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The Virology of Ideas—An Indispensable Pandemic

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Thank you, shukran, Ubai, and Haynes. And greetings, salaam, shalom everyone. It's a privilege to give the inaugural lecture in the Bisan Lecture Series!

Before I start, though, a word about the SARS CoV-2 virus—the virus that's responsible for the pandemic. The red things sticking out from the surface in this image represent the virus's Spike protein, the protein that orchestrates the infection process. It's not actually red. Spike is the target of nearly all COVID-19 vaccine initiatives, including the remarkable project that Dr. Gertrudis Rojas, Director of the Center of Molecular Immunology in Havana, will describe in the third Bisan Lecture on Wednesday, May 11.

Here, though, the virus serves as a metaphor for an "idea"—my vaguely-defined term for an element of culture. It's culture, along with community, that are at the heart of the Bisan Lecture Series's declared aspiration: to help integrate Palestine more fully into the global cultural community.

My cultural metaphor is totally unoriginal. Cultural evolution has long been likened to evolution in the natural world. Equating ideas to genes is a particularly common conceit because of genes' ability to replicate and mutate. But today the closely related image of a virus seems even more compelling: not only because of this

accursed pandemic, but also because in 2018 Greg Winter and I shared half of the Nobel Chemistry Prize for our role in developing a technology called “phage display.” Phages are viruses that infect bacteria.

My personal experience of culture has been mostly scientific of course, and scientific communities are what I’ll concentrate on. But unlike some writers, most notably Karl Popper, I don’t think there’s a defensible demarcation between science and non-science. What I have to say today about science and technology I believe applies to the broad cultural enterprise.

Our brains teem with bright ideas—more haphazardly organized, I suppose, than implied in this cartoon. They’re constantly proliferating, and as they proliferate, they undergo tiny changes—sort of intellectual mutations. And as they proliferate and mutate, they engage in promiscuous intellectual sex with one another on a massive scale, producing a great profusion of mongrel ideas of mixed parentage.

When we speak, when we write, when we do things with our hands or take other actions that are perceivable by other people, we are in effect releasing our ideas into the environment in infectious form.

Our brains create an environment that’s densely populated with infectious ideas: an “ideosphere,” as I’ll call it by analogy with a biosphere of the natural world. Some of these ideas infect our own brains, adding to the teeming multitudes that are already there.

All this proliferation must be balanced by ruthless culling by cultural selection. Most ideas meet obscure deaths of neglect in the struggle for existence, their space being taken by other, fitter ideas. Very rarely there arise super-star ideas—conspicuous cultural achievements—that proliferate through the ideosphere at exceptional rates. Think of them as the intellectual analogs of the SARS CoV-2 Omicron variant that has swept over the globe.

Let me pose an epidemiological question: Is the person, possibly somewhere in southern Africa, who breathed out the first Omicron variant virus personally responsible for that variant?

No biologist would answer “Yes” to such a question. Let’s look at the last 20 months of the “phylogeny”—the family tree—of a small sampling of the millions of SARS CoV-2 viruses whose RNA chromosomes have been analyzed. The bundle of orange branches in the upper part of the figure constitute the Omicron variant lineage. Each of the orange and red dots on those branches plots the position of a particular Omicron variant virus sampled on a particular date from a particular person. (Other colored dots plot viruses in the Delta, Eta, Kappa, Beta, Epsilon, Iota, Lambda, Mu, and Alpha lineages.)

Could any particular person represented in the Omicron lineage be said to be the origin of Omicron? And what about the tens of thousands of people who are not represented by colored dots in the Omicron lineage? Before early September last year Omicrons were so rare they weren’t detected at all. Yet the random mutations that ultimately gave Omicron its superior infectiousness were steadily accumulating in those anonymous people, wherever they lived.

Manifestly, no single person, whether or not represented by a dot, is the origin of the Omicron variant. It emerged from random mutation plus natural selection in a gigantic global community of infected people.

And the analogous cultural question? Is a super-star idea the personal intellectual property of the individual who first released it into the ideosphere? Surely this too is nonsense.

When I, as a supposed scientific innovator, catalog the intellectual contributions of my fellow scientists to my supposed innovation (phage display technology), as I began to do in this table while preparing my Nobel

Lecture in 2018, I'm hard pressed to identify any contributions that remain truly my own. By the same token, almost all the ramifications that have made phage display prominent enough to be recognized by a Nobel Prize are likewise contributions by my fellow scientists, including my co-laureate Greg Winter.

I think all scientific discoveries and technological innovations are like this. They emerge from great overlapping communities of workers sharing their infectious ideas and material resources over time and space. No individual is the "creator"; all community members are temporary hosts for community-acquired intellectual infections.

Treating a conspicuous scientific discovery or technological innovation as if it were the personal intellectual property of a single person or group is manifestly unjust. More important, though, is that it damages creativity by impeding the free sharing of ideas.

The injustice and damage are particularly severe when intellectual property rights take the form of government-enforced patent monopolies. Take as an example the patent monopolies that are being enforced for the spectacularly successful messenger RNA vaccines against SARS CoV-2. This technology is the fruit of a focused initiative that has been ongoing now for almost 30 years in many laboratories across the globe, almost all of them publicly funded. And that 30-year initiative has relied in turn on discoveries and advances by thousands of publicly-funded research groups in immunology, molecular biology, chemistry, physics, and other disciplines over a span of at least a century. By right these vaccines belong to the people of the world at large—the people who have sustained the science over all those decades.

Yet a handful of corporations, responsible for minute contributions to the technology, are permitted to manufacture and sell these vaccines at monopoly prices without fear of competition. They are allowed to withhold crucial manufacturing know-how from enterprises all over the world who together could produce vaccine on the scale necessary to vaccinate the whole globe.

Let us not demean the corporations' contributions though. They were indeed remarkable achievements. It's only in comparison to the century of publicly-funded scientific discoveries and technological advances on which they relied—many of which were themselves remarkable achievements—that the corporations' contributions can be called "minute."

Was the promise of enormous financial rewards in the form of patent monopolies necessary to motivate the corporations' achievements? I don't think so. A number of economists argue that pharmaceuticals, including vaccines, could be developed more effectively and far more cheaply with direct public funding than with the promise of patent monopolies.

We should keep in mind that it has been the scientists and engineers at the corporations—not the investors, not the financial officers, not the lobbyists, not the patent lawyers—who are actually responsible for the vaccines' development. Those scientists' and engineers' brains are at an important disadvantage: they have to work in a constricted ideosphere. They can't make use of information that might compromise intellectual property rights. And of course they can't release their own ideas into the global ideosphere either—again lest intellectual property rights might be compromised.

Maybe you think that scientists and engineers don't suffer if they can't disseminate ideas and resources freely to the broad community. Well think again. Free dissemination of scientific ideas and resources mediates science's primary reward system: acquiring the esteem and respect of our scientific peers. Of course, as compensation for their labor scientists and engineers demand the wherewithal to live comfortably. But here I'm talking about another type of reward—a cultural reward.

We scientists are an ambitious lot. We crave recognition for our work. We strive to earn recognition by explaining our ideas clearly to our students and colleagues in written and spoken word, by supporting our ideas with well-planned, workmanlike experiments, by distributing the resulting material resources freely among our fellow scientists. This, I think, far more than material compensation, is what drives our ambition.

And is this not an estimable ambition—one that depends on our diligence rather than incredible good luck? But who's to know of our diligence if we don't make its results freely available to our scientific community?

Does not what I've just said about scientists apply equally to cultural workers generally? And aren't we all cultural workers in the deepest sense?

If we as a society want our culture, including science, to be creative, there's no choice but to sustain the broad cultural community. Any attempt to enhance innovation by narrowly focusing resources on an elite cadre of supposedly creative individuals endangers innovation because we can't know in advance who in retrospect will be regarded as outstanding innovators, and because we would impoverish the ideosphere in which their brains would have to work.

Teachers are a core component of our cultural community. We willingly pay kindergarten teachers—not enough!—because they enrich society by infecting our and other children's brains with ideas. It's true that a few of these kindergartners will go on to write heartrending novels, compose poignant music, midwife world-changing inventions, and so on. But we value teachers' work in its own right, not just because it occasionally contributes at many removes to unanticipated conspicuous cultural achievements.

The Omicron variant is a rare, unpredictable byproduct of world-wide community infection. Likewise, great cultural achievements are rare, unpredictable byproducts of the vibrant, all-encompassing culture of a free people.

And when unfree people are liberated, it's a triumph for culture as well as for justice.

The Nakba—the catastrophe—that Zionism has inflicted on the Palestinian people has an essential cultural dimension. Great swathes of Palestine's rich culture were pillaged or destroyed in 1948, and the campaign of erasure and appropriation has continued ever since.

Erasure hasn't been very successful. Nowhere is Palestine's *sumud*—the steadfastness of its resistance to dispossession—more evident than in the cultural realm. Subjugation has engendered a defiant efflorescence of Palestinian arts and a driving appetite for scholarly and technical achievement among Palestine's youth.

But let us not draw a perverse conclusion! The resilience of Palestine's culture in the face of oppression is not a justification for oppression! It's been the burden of my argument that culture, like a pandemic, thrives only in communities. Zionism's apartheid regime—its forcible segregation of Palestinian communities in order to protect its ethnic supremacy—is intolerable cultural deprivation. It's cultural deprivation for Palestine. It's cultural deprivation for people around the world. It's tragic cultural deprivation for the Jewish people, in whose name the oppression is being perpetrated.