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From a historical perspective, the concept that "the more things change, the more they remain the same" has -unfortunately been considered a truism where the duality of humanistic values and technology are concerned. This duality had its beginnings nearly 2500 years ago in Greek culture. This society was a paradigm with its concept of "ethos," the disposition of the people to guide their behavior by a set of principles predicated upon right or good conduct; and of "tekhnê," the body of knowledge used within a context of arts and skills.

One must be cognizant, however, of the interactive, symbiotic nature of Greek society. In the time frame of Socrates and Plato, a period which saw the formulation of philosophy, ethics, values, and divergent thinking, there was also the influence of Aristotle, predicated upon a deductive scientific methodology, observation, and technological applications of knowledge. Thus, a schism began to develop, both in the "gymnasia" (schools) and in the "agora" (society at large).

As western civilization struggled through the Middle Ages, the official repression and suppression of critical and creative thought mitigated against formal education as a tool to be used by humankind to develop its potential. It was, rather, a period of dogma, where ethics and morality were instituionalized and shaped by rigid theological laws, not quite the intent of Thomas More's *Utopia*. Conversely, scientific knowledge transformed into technological constructs was largely focused on a singular objective, the waging of wars.

When the Renaissance emerged with its promulgation of the arts, philosophy, and creative science, the schism nevertheless persisted, in part because there was no formal educational system for the masses: as always, only the elite of society's males were educated. The Renaissance was a period which saw technology moving more and more to the forefront as its products were theoretically for mass

consumption (note especially the development of the printing press). But while academia's concerns were focused on what Abraham Maslow later defined as the highest level of needs (self-actualization), technology was focused largely on the lower needs (physical concerns).

The schism certainly widened with the advent of the Industrial Revolution. Society was literally in thrall to the myriad machines and inventions which materialized. What was even more telling was the direction of formalized education. While the Middle Ages had only theological education as a frame of reference and the Renaissance its universities of divinity and art, the Industrial Age saw the initial development of both universities of liberal arts and technological sciences. The emergence of the latter began to take on increased significance as society demanded greater materialistic productivity. An individual who knew nothing of classical or modern philosophy was capable inventing a "perpetual motion machine" and thus could secure a measure of recognition as well as financial success.

Yet at the same time the Industrial Age was a period which nurtured a re-examination of philosophical values of humankind. There were, however, two forces which in essence isolated the philosophers. First, their discipline was, as always, for the elite; and second, these philosophers began critically to attack emerging technology. If philosophers and educators had made gestures of reconciliation, emerging technocrats might have been open to discussing values and ethics, both intrinsic and extrinsic, integral to their disciplines.

By the beginning of the twentieth century, the Industrial Age was changing into the Technological Age, creating a complex communication system which brought to all mankind a "technological mind set." The schism remained intact as the concepts of ethics, values, and morality were synthesized into a rigid legalistic framework. In addition, post-World War II society has seen a new schism emerge within the educational system: the classic liberal arts curriculum is at odds with the technocratic curriculum. But there is a chance for education to reconnect values and technology and make them enhance one another again. Once education became available for the masses, a global society emerged which provided an opportunity for true change. Educators must reconstruct the schools to prepare

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students for the twenty-first century.

In 1986 we live in a competitive society, a world which emphasizes both competition in education and in the job market. Most of the schools today are primarily essentialist in nature because the public seems to support the idea that teaching the basics is a good thing. The 3Rs, reading, 'riting, and 'rithmetic have been the tools of the affluent and elite in all civilized nations of the world. But a new scenario must be created in order to teach the new values that must infuse society if it is to adapt and survive with a higher "quality of life" available to all. Moving to a creative futuristic mode of education does not require us to give up the basics, but basics must not be taught in isolation. The basics must be taught as part of a longitudinal process with a purpose people can relate to. Values must be integrated into curricula via an interdisciplinary approach to learning. Human life must be enhanced by values which are related to human communities and their peaceful interaction.

The schools of the future will still focus on the 3Rs, but these basics will be transformed by the new technologies and will be mastered at a much earlier age — perhaps the age of 10 or 12. Chris Dede, a leading futurist, remarked that "Training will be almost completely done by machine, while educating will be facilitated by people."[1] It will be necessary to see centralization of curriculum development and finances but decentralization of the learning environment from the traditional educational establishment to homes and communities. Curricula will need to be flexible to encompass the needs and wants of all human beings — slow, average, and superior intellects whether poor, middle-class, or rich. The interdisciplinary approach combined with flexible scheduling will be the rule rather than the exception. Educators will dispense with the practical aspects of subject matter and emphasize the conceptual or analytical dimensions. While the emphasis will tend to center on a "liberal arts" education, all students will be prepared for employment. Students will no longer be guided by a step-by-step approach of "this is how you do it," but rather, in order to stimulate the inquiring mind, students will be asked to conceptualize, analyze, and create relationships among the disciplines.

The more sophisticated the new technologies become, the more

they disengage us from life. Critical thinking, logic, and creative problem solving will need to become major focal points for the education systems. As the noted columnist Sydney J. Harris stated, "The real danger is not that computers will begin to think like men, but that men will begin to think like computers."[2] In anticipation of this, a futuristic paradigm can be found in Isaac Asimov's fictionalized account of robotics, *I, Robot*, in which the "brains" of robots are directed by laws which are a culmination of the highest moral and ethical values of humankind.

In the year 2000, 14 years away, it is imperative that students be prepared to live as involved citizens in this exciting and futuristic world. We must teach students how to access information using available technology and then to use the human intellect to assimilate and digest the implications of this information. They must be taught to use information wisely and selectively, and to sort it out to determine its value. There must be no limits on the imagination by superimposing restrictions on the inquiring mind. Students must look for multiple answers to issues, thus stimulating the intellect. Freedom of thought, individualism, and intuition must not be sacrificed. Free will must never be restrained, or we will become nothing more than humanoids living in a vacuum. Schools must implement an affective/cognitive approach to learning. There must be a transition from a basically closed-geocentric system appraoch to an open-cosmocentric system approach. Emphasis in the curriculum will have to be placed on the formation of the conscience and universally shared values. Concern for right and wrong, mutual respect, responsibility, awareness of others, appreciation of diversity, fairplay, integrity, and empathy will need to be nurtured from infancy.

To function adequately in a fast-changing society, we must never lose sight of our unique potential: we are beings with an intellect and a free will, capable of attaining individual gratification and fulfillment; and we are the only beings capable of rationally analyzing behavior, moralistic values, and the standards which govern our life. The behavior of all educators will be essential in transmitting and modeling ethical values. According to Alvin Toffler, author of *Future Shock*, if the primary goals of education are to enable each

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individual to make informed choices about one's destiny, to enable him or her to have greater command over life, then he or she must be provided with the best opportunities for fulfilling a self-chosen role. Each individual must decide what he or she wants to learn and must go to the best source for that instruction.

To accomplish Toffler's primary goal, another task for educators will be to assist students to learn how to learn. Students must be helped to become self-motivated, self-directed lifelong learners. Learning will deal primarily with the unknown and will focus on the discovery of knowledge. Educators will have to assist students in understanding relationships and connections. They will need to guide the learner in synthesizing information in holistic ways.

The concept of societal cooperation in education has been slow in developing, but as futuristic trends begin to take hold, this concept is becoming more and more critical. Children will need to sense the advantage of cooperative, collaborative behavior. The best place to begin our shift from the "Me Generation" of the twentieth century to the group-oriented collaboration of the twenty-first century must be nursery schools of the 1990s. During the 1990s, nursery schools will be commonplace in America. In the classroom, cooperation and sharing enable a student to derive more knowledge and maintain a firmer grasp on social relations. Games, simulations, and group activities might be used to introduce the three and four year olds to ways they can deal with conflict that they have experienced or will experience in later life. Beginning with the curriculum of the nursery schools, classroom units will have to teach pupils adaptability. At the same time activities must help students develop an open mind so that they can cope with constant change and the pressures of individual and social life.

Other futurists have developed a set of values and curricula to help prevent people from thinking and acting like machines. These programs are aimed at developing people who, according to Jonathan Kozol, remain alive mentally as long as they are alive physically. Again, beginning in nursery school much must be done to liberate and strengthen children's imagination. All through schooling, original ideas, questions, and creative thinking should be valued more highly than the intake of what is already known. Younger

children will be asked from time to time to teach older ones as well as their teachers, who may evolve into Socratic "midwives."

Theodore Sizer believes in a liberal arts education for all. As a proponent of coaching vs. telling, Sizer asserts that one obvious purpose of our schools is the education of the intellect; another purpose, education in character, is also inescapable. The essential goals of education are elementary: literacy, numeracy, and civic understanding. "The foregoing desiderata are neither surprising nor threatening. They are the chestnuts of American educational thought."[3] They can be taught, and can be learned by most Americans by early adolescence, he claims.

Mortimer Adler responds to these vintage queries in the "Paideia Proposal." The NASSP and the National Association of Independent Schools analyzed the most recent policy statements of the major professional organizations concerned with high school curriculum. The rhetoric of the policy is remarkably consistent and emphasizes various key themes. For example, problem solving rather than rote memorization and drills should be a central focus, and students should be taught to apply skills to real-life situations. The curricula must be relevant to students' lives and connections must be made between what is learned and those conditions in society with which students have no personal experience. There should be more integration of academic courses, which have traditionally remained isolated from one another in the curriculum. Lastly, curriculum should be designed in stages which mirror the stages of intellectual development determined by behavioral science and psychological research.

According to futurist Alfred Bernhart, mankind's future creativity will emphasize these values: guiding the ethics of procreation of human life; improving the quality and duration of human life; intensifying human life in community; shaping "urbia" for stronger community interaction; strengthening global understanding and sharing; developing multi-thought capabilities and unifying spiritual concepts. With this list of values, Bernhart believes redirected creativity with contributions from all of us will bring humanity a peaceful future — materially rewarding, intellectually inspiring, and spiritually enlightening. In line with this, Scott Enchson sees the new

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ABCs of education as: 1. an "all-time" approach to curriculum; 2. a consideration of the biosphere in all curriculum matters; and 3. the fostering of a cosmocentric orientation toward curriculum construction.

As educators we must look ahead if we want our students to survive, adapt, and prosper in the fast-changing world of the twenty-first century. Educators must demonstrate a responsibility for the future. The proper attitude to develop is a philosophy of "hopeful realism." With hopeful realism a person has a clear appreciation of the issues and risks that lie ahead but also a recognition of the emerging solutions and opportunities. We must never forget Plutarch's well-considered dictum: "The mind cannot be seen as a pitcher that needs to be filled, but as a flame that must be kindled and fueled."[4] Hopeful realism teaches not for the computer but rather for how one can apply the knowledge and power gained by using that computer. It exemplifies values that will continue to transform us into useful citizens and relates information to wisdom.

It is this philosophy, not science or technology, which should be uppermost in any culture or civilization, simply because the questions it can answer are more important for the continuance of human life. It is evident that the more technological capacity we possess, the more we need enduring values, because the more power that exists, the more we need to control its direction.

ENDNOTES

[1]Quoted by Henry Skolimowski, in "Freedom, Responsibility, and the Information Society," a speech delivered at the Educating the Information Society Series, 1984.

[2]Quoted in Lane Jennings and Sally Cornish, *Education and the Future* (Washington, D.C., The World Future Society, 1982), p. 89.

[3]Theodore R. Sizer, *Horace's Compromise: The Dilemma of the American High School* (Boston: Houghton Mifflin Co., 1984), p. 237.

[4]Quoted in Ira Winn, "High School Reform: Stuffing the Turkeys," *Phi Delta Kappan*, 65, No. 3 (November 1983), 185.