Faculty Dialogue:

Can History Provide Solutions for the Current Climate Crisis?

By James Devitt

In the past few years, elected officials, advocates, policy-makers, and business leaders have been scrambling to better understand and address the wealth of issues surrounding climate change. But while the environment has increasingly dominated public debate, few are aware that this generation is actually one of many throughout history to grapple with such a problem.

NYU anthropology professor Rita Wright has studied civilizations dating back to 11,500 B.C.E., examining how they responded to climate change in order to ensure their survival. Stern School of Business professor Roy Radner’s research includes strategic analysis of global warming and game theory. These faculty members recently sat down with NYU Research to discuss what measures some early cultures explored as they adapted to an altered climate and to consider what lessons we can learn as we wrestle with similar issues.

NYU Today: How do we examine past civilizations to understand their methods of dealing with climate transformation?

Wright: Studies of paleoclimates contribute to an understanding of the impact of climate change on populations and their responses. A significant difference between present-day global warming debates and paleoclimate changes, however, is that early societies did not engage in activities that led to the emission of greenhouse gases. Most of the changes they responded to were the result of natural causes and, if induced by humans, were of a more local nature.

My research on the Indus civilization in South Asia is a case in point. In a landscape and environmental survey of settlements that ranged in date from 3200 to 1900 B.C.E., located along a now dry bed of an ancient river, the Beas river, and a major urban center, Harappa, we discovered fluctuations in precipitation patterns over a period of several thousand years. Our evidence shows that around 3600 B.C.E., there was an abrupt increase in precipitation, which lasted for almost 1,500 years. At around that time people began to settle along the Beas and at Harappa, and at 2000 B.C.E., there was then a dramatic change in seasonal precipitation there due to diminished monsoon and winter rains. These changes were correlated with a drop in the river discharge levels of the Beas. In response to these fluctuations, people made adjustments to a multi-cropping agricultural strategy. The shift also involved growing more drought resistant crops, making it possible for the settlers to sustain their way of life during the uncertain climate shifts.
NYU Today: Does the response of earlier civilizations offer any lessons for us follow?

Wright: I think so. For instance, 14,000 years ago, when the glaciers receded, there were settlements in the Near East that were affected, and people took advantage of the opportunity to move into areas that had been sparsely inhabited. However, after several thousand years of subsisting on a basic food source of wild plants and animals, there was another change, called the Younger Dryas, when there was an abrupt cooling and drying trend that threatened to disrupt the hunting and gathering economy. At that point there may have been a displacement of some populations; however, in other instances, people made adjustments. Archaeologists working at a site in Syria near the Upper Euphrates have good evidence that the farmers began cultivating crops such as rye in response to these dramatic changes. Researchers believe this triggered a new era giving rise to the domestication of plants and animals.

NYU Today: What sort of general steps has our culture taken to counter the predicted climate changes.

Radner: It is generally thought that people discount the future, meaning they value future benefits (for themselves and future generations) less than they do present benefits, and are therefore not very willing to invest today to obtain the somewhat distant future benefits of controlling climate change. The opportunities for such investments vary; very poor countries don’t have a lot to invest. Finally, there seems to be a negative correlation between the damage done by global warming and the level of economic development of the country - damages seem to be highest in those parts of the world that are the poorest, such as Bangladesh, sub-Saharan Africa, and parts of Asia.

NYU Today: What has your research shown regarding potential shifts for how governments consider their own environmental responsibility?

Radner: Our analysis is based on game theory. (I am working with Prof. Prajit Dutta of Columbia University.) In our model, the players are the 150-odd sovereign countries in the world, which can pass laws and decide how to control their greenhouse gas (GHG) emissions. Now, how can each country reduce its emissions? Several factors affect this process. The use of energy is most relevant to climate change—we burn fossil fuels, the primary force behind the growth of GHGs. We can reduce the energy we use, but that reduces our output, which reduces our standard of living. We can also change the technology of energy use to decrease energy consumption - we can make our cars and our manufacturing more energy efficient. We can also change the technology used to make energy. We can go from fossil fuels to other sources, but that’s costly because it requires a lot of research and development. Deforestation is another factor that increases the atmospheric stock of GHGs.

NYU Today: Professor Wright, how does this fit in with your work on civilizations?

Wright: I would say that the changes that we ask people to make have to be locally advantageous. Regarding wind, solar, and nuclear power, these solutions may not rank
high on a scale of social value. The examples I sketched earlier show that people are often aware of changes in their environment and fluctuations in climate, but the strategies that worked best are those that were locally advantageous.

Radner: For example, people don’t want a nuclear power plant because they don’t want the waste where they live. The main problem with nuclear power is what one does with the radioactive waste. I’m not an expert on this, but we know how to dispose of the waste pretty safely underground in certain parts of the world. But people in Nevada near Yucca Mountain, where the U.S. government is considering a disposal site, don’t want the waste there even if they can be assured that it can be safely stored.

Wright: Yes, that’s true and it indicates that there are a lot of social issues that come to mind that have nothing to do with economic interests. People in the past, like today, did not always approach climate change from an economic perspective. The changes they adopted were often based on social considerations.

NYU Today: Professor Radner, what have you determined to be the best way for governments to control emissions?

Radner: The first thing is to notice that because any country’s emissions go into the atmosphere and get mixed up across national boundaries, it very quickly becomes a problem for everybody. So this problem is not one that is going to be solved by unilateral action of any country; we have to find a way for everybody to move together. That’s what a treaty is supposed do. But a treaty has to be self-enforcing because we don’t have a world government.

NYU Today: How would you define self-enforcing in this context?

Radner: An example of a reasonably successful treaty is the World Trade Organization’s (WTO) General Agreement on Tariffs and Trade. If a country that belongs to the WTO does something that violates the treaty, the rest of the members levy sanctions, e.g., raise tariffs on its products or refuse to import them. Now the question is, ‘Why would they apply the sanctions?’ Well, because the treaty also says that if you don’t apply the sanctions, the sanctions will be applied against you. This is an example of a self-enforcing treaty: there’s a set of mutually reinforcing expectations.

Right now, the Kyoto Protocol addresses climate change, but is not self-enforcing. The question for us is, ‘How do we go from one equilibrium of expectations to another?’ That’s where the vague concept of leadership comes in. For example, the United States cannot unilaterally solve the global warming problem, but it can, by leading the way, change other countries’ expectations.

NYU Today: Professor Wright, is there any specific precedent we can draw upon for dealing with our current threat to the planet?

Wright: Well, I would say that Professor Radner has it right when he says that the effects of some climate changes can be good. The example of early settlement in the Near East
after the glacial retreat certainly fits that notion. In that case and in other examples I
described, people exhibited an amazing resilience. Although they were aware of the
climatic fluctuations, they took action in the face of difficult circumstances. I do think
what we know about paleoclimates and the way it was played out in archaeological
contexts, points us in the direction of seeking solutions and not simply relying on a ‘wait-
and-see’ attitude.