

36° Celsius

On the Celsius* scale, used by the global scientific community in the International System of Units (SI), normal human body temperature is commonly found to fall between 36°C and 37°C, trending toward the lower value as an individual ages.

This well-established benchmark for human body temperature is of increasing interest today owing to the progressive escalation of epidemics of deaths due to what is becoming to be known as the 'red death', a.k.a., *hyperthermia***.

It is now the summer of 2029, a little over nine years since my death. Globally, persistent heat waves, droughts, and firestorms, long commonplace in bellwether regions such as Australia***, are arriving earlier with each year - and lasting longer****.

However, this year, even as warming temperatures in the world's temperate regions were just starting to increase the rate of evaporation of the surface waters stored in northern lakes and reservoirs, a critical change occurred in the weather pattern over the Southeast Asian Indochinese Peninsula. This broad region's annual period of sustained high temperatures, traditionally extensive, not only increased, but started early and has since remained stubbornly relentless.

For generations, residents of Southeast Asia have acclimated to 30°C average spring temperatures - generally lasting through the months from March to June. Beyond that, the natives of Vietnam, Cambodia, Thailand, Laos, and Myanmar have endured periodic highs of 40°C - often exacerbated by 80% relative humidities*****.

This year, throughout the megalopolis of Bangkok, heat-related deaths were first logged in late February. As usual, most of the early victims were the aged. However, with each succeeding body count over the next four weeks, the daily mortality tolls attributed to heat effects ramped up. As early as mid-May, hospitals and mortuaries were reporting difficulty coping with the numbers of heat-stricken and dead. By then, estimated heat-related fatalities had increased to, a not unheard of, 500 per day.

But the cumulative physical distress caused by near record temperatures and high humidities were starting to enervate both healthy children and the region's able-bodied working population. Their progressive exhaustion was inflamed when night-time temperatures failed to descend into that range in which a heat-stressed body could recover overnight.

By the end of an unprecedented tenth week of what would become known as the *Southeast Asian heat death pandemic*, statistics were no longer being compiled. In the City alone, the daily death toll had advanced to well beyond 1,000. Few people ventured out in the daylight to labor, fish, plant, ..., or for that matter, even to socialize or shop. Most survivors had little reserve stamina to do anything but tend to their most immediate family and personal needs. Work was no longer a priority; even preparation of meals, a burden.

Except for a few air-conditioned vehicles, public transportation services had already come to a halt. Vendors had left their produce and seafood stalls unattended. Bangkok's army of public servants (police, bureaucrats, teachers, utility workers, repair crews, sex workers, ...) sought solitude, shade, and, where possible, refuge in air-conditioned spaces.

Adding to the devastation, the urban infrastructure had begun to fail. Almost concurrently, both the electrical power and water utilities began to experience major breakdowns, owing both to overworked equipment, fire outbreaks, and, most critically, the disappearance of functional operating personnel.

From the start of the pandemic, peak municipal water consumption mandated the near-continuous operation of all the water utility's well and high service pumps in an effort both to keep elevated water storage reservoirs filled and to maintain faltering distribution system pressures. Early on, diesel-fueled auxiliary electrical generators had been placed in service in an effort to sustain the electrical demand required by the water system. Finally, shortly after fuel delivery supply services ceased, the auxiliary generators fell silent.

When high-service pump pressures could no longer be sustained, and as distribution system maintenance personnel became unable - or unwilling - to undertake the manual labor to repair main breaks as well as to close illegally opened hydrants, an extraordinary concession had to be made. The water utility would no longer attempt to maintain the pressures and flows necessary to fight fires. Fires would have to be allowed to burn to exhaustion.

The provision of safe drinking water also became impossible as suppliers ceased their monthly delivery of ton cylinders of chlorine and other treatment chemicals. It was untreated water that was provided to a distribution system that was increasingly compromised by main breaks, vandalism, and back-flows.

Simultaneously, the electrical utility was faced with extreme demands. Air-conditioners, fans, dehumidifiers, ice machines, ..., ran ceaselessly - particularly, in upscale restaurants, hotels, and facilities that catered to the region's economically vital tourist trade. However, even as the tourists fled, portions of the city's electrical distribution network failed due to transformer fires - or were manually deactivated in order to prioritize service to hospitals, municipal buildings, cooling centers, and important people.

The grim retrieval of the dead, as well as the routine collection of other municipal refuse, ultimately became problematic. One clever incentive for sanitary workers included allowing them to ride in air-conditioned vehicles as they went about the task of stockpiling the parboiled victims of the heat pandemic. Not surprisingly, few such vehicles for collecting the morbid intermingling of solid wastes were available.

Southeast Asia's temperatures finally moderated with the late arrival of the southwest monsoon. By then, crude estimates of the regional death toll ranged from 1,000,000 to

2,000,000; a tally that environmental activists thought might be shocking enough to command the attention of those sheltered in the more insulated regions of the world.

However, the human death toll was only part of the tragedy of the 2029 pandemic. The future economic prospects of an entire region had been shattered. Already poor, the society was further impoverished as well as rendered hopeless and desperate; the survivors - traumatized and fearful of what even more hellish penalties the future would impose. The migration of the destitute and soon-to-be-unwelcome is now underway; an unending, shuffling horde seeking comfort at an unknown refuge.

So, that is now the situation throughout the Southeast Asian Indochinese Peninsula, - or perhaps, in Southern India, - or the Middle East, - or Eastern Africa, - or Australia, - or Central America, or...?

Why are you even paying attention to an unresolved narration told by a dead man?

Alternately, in the U.S., at the New York Stock Exchange, the Dow Jones Industrial Average gained 233.9 points as the Nasdaq Composite rose 71.4 and the S&P 500 ticked up 23.0.

* **Anders Celsius** was a Swedish astronomer, physicist and mathematician who earned his salary as Professor of Astronomy at Uppsala University (1730-1744). He denoted a scale of temperature on which water freezes at 0° and boils at 100° (under standard conditions). Over the centuries, the utility of the Celsius scale found favor with most scientists and, indeed, with most non-scientists throughout the world. Refractory exceptions remain the U. S. and its Weather Bureau.

** **Hyperthermia** occurs when a body's temperature starts to increase to above its core levels, either as a result of intense physical exertion or exposure to extreme heat.

Reportedly, as an overheated body becomes unable to effectively discharge the waste heat generated by its metabolic processes, it begins to, perversely, shiver. The blood in the body's core is then increasingly distributed to the body surface in an effort to facilitate cooling. This phenomena results in 'blushing' or reddening of the skin.

If the blood is unable to cool, the pulse steadily weakens and breathing decreases. By the time respiration and pulse completely cease, one is, mercifully, dead - and the decaying organic residue will soon be contributing endogenous discharges of carbon dioxide, methane and odorous compounds, such as cadaverine, to earth's atmosphere.

*** Once more, this year, **Australia** is setting new records for heat (eclipsing its previous record of 46°C), drought and wind-driven bushfires. These annual scourges have long since prevented subsistence farmers from raising grains, forcing them to sell their livestock for lack of water and feed. The residual community of Australia's hardy farmers has diminished almost to a vanishing point. Most have joined the global trend in migrating to the large coastal cities in hopes of finding a safer and more financially secure future.

**** Earlier this year, global estimates of heat-related deaths have increased only marginally. However, the onset of extreme heat events has started earlier around the world.

***** When ambient air has a high moisture content, as near coastal regions or during monsoon seasons, body sweat evaporates more slowly, reducing the body's ability to dissipate heat. This results in further sweating, accelerated loss of water, and increased respiration.