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Beginnings

Vaughan C. Turekian

LIKE many parents, I recently completed the age-old ritual of taking my older child to her first day of kindergarten. She joined a group of twenty-four bright-eyed five-year-olds on an educational journey that, if all goes as planned, will lead to strong friendships, new knowledge, and greater insights about the people, places, things, and ideas that make up their world. After saying goodbye to their weepy parents, the children assembled—as they will every day—for circle time, settling on a floor map of the world representing the diverse regions and countries that they will study and discover over the coming years.

On the same day that my daughter and her new friends were entering Ms. Morgan's kindergarten class, half a world away in the Levant—the green section of the class map—an emerging group conducted a reign of terror. The group had just brutally and graphically executed an American journalist, adding to a resume that included killing innocent women and children and torturing those who did not subscribe to their ideology. ISIS (the Islamic State in Iraq and Syria or ISIL, the Islamic State in Iraq and the Levant), which had become enemy number one for the national security community, has become firmly established in Iraq and Syria.

Five years ago, I was part of a science diplomacy visit to Syria, which included a former U.S. ambassador to Syria, a Nobel Prize winner in Medicine, and other distinguished scientists and science policy leaders. We were there because after nearly a decade of a freeze in relations, there were flickers of hope that the United States and Syria might build some constructive, albeit limited, areas of cooperation. Our meetings with scientists, university presidents, young entrepreneurs, and

government technocrats were like any of the other places where science diplomacy had taken us.

On the last day we met with President Bashar Assad in his palace overlooking the city. Our group was greeted by only him and his father-in-law, a well-known British cardiologist who had been the head of our Syrian counterpart group. We told the president of the prior days' conversations, on areas where cooperation might be possible, including working to build links on solar energy, water limitations, and agricultural productivity, as well as nurse training and accreditation of universities. In response, he stated that while each of these are important issues, he was focused on how to build true research universities, how to link government funding in science and research to support these universities, and how the research that would come out of these universities could lead to technologies that could create new industries and businesses. Here was the leader of Syria talking to a group of U.S. scientists and policy leaders about the innovation and entrepreneurship ecosystem that was taking place throughout Western countries working to move beyond the "Great Recession" and build knowledge-based economies.

Everyone in our group left Syria thinking that indeed change might be possible, and science diplomacy could—and would—be at the vanguard. Months later as part of the outputs of our original visit, we received a brilliant Syrian science diplomacy fellow who had received her advanced degree and postdoctoral degree from top U.S. universities. Her passion was (and is) science, having left a promising research career in the United States to help Syria build its own science community. She was committed to no political agenda other than a desire to improve the lot of her country and its people. Optimistically, she believed that science was central to finding solutions to some of the great challenges of health and societal wellbeing and to training the younger generations so that they might be agents of positive change.

Within months of her return to Syria, it was clear that the changes envisioned and discussed in the Presidential Palace were not taking place. The wave of the Arab Spring, initiated by the bubbling frustrations among large portions of the population that had felt alienated by the long-term rule of often tyrannical dictators throughout the region, thrust Syria into a brutal civil war, which continues today. Scientists were being called into Syria, not for cooperative projects designed to build economic growth, but to identify and dismantle chemical weapons that had become part of the arsenal of war. Researchers, including our former visiting scholar, faced deplorable humanitarian conditions, often under threat of assassination from the various parties within the country. But still she stayed, retreating to the transient Eden of her lab, advising her young students and hoping that things might get better.

The tragic news coming out of the Levant is part of a continuum of history of conflict in the region and around the world. This year, the world marks the centennial anniversary of the start of World War I. Regional rivalries and a series

of miscalculations led to ineffective diplomacy and represented one of humanity's greatest failures. New technologies, in the air and on the ground, provided the means to destroy at a scale and rate never before seen. It would take nearly five years for "the war to end all wars" to end, and its aftermath left redrawn maps, decaying empires, and the emergence of new grievances that would lead to an even more horrific bloodletting a generation later. The commemorations of this event will shine the light on the ease with which humanity can engage in the endeavor of destruction.

But this year is also the centennial of one of humanity's greatest technological accomplishments. The same year and month that "the guns of August" erupted, the Panama Canal was completed. A well-known feat of technology, the Panama Canal was also the victory of years of infectious disease research that led to an understanding that mosquitoes were the vector for deadly diseases, such as malaria and yellow fever, which had contributed to failures in earlier efforts to build the canal. As the world descended into war an ocean away, the opening of the Panama Canal would mark the merging of the Atlantic and the Pacific and open a new generation of connection and trade that would help drive economic growth through the century.

And so it is in this context that my daughter and others like her commence their educational journey. They live in a world more interconnected than ever before. New technologies allow for more rapid and easier contact, increasing the speed with which ideas, ideologies, diseases, and people move. Their challenge will be to channel the compassion of youth, with the new knowledge they gather, to build a world that is a better place a century from now than it is today. It is this optimism and hope that come with new beginnings. **SD**