

Lysenko Comes to the CDC: Exploring the Relationship Between Science and Politics

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When I was a pre-med student in 1971, taking a course in genetics, the very first lecture was about Trofim Lysenko (1898-1976), the Soviet biologist who, in the 1930s and 1940s, had great influence during the years of Stalin's rule, becoming the Director of the Soviet Union Lenin All-Union Academy of Agricultural Services. The point of the lecture was to show how politics can pervert science, contrasting Lysenko's methods under Stalinist rule to the "scientific method" under Western democracies, which purportedly allows science to be free from political pressures.

Who was Lysenko?

Lysenko became famous for his rejection of Mendelian genetics and natural selection. He believed that environmental changes, acquired changes in an organism, could be passed on to its offspring.[1] Lysenko's belief fit with the doctrine of Soviet historical materialism which viewed Marxism as a "science" of materialism, and which defined people (or plants in the case of Lysenko) as determined solely by their socio-economic environment. A change in material conditions would lead to a change in people. This "scientific socialism" provided the philosophic justification for Stalin's totalitarian state. Lysenkoism and Stalinism had in common a deterministic and reductionist distortion of Marx's notion of dialectic materialism, addressed further below.

Lysenko's theories of acquired changes led to his methods of subjecting crops to freezing water—this was supposed to force plants to sprout all year long, and to create future crop generations which would "remember" these acquired changes. The theory thus promised year round sustainable agricultural bounty, and was just what Stalin needed as he began instituting forced collectivization of Soviet agriculture.

There were two major consequences of Lysenkoism. The first was that his methods led to mass failure of crops, and subsequent famine and starvation of tens of millions of people in the Soviet

Union, in the 1930s, and in its ally, China, in the 1950s. The second was that it allowed no dissent—any scientist who disagreed with or questioned Lysenko’s theory and method was considered an “enemy”. During this time over 3,000 biologists were dismissed or imprisoned, and numerous scientists were executed.

Lysenkoism and the current pandemic

I thought of Lysenko when I read of the Center for Disease Control’s (CDC) recent revision of its coronavirus testing guidelines. These new guidelines, supported and promoted by the Trump administration, state that people with asymptomatic COVID-19 infection need not be tested, nor do people who have been in close contact with an infected person if that person is asymptomatic. It is clear that the new recommendations are consistent with Trump’s promotion of less testing, with the absurd argument that too much testing was driving COVID-19 case numbers up, reflecting poorly on his administration.

The impetus for these revisions came from Brett Giroir, assistant HHS secretary who oversees testing. Giroir said that the revisions were supported by CDC Director Robert Redfield, as well as by all the physicians on the Coronavirus Task Force. This included Dr. Scott Atlas who is close to Trump and a frequent commentator on Fox News. Scott Atlas has also questioned the efficacy of mask wearing, and has stated that children do not transmit coronavirus. Both assertions have been proven untrue. Another doctor on the Task Force is Dr. Stephen Hahn, the current Commissioner of Food and Drugs, who agreed to the FDA’S precipitous emergency approval for the use of immune serum from recovered COVID19 patients as treatment for actively infected COVID-19 patients, without strong evidence that the treatment is effective. These are the new Lysenkos, doctors and other political appointees who promote methods and theories which support Trump’s administration. Giroir also claimed the support of Anthony Fauci. Fauci has subsequently distanced himself from the new recommendation stating that he was undergoing surgery at the time the decision for revised guidelines was made. He did not sign off on the new recommendations and has expressed “concern” about them. But he has not directly spoken out against them, even as the Infectious Disease Society of America has called for the “immediate reversal of the abrupt revision of the CDC Covid-19 testing guidelines.”

These revisions of testing recommendations are exactly the **wrong** thing to do—they are counter to the clear evidence that asymptomatic individuals are significant transmitters of the virus. They hobble our ability to better understand and control transmission of the virus. The new revisions come at a time when cases in the US are at an all time high of nearly 6 million cases, with over 180,000 deaths, and when contact tracing can be a significant method to reduce further spread. Testing and contact tracing are particularly important at a time when students and teachers may be returning to colleges and schools, and when even more “essential workers” are being called upon as businesses are clamoring for opening. These revised recommendations increase public confusion, and will likely increase the spread of Covid-19, with more deaths ensuing.

During my career as an Infectious Disease physician, the CDC has been a respected source for investigating outbreaks and for making evidence based recommendations. It is tragic that this previously renowned agency has been pressured by Trumpian politics to promote policies at the expense of public well-being. Indeed, the specter of Lysenko is haunting the CDC and the entire Trump administration, revealing that the perversion of science is as likely in a capitalist democracy as it is in a Stalinist state, and always with dire consequences.

The relation of science and politics

The larger issues raised by contemporary Lysenkoism have to do with the relationship of science and

politics (or ideology and religion). Clearly there are historical precedents for the *control* of science by those in power. The most well known example is that of Galileo (1564-1642), whose theory of heliocentrism (the earth and planets revolve around the sun), was investigated by the Inquisition and deemed heretical by the Catholic Church. Galileo was forced to recant.

Of course, scientific investigation does not occur in a vacuum; it always occurs in a social and historical context. But if the scientist's goal is to understand the world in which she lives, then the scientist must, as Thomas Kuhn has described:

"extend the precision and scope with which (the world) has been ordered. That commitment must, in turn, lead him (sic) to scrutinize, either for himself or for his colleagues, some aspect of nature in great empirical detail. And if that scrutiny leads to pockets of apparent disorder, then these must challenge him to a new refinement of his observational techniques..." (*The Structure of Scientific Revolutions*).

The problem with Lysenko and contemporary Lysenkoism is first the denial of this basic methodology of conventional science, the use of precision and scope to understand the world, second, the obliviousness to the ever changing nature of science and research, and third, the willingness to disregard the safety and health of the earth and all its life forms.

Lysenko accepted the most deterministic interpretation of Marx's philosophy promulgated by the Stalinist Soviets, which to this day is still accepted by mainstream media. Lysenko's theory of acquired change in crops as products of changed environment was consistent with Stalin's version of historical materialism, in which human beings were merely the "products of circumstances." For Stalin, historical materialism justified the totalitarian imposition of forced change upon people, rather than allowing change to be created *by* people. Marx himself was critical of this kind of historical materialism:

"The materialist doctrine that men are products of circumstances and upbringing, and that, therefore, changed men are products of changed circumstances and changed upbringing, forgets that it is men who change circumstances and that the educator must himself be educated. (Third Thesis on Feuerbach)

For Marx, it was the element of human activity, the ability of human beings to alter their conditions, which gave life to his theory of dialectic materialism and made it a revolutionary philosophy.

If this more humanistic and dialectic aspect of Marx's theory is applied to scientific inquiry, it is not through the *control* of science, but rather through the *possibility* of a more profound basis for scientific inquiry—a method which allows the scientist more creative agency in approaching problems and in exploring the world.

There have been many scientists, including Richard Levins, Richard Lewontin, Stephen Gould, and others, who have seen the value in applying a dialectical approach to scientific research. In *The Dialectical Biologist*, Levins and Lewontin point out that conventional science tackles a problem in a piecemeal fashion, looking only at a part of the problem, and therefore leading only to partial solutions. Conventional science often neglects the contradictions and complexities that exist beneath the superficial aspects of a problem. Conventional science, said Levins, was unsuccessful "at recognizing the shared biases of a whole scientific community, the beliefs that are so much a part of the community that that they are not even recognized as biases." (*Talking about Trees*). Thus, he believed that looking at the natural world as a fixed entity, and in a piecemeal fashion, with perfectly adapted organisms, neglects ongoing evolutionary processes and the potential for ecologic crises that lie beneath the surface. This perspective bears resemblance to Lenin's notion of

dialectics—“Dialectics demands the all sided consideration of relationships in their concrete development and not pulling of a piece out of one thing and a piece out of another.” (Selected Works, Vol. 9)

In my own field of infectious diseases, I have seen the contrast between conventional science and dialectical science. The whole history of infectious disease as a specialty has been based on the germ theory of infections, and has been devoted to eliminating infections by developing specific antibiotics for specific infections. This has led to an enormous armamentarium of ever new antibiotics, but has also led to the opposite of the intended outcome—rather than controlling infection, we have seen the proliferation of new infections due to increased bacterial resistance to these antibiotics. These new infections are often more virulent and difficult to treat and often associated with life-threatening adverse effects.

A more dialectical approach would be to understand the many contradictions that lie beneath the surface of infectious diseases. Such an approach would explore the ecosystems in which particular bacteria survive, how antibiotics are prescribed and how they are over used. It would look at the role of pharmaceutical companies in developing new and more expensive antibiotics, and pharmaceutical marketing influences on doctors. It would look at the effects of hospital management of nursing quotas, of custodial staff, the effects of crowding patients in small rooms, inadequate ventilation systems, and the poor quality of care in long term care facilities. This approach would also look at the role of class and race, and the access to healthcare in outside communities, as well as issues of increased susceptibility of particular people to infection.

Finally, the current pandemic of Coronavirus itself provides a striking example of the differences between a conventional approach and a more comprehensive dialectical approach. Conventional scientists, physicians and epidemiologists, knew that a pandemic such as we are experiencing was inevitable. But even without the recklessness and incompetency of the Trump administration and its contemporary Lysenko's, the experts' best preparations for and responses to this pandemic have proven inadequate. We find ourselves, in 2020, not much more advanced than in the 1300s with the Black Plague:

“The condition of the people was pitiable to behold. They sickened by the thousands daily, and died unattended and without help.” Giovanni Boccaccio, *The Decameron*, 1353

In the absence of an “all-sided consideration” of the reasons this pandemic occurred, and neglecting the contradictions, those natural and human crises that exist beneath the surface of the pandemic, conventional experts have not been able to assure public safety. They have been unable to provide consistent messaging and education about, and implementation of, such basic measures as mask wearing physical distancing, and of enforced quarantines when necessary. The response has been reactive rather than proactive, with the focus on treatments and vaccines. This is not to deny the importance of treatments and vaccines, but to say that these alone cannot effectively control the current pandemic or prevent future pandemics. What has been ignored or underestimated occurs at both a national and global level, and includes multiple biologic, environmental, and social forces.

At the national level, we have witnessed the inability to assure quality care for all due to the current private insurance system, allowing major disparities in care by class, race, and geographic location. We have witnessed the inability to provide a consistent strategy for prevention and response to such pandemics due to the absence of a fully funded, centralized public health agency with the authority and accountability to act in such situations. Rather we have a chaotic conglomerate of departments, agencies, services, each in their separate silos, and unable to provide leadership of a centralized strategy that could be rapidly implemented. Without the integration of universal health care *combined with* a strong national public healthy agency, there can be no consistent policy or

messaging, no guarantee that treatment will be available to all, no coordination of protection for health care workers, for dissemination of necessary medical equipment and supplies, or for the availability of testing materials and contact tracing. Further, with a central public health agency, coordination with the efforts of other countries would become possible.[2] The pandemic is, after all, not just an American problem, but a global problem

At the global level, a comprehensive and dialectic approach would address the intricacies of relationships between and among human beings, animals, and the changing environment. It would address climate change in general and in particular how climate change has led to massive shifts in human and animal populations, with increases in global poverty. It would explore the ways in which the effects of climate change impinge on ecosystems, creating conditions for the evolution of new pathogens, mostly viral, and new ways for these pathogens to multiply, and shift their transmission from animal hosts to human hosts. As Ed Yong wrote recently, “Humanity has squeezed the world’s wildlife in a crushing grip—and viruses have come bursting out.” (“How the Pandemic Defeated America,” Ed Yong, *The Atlantic*, Sept. 2020.) Today, any disease anywhere can spread within days to involve everyone.

The coronavirus pandemic is not the result of “a perfect storm”, which implies forces of nature beyond human control. The pandemic is primarily the result of human activity, and the solution can only be the result of human activity. We will have to consider the myriad and complex forces leading to pandemics and understand what cripples our response to them. This requires a major shift in scientific perspective, a paradigm shift, to use Thomas Kuhn’s term, to a more dialectic science, a scientific revolution in which the scientific imagination is allowed to expand its approach to problems. It is time for our human activity to “change circumstances,” to become educated and learn the lessons that this pandemic, catastrophic as it is, can teach us.

[1] It should also be noted that there has been a new interest in Lysenko in Russia, under Putin’s regime, partially due to the interest in the field of epigenetics. But Lysenko’s beliefs should not be confused with contemporary epigenetics. Epigenetic theory is based in an understanding of genes and DNA, and the issue of repressed and de-repressed genetic material. Lysenko did not believe in genes at all, and the description of DNA by Watson and Crick did not become known until 1953.

[2] The United States is not alone in its neglect of public health. As Laurie Garrett points out in her book, *Betrayal of Trust*, the neglect and collapse of public health is also an international problem.