Contents lists available http://www.kinnaird.edu.pk/

Journal of Research & Reviews in Social Sciences Pakistan

Journal homepage: http://journal.kinnaird.edu.pk

ISOLATING THE SCIENCES FROM THE ARTS AND HUMANITIES: WHY IT IS DANGEROUS AND AGAINST THE VERY NATURE OF HUMAN KNOWLEDGE

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Abstract

This is a slightly revised version of a plenary talk given at the first International Conference on Science, Technology, and Innovation hosted by Kinnaird College. It is a call for an education system that integrates (rather than isolates) the sciences from the arts and the humanities. The argument is that not only does such separation impoverish education; it is harmful for society—and, ultimately goes against the very nature of our species.

Keywords
Education System, Impoverish Education, Solidarity, Kinnaird College.

1. Introduction

Thank you for inviting me to speak at Kinnaird's 1st International Conference on Science, Technology, and Innovation.[1] It is an honor, especially for someone who has little educational background in the sciences, thanks to the wedge between the sciences and the arts that runs through our entire education system. I am looking forward to learning from you and to fill some of that enormous lack in my own education, which has been primarily in the fields of social history and theory of media arts.

As such, what I can offer here is a reminder that as we talk about scientific and technical advances in the next few days, we keep in mind our historical context. For a start, there is the general sense that we stand at the threshold of a profound transformation, i.e., we are either evolving into a new species or facing our end.

The first is artificial intelligence, which holds the potential of freeing us from unnecessary labor and empowering us to direct our time towards greater self-realization. At this time, however, it largely hangs as a threat on our heads—of unemployment and vulnerablity to new forms of surveillance and social control. The second is bio-engineering, which has broken new frontiers in our understanding of life, revealing the degree to which we share the ingredients of life with other living beings on our planet. This should make death itself seem not so final, as we learn that life takes many forms. Yet, this too appears largely as a terrifying ordeal in the current scenario where human life appears to have no intrinsic value or dignity and entire populations are considered disposable, resource material to be exploited and used. In both cases, the dread of science and technology stems from its use to perpetuate the violent subjugation of the many by the few. Simultaneously, science and technology is now an absolute necessity, to help us evolve into a new relationship with each other and nature if we are to survive the climate crisis that is now upon us. Our education system has, however, played no small part in creating a science and technology that is more feared than loved. It is the result of isolating the sciences from the arts and humanities; a separation that not only impoverishes education, but society as a whole. Moreover, it is an artificial breach that goes against the nature of human enquiry, i.e., how we, as a species, come to know and have evolved. We find that in periods of revolutionary change in the modern world, these distinctions were swept aside to challenge the status quo; to call for an egalitarian development of all of humanity. Let us go back four hundred and fifty years ago, to another period of intense scientific discovery, to the 1600s in Europe where Galileo Galilei – who is known as the father of observational astronomy, modern physics, and the scientific method—made the claim that the moon was, in fact, no different from the earth. He asserted that the moon had an irregular surface, with mountains that were higher than the Alps. And, that he could prove this to anyone who was willing to look through his telescope. At the same time, another equally renowned British astronomer and mathematician, Thomas Hariot, had looked through a very similar telescope, but all he could discern, in his words was a "strange spottednesse." It was not that Galileo had more advanced technology, a telescope 2.0, in comparison with Hariot. The difference was that Galileo was a master draftsman. Trained in the art of the Renaissance perspective, he recognized, Samuel Edgerton (2009) tells us, that the "strange spoteddnesse" was, in fact, shadows cast by the mountains and craters. Thus, Galileo demolished the view that the moon was a perfectly round, pure celestial sphere, "an eternal pearl," as Dante had described it. In a stroke, Galileo shattered the idea of heaven and became part of an age that overthrew the authority of the Church and divine

rights of kings, the belief that one's life was pre-determined by fate or destiny. [2]

In our time, too, there is an orthodoxy. But, it is a secularized one, although it easily beds with religious fundamentalisms of all hues. It is the power of capitalism as a system, which is everywhere and in no one place, all at once. Its ideology is market fundamentalism -- the belief that everything must be directed towards making profits. Under this orthodoxy, even the term sustainability has become equated with profitability: i.e., the question to which all innovation must now answer, is it sustainable in the market? The tiger of global capital steps in and out at will, devastating livelihoods and our lands – and today the disparities in wealth and options for life stand at a staggering disjuncture. Religious fundamentalism fans hatred for sections of the population deemed the Other, justifies the existence of inequality in society more generally, and perpetuates it through outright force.

In 2018, 26 people owned wealth equal to the bottom 3.8 billion (Oxfam, https://time.com/5508393/global-wealth-inequality-widens-oxfam/). Many governments are continuing to fuel this crisis of inequality through their neoliberal agendas. They are under-taxing corporations and wealthy individuals, yet withdrawing support to essential public services like healthcare and education. These policies hit the poor hardest.

Such gross inequality is accompanied by an increased investment in the military, with the greatest escalation occurring in the most unequal nations. In the U.S., 24 cents of every tax dollar went to the Pentagon (The National Priorities Project). India is now in the top five countries of the world in terms of military spending, following the U.S., China, Saudi Arabia, and Russia. Yet, India also ranks 130 and Pakistan 150 out of 180 countries in the Human Development Index, 2018. The Human Development Index measures quality of life, health, and education as opposed to only economic criterion like the GDP. It should be obvious that the prioritization of military expenditure over human welfare is a political decision in favor of elites. It also comes at a time when the climate crisis is threatening to make the planet itself uninhabitable for humanity.

Such brutal conditions of life are maintained by fear and not a day goes by when we do not hear of a new low in the acts of human cruelty—lynching, rape, police brutality, and concentration

[2] "The men who founded the modern rule of the bourgeoisie", Marx wrote, "had anything but bourgeois limitations. Anyone with any significance had travelled, spoke four or five languages, and shone in a number of fields….what is especially characteristic of them is that they almost all pursue their lives and activities in the midst of the contemporary movements, in the practical struggle; they take sides and join in the fight, one by speaking and writing, another with the sword, many with both. Hence, the fullness and force of character that makes them complete men." *Theories of Surplus Value* ((Engels and Marx 1973, 65). Marx had in mind Da Vinci who was a painter, mathematician, musician, and engineer; and Machiavelli, who was a statesman, poet, historian, and military author.

camps for immigrants are becoming daily news in India, Pakistan, and the U.S. The war cries of religious fundamentalism, supremacist of all hues-Hindutva, Islamic or White--offer a way to deal with this insecurity, especially amongst a shrinking middle class that finds it easier to blame migrants, refugees, religious minorities, rather than the bankers, CEOs, and governments who continue to close life opportunities for them and their children. The self-loathing at one's failure (or fear of it) is turned into rage against others and a special admiration for strong men and spectacular acts of violence. Life appears, Marx says, under the bourgeoisie "more accidental" because in our imagination it is supposedly free – we are free to make our own destiny. In reality, Marx says, these conditions are "are less free because they are subjected to the violence of things." (Marx 1845-46 [1978], 199).

So yes, we will need science and technology to pull us out of this sordid mess, but it will have to be a science and technology that works for "100% of humanity" as Buckminster Fuller (1962, 75), had once said. And, such science and technology cannot be devoid of the arts and humanities—because it has to put the human before profit. A science that puts profit above people is a cruel science. In its ugliest phase, it brings us wars and concentration camps, psychological and environmental devastation. Human dignity or the value of human life is a concept foreign to it.

Inevitably, such anti-human science emerges by suppressing humanity. And although our educational institutions exist within society and so cannot be blamed entirely for this, they do the dirty work of amputating human ingenuity for the status quo. It is in this regard that I wish to elaborate on Marx and Engels' concept of the human as a species, what they call "species-being", and its relationship to education. The human, in Marx and Engels' reckoning, is a homo faber/maker, a linguistic tool-making animal, who is capable of not just creating the external world, but creating itself in the process. It is our linguistic capability, what evolutionary biologists call "extra genetic intelligence", that makes it possible for us to join our individual labor with the entire wealth of human history; to not reinvent the wheel with each generation. Our cultural artifacts — writing, painting, carving, cinema, digital media, in short, the entire history of media arts – are our extra genetic intelligence, the means through which we pass on knowledge and memory. Nature and nurture, our biology *and* our culture are, thus, inextricably interconnected. The larynx, for example, is biological, but its use for voice and music is a product of human development over the course of our history. Furthermore, not only do we create, we also then contemplate and reflect on our creation, what Marx calls "objectify" ourselves.

In fact, the larger claim that Marx and Engels make is that we have participated in our own evolution through labor, which Marx described as both a necessity and an end-in-itself. What defines our species, for Marx, is "free conscious activity," i.e., we create for the pleasure of

creation and it is through labor that we *metabolize* our relationship with nature and the world we find ourselves in (*Capital* V 1). The thought can be traced to Marx's earliest writings and contemporary developments in 19th century evolutionary biology, following Darwin's thesis that the human species did not originate from some divine source, but rather from animal life.

In *The dialectics of nature (1883)* and *The part played by labor in the transition from Ape to Man (1876)*, Engels builds on Darwin, adding that humans were active participants in their own evolution (something now recognized in other animals as well). The invention of fire, for instance, Engels notes, made it possible for humans to consume meat (which he says with all due apologies to vegetarians) and freed up energy from the stomach to the brain, allowing for the greater complexity of the brain. Standing up on two feet frees the hands granting us greater dexterity, which in turn leads to the development of new tools and even greater dexterity, which "thus acquired was inherited and increased from generation to generation." "Even the most materialist Darwinians", Engels says, "cannot explain the origin of man because they do not recognize the part played by labor."

The human hand has been perfected by hundreds of thousands of years of labor. Thus, the hand is not only the organ of labor, *it is* also the product of labor. Only by labor, by ever new adaptation to ever new operations….have given the human hand the high degree of perfection required to conjure into being the pictures of Raphael, the statues of Thorwaldsen, the music of a Paganini. (The Part Played by Labor in the Transition from Ape to Man)

Thus, there is a human hand, a human eye, human hunger, and human shelter. In other words, our individual development is tied to the development of society at large—we are just as rich or poor, good or evil as the others in society. Today, when refugees ask to be treated like humans, they are asking for that fundamental respect and dignity—they call upon the sense of a shared humanity, which both market and religious fundamentalism are violently at work to destroy. Socialism, in this sense, offers a practical morality whose basic premise is that the destruction and exploitation of other's humanity is the destruction of humanity itself. Some human animals may survive, but they will not be human if our culture, our coexistence with others, including nature, has collapsed.

Moreover, the other distinguishing feature of our species, Marx and Engels point out, is that the human is a universal species.

Animals produce only according to the standards and needs of the species to which they belong, while man is capable of producing according to the standards of every species and of applying to each object its inherent standard; hence man also produces in accordance with the laws of beauty. (Economic and Philosophical Manuscripts, 329)

For instance, we have figured out how to fly planes; swim in and under water; and to draw energy, like plants, from the sun with solar panels. Mimesis is now recognized as an essential

capacity in science, developed in biomimicry, where technological innovation follows the forms of nature. For example, the Shinkansen (the Japanese bullet train), which travels at 200 miles per hour, copies the long beak of the kingfisher to reduce noise. Marx calls the natural environment we inhabit, our "inorganic nature," i.e., our body and habitat. Plants, animals, light, stones, air are real/external as well as internal/ideas. They exist for us, Marx says, "partly as objects of natural science, partly as objects of art." (Economic and Philosophical Manuscripts, 75)

In fact, it is the universal nature of human labor that causes the greatest disasters and calls not just for more technology but a transformation in how we organize our relationships in society itself. Engels gives the example of the Irish famine caused by scrofula devastating the potato crop.

In animals the capacity for conscious, planned action is proportional to the development of the nervous system, and among mammals it attains a fairly high level…. But all the planned action of all animals has never succeeded in impressing the stamp of their will upon the earth. That was left for man. (The Part Played by Labor in the Transition from Ape to Man)

In other words, Engels is insisting that we are fallible, that we cannot predict all outcomes, but nevertheless, we can be clear in our intentions. In the case of socialism, it is creating an egalitarian, cooperative society in which the development of each is guaranteed by the development of society as a whole. Thus, he concludes that technology alone cannot save us, but what is required is "a complete revolution in our hitherto existing mode of production, and simultaneously a revolution in our whole contemporary social order."

This is a corrective to those who look for technical solutions alone to save us from the Anthropocene. The wildest fantasies are of the rich, ideas such as an escape to Mars or underground bunkers and replace workers with robots. For most of us, there is no place in this futuristic imaginary. We should not be surprised that our science fiction has become so dystopian in this age of total capitalism or neoliberalism.

My reason for bringing up this 19th century history is to indicate that we are not in some radically new situation, but can draw upon history to meet the present. Marxist critique has become more relevant as capital has become more dominant, and it is worth remembering that this alternative has dogged capital for its entire life. Scientific discovery is not only hindered, it is altogether derailed by the capitalist imperative in our educational institutions. Much of what is passed off as research is geared towards corporate profits and the military. In parallel, the scientific attitude itself, i.e., critique, enquiry, evidence-based conclusions has been severely undermined through the entire education system.

The task for us is to educate the complete human, to bring to our educational institutions the wealth of our inherited culture as a species. This work can only be done collaboratively. In my university, we are doing this by examining our curriculum, co-teaching, and organizing courses thematically. In the University Honors Program,

our theme for the 2019-2020 school year is *survival* and several of our courses and events will cohere around this theme. In a significant development, we have pairs of students propose a class for which they bring five-six faculty, asking them to teach a topic the students want to learn. The two upcoming classes are: *Innovations in Sustainability: Surviving in a changing world*, which will bring together faculty from Geology, Art and Design, Agriculture, Architecture, and Engineering to design and work on projects in the area; and *The Evergreen Model* during which students will build an international children's garden in the university's graduate housing complex, largely occupied by international students, bringing together sustainable agricultural practices with stories and narratives culture tell children about forests and gardens. One of the goals of the class will be a book of children's stories for children.

This generation of students cannot afford to continue to make our mistakes and specialize narrowly—nor do they want to. It makes no sense for the arts to continue to create objects of consumption for the jaded appetites of those who already have too much and remain unmoved by the misery and cruelty imposed on their fellow human beings. Nor for science to continue to believe that technology alone can save us from the crisis of capitalism. In other words, we will not be saved from capitalism by more capitalism—and our education is incomplete if we do not fully understand the context in which are teaching. We also have at hand far more tools to collaborate (certainly more than Galileo and Hariot did). We will, however, need to deepen our insight, our imagination, and solidarity with possibilities of human life, when lived freely in cooperation with others and nature.

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