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TECHNOLOGY, SCIENTIFIC CONSCIOUSNESS AND VALUES

The Challenge of Scientific Responsibility for the Future of Science

INTRODUCTION

Today we live in a world that is in the midst of an accelerating technological revolution. The consequence of dramatic technological innovation and change quite literally imposes dramatic changes on the way social process works. The physicist Albert Einstein put the dilemma this way: „There are only two ways to live your life. One is as though nothing is a miracle. The other, as if everything is." So dramatic have technological developments been that they challenge the traditional grounding of human identity, spiritual aspiration and transcendental consciousness. Today we live in a world that is radically transforming itself. First, we experience the radical transformations in communications and transportation technologies. Communication has been compressed between human beings so that information is instantly communicated across the planet and technological innovation in travel have radically compressed the distance of both time and space between human beings. In the context of major coercion and more, the development of modern armaments including thermonuclear weapons and delivery systems put in the reach of human decision the basic question of whether humanity will be sufficiently shortsighted to destroy itself. In the areas of industrialization and mass production of goods and services, technological innovations are increasingly dependent on modern innovations and less dependent on human labor. This is an area where change requires a radical rethinking of the role of labor and social stability in human relations. Even more remarkable are the developments in the areas of artificial intelligence. Scientists predict that shortly within the grasp of modern science will be in-

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struments of artificial intelligence vastly superior to those of the humans that created it. This may raise the difficult question of whether such artificial forms of intelligence may resist control by human agency. Other technological prospects include the radical new developments for the advancement of solar energy. Scientists have already determined that in the molecular structure of sand there are elements which if isolated could dramatically increase the collection, storage and distribution of solar energy. Since this is an inexhaustible supply of energy, it could have radial implications for political economy in the social process. These few introductory comments are simply used to raise the question of the role of values in the evolution of the technological capacity of the human family.

SCIENCE AND HUMAN CONSCIOUSNESS

We would contend that values are implicated in virtually all levels of technological innovation. The problem with values in this context is that values are produced and understood by the same intellectual processes that generate technological innovation and change. In short, technological progress and the importance of values in understanding and providing normative guidance for such processes emerge existentially from the process of human consciousness. The question is, what do we understand about human consciousness? For the scientists, human consciousness would simply be necessary for the development of scientific reason and scientific rationality. From the perspective of the culture of transcendental experience, human consciousness is the tool or lever for the development of spiritual conscious aspirations. In general, scientists tend to accept the idea that there does exist a form of consciousness which indirectly influences scientific reason and scientific achievements. However, scientists have had difficulty in understanding a possible connection between the study of the human brain and the study of human consciousness. The central problem is whether consciousness is a reality or an illusion. To some scientists the idea of consciousness is simply one of the great mysteries that confront scientific inquiry. To other scientists it is really a non-problem. Following on this conclusion, many scientists believe that consciousness is insufficiently scientific to waste such time on it. At most, consciousness may simply be a byproduct of complex physical processes. Another problem is that in general, scientists tend to believe that consciousness is something that lies outside of the boundaries of normal science. An important contributing factor to the notion that consciousness is outside of science is the philosophy of science grounded in positivism. Positivism suggests that the concerns of science be completely objective and distinct from the contamination of human subjectivity and values. It insists on the principle that science has an exclusive preoccupation with the *is* and not with the *ought* implied in value analysis.

Modern physics has raised important questions, which implicate the process of consciousness; this further implicates the problem of values. In the 1920's Heisenberg, one of the founders of quantum physics, made a completely inexplicable discovery. He discovered that when observing subatomic phenomena, it was impossible to separate the observer from what was observed. The observer influenced the

movement of subatomic particles. This means that the observer has a level of subjectivity that influences the object of observation. This is an uncomfortable conclusion for strict positivism. [1]

HUMAN SUBJECTIVITY, CONSCIOUSNESS AND MODERN SCIENCE

Human subjectivity[2] in the form of perspective has been largely a field monopolized by the psychological sciences. It has been in a very important way also, a field

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[1] The evolution of human consciousness has a rich intellectual popularity in our time. Donald presents a theory of consciousness that is multi-layered draws its efficacy from a cultural matrix. The author makes a convincing argument for the centrality of the concept of mind in the evolution of consciousness. Donald proposes that „the human mind is a hybrid product, interweaving a super-complex form of matter with an invisible symbolic web to form a „distributed" cognitive network". Among the most important works A Mind So Rare: The Evolution of Human Consciousness by Merlin Donald. (2001).

Theorists from the Noetic sciences have also contributed to a better understanding of the issue of consciousness. For example Peter Russell compares the consciousness of animals to that of humans. He makes a point that animals are also conscious, but what animals and humans generate as a form on consciousness is different. He explores consciousness in terms of biological evolution including the role of language in consciousness and goes further to transcend language in the sense that consciousness goes beyond language coalescing around self-consciousness. He sees our evolutionary mandate as of an unfolding consciousness that is incomplete. The importance of our evolutionary consciousness is that we can think ahead on the projector of time and use tits faculty to shape our possible futures.

Consciousness has historically been connected to religion, faith and transcendental understanding. Here, the general assumption is that human consciousness is dynamic in the sense that it's evolving towards some greater and ultimate, initial course. Piyasilo (1991). In the Christian tradition, the example of Christ is often referenced as a model of Christ-conscious. The assumption behind this conclusion is that consciousness had advanced in term of spiritual self-knowledge and understanding. This consciousness brings a person closer to god or the universal spirit.

Carl Jung had important insights into the notions of human consciousness. In particular, the identification of a collective unconsciousness, which has a connection to the human consciousness. Collective unconscious, a term coined by Carl Jung, refers to structures of the unconscious mind which are shared among beings of the same species. According to Jung, the human collective unconscious is populated by instincts and by archetypes: universal symbols such as the Great Mother, the Wise Old Man, the Shadow, the Tower, Water, the Tree of Life, and many more.

[2] In bringing human subjectivity to the center of an appropriate focus of inquiry for scientific consciousness, raises the critical question of the absence of objective measurable indicators of shared human subjectivity and shared professional consciousness. This is an issue that has generated an important interest in the measurement of subjectivity. A founding presence in this initiative was William Stephenson. Stephenson was an Englishman. He obtained a PhD in both physics and psychology. He is credited with developing a credible scientific method for the measurement of shared human subjectivity. His method was called the Q Methodology. The Q methodology is described as „a methodology for dealing with intra-individual data. Its relations to other methods of multivariate data analysis are described

dominated by the religion. Today this sharp division has been eroded as the field of quantum mechanics has disclosed properties and insights of micro-particles and waves. The experiments in quantum physics confirm results that are sometimes described as weird. The results do not make sense in the world of cause and effect as objectively observed. One of the insights of quantum physics is the role of the observer in shaping the behavior of the particles observed. This has raised the question that human consciousness when focused on the particles has an influence on how the particles behave. In short, observational consciousness appears to be a form of participatory interaction. It has been shown experimentally the cells of the body and the DNA communicate through this subtle field of energy that is difficult to quantify or measure. More than that it is been shown that human emotion has a direct influence on living DNA. These effects eliminate the interposition of distance between these objects. According to the physicist Amit Goswami, „when we understand us, our consciousness, we also understand the universe and separation disappears." The scientific results from quantum physics experiments indicate that the human DNA has an effect on the particles that constitute the matter of the universe. It is also established that human emotion has an effect on DNA, which in turn affects the particles the world is made of. Additionally, the connection between emotion and DNA has effects which transcend space and time. Scientists now believe that there is, in space, a matrix of energy that connects any one thing with everything in the universe. This connected field accounts for the unexpected results of experiments. It is further believed that the DNA of the human body gives us access to the energy that connects with the universe. Emotion is the key for the tapping into this field. According to the famous quantum physicist Max Planck „As a man who has devoted his whole life to the most clear-headed science, to the study of matter, I can tell you as a result of my research about the atoms this much: There is no matter as such! All matter originates and exists only by virtue of a force which brings the particles of an atom to vibration and holds this most minute solar system of the atom together… We must assume behind this force the existence of a conscious and intelligent Mind. This Mind is the matrix of all matter." (Cited in Gregg Braden's Book pp. 216)

The central insight of modern physics is that we live in a participatory universe. Human consciousness, it is believed, participates in this universe via human perspectives and emotions and represents a profound insight and even deeper challenge to the age- old question of the being and becoming of humanity. This participatory universe generates the future of multiple possibilities which gives strength and responsibility to the idea of creative orientation. Which of the possibilities may emerge as real would therefore appear to be influenced by emotion filter through consciousness and observation? In short, there is more to the idea of a focus of attention. A focus of attention generates the enemy of human consciousness which

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and, in particular, the implications of factor analysis for it… the practical applications to different fields, e. g. type psychology, social psychology, projective tests, etc" See Stephenson, The study of behavior; Q-technique and its methodology (1953). See also Brown, „Q Methodology and Qualitative Research" (1996)

Brown, „A Primer on Q Methodology" (1993), www.operatsubjectivity.org

may create a possible future reality. Scientists still dispute the precise meaning of the nature of possibilities and overlapping possibilities. Three of the most important of these interpretations is the Copenhagen Perspective. Theorists here focus on experiments which indicate that a person observing an electron moving through a slit in a barrier suggests that observation itself is what turns quantum possibilities into reality. Second there is the many worlds interpretation. This interpretation is similar to the Copenhagen Perspective but suggests that the possibilities are infinite and all of them exist simultaneously. However, in the „many worlds" view each possibility happens in its own space and cannot be seen by others. These unique spaces are called alternate universes. Finally, there is the Penrose interpretation. Here, Penrose maintains the belief of many possibilities existing at the quantum level. However, his theory is distinctive as to what it actually is that „locks" into a particular possibility that becomes our reality. Penrose recognizes that each possibility has its own gravitational field. It takes energy to maintain this field and the more energy a probability requires the more unstable it is. The consequence was that without enough energy to sustain all possibilities they collapse into a single state which represents our reality. The conclusions that are drawn from the insight of quantum possibilities are that emotion as a part of consciousness is the central factor in the choice of reality.

From this point of view, it is the language of human emotion that speaks to the quantum forces of the universe and to Planck's intelligent matrix. The polar extremities of feeling and emotion, which may feed into human consciousness, are the extremes of love and hate. Thus, the greatest challenge presented in the world of quantum physics and human consciousness has a similarity to the challenges posed by great religious and mystical insights. For example, Central to love is the idea of compassion, empathy and positive sentiment which we describe later as „affection". Positive sentiment in the form of compassion is according to the Buddhist tradition the feeling of „what connects all things". And compassion in this tradition is both a force of creation and an experience. In short, science and mystical experience seem to converge on the importance of positive sentiment for personal growth and transformation with large- scale existential implications. In short, it is love, compassion, and empathy that we must embody in our lives and feelings as the way we choose to experience the world. On the other hand, there is the inevitability of choice in the orientation of emotion and feeling. Such choices may well reflect the framework of the pole of hate which is reflected in the existential fears human experience in terms of abandonment, low self-worth, and lack of trust. The negative sentiment would be the feature for the creation of a negative utopia and the ultimate expression in reality of a negative utopia would be the practices and policies for the extermination of human aggregates.

## HUMAN SUBJECTIVITY- EMOTION AND CONSCIOUSNESS AS A DRIVER OF HUMAN VALUE

It may also be that, in general, societies take for granted the importance of emotion and sentiment in the construction of future generations. Here, intellectu-

ally, the idea of affection or positive emotional sentiment may need to be more explicitly recognized as an important cultural and policy preference. In short, emotion and sentiment permeate all human behavior. Emotion and sentiment may be the driving force about what is right concerning the human prospect and what is required to avoid was wrong with it. Modern scholarship has drawn attention to the importance of the emotions encapsulated in positive and negative emotion. We provide a provisional overview of positive and negative sentiment. Indeed what we suggest is that genocide is impossible when culture, law, and politics give due deference to the principles of positive sentiment or affect and heightens the prospect of genocide and atrocity when the negative symbols of emotionalized hate are dominant. Perhaps the most important insight here is that positive sentiment is a critical foundation for the culture of human rights. Negative sentiment is critical for the denial of the cultural of human rights.

The following diagram is an illustration of modern psychological science connecting emotion to the ideas of positive and negative sentiment. The diagram does not quite explain that positive sentiment as affects is an identifiable social process.

To the extent that we are living in a participatory universe, positive and negative emotions require the guidance of basic values. Below, I set out a generalized model of positive and negative sentiment that we can assume permeates the culture of science and any other discipline. Negative sentiment is a psychosocial process of community wide salience. Below we reproduce a model of the structure of negative sentiment as a social process.

The first line of inquiry must be the ubiquity with which human beings generate the culturally acknowledged and received symbols of identity. We generally consider this to be a natural process. The „I" is born into a family, or analogous micro-social unit, and soon the identification of the „I" broadens to include
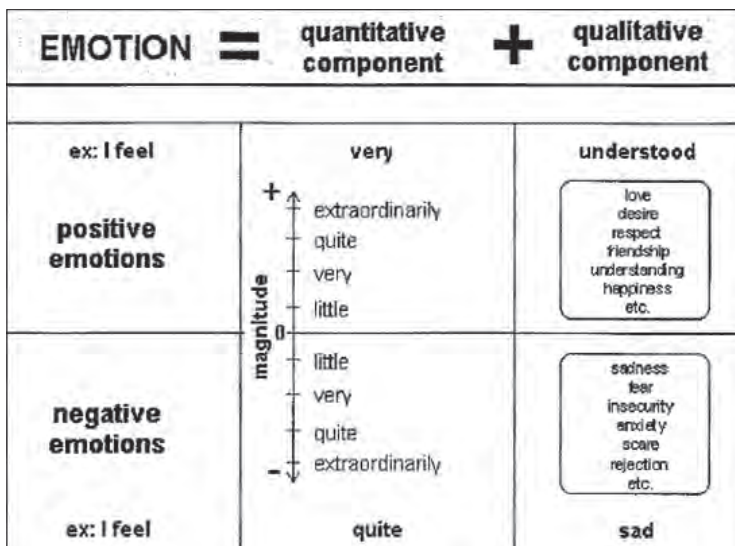
the „we". But how inclusive or exclusive is the „we"? We realize that the expansion of the „we" is not unlimited and the boundaries of the „we" invariably demarcate those groups that constitute the „non-we" that is to say the group or class of „non-self others". This is an ordinary process that happens in all human communities.

The social process also generates the identifiable markers of a social process of positive sentiment. Part of positive sentiment maximizes within the personality of the individual self system the salience of affection, empathy and solidarity with humanity as a whole. As such, it is a process that is very fundamental to social organization that seeks to universalize the dignity of man. As such, a social process of positive sentiment is an antidote to anti-Semitism, to racial discrimination, to prejudice, to group domination and to group extinction.[3]

It is important for us to recognize that every technological innovator comes to his craft with human consciousness influenced by human subjectivity and emotion. If we accept the guidance of Socrates, namely „know thy self", then we would have to admit that all scientists and the rest of humanity come to their vocation with a context of emotions, some positive and some negative.

TECHNOLOGY, SCIENTIFIC CONSCIOUSNESS AND SOCIAL RESPONSIBILITIES

It is widely acknowledged today that science, technology and innovation are some of the most powerful forces directing the future of our global social process. It is also recognized that technology represents remarkable advances as well as existential threats to humanity. Some aspects of technology are, in fact, fairly strictly controlled politically. These areas include nuclear technology, pharmaceuticals, agricultural chemicals, and food additives. Other areas of technological development would appear to be somewhat more anarchic. These areas include the computerization of financial transactions, automation, biological research, and telecommunication systems. The speed of technological development and distribution appears now to be way ahead of the capacity of governance to adapt to the changes that technology generates. This results in social stress, uneven social development, social upheaval, displacement and mass-migration and vast disruptions of stability in social process globally. Leading thinkers in international governmental institutions and global scientific institutions continue to stress the critical importance of the issue of values in scientific research and education and are of great importance in the formulation of wise public policy. Michel Jarraud recently stressed the issue of social responsibility for the management of scientific activity. Ivo Šlaus, in similar vein, stressed the acceptance of a collective and individual duty from a global point of view for a commitment to the realization of sustainable development objectives. Raymond Torres stressed the question of technology's imprint on global income inequality and insecurity. He also insists upon a socially responsible form for the governance of technological innovation. Marie-Paule Kieny from WHO also insists on a recognition of a

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[3] For a comprehensive table on both positive sentiment and negative sentiment processes, see Nagan, *Lectures on Genocide and Mass Murder,* Landbridge University.

mutual sense of social responsibility addressing the tension between the promotion of global health and the commercial objectives of pharmaceutical interests. Alexander Likhotal warns of the corrosive aspect of money-power on technology. Herwig Shopper underlines the special responsibility of scientists and intellectuals toward global society. Garry Jacobs draws particular attention to the problem of the perspectives of technological innovators. His fear is that their perspectives may be unduly influenced by selfish motives such as careerism, competition for grants and intellectual prominence. He insists on a refinement of scientific values in the public interest. Martin Lees is another important world leader who draws attention to the difficult problem of political responsibility versus intellectual and scientific responsibility. Christophe Rossel stresses the importance of classical scientific values and their ethical guidelines. He insists that regular assessments of the social and economic impact of technology are an urgent necessity. Professor Momir Durovic draws attention to the problem that technological innovation has an incipient tendency to determinism. This means that human beings do not control technology; technology controls human beings. He too stresses the importance of strengthening mechanisms to improve the social responsibility factor. What is implicit in these important views is that technological innovation and development is a critical driver of paradigm change in the context of appropriately developing the theoretical frameworks to better understand, to better control and regulate the scope and character of revolutionary technological changes. It is apparent that there is a critical link between the issue of social responsibility and consciousness and the critical relevance of a deeper and more comprehensive understanding of the role of values in scientific consciousness, political consciousness, and in general, the consciousness of humanity.

This summary of the perspectives that stress scientific responsibility, the centrality of ethics and morality and values is, of course, the critical challenge of understanding the interrelationship of consciousness, technology, and human values. Alexander Likhotol puts this challenge in terms of a level of practicality when he states the following:

„ Political leaders, in particular, badly need to be exposed to scientific vision. The mind, once stretched by a new idea, never reverts to its original dimensions. Unfortunately, we have to recognize that today's governments are ill-equipped to understand science, sophisticated technological challenges, or the opportunities facing the world. New instruments are needed to ensure that science and technology are adequately applied to address the wide range of increasingly urgent global problems- and not just to make our Smartphone batteries last longer. This will require a rapid transition to a different model of development; one which not only takes into account the interest of short –term growth, but provides opportunities for sustainable and inclusive development."

CONSCIOUSNESS, VALUES, TECHNOLOGY AND SCIENCE

The discussion of consciousness and values in scientific culture has always been an uneasy business. From a scientific point of view, the proper scientific culture is to be value-free. If the discourse of science is permeated with values, it is permeated

with human subjectivity and not scientific objectivity. On the other hand, we know that in human society the important stakes about community organization, endurance, and promise seem to be tied up with values in some form or another. The traditional limit on the use of values from a scientific point of view remains a problem for the subjectivity of value-toned discourse. Let me start with a distinction. Values in the context of intellectual culture are used in two distinct ways. First, values are used descriptively. In this sense, the scientific observer is merely observing the value-conditioned behavior of social or legal participators. What does the observer see? He sees individual human beings acting in a community, energized to pursue the things that they desire or value. In this sense, viewed from an anthropological point of view, what we call things that are desired or valued might, in a basic sense, be the human needs that the individual seeks to secure in the social context of his or her life. This is simply a descriptive inquiry into what the individual wants, how the individual goes about getting what he wants, and what he does with the desired thing that he has gotten. This will give us a description of the system of community or public order as it is. There is another sense in which the term values is used. In this sense, the term is vested with normative importance. In other words, the question is not how values are produced and distributed but how they ought to be produced and distributed. This, therefore, is not a descriptive exercise; it is an exercise of normative judgment. In the case of values used as a description of community order as it is, we are dealing with propositions that can be proved or disproved by observation, creating a hypothesis about what is observed. Further observation may prove or disprove the hypothesis. This is an empirical inquiry. When values are used in a normative sense, we are really evaluating the goodness or badness of their production and distribution. The determination of the normative priority or the preference given to a value statement reflecting the „ought" will have to be established by some other criterion of validation. That criterion, at least in the context of moral philosophy, is based on the idea that a statement about a normative preference or „ought" can be validated by reasons external to the statement-maker. In short, there are objective, justifiable reasons that may be formulated to determine the currency, or lack of it, of a moral or value proposition. We shall be using the terms value in both a descriptive and a normative sense, but we will attempt to secure a sufficient clarity of exposition that while we discuss them as interrelated matters, we can keep them sufficiently distinct in order to establish different insights into the problems we are discussing about society.

HUMAN NEEDS AND VALUES IN THE ANTHROPOLOGICAL SCIENCES

The anthropological literature has given us a key to understanding life in a very elementary community. Life revolves around human beings energized to satisfy human needs. Anthropologists also identify the structures that emerge from society which are specialized in whatever degree of efficacy to facilitate securing those needs. When we map needs onto institutions, we emerge with a social process that is based on the interaction of energies directed at securing needs through institutions. These institutions direct human energies, in some degree, to the satisfaction

of those needs. We can now begin to identify basic human needs as the goods, services, honors, and gratifications that people in society desire or need. Moreover, we can classify these desires/needs in terms of the basic values that the individual social participant acts to secure for himself and those dependent on him. Thus, we may emerge with a model of social process in which human beings pursue values through institutions based on resources. Now, this is a purely descriptive inquiry, but it is possible to observe that the needs/values and the institutions specialized to secure them are, generally speaking, identifiable. What are these values and what are the institutions specialized to secure them in any social process?

THE HUMAN PERSPECTIVE AND CONSCIOUSNESS IN THE EVOLUTION AND INTERDETERMINATION OF VALUES IN THE HUMAN SOCIAL PROCESS

Values	Institutions	Situations	Outcomes
Power	Governance-Political Parties	Arena	Decision
Enlightenment	Universities- WAAS	Forum	Knowledge
Wealth	Corporations	Market	Transaction
Well-Being	Hospitals, Clinics	Habitat	Vitality
Skill	Labor Unions, Professional Organization	Shop	Performance
Affection	Micro-social Units (Family) Macro-social Units (Loyalty)	Circle	Cordiality, Positive Sentiment, Patriotism
Respect	Social Class	Stage	Prestige
Rectitude	Churches, Temples	Court	Rightness
Aesthetics	Museums, Monuments, Culture	Creative Orientation	Symbols of Cultural Beauty and Aspiration

In this representation, values and institutions are represented descriptively in order to describe the system of community order as it is. It should, however, be understood that the social process of the community is a dynamic process in which there is an energy flow between the participators, the values, the institutions, and the results. Some of the results are generative of conflict. Other results are generative of the success of institutions functioning optimally. What is important is that social process is a generator of problems, and these problems are about the acquisition and distribution of values. This means that the dynamism of society requires a decision process that is frequently challenged to produce a solution to the problems of value conflict, value deprivation, or value over-indulgence. Thus, the community response to the problems that values pose for community order invariably must implicate a normative dimension about the optimal allocation of values in society. Indeed, some political scientists describe political science as concerned with the authoritative allocation of values in society.

In reviewing this map of values and institutions of social process, it is important to keep in mind that it is the human perspective that gives meaning and life to

the values and institutions in society. The human perspective comes with the perspective of identity, ego-demands, and the value ideals of expectation. These perspectives are driven by deep drives for self-actualization, self-realization, and psycho-social fulfillment. In this sense, the private motives of personality, even when displaced on public objects and rationalized in the public interests, still represent an underlying force that moves the personality in all social relations. This underlying force may be the force of self-affirmation for self-determination and is the most foundational energizer of the demand for human rights and dignity. The relationship between personality and value achievement may itself generate a sense of inner-fulfillment, which, in turn, becomes the driver of still greater levels of value creation and achievement.

CONSCIOUSNESS IN THE IDENTIFICATION AND ALLOCATION OF VALUES IN SOCIETY

The problem of the allocation of values implicates the idea that there may be different standards which justify one form of allocation over another. Historically, at least in law, there has been an assumption that legal interventions are meant to discriminate between the claims for values that are just and those that are unjust. It is this challenge that has given rise to the great traditions of jurisprudence and, most importantly, the jurisprudence of natural law. Natural law, however, could only generate procedures, not substantive rules, to facilitate the use of right reason in the resolution of value conflicts. Two of the most enduring of these natural law-based rules have survived and are essentially matters of procedural justice: audi alteram partem [the obligation to hear both sides] and nemo iudex in causa sua [no one should be a judge in his own cause]. However, we had to await the aftermath of the tragedy of the Second World War before we got a kind of official code of natural law in the form of the Universal Declaration of Human Rights. Although couched in the form of rights, the Declaration may be reduced to nine fundamental value-needs categories. The adoption of a code of moral priority, intended to bind all participants in the international system limited the speculation about the role of values in the social process. Although most intellectual and scholastic speculation stresses the notion that values are somewhat opaque, difficult to distill, and even more difficult to clarify, the adoption of the United Nations Charter has served as a political impetus for the development and clarification of values.[4]

GLOBAL VALUES, THE UN CHARTER: THE NORMATIVE VALUE GUIDANCE FOR SCIENCE AND SOCIETY

Based on UN Charter, the world community also adopted an International Bill of Rights. The central challenge to a scholastic understanding of the International Bill of Rights is the need to clarify and distill its basic, underlying values. It may

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[4] For a comprehensive keynote regarding the UN Charter, see Nagan, *Power of Values and the Process of Value Realization.*

now be with confidence stated that we can distill at least nine functional values that underlie the entire international bill of rights. In a general sense, these rights, when considered collectively, represent the integrated, supreme universal value of human dignity. The central challenge then, is that those charged with decision-making responsibility must prescribe and apply a multitude of values in concrete instances and hope that their choices contribute to the enhancement of human dignity and do not, in fact, disparage it. At an abstract philosophical level, distinguished philosophers such as Sir Isaiah Berlin have maintained that it is futile to attempt to integrate these values with the abstract principle of human dignity because fundamentally, these values are incommensurable. Not everyone agrees with this. Specialists in decision and policy acknowledge that human dignity based on universal respect represents a cluster of complex values and value-processes. Therefore, the challenge requires that ostensibly conflicting values be subject to a deeper level of contextualized social insight and a complete sensitivity to inter-disciplinary knowledge, procedures, and insights. Thus, decisions in these contexts are challenged with the task of broader methods of cognition and a better understanding of abstract formulations of value judgments. Disciplined intellectual procedures have been developed to provide better guidance in particular instances of choice to approximate the application and integration of values in terms of the human dignity postulate. Does the ethic of universal respect and human dignity demand absolute, universal compliance at the expense of other universally accepted values? Ensuring that the values of respect, democratic entitlement, and humanitarian law standards are honored requires fine-tuned analysis and great subtlety in the structure and process of decisional interventions. Rules of construction and 'interpretation' are painfully worked out, which hold, for example, that even if a peremptory principle (ins cogens) of international law embodies an obligation erga omnes. It should be evaluated, appraised, and construed to enhance rather than disparage similar rights, which may also have to be accommodated. The currency behind the universal ethic of essential dignity and respect is that it provides practical decision-makers with goals, objectives, and working standards that permit the transformation of law and practice into a greater and more explicit approximation of the basic goals and standards built into the UN Charter system itself. This prescribes a public order committed to universal peace and dignity for the people of the entire earth-space community.

GLOBAL VALUES, SCIENTIFIC RESPONSIBLY AND THE PERSPECTIVE OF GLOBAL GOVERNANCE

Consciousness, Values and Public Order

It is useful to approach the questions of value in terms of the nature of the public order that the rule of law system seeks to promote and defend. The system of public order secures the complex values that it is committed to defend by making an essential distinction between the minimum-order aspects and the optimum-order aspects of the system of public order.

Consciousness, Values and the Minimum Order

The problem of scientific responsibility, values and the prospect of at least realizing a system of minimum order in the global governance of humanity now represents a critical challenge for scientific consciousness. We may understand the relationship between community, minimum order, and values by imagining a society without an expectation that agreements and exchanges made in good faith and according to law will be honored, that wrongs (delicts) inflicted upon innocent parties will be compensated, that basic interests and expectations of entitlement [as in fundamental norms of right and wrong] shall be sanctioned by a collective community response, or that basic structures of governance and administration will respect the rules of natural justice such as nemo judex in sua causa or audi alteram partem, and will in general constrain the abuse of power and thus the prospect of caprice and arbitrariness in governance. The necessity of minimum order in a comparative, cross-cultural, historic reality is that human beings interact within and without community lines. In doing so, they commit wrongs intentionally or unintentionally, they require some security over their possessions and entitlements, and their systems of governance aspire invariably to constrain the impulse for abusing power. These are the minimum values of social coexistence. It is in this sense that law as minimum order confronts the idea of justice and potentiality. It is commonly thought that minimum order is a critical, but not absolute condition of a more just, more decent, more optimistic human prospect. The rule of law precept is uncontroversial in the sense of minimum order and its 'boundaries. ' Peace, security, and minimal standards of human rights are reflections of these values in international, constitutional, and municipal law. Fundamentally, the quest for the maintenance of a minimum order in society would appear to be an essential condition for the individual or aggregate of individuals to evolve toward a social process that maximizes value production and distribution. It is possible to see in this an evolutionary idea of progressive change relating to the production and distribution, optimally for all social participants. It is imperative that in the education of scientists and technology innovators, that their sense of social responsibility is at least minimally influenced by the global values of a minimum sustainable system of world order.

Consciousness, Values and the Optimum Order

This challenge to the public order raises the question of the production and the distribution of values beyond the minimum for social coexistence. This is an insight that is more challenging to the question of scientific responsibility and the values that ought to guide it. Clearly, a great deal of science will have an imprint that goes beyond minimum order and will be let loose in the domain of optimal possibilities and prospects. Here, it is critically important that value clarification be a component of the definition of scientific social responsibility. This is the challenge of the unequal distribution of opportunities or results. Human beings exist not only spatially, but also in terms of the duration of time and events. There is hopefully a tomorrow, a next week, next month, next year, and next century. Human beings, such as scientists, are also transformative agents who make things

happen, and in doing so underline the question embedded in the nature of law and community that we can change things for better or worse, for the common good or the special interests, for the sense of expanding human dignity or the prospect of a negative utopia, the rule of human indignity. This is a critical challenge for scientific consciousness. The central challenge for values posed by the optimum order precept is the problem of the procedures and methods for producing values as well as the procedures methods and normative ideas about the fair distribution of the values that are produced in society. At the back of the concern for human values is the belief in human capacity for the essential, energized generation of value at every level of the social process and the human resource as a producer of ideas, insights, and values of exponential salience. At the back of the human dignity idea is the belief that widespread human dignity flourishes when the dignity of the individual flourishes and reproduces values of exponential importance for the common interest of all. Fellows of the Academy have suggested that the nine values embedded in the International Bill of Rights [power, wealth, respect, rectitude, enlightenment, skill, affection, health and well being, and aesthetics] are the key to the notion of a public order of human dignity. They postulate that the maximal production and distribution of these values on a universal basis is the key to improving the human prospect and approximating a public order of human dignity. This means that the prescription, application, and enforcement of the fundamental values behind human rights remain a major professional challenge for the global processes of governance charged with the defense of global public order. We may conclude that value needs are a condition and a consequence of focusing and directing the energy of the human perspective into concrete operations that establish institutions concentrated and specialized to value realization. In this sense, values and needs are incentives that generate a self-directed force, which ultimately evolves into institutions of effective power crucial to the allocation of values. It is possible to see these generalizations in the evolution of the sovereign authority of the nation-state and its own evolution from state absolutism to sovereignty routed in people's expectations. Another insight of this model is found in the notion that the power process itself is energized by human expectations, especially expectations of demand. Without demanding or claiming an aspect of social power, society would be static. Thus, we see in the power process, the social activist. In the United States, Rosa Parks resented segregation in public transportation, so she staked a claim to repudiate racial discrimination in public transportation. Gandhi was thrown off a train in South Africa because he was not white. He initiated a claim to challenge the power of the state to impose unjust discriminatory laws. His challenges to the power process brought him to India as a leader of the Indian Independence Movement. Nelson Mandela challenged apartheid and indicated in open court that he was committed to human dignity and democracy and that these ideals were ones that he was prepared to die for. Therefore, it is important that we have a clear understanding of the process of effective power, and what the limits and strategies are of mobilizing bases of power, to effect meaningful social change. It is quite obvious that scientific consciousness, driven by a commitment to scientific social responsibly, will have to carry a significant level of commitment in utilizing social power

so that the results of technology serve human purposes that are constructive and avoid those that are destructive. As Einstein suggested, the development of science and technology should be a blessing and not a curse on human kind.

From the perspective of science, consciousness and value the following framework is provided as value condition guidance for the technological innovators of our time and the immediate future.

VALUE FRAMEWORKS TO GUIDE SCIENTIFIC CONSCIOUSNESS AND SOCIAL RESPONSIBILITY

1. *The value of life*: This is a centrally valued human subjectivity. It is referred to not in the „pro-life" sense (that a pregnant woman must bear a child), but in the Bill of Rights sense (that a person has right to personhood and autonomy). The value of life, therefore, includes the respect and deference given to the individual in the global community.

2. *The status of the value of power and security*: Should it be narrowly or widely shared? Is the common interest of all honored in a system that seeks to secure the widest possible participation in all key areas the power process? One of the central values identified in the Atlantic Charter was the freedom from fear. This concern for freedom has evolved so that today no one denies that there is a critical interdependence between the concept of peace as a human right and all the other values in the UDHR. Peace and security might well be included under the functional category of power. However, peace is recognized as a complex peremptory component of the human rights value system. It is of value to again recognize that there are complex ways in which all human rights values have an influence on peace and security, recognizing as well that peace and security at all levels are critical conditions for the effective mobilization of human rights values. A central aspect of the values of peace and security relates to the connection between the mobilizing force of strategy for the realization of human rights goals and the realization of these goals themselves. For example, is it appropriate to deploy violent strategies of action to achieve human rights objectives? Is it appropriate to disengage the value discourse involving strategy and struggle on the one hand and idealistic value objectives on the other hand? Gandhi, for one, insisted that the morality of struggle was even more important than the morality of distant idealistic objectives. Indeed, he also insisted that a disconnect between struggle, strategy, and goals was morally indefensible.

3. *The status and value of economic and wealth processes*: Is the common interest of all better secured by optimizing the capacity to produce and distribute wealth or the opposite?

4. *The status and value of respect and equalitarian values*: Should invidious discrimination be fully prohibited (covering all areas of race, gender, alienage, etc.)? Can equality be meaningful if it is only a formal, juridical idea without regard to the legacy of exploitation, repression, and discrimination?

5. *The status and value of educational and enlightened values*: Should these values be widely produced and distributed or narrowly experienced? In the context of science, the critical value that secures scientific innovation and the liberation of

scientific consciousness is the freedom of inquiry. The challenge posed by dramatic technological innovation is that further scientific consciousness will generate an internal process focused on scientific responsibility and a deeper sense of the value implications and consequences of technological innovation. The problem with regulating science is the problem that it will be regulated by a politically ignorant constituency, who may seek to appropriate technology with selfish special interests.

6. *The status and value of skill and labor values*: The centrality of labor and skills values to the human condition indicates that these are central and fundamental values implicated in the rights and expectations of those who seek to create and sustain these rights and labor values. Should these rights and expectations be widely shaped or narrowly shared?

7. *The status and value of health and well-being values*: The delivery of reasonably formulated and accessible healthcare and social services to all is now widely regarded as crucial entitlements, if the most basic standards of decency in politics and society are valued. Today, unemployment aid, social security, Medicare, and other social services are considered crucial to a society that cares for its people.

8. *The status and value of the family and other affective values*: Because the family is the basis of collective existence and is central to the human rights of children, the public policies of a society that destroys family (and other affective ties) pose a problem for the wide generation of affective values including the loyalty values of patriotic deference.

9. *The status and value of moral experience and rectitude*: A system that endorses the centrality of moral experience to the legal and political culture and seeks to maximize the spiritual freedom of all is yet another of the central themes of the human rights

How do we translate expectations of care or fundamental moral experience into the practical prescription of law and policy?

10. *The status and value of cultural and aesthetic experience*: The term cultural includes the concept of the aesthetic. In fact, the word „cultural" could encompass all the value preferences that we might extract from the UDHR. There is, however, a narrower meaning that the term culture might carry. That meaning ties in with the notion of human rights as also emblematic of the diversity of human experience, experience that reflects the cultural richness of humanity as a global community. There is great controversy about the issue of culture and tradition, culture and creativity of the present, culture and the elaboration of the aesthetic, which may capture and nurture the cultural narrative of creativity and beauty which may in fact be the critical psychological view of how the glue of social solidarity promotes creativity. The boundaries of this discourse are controversial. Sensitive matters of sexual regulation which may differ widely may be justified by culture and yet here the culture of tradition may not be compatible with the culture and creativity of the present or the future in human rights terms. For example, female genital mutilation justified by cultural tradition is not justified by either religion or by the science of human sexuality. Human rights thus provide a process by which these boundaries may be appropriately protected and appropriately expanded according to the normative challenges of human dignity. The current discourse often suggests that

universality trumps cultural relativity or vice versa. This is not necessarily helpful unless one sees these ideas as only the starting point for value clarification and application from a human rights perspective.

11. *The status and value of the eco-system*: Today, we recognize a complex right to a viable eco-system on what theorists have seen as Spaceship Earth. The values embedded in the protection and promotion of a healthy eco-system, are, like many other values, issues of complex inter-dependence and inter-determination. However, implicit at least, in the concern for the integrity of the eco-system is clearly the notion that there are no human rights if there is no environment in which human beings can survive and possibly even improve the human prospect. But this insight suggests an even higher level of moral consciousness in the sense that the eco-system (with its plant life and animals, wild and domesticated) is part of a complex cycle, in which human beings are both custodians and also utterly dependent as individuals and as society. This means that we now see in nature not something irresponsibly exploited and destroyed but central to our identity as a sentient species. To take a simple example, for all the vaunted technology of human progress and human egotism, no one has seen a dog or a cat or a rat or indeed the most elemental of recognizable life forms outside of this lonely and unremarkable planet called Earth. Thus, as humanity, we now look at life even in its most humble forms as not only indispensable to the interconnected chain of life on this planet but we see in it something new and utterly connected to the very consciousness of being human and being alive. In short, we know that our dogs identify with us. We may now know those ordinary pets in terms of how they and all other living forms have shaped our identity both psychologically and physiologically.

CONCLUSION

This paper has sought to clarify the salience of the difficult concept of scientific consciousness, the importance of cultivating that consciousness not only in creative ways but in ways that are morally and ethically compelling. This means that consciousness should be alert to the dynamics of positive and negative sentiment in the shaping of the technological paradigm of the future. Even more importantly, it is crucial for scientific consciousness to self-regulate itself by being better informed about the values it seeks to promote and defend. Successful self-regulation of science avoids the danger of control and regulation by forces completely ignorant of the implications of science and technology. This means that scientific leadership must be more articulate in the defense of the values that sustain a creative, dynamic and responsible scientific culture as an indispensible foundation for an improved world order based on human rights and human dignity.