

Activation of Education : Tips from Organisms and Ecology

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SUMMARY : (1) The futurologist Alvin Toffler has shown that times have changed considerably from the agricultural revolution, to the industrial revolution, and to the products of the information/communication revolution. He analyzed a human beings' way of life in the course of these changes in civilization, and expressed opinions full of penetrating insights and replete with implications about how we will survive in the next century and what will become of the stage on which humankind throughout the world exists. It was pointed out that mature consideration of the background of the era of the coming century is necessary when attempting to define how education should be in the future.

(2) Since similarities can be seen between the structure of human beings and the structure of society, comparing the physiological structure of the human body with the structure of society suggests the direction of reforms, and I have discussed the importance of "harmony" from that standpoint.

(3) The evolution of life can be described as a response of living creatures to changes in their environment, but the opportunity provided by the transition from walking on all four limbs to the erect posture and ambulation on two feet freed human alone, who acquired knowledge, from the control of the environment. As a consequence, even though man has been adapting to changes in the environment, we must search for ways for humankind to be connected in prosperity and happiness while coexisting and living together with plants and animals that can live as life on earth, and that is a great responsibility. Accordingly, I have added a some discussion of the conditions required for leadership.

(4) Finally, at the present time, when there is a demand for medical care providers full of humanity, I have stressed the need to re-study the spirit of Hippocrates and Nightingale, and that the concepts of Oriental medicine provide many suggestions.

VIEWPOINT FOR REFORM

Recently, I read "War and anti-war: survival at the dawn of the 21st century" by the futurologists Alvin and Heidi Toffler. It enabled me to glimpse the world that we are about to enter in the 21st century and I was deeply impressed. According to the Tofflers' theory, the "first wave" was the era of agriculture, the "second wave" was the era of large-scale industrial production, and the "third wave," is the era of diversified, high-tech, small-scale industrial production. In tandem with them, the nature of war has undergone a

transition from hand-to-hand fighting, or close combat, to indiscriminate genocidal wars, and then to high-tech wars involving the use of "smart" weapons, as seen in the Gulf War. When I thought about this, I realized that methods of treating cancer and methods of education have also changed in parallel with these changes in civilization. By that I mean that we have passed through an era in which there were no other methods of treating cancer than early detection and early resection, to a period when multi-drug combination chemotherapy is being tried under the treatment banner of

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“total cell kill,” so that even cancer is now seen as one of the diseases that can be completely cured. However, the effect of cancer chemotherapy has been limited, as everyone knows, in recent years there have been attempts to use gene therapy and missile therapy with monoclonal antibodies, methods that specifically target cancer cells. And when we reflect on the changes that have occurred in education in Japan, we find that we have passed through an age of tutorial education in private schools by just a few people to a time when attempts were made to improve standard education by the widespread introduction of compulsory education, and then higher education. Currently, educational reform is forging ahead under the banner of “diversified education,” with emphasis on the individual. Our educators must search for better forms of education in the 21st century after mature deliberation against the background of that age.

In thinking about the “activation of education,” I would like to show that living organisms and ecology provide clues, and I would like to discuss the fostering of medical care providers with abundant humanity

who possess a high level of knowledge and technology and who are responsible for holistic care, as well as to discuss the conditions required for leadership.

THE IMPORTANCE OF HARMONY

Human beings are organisms in which cells having the same function are gathered together to form organs, and these organs are governed by a purpose, maintaining life. Society can be thought of in the same way as a group of human beings in which people having the same function or purpose are gathered together, form occupational groups, and are organized for the purpose of maintaining life activities. Since the structure of human beings and the structure of society appear to be so similar, it seems that a comparison between the physiological mechanisms of the body and the mechanisms of society might suggest some directions to take in making reforms.

Let me give you an example, the activity of the economy closely resembles an organism. It is alive. Banks that have the authority to issue currency correspond to bone marrow, and the red cells produced by the

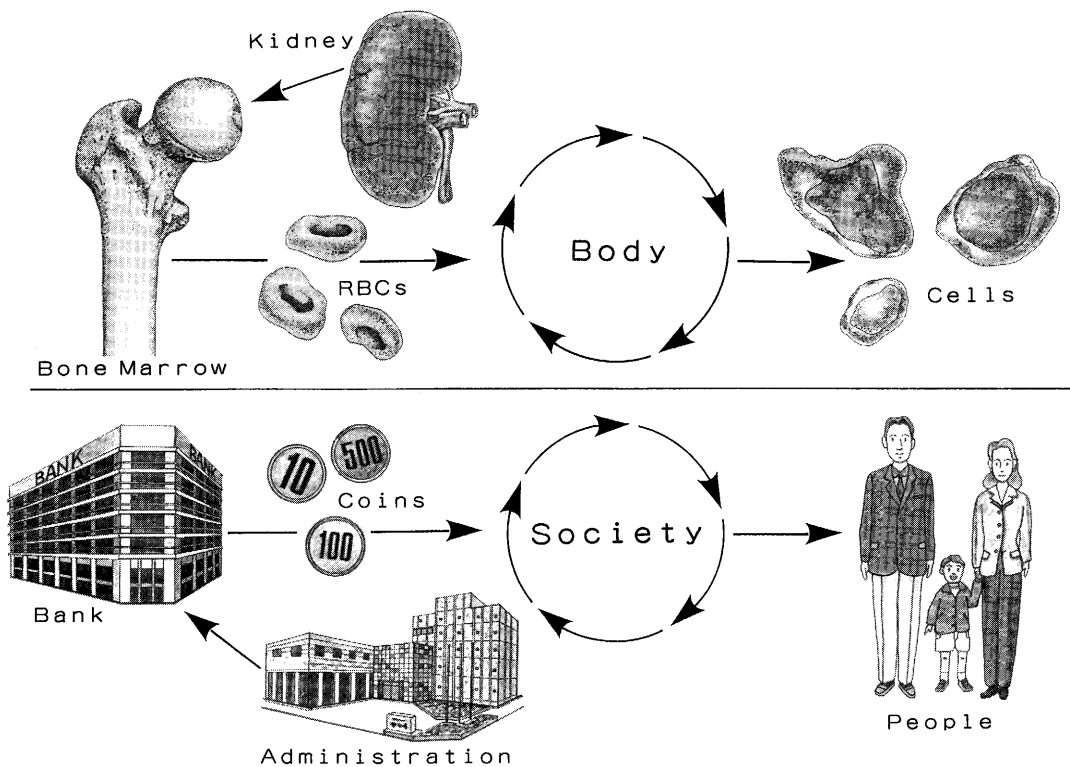


Fig. 1 The physiological mechanisms of the body and the mechanisms of society.

marrow are like coins. The cells that compose tissues correspond to the people who comprise society, and the kidneys, which secrete erythropoietin and regulate hematopoiesis, could be thought of as administrative agencies. "Times are good" means that there is a good flow of currency through society, and if a person is healthy and in good condition, body fluid circulation is good and the cells are consuming the oxygen that hemoglobin brings them and generating energy. This resembles individual people spending money and brimming with vitality.

The body activates cells by neural regulation and chemical adjustments, and maintains life. Neural regulation is comparable to the telegraph. Information transmission is fast, but the amount of information is small and transient. Chemical transmission, on the other hand, is comparable to mail, a method of transport is required, blood, and while information transmission is slow, the volume is large, and continuous. In terms of economic measures, policies corresponding to the former and expected to have an immediate impact are cuts in the official discount rate and major tax reductions. Policies that correspond to the latter, whose effects are felt later, but are continuous, can be said to

consist of structural economic reforms that incorporate bold deregulation.

Well now, if asked "What is the most important vital phenomenon in our bodies?" I would reply "harmony." In other words, I don't think it would be going too far as to say that life dwells in harmony. The same is true of society: reform takes place when harmony has broken down, and reform proceeds in the direction of maintaining harmony.

The concept of cell death referred to as "apoptosis" has been attracting interest in recent years, and research papers related to it have been attracting attention. Cell death in the form of necrosis due to ischemia was long known in the past, but Dr. Kerr and coworkers noted that cell death occurs at sites other than areas of ischemia and defined this new concept of cell death in 1972. The cell death that occurs in necrosis begins in the cytoplasm, whereas apoptosis is characterized by death that begins in the nucleus, and constitutes a self-destructive, genetically programmed form of cell death. Etymologically, the word "apoptosis" is derived from the Greek for "leaves fall from a tree." Strangely enough, cell death at the time when leaves change color and fall from trees in the fall has been

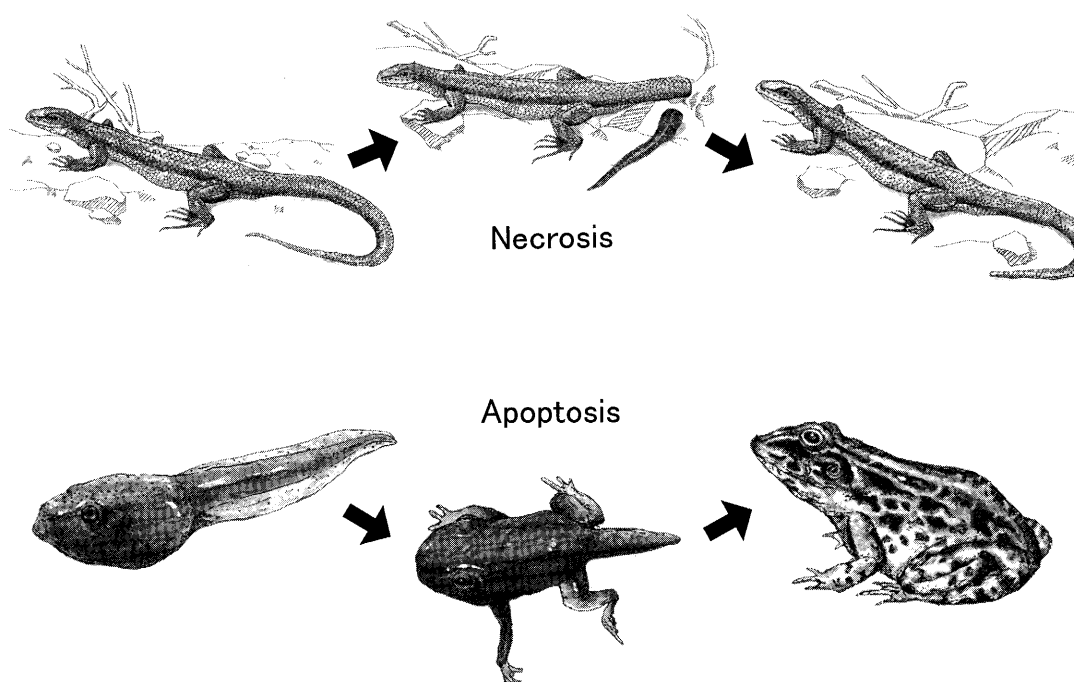


Fig. 2 Necrosis and apoptosis

shown to represent apoptosis. Falling from trees is an necessary condition for growth.

Let me to try to explain the concept of apoptosis by way of an example. Unless a lizard is attacked by an enemy or some sort of accident occurs, its tail should be attached to its body, and when a lizard's tail falls off, it is because of necrosis. The tail of a tadpole, on the other hand, has to be lost for it to develop into a frog, and its loss occurs as a result of apoptosis, cell death that is necessary for growth. The sloughing off of an infant's umbilical cord is also clearly the result of apoptosis. Cell death due to apoptosis occurs not just as a result of pathological factors but of widely divergent physiological factors, and is a "controlled cell elimination mechanism" that controls cell groups, forming "two sides of the same coin," so to speak, with cell division.

When we consider applying this to social phenomena, it seems to suggest many things. Apoptosis is necessary for reform. For example, when we consider current medical care and education, we find too many extraneous elements. There is an overabundance of drugs, and doctors prescribe enough of them to fill us up. In tandem with advances in medicine, medical care and medicine-related education have been upgraded and become more complex. The cost of medical care has steadily increased and medical textbooks have gradually grown thicker. We therefore need to consider basically "What is important?" in accordance with their individual ideals and purposes, and careful selection and rebuilding is required. In other words, there is a desire to adapt to the medical care environment.

THE RESPONSIBILITY OF EDUCATORS

When we try to unravel the process of evolution over 3 billion 500 million years from primitive organisms to humans, it seems reasonable to conclude that evolution is a reaction of living things to changes in the environment. Moreover, as the change from walking on four limbs to standing erect and walking on two took place under harsh environmental conditions, and the forelimbs, or "hands" became capable of delicate movements, the number of synapses between neurons increased, and the brain developed considerably. It should also be noted that human beings acquired intelligence and became free from domination by their

environment as a result, and even became capable of changing the environment itself. This is important to remember, because the way human beings have used their intelligence has sometimes had tragic consequences. In their quest for "wealth" human beings have disrupted the harmony in the natural world, and we must not forget the situation in which we find ourselves today, struggling to find ways to compensate for the "environmental destruction" that we ourselves have wrought.

With the 21st century just around the corner, a better design for education with the future of the nation and society is being sought, because today's education will form tomorrow's people, and form the people of the future. Accordingly, we educators bear a great responsibility.

Intelligent workers will be in demand in the new "smart" economy cresting on the "third wave." It is said that as physical labor becomes increasingly obsolescent, there will be a strong trend toward smaller numbers of workers who have acquired a high level of special skills and "intelligent" machines replacing large numbers of workers who do not possess any skills. Alvin Toffler points out that precisely the same trend can be seen in the military, where "smart" weapons require intelligent soldiers.

It would seem that the same could be said of the medical specialties, meaning that in the future, a single medical specialist will perform the work of two or three by taking full advantage of "intelligent" machines. Thus, it will be necessary to stress information education and at the same time to acquire a high degree of knowledge and skill in medical care. From this standpoint, raising the level of co-medical education would seem to be the natural trend of the future.

REQUIREMENTS FOR LEADERSHIP

The word "education" is derived from the Latin verb "educare," which does not mean "to receive instruction", but "to draw out." Accordingly, it is fair to say that the duty imposed on us educators is to draw out the latent talents that each student possesses. In the process, while the "attitude that students learn on their own" is desirable among those taking courses, if teachers do not have enthusiasm for education, it will not be effective at all. Thus, the first condition for

activating education is that teachers must increase their enthusiasm for it.

With the 21st century at hand, forward-looking education reforms are under way, but the way university leadership should be has been questioned. Whether the most will be made of an individual or organization depends a great deal on the standards of their leaders. This is something that history has testified to in every age.

Professor Kokubu of Tsukuba University, one of the authors of "The psychology of leadership," expresses the conditions for leaders very cleverly by using the letters that form the English word "leadership" as an acronym for them. They can be summarized thus. For smooth operation and goal achievement, "Encouragement," which corrects the leader's own self-assertiveness based on team members' opinions, and "Power" which clearly expresses "Directiveness" and makes decisions indispensable are desirable. It is also necessary to adopt an attitude that accepts "Responsibility" for the conduct of the members of the team. In regard to interpersonal relationships in groups, on the other hand, leaders strive for harmony with "Security" that makes it possible to always keep "Holism" in view, while "Empathy" is needed for the concerns of individual people. In addition, "Identity" as a leader, making a good appearance, that is, "Looks" that do not convey a feeling of indecision to others, and "Acceptance" that goes beyond personal interest and personal feelings are important.

The importance of V-S-O-P was advocated in the past as an expression of the same sort. The first secret to success as a leader being principally possession of physical and emotional energy, or "Vitality" with this energy arousing efforts and enthusiasm towards achieving the goal. In addition, the knowledge cultivated through "Specialty" and leading technology provide material for decision-making and decisive action, "Originality," which identifies goals and directions, and "Personality" that possesses affection and consideration for others, are the conditions of an attractive leader.

FOSTERING OF MEDICAL CARE PROVIDERS RICH IN PERSONALITY

The medicine of ancient Greece is the source of

Western medicine today. It was fostered against a background of philosophy, and gave rise to the great master of medicine Hippocrates. Hippocrates' oath is highly regarded in medical ethics, and the Helsinki Declaration of 1964 follows in its footsteps. It was the Renaissance movement that propelled modern medicine forward. Since that time learning has gradually advanced and become specialized, the notion that philosophy, which nourished the pure scientific spirit, should stand above other specialized fields was established, the philosophical background of medicine gradually weakened, and we find ourselves in the circumstances that prevail today.

Meanwhile, some of the advances in the medical sciences in the latter half of the 20th century have been remarkable, and the contribution of Western medicine to medical care has been immeasurable. That has largely been attributable to its elucidation of pathophysiology by analyzing the scientific mechanisms concealed within the body and to pursuing the development of methods of treatment based on what was learned. However, based on remorse for seeming to have neglected "human spirit" in recent years, medical care is taking a new direction, making the fullest use of state-of-the-art medicine and medical technology, while at the same time striving for medical care that attends to the human spirit in the form of "holistic care."

The fostering of medical care providers who, in addition to having acquired special knowledge and techniques, have an abundance of human understanding and an appreciation of "medical ethics" is a urgent task, and there is a need to renew the spirits of Hippocrates and Nightingale.

I recently encountered these wonderful words in a Chinese classic, "不為良相，願為良醫" meaning "if someone does not become a good government official, direct that person toward becoming a good physician." I think the reason behind this is that most government officials are originally educated in cultural matters, whereas scientific studies is the everyday work of the physician. However, when these words are carefully considered, they clearly contain the concept of Oriental medicine of "grasping all phenomena in the world, including man, in a single concept."

At the present time, when there is a demand for

“holistic medicine,” a great deal can be learned from this concept of Oriental medicine, and I feel very strongly that medical specialists must study both the fields of culture and science.

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