OPINION: Dominion Post. CORONAVIRUS. COVID 19 (SARS CoV-2) FINAL

TITLE: "WE LIVE IN A MICROBIAL WORLD"

My love affair with microbes and viruses began as a college student in Vermont, 1963, reviewing a speech by JFK concerning man walking upon the moon. Unheralded, were his comments about cancer and viruses, which catalyzed my PhD Thesis at Syracuse University, addressing potential Herpes simplex virus in cancer. We used animals and plants, learning that viruses inhabited a wide range of animals, birds, reptiles and bats. The research promoted me into the US Army at Presidio, San Francisco, as Captain, 6th Army Virus Lab, 1969-71; a major effort was the detection of a respiratory virus, Adenovirus types 4/ 7, in Army training units that could derail an entire fighting unit of healthy men. Transmission occurred by droplet transmission in the close quarters of barracks.

My circuitous academic path brought me to WVU/WVUH as Director of Microbiology and Virology in 1990, Dept of Pathology, and fostered international lecturing/research. As a US Delegate on the Dwight D Eisenhower HIV Expedition (1993), I spoke to Russian virologists in Moscow more about Afghan "killer viruses" transmitted by mosquitoes from animals than HIV. The promotion of my research triggered further meetings in Asia Pacific, 1995-2007; the focus was ultimately China, where in Hong Kong, Beijing and Guangzhou, where under strict surveillance, discussions about respiratory viruses and pneumonia was always key. I was struck by the interface of social eating habits and animals, birds, snakes, turtles, etc. and the open-air markets.

Lecturing to WVU Medical and Dental Students helped me develop a teaching theme: "We live in a Microbial World". Hence, I was not surprised by the 2014 publication of One Health, edited by two former American Society of Microbiology presidents. Here, contributing authors outlined the interdependence of Environment, Animals and Human Domains. Scientists specifically emphasized that every year, 2-4 new, novel viruses would invade the human domain from animals, zoonotic, noting that 75% of pandemics were associated with animals. Humans were destroying the natural buffers between Domains, catalyzing animal virus incursion. The WHO had a similar focus as it adapted the One World, One Health Theme in 2004. The idea that pandemics would occur only every 100 years was biologic fake news: 1720, Plague, 1820, Cholera, 1920, Spanish Flu, and 2020, Covid-19.

Human coronaviruses were 'The Perfect Viral Storm'. They were intracellular parasites, requiring a living cell to replicate, but incredible cellular engineers, where "Structure equals Function" with a specific design strategy as hallmarks; communicability, as a single infected cell could produce a million new coronaviruses. They were easily transmitted via respiratory droplets as large, enveloped viruses with spikes for attachment. Copies of their viral RNA during nuclear replication, were often inexact, leading to mutations, potentially resulting in new strains, explaining the rapid development of human to human transmissibility and the 8 global strains of SARS-CoV-2(next strain.org), tracing New York strain origins from the EU, primarily. This global zoonotic impact was highlighted by the earlier appearance of 2 other coronavirus epidemics; 2002, China, SARS and 2012,2015. MEARS, Middle East; animal vectors included bats and marsupials and camels, respectively. Most recently, 6 new coronavirus strains have been identified in Myanmar bats (PREDICT/2020).

It is painfully apparent to me as a virologist that epidemics/ pandemics are not going away, if anything, potentially the periodic norm. Mother Nature as she proves the strength of microbial/viral genetics, highlighting the theme, ”Don’t Trash your Global Microbiota”. Intervention must highlight natural animal virus reservoirs, where it is estimated that 1.6 million animal viruses inhabit 23 million animals (Dr Dennis Carroll, Australia). It should require a global strategy, including web-based and functional surveillance linked to AI, (GIDEON), with in-place response protocols based on scientific observations formulated in advance. It must be driven by One Health, recognizing that climate change in the environment, animals and humans are linked. As a famous ID Doctor and noted microbiologist, Dr S. Levy (Tufts, Boston) said in 2002, “We cannot win this war”. It will be our theme as I with a team at MGH/Harvard, Boston, continue clinical trials to eliminate the Covid-19 disease progression, recognizing there is an 85% genomic similarity between SARS-CoV-2 and SARS. Ultimately, however, we must remember, “We live in a Microbial World”, with apologies to Madonna.

John G Thomas. PhD., Professor Emeritus, WVU

29 Quail Rd. Morgantown, WV 26508