## **Discussion of "Eulogy for Amy Gold, a Climate Visionary"** by Bill Menke<sup>1</sup>, November 18, 2024

*Eulogy* is a story about the climate change response of the next generation, meaning the people soon to be born. Theirs will be the first generation to have to deal with its really serious effects. The two protagonists, Menendez, Governor of New York State, and Gold, Mayor of the Village of Piermont in New York's Hudson Valley, are two local people whose careers center around finding practical solutions to the societal problems brought on by that change. Menendez is a career politician and his contemporary, Gold, is a builder and small-town civic leader. The story is told as a eulogy for Gold, so as to be able to refer to events that occurred throughout the sixty-year span of their adult lives.

Broadly speaking Menendez and Gold are focused on adaptation to climate change. For them, climate change is not the abstract issue of a world getting warmer. It is about two interrelated and concrete problems: shortages of water and housing.

The water problem is caused by a very long drought that ended well before Gold's death in 2117. Climate scientists predict that global warming will cause some parts of the Earth to become wetter and some to become drier. Furthermore, it may cause changes in the natural, multi-decadal climate oscillations, such as the North Atlantic Variability (NAV<sup>2</sup>) that are associated with long-term changes in rainfall. However, whether global warming will make droughts more frequent in the New York area is as yet uncertain. It is better to think of the drought in the story as a proxy for an as-yet-unidentified transient problem which people living in that era will have to face. However, the actual, and in some ways very unusual, drought that New Yorkers are currently (in 2024) experiencing makes a future drought that much more plausible.

Housing is already in short supply in the New York City metropolitan area. The shortage will be exacerbated by the arrival of climate refugees from all over the world and by the loss of housing in low-lying parts of the region. By 2060, global sea level is predicted to rise<sup>3</sup> by one-to-three feet. Although a modest rise, it may be enough that already low-lying communities in south-coastal Long Island - the ones that already flood at every spring tide - may no longer be viable. Water damage to houses may not be the biggest issue; inability to obtain insurance, frequent road closures that delay commuting, problems with sanitation and a dramatic decline in investment (especially in the upkeep of rental properties) may be the proximal drivers behind people moving out. Some of these people will begin to relocate and some of those will come to the Hudson Valley.

Shortages of water and housing are problems that are primarily political and economic in nature, even though their solution requires sound applications of science and engineering. In the case of water, scientific factors like the total amount of rain and the availability of groundwater are important. But given that both are already being fully exploited (as is the case for Piermont), solving the shortage means conserving water so that the existing supply serves more people, or building an aquifer to bring in water from far away (and getting the permission of people living there to do it), or desalinating the brackish water of the nearby Hudson River Estuary (which is expensive and controversial). Menendez successfully champions the desalinization pathway, but as the desalinization plants are built only after thirty years of drought, one suspects that many

other more politically palatable but ultimately futile ideas have been tried. His major achievement may have to get the plants built amid vehement opposition.

Change can bring opportunity. Gold's first big success as a builder is founded on the proposition that a society completely dependent on desalinization no longer needs reservoirs and, consequently, that former reservoirs are the open land on which new housing can be built. Her realization was only the first step; convincing other people was her big accomplishment. It's like getting someone to discontinue their land-line in favor of a cell phone. Going without a tried-and-true backup is scary. In going after reservoirs, Gold may also have realized that she could gain the support of environmentalists, who ordinarily might have opposed converting empty land into housing. Perhaps Gold argued that the reservoirs were unnatural and with some careful urban planning the original river could run wild again.

By the last decade of Gold's life, the New York's seas will have risen<sup>3</sup> by at least three feet, and maybe by as much as six. That's high enough that the part of Piermont that is adjacent to Hudson River will be uninhabitable - unless some action is taken to hold back the flood. The part of Piermont near the Gap, where Sparkill Creek flows between high ridges into the Hudson River could probably be saved by an arcuate levee that extended between the ridges, together with a pump station so the creek didn't back up to form a lake. But such a structure would save only part of Piermont and would be very expensive. That's a political problem that inspired civic leadership could help sort through. It's that leadership, and not the building of the Barrier, per se, that is Gold's last contribution to her hometown.

The overall tone of Menendez's Eulogy is optimistic. New York has adapted to the climate change that occurred over his and Gold's lifetime, so there is every reason to believe it will succeed in adapting to future changes, as well. But the very articulation of this point is uncomfortable, because it entails the recognition that challenging changes will be in store<sup>4</sup> for generations to come.

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<sup>2</sup>Qin, M., Dai, A., Hua, W., 2022, Influence of Anthropogenic Warming on the Atlantic Multi-Decadal Variability and Its Impact on Global Climate in the Twenty-First Century in the MPI-GE Simulations, Journal of Climate 35, 2805-2821, https://doi.org/10.1175/JCLI-D-21-0535.1.

<sup>3</sup>Kopp, R. E., Horton, R. M., Little, C. M., Mitrovica, J. X., Oppenheimer, M., Rasmussen, D. J., Strauss, B. H. & Tebaldi, C. (2014). Probabilistic 21st and 22nd Century Sea-Level Projections at a Global Network of Tide-Gauge Sites. Earth's Future, 2(8), 383–406.

<sup>4</sup>We all have the temptation to think of the year 2100 as the end of the climate change era, but actually it's at its beginning. Consider that, should all the Greenland and Antarctic ice sheets melt, sea level will rise a total of two hundred feet (over many centuries).