



Camels for export in Mogadishu, Somalia, 2013. The MERS virus translocates from camels to humans. F. Omar

COVID-19 AND GRAVE ETIOLOGY

April, 2020

“Life on earth is such a good story you can’t afford to miss the beginning.” — evolutionary biologist Lynn Margulis.

We keep declaring war! What does that persistence have to do with the persistence of wars we need to declare?

Talk of care and cure and self-congratulatory competence with “everyone’s needs more than met,” without a word about *cause* which the talk of care and cure and self-congratulatory competence is part of, as we listen to the White House Coronavirus Task Force day after day deeper into this crisis ...

SARS-CoV2 is a zoonotic outbreak caused by behaviors that besiege and unbalance our intricately interwoven ecosystem, creating novel contacts and crossovers species to species as remote viruses break out of their biotic reservoirs and transform into human pathogens. $\frac{3}{4}$ of new infectious diseases are caused by microbes with a wildlife origin. It's estimated that there are half a million zoonotic viruses *out there*, 12,000 of which are capable of infecting humans. We razed an area around the size of Africa to raise our livestock. The square footage of all the buildings in NYC is added to the earth every 34 days. In 2018, 70.8 million people were forcibly displaced by war, violence and persecution. Another 17.2 million were "environmentally displaced." Human-driven habitat loss forces wild animals into intimate contact with humans and their domesticated animals. COVID-19 etiology starts in the intersecting of these micro and macro rhythms and arrhythmias, favoring either the ecocidal behavior of human supremacy or balance.

Nature, of which the cosmos is a part, happened this way and not any other way. It is only *this*, and this is what we're being asked to keep sacred. Through the deadly gift of the coronavirus, it's our power of pathogenicity that we're being asked to confront. All that exists, and all that ever existed, as it is in us, whether matter, microbe or molecule, is ancestral.

All the Administrative talk is about defeating the virus in order to get "the greatest economy the world has ever known" back on track as soon as possible, if not sooner; an economy that is a summation of the causative factors of COVID-19; and to as quickly develop a vaccine — the "ultimate game-changer" — that will save us from within as it at once shields us from facing the extraverted behaviors behind further outbreaks; as the causal dots instinctively connect themselves in our hearts and minds as we listen to the disconnect of the Task Force forced into a position — cornered, besieged — to mitigate a wave of deaths rolling right over everyone. And every word of the WAR CRY raised against the virus is another inciting of another viral novelty that will come "out of nowhere" to terrorize us, this, this teaching that we still haven't learned from the war on terror — another wasted cataclysm that could have been a bone-chilling call for common humanity as part of an infinitely precious and fragile earth. When will the lessons of aggression and dissonance show up in the DNA of the direction of our democracy?



The word "virus" traces back to Sanskrit and Old Avestan. It has always and only meant *poison*. Viruses have had the ignominious fate of being identified and studied only in relation to infection and disease. Although viruses vastly outnumber all other organisms on the planet, the virome (the totality of viruses) as integral to the web of life, as an indispensable component of the origin, evolution and diversification of all lifeforms, has been welcomed into our consideration only in the last 20 years.

The *human* virome is almost entirely uncharted. It is known that there are roughly 40 trillion bacteria in a typical human microbiome, and that virions typically outnumber bacteria in nature by a ratio of 10:1 — to give a rough idea of our microbial demographics. And it's currently estimated that there are 10^{31} (10 0000000000 0000000000 0000000000) viral particles in the oceans alone. We're fundamentally overwhelmed, but not necessarily pathologically, in fact, rarely so. So, what goes "wrong"? How does viral influence become infectiousness?

Viruses are not a kingdom of life in themselves, like bacteria, fungi, plants and animals, because they inhabit all kingdoms, and of course because they are acellular, lack metabolism and are incapable of replication outside of a host cell. They are genetic material — either double- or single-stranded DNA or RNA — encapsulated in protein packets called capsids. But what are they, really? What do they do and what are they doing to us? Right now, they're determining who lives and who dies. And this is what they have always done in their co-evolution with biological forms. They modify; marking which individual and which species survive. In 1959, Nobel laureate Salvador Luria asked: "May we not feel that in the virus, in their merging with the cellular genome and reemerging from them, we observe the units and process which, in the course of evolution, have created the successful genetic patterns that underlie all living cells?" To be living through this pandemic is to witness evolution happening in real-time, as novel biological entities mutate into being and cause fatal outcomes in us, almost instantaneously.

We don't know. We don't know what is a virus. Or, say, knowledge itself is as baseless as not. What we secrete as knowledge does at least allow us to distinguish our species, to 'have a life'. Perhaps the cell nucleus is of viral origin, an endosymbiont taken in by an anucleated cell as an organelle. In that viruses are tiny sacks of genes that transmit themselves laterally into every life domain, it can even seem probable that the nucleus of a eukaryotic cell is at origin a viral infection. Or viruses may have escaped at some point from the bacterial nucleoid to form a better, more independent life for themselves. Perhaps they're cellular excrescence.

The debate whether viruses are unalive or alive is, potentially, revealing of their nature. They are *liminal* energy forms, between biochemistry and biology, living and nonliving, seed and seedling; inert virion and virulent virus; autonomous and not; always emergent. They're *crossover* and *cusped*. They're designed to depend on others for their survival. They're not a kingdom of life because they have no illusion of autonomy, as distinct from all cellular life that wonders and wanders between real and unreal substantiation. Perhaps it could be said that they're interdependently autonomous, perfectly equipoised, transkingdom interactors. Of course, no organism is actually, entirely self-sustaining. The moral of the story: merely add a little metabolism, self-replication and other life-defining features and watch the hubristic delusion of independence grow.

Viruses have dropped (or opted out of) every possible piece of unwieldy biochemical machinery for synthesizing themselves. They've outsourced their very vital force.

They're non-owners who yet govern those who possess material existence, particularly the multicellular macro-oafs like ourselves. What we must seem to them! Roving mountains, ripe with readily exploitable resources, rife with wrongheaded reactions? Even at jet-speed or running for our lives, we're experienced as utterly static and off guard. They've been mastering adaptive interplay for billions of years before us. They know they are us, and our ignorance of this is their advantage. Who wants to die? Who wants to die next? Who wants to die for a vir-us? They attack our isolation from each other, our soft, exploitable spot, in order to exist everywhere. As streamlined interconnectedness, they're not about to let us, as their raw material, material means, free lunch, free ride and unlimited guest status, self-destruct. They interfere in our reckless self-endangerment, as they have through SARS-CoV2, as our biosphere heals, as we step back, take our foot off the gas. No income. Inward comity. Inward compass. Composting wasted opportunity. Coming into question. Coming to our senses. Home to roost. Come hell or high water. Everyone's life on the line, endangering our lives just by going to the laundromat. During this time, may we flourish instead of survive. But will we take up the teaching? Can the "unleashing of the full power of the United States of America to vanquish this invisible enemy" learn anything seriously etiological?

So, is it a valid question to ask whether the webbing of the web of life is alive; or the space between the threads that makes the threads *thread* (like the rippling of vibration that patterns matter in material form)? If I had to say, I'd say life is definable as *interdependence*, and this is exactly the truth the virome has identified and made its mode. Just the code. Code carriers. Carefree? Cold as an evolutionary accident. They've thought us through without giving it a thought; a multiplication orgy until we shut down, or the antibody or vaccine arrives, like, billions of years later, in viral time.

We've been colonized, perhaps permanently, vertically, generation to generation, and we're lashing out. We're losing loved ones, as the strain of this coronavirus senselessly slaughters its hosts and we witness a horrific real-time morphological instance of the very endosymbiosis that brought life about and contributed to the biodiversity we behold.

As we keep our distance from each other, we see that the outbreak was always a crying out for respect of space and respect for interwoven life-cycle tempos ... for all kingdoms.

We do owe our existence to viruses. To acknowledge the virosphere as integral to biosphere is to begin to understand how we can coexist with viruses and keep them from injuring us. Perhaps they remind us of ourselves. We can't live without our host, either. And war against Nature, even against one renegade strain from a subgroup in the vast Coronaviridae family, can only ever be war against our own behaviors and mindsets. "People" are their own worst enemy...and I don't mean *other* people.



But if we insist on framing the pandemic in terms of war, we have to consider that we're being slaughtered *in retaliation*, for crimes of obtrusion and for crimes of omission and unconsciousness. Virus-as-disease is a counter-siege. We misstep into the wild, remake the matter of which we're made, and the coronaviral rejoinder is invagination of our most intimate circle — the cell — and the co-opting of our hereditary machinery. Each SARS virion will replicated itself at a rate of 1,000 to 1, releasing its progeny into our bloodstream, turning our own immune response against us (the so-called cytokine storm, or scorched earth defense). This is experimental ground for the virus as well, as self-destruction of the host, technically, as overkill, wouldn't facilitate further infectiousness, unlike the sustained underkill of the common cold-causing rhinovirus. But maintaining our innocence in this interaction would be an insult to the postulated intelligence guiding our response to the attack.

It's very different to hear a Cuomo or a Trump declare "we're at war" ... than to hear from our health care workers overwhelmed on the "front lines" whose real analogy to war is the rate of casualties arriving all at once. For them it's a full alarm empathic overload, a focalizing of the ambient stress on their every action, while underequipped and often unable to do what they've vowed to do, to tend to, comfort, hopefully cure.

It's the necessary mobilization that makes us cry "war". Earlier this week Surgeon General Jerome Adams told the country to brace for "our Pearl Harbor moment." But the analogy is half-apt at best. The list of viruses that have recently broken our defenses includes: Machupo, Bolivia, 1961; Marburg, Germany, 1967; Ebola, Zaire and Sudan, 1976; H.I.V., recognized in New York and California, 1981; Sin Nombre, southwestern United States, 1993; Hendra, Australia, 1994; bird flu, Hong Kong, 1997; Nipah, Malaysia, 1998; West Nile, New York, 1999; SARS, China, 2002-3; MERS, Saudi Arabia, 2012; Ebola, West Africa, 2014. (More on the mechanism behind the claim that COVID-19 targeted us "out of nowhere" below.)

It's the invisible enemy, that which we've declared war against, and the idea of *invisible enemy*, that needs fuller etiological examination.

Moreover, with regard to this novel coronavirus that has entered us, it can definitively be said that we're not its *host* if it is not our *guest*.



We've stepped on the proverbial rattlesnake. But before any further saber-rattling and virome- bigotry beef-up, it might be beneficial to know the full power of our designated foe. If for no other reason than to prevent a mono-modal reaction (silver bullet vaccine

or strictly reactionary mitigation) or short-term fix, and to make sure our response to the attack is not constitutive of the same conditions that created it, conditions assuring pathogenic recurrence. We've declared war on the most abundant biological population both on earth and within us, but unlike us, the virus knows that in biological warfare an injury to one is an injury to all. War is a uniquely intra-human act of consensual murder. Do we really want to confuse the rest of life with this conceit? Will this help us heal, or further estrange us from our bodily beings as we avoid each other "like the plague" and continue to systemically practice habitat degradation?

We also share a common ancestor. Both viruses and humans are built up of proteins from a list of 20 amino acids determined a few billion years ago, as life arose, in all likelihood, only *once*. Even the intercommunication between a pathogen and its host celebrates the unique, basic, defining, biochemical signaling of all life. No translation is needed. Humanity accounts for 1% of the time life has inhabited the earth. We've just arrived and have begun to speak an unbelievably complex chemical creole while, nonetheless, having brought ourselves to the brink of extinction. We have to ask (with Lynn Margulis) did life "take over" the planet by combat or interchange? Did life multiply and complexify by cooperating with others or by killing them? Would life be saved by collaboration or, on the other hand, combat and the intense loyalties that develop by together fighting *against*.

Viruses drive evolution by transferring genes between species and increasing genetic diversity. Is this an energy that we want to engage antagonistically? The virome is the largest reservoir of unexplored genetic diversity. Do we really want to trample on this and come-out-swinging.

Our selection pressures have been guided by viral infection. In light of our retroviral genes, it's difficult to tell who has domesticated whom. Most known viruses are persistent, not pathogenic. The human virome is not a small corral of pathogens that occasionally wreak havoc, but an intricate network of pathology-changing interactions. In most interactions, viruses establish a tempo of replication in harmony with the host. Every step in the immune process can be altered or controlled by genes found in one virus or another. In terms of infection, asymptomatic response is often synonymous with beneficial influence.

"Missing" viral infections at an early age make one vulnerable to more virulent infections and immunological overreactions later on. Again, asymptomatic infection can function as natural vaccination.

Would we really want to wipe out the medium of our diversity (may no eugenicists understand this sentence!) ... even if the purge *wouldn't* inexorably include *you*?

What we're about to see as the pandemic passes and we can get out from under emergency reaction and pathology-detection: COVID-19 will move the virome to the forefront of clinical science, including "fighting viruses with viruses" (if the war analogy must persist).

In case it wasn't already apparent for all peoples, we are now universally in awe of viral velocity. Viral genes can integrate with host genomes, generating faster, more direct genetic variations than any other external pressure. Their large, rapidly replicative populations make them evolution's leading source of genetic innovation. To date we are aware of only a tiny fraction of the total genetic diversity of viruses and their myriad influences on bio-interaction. Like the lesson we're learning from "junk" DNA: just because we don't know what something does doesn't mean it doesn't do anything. Nature just doesn't operate like that, vertically passing along a bunch of deadweight and discarded parts.

With regard to viruses, the assumption of guilt until proven innocuous could kill us. Take the lesson of bacteria. We wouldn't even be able to digest a plant without being the guests of the mutualistic microbiota in our guts. The solid matter of our shit is about 30% bacteria and it's estimated that each gram of that solid matter contains up to one million viruses. Shit is being studied for use as medicine (a process called "fecal transplant) and once this therapy is understood well enough to be implemented for improved homeostasis, you can be sure that viruses will be found among the beneficial influences.

Viruses are self-expression. If you happen to like the way you look and feel and wouldn't change a thing, beware, as viral infections act in concert with host genes, microbiome and environmental factors to modulate phenotypic variability and viability. We keep traces of all past viral infections integrated in our genomes. As a baseline, roughly 8% of the human genome is made of retroviral sequences already inscribed in our germline. When we procreate we pass on the "enemy" within. Viruses are having wild beastial sex with us. You can call COVID-19 an infection, or you can call it mutual, commensal or parasitic zoophilia.

You're only as secure as your interbiotics. You're only as protected as your pathogens are kept in perspective and prosocially positively predisposed. We need a massively funded science focused on viral reparative propensity. Even cancer remissions have been found to be coincidental with viral infections, suggesting that rapidly dividing viruses may preferentially, antagonistically, infect rapidly dividing cancer cells. (In war-speak, this makes the virus an ally, a co-belligerent.) Endogenous retroviral genes can express proteins that block cell receptors (like ACE2 in the case of Covid-19) otherwise used as entry points for exogenous pathogenic retroviruses. Endogenous retroviral proteins are known to assist in the mediation of nutrients and gas exchange along the placenta. The ability to analyze a drop of blood or a mouth swab in terms of its complete viral content may one day become the standard practice in labs and at home.

In sum, "infection" is biological communication crucial to the mobilization and flow of matter and energy in the environment. In our case, the conversation is between an acellular microorganism 100 times smaller than most bacteria and a eukaryotic multicellular macro matrix. Declaring war within this fundamental interaction is pure

collateral damage. Like declaring war on matter, as though we're made of something else.



I started this pandemic writing because I was horrified by the comorbidity of the Administration's sense of etiology and the COVID-19 infection itself. With the pandemic, we're obliged to interface poison (the longstanding definition of virus) and healing. Already, a vaccine is a matter of fighting poison with poison. It stimulates an immune response intended to destroy the poison that's been introduced, not unlike homeopathy. It's about creating a harmony. Paracelsus said that there is no healing without the disease. We draw out poisons, learn to breathe with them, plead with them. 85% of COVID infections in China were treated with medicinal herbs that support the endogenous mechanisms that purge the poison. It's therapeutically desperate to just be out to destroy. Many of us have found out personally in the most anguishing ways imaginable that "treatment" (often termed "a preventable adverse event") is a leading cause of death and injury. What's our microbial post-SARS-CoV2 Marshall Plan ... so that our behaviors and being attacked don't recycle a cause and effect co-morbidity. Will the language with which we go forward be an integral part of prevention?

SARS-CoV2 first latches onto the blood pressure control at the ACE2 cell receptor, which functions as a vasodilator. ACE2 translocates the virus into the cell's cytoplasm. The interaction between the coronaviral spike and the enzymatic domain of ACE2 on the cell membrane is not perfectly understood. But I can speak of my own experience of this vibratory, deregulatory shift.

Not just my own, but the *ambient* stress level pulses through me. A continuous, intrinsic pranayama and qigong keeps me breathing. I'm being ventilated by beneficence. The deep preventative work was not in place for us. We were "attacked" and our backs are to-the-wall, as a globe. Can one give oneself over to the stressors to take them on for many? We've never needed to learn how to breathe with stressors more than we do now. It is radically replenishing to merely lower the diaphragm one more millimeter when inhaling. I'm surviving word to word, writing word to word, as an opening of my respiratory rhythm to the total etiology of this pandemic. Fighting to save myself would kill me during this heavily ritualized time of Passover, Ramadan and Resurrection. The heart itself can behave pathogenically. It can beat against us, if we are an affront to the rest of life. We declare war as part of our doom. The stressors alone, without being infected, could take my breath away; the doubled ambient stress of pandemic and massive information intake, another potential co-morbidity. And adding the ego to the mix, the absorption ... even more detrimental. Still breathing as long as it is prayer.

It's presumptuous to use the pronoun "we" when "I" write. I feel like I never have, until now. The rite of *we*. The right to *our*.

