prevention of lead poisoning in children. *Pediatric Clinics of North America,* 1974, *21*(2), 277-290.

Kohl, Herbert. *Thirty six Children.* New York: The New American Library, 1967.

Kotin, Paul. Environmental aspects: Problems and priorities. *Pediatrics,* 1974, *53*(5), 782-785.

Kozol, Jonathan. *Death at an Early Age.* Boston: Houghton-Mifflin, 1967.

Kozol, Jonathan. Free Schools. Boston: Houghton Mifflin, Co., 1972.

Leonard, George. *Education and Ecstasy.* New York: Delacarte Press, 1968.

Miller, M. (Ed.) *The Neglected Years: Early Childhood.* UNICEF.

Ogburn, William F. The changing family. *The Family,* 1938, *19,* 139-143.

Radhakrishnan S., & Raju P. T. (Eds.) *The Concept of Man: A Study in Comparative Philosophy.* London: George Allen & Unwin, 1960.

Raman, Pattabi S. Role of nutrition in the actualization of the potentialities of the child: An Anisa perspective. *Young Children,* 1975, *31*(1), 24-32.

Rogers, Carl. *The Freedom to Learn.* Columbus, Ohio: Merrill Publishing Co., 1969.

Sarason, Seymour B. *The culture of the school and the problem of change.* Boston: Allyn & Bacon, 1971.

Scott, J P., Stuart, J. M., & De Ghett, V. J. Critical periods in the organization of systems. *Developmental Psychology,* 1974, *1*(6), 489-513.

Shorter, Edward. *The Making of the Modern Family.* New York: Basic Books, Inc., 1975.

Silberman, Charles E. *Crisis in the Classroom.* New York: Random House, 1970.

U.S. Health 1975. *United States Health 1975.* Washington, D.C.: DHEW Pub. No. 76-1232, 1975.

Wallace, Helen M. Social and economic aspects of handicapping conditions of fetal and perinatal origin. In Research to Improve Health Services for Mothers and Children. [HEW Pub. No. (HSA) 74-5122]. Washington, D.C.: HEW, 1974, 25-27.

Weinstein, Gerald & Fantini, Mario. *Toward Humanistic Education, The curriculum of affect.* New York: Praeger Pub., 1970.

Whitehead, Alfred N. *Adventures of Ideas.* New York: The Free Press, 1961.

Whitehead, Alfred N. *Process and Reality.* New York: Macmillan and Co., 1929.

Young, J. Z. *An Introduction to the Study of Man.* New York: Oxford University Press, 1974.

Zimmerman, Carle C. *Family and Civilization.* New York: Harper and Brothers, 1948.

Nutrition In Human Development

Edited by Pattabi Raman

This book of original articles has tremendous implications for our understanding of preventive nutrition and its role in human development. This volume is intended to encourage students of Child Development, parents, teachers, professionals, and paraprofessionals involved in delivering nutritional, health, and educational services, to increase their knowledge of those factors that have a profound effect on the biological integrity of the growing child. It will enable them to see the advances in the biomedical sciences in a new and larger context of human growth and development as understood by theorists.

Contents:

About the editor: S. Pattabi Raman, Director of the New Era Center for Higher Learning, India. He was in charge of the Early Childhood Education Model, called Anisa, developed at the Center for Study of Human Potential, University of Massachusetts. Dr. Raman was formerly a Senior Research Chemist of the Division of Biochemistry, Ayerst Laboratories of Montreal, Canada.

Contributors: The late Professor Pokrovsky was Vice President of the USSR Academy of Medical Sciences • Dr. Ray C. Wunderlich is a pediatrician now specializing in preventive medicine for persons of all ages • Dr. John Yudkin is a retired professor of Nutrition and Dietetics from Queen Elizabeth College, University of London, England • Dr. Abram Hoffer was an industrial research chemist concerned with the cereals used in the manufacture of flour • Dr. Benjamin F. Feingold, Chief Emeritus, Department of Allergy, the Kaiser-Permanente Medical Group of Northern California • Dr. Daniel C. Jordan directs the Center for Study of Human Potential at the School of Education, University of Massachusetts, Amherst.

ISBN: 0-89223-028-2 (hardbound) $10.00

All orders must be pre-paid. Greylock will pay all shipping and handling costs. Purchase orders accepted from institutions and libraries.

GREYLOCK PUBLISHERS

13 Spring Street, Stamford, CT 06901