A new paradigm for a humane and ecological civilization

We have entered the era of broken systems. A broken public health system allowed a new virus to turn into a pandemic, a broken political system resulted in a would-be dictator in the White House, a broken policing system has led to national rage, a broken economic system is immiserating millions of people needlessly. And we haven’t even dealt with a broken energy-manufacturing-agricultural system that will lead to ecological and climate chaos.

As John Feffer wrote recently:

“The global economy remains market-centered, even though the evidence has been mounting that these markets are failing us and the planet. Tweaking this model isn’t good enough. We need a new Copernicus who will provide a new theory that fits our unfolding reality, a new environment-centered economics that can maximize not profit but the well-being of living things.”

Copernicus, the 16th century astronomer who first proposed a framework for understanding that the planets revolve around the sun, was the main subject of the philosopher Thomas Kuhn’s groundbreaking book, “The Structure of Scientific Revolutions”, in which he unleashed upon the world the now much misused term ‘paradigm’. There are many definitions of this term, but I saw him give a lecture in which he explained it to mean something akin to a systematic network of ideas that have an internal coherence. Most people stick with particular paradigms, even when there are ‘anomalies’, as Kuhn calls them, which usually leads to what Feffer referred to as ‘tweaking’.

Neoclassical economics holds the lofty position of being the central paradigm for understanding economics. It has failed miserably at the job of indicating to the public which direction the economy should go in order to avoid the many calamities that clearly await us. But mainstream economics has accomplished what it has been constructed to do: first, provide the intellectual underpinnings for Ronald Reagan’s claim that ‘the government is not the solution, the government is the problem’, and second, to justify economic inequality.

*Classical* economics, often ascribed to Adam Smith and David Ricardo, was not particularly well embedded in a formal mathematical system. By the time *neoclassical* economics was formulated in the late 19th century, physics had developed a field called statistical mechanics that explained the behavior of very large numbers of elements, as in a container of gas or a system of water piping. This served very well for understanding how prices were set, assuming a constant number of relatively powerless, similar firms, in which differences between industries did not matter, and in which exchange, not production, is the most important economic activity. To this was added Ricardo’s idea of diminishing returns, that is, that as you add a factor of production (say, land), you get back less and less for your investment; and from this John Bates Clark at Columbia University added the idea of marginal productivity, which essentially meant that everyone receives in income what they contribute to society – a breathtaking statement to make, considering the horrendous inequality of income around the turn of the 20th century as he was writing, but the concept was an attempt to counter the Marxian notion that a revolution was needed to achieve this ideal end.

An economic paradigm is inevitably a political paradigm, because the implications of the paradigm lead to a set of policy recommendations. The neoclassical paradigm has become the intellectual core of conservative and neoliberal policy, and claims to be scientific.

However, and most commentators don’t seem to notice this, this rickety assemblage of ideas has an achilles heel: the theory of economic growth. That is, if the way you explain production is to concentrate on how returns *diminish*, you can’t very well explain why economies *increase*. If you are concentrating on how goods and services are *exchanged*, you will ignore how things are *produced*, and since growth is a consequence of increased production, your theory will fall short. If your theory is based on the idea that everyone receives the income they deserve, and capital receives much less in income than labor, in the aggregate, then you have a problem when growth correlates with the growth of capital and not the growth of labor. So when Robert Solow received a Nobel prize for creating the neoclassical theory of economic growth, all he could account for was about 1/8th of all growth. It is as if physics claimed to be a thorough explanation of the physical universe, but could not explain the motion of the planets, the very problem Copernicus was trying to solve.

Neoclassical economics proposes that the market knows best in almost all situations, not the government; and that the distribution of income and wealth leads to the highest economic efficiency. The falsehood of these propositions became so clear by the 1930s that an exception was made, helped along by the writing of John Maynard Keynes: sometimes the market gets to a point where it gets ‘stuck’ at a low level of activity, and the government has to spend money to kick start it back into normal processing. This basic insight has permeated the political system so thoroughly that even the far-right Republican party approved a multi-trillion dollar spending program to overcome the pandemic, as inadequate and badly designed as it is.

Neoclassical economics, because it ignores production, also ignores the most basic aspect of economies: the underlying ecosystems that are the foundation of human society. Since much of the problems of the environment involve how we produce things, economics has nothing to say, except that the government should not be involved, except to regulate and tax in such a way as to move closer to a better outcome. But this doesn’t work if the problem is the architecture of the entire civilization, as opposed to the behavior of individual firms and individual consumers.

We have reached a point in the history of human civilization where we need to consciously redesign what we can call the *structure* of the civilization. That is, we have to plan what the various interconnected parts of the economy should look like, and how those parts work together to form a greater *system*.

Instead of looking at the economy as a system of water pipes, as in neoclassical economics, it is much more useful to understand that the economy is an *ecosystem*. An ecosystem, unlike a plumbing system, is composed of different parts that fulfill different *functions*. All of these sectors, or *niches* as they are called in ecology, are necessary and collectively are greater than the sum of their parts. Ecosystems can usually be simplified further in a way that leads to an important conclusion about how we need to reorganize our economy: the concept of trophic levels.

In all ecosystems, there are basically four different levels: a *producer* level, generally filled by plants, that creates organic material from sunlight, soil and water; a *primary consumer* level, that are composed of animals that consume plants; a *secondary consumer* level, the predators that eat the plant-eaters; and finally, a detritovore level, the various organisms that break down the dead corpses of all the other levels. This last level is critical, because the broken down organic material becomes the *input* for the first level; the entire system is a virtuous circle, which is why ecosystems are usually very long-lasting and relatively stable (of course in the real world there are many qualifiers and variations, but the basic ideas are the same).

The human ecosystem – an economy – can have this virtuous circle, but modern ones do not (indigenous peoples usually could manage this feat). The human ecosystem can be conceived of as being composed of trophic levels as well, but they are much different, and as a result, humans are capable of great feats of both production and destruction.

Just as humans, and humanoid species before us, used a tool to then make other tools that were then used for everyday use, so modern economies use specialized industrial machinery which is then used to make more of themselves and to make the machinery that is then used to produce the goods and services we use. The first level, which I call the reproduction machinery level, is made up of very particular types of machinery, such as machine tools, that collectively have the capacity to be used to reproduce themselves. Thus machine tools can be used to make parts of other machinery and parts of more machine tools, using steel, which is made using steel-making equipment, which itself is made using steel, and also using machine tools to make pieces of steel-making machinery, and so on. While in a natural ecosystem reproduction takes place on all levels, the reproduction machinery level is the only one where reproduction occurs.

These kinds of machinery, since they hold such an important strategic place within an industrial ecosystem, are the key to the technological change that drives economic growth. When these kinds of machinery improve, it makes it possible to make better and different kinds of industrial machinery that is used in factories, which makes it possible to make different and better kinds of goods and services. Thus continuous improvements in semiconductor-making equipment make it possible to create the tiny chips that make it possible to produce cell phones, modern computers, and the internet itself.

So there is a primary producer level, the reproduction machinery level, a secondary producer level, the production machinery used in factories and construction sites, and the consumer level for final goods and services. What is missing from this story is the fourth level in a natural ecosystem, the part that recycles the outputs so that the ecosystem operates as a virtuous circle.

In human ecosystems, pollution and greenhouse gas emissions ruin ecosystems, including the health of many humans, while other ecosystems are destroyed in order to extract what becomes the input of the production system. If we are to stop our slide toward eco-catastrophe, we will have to add this fourth level, partly by recycling and reusing our manufactured goods. The current term for this is as a ‘circular economy’.

We can think of the economy as an ecosystem and transform it to make it circular, but we also clearly need to integrate it with the natural ecosystems. We could have a perfectly circular economy, but we could still be expanding agricultural systems, and plowing up meadows and forests to construct housing developments, and still be destroying ecosystems. As we see with the pandemic, human encroachment on wild areas has come back to bite us in the form of accelerating exposure of zoonotic diseases like Covid. To do this, we would ideally want to retreat as much as possible from natural ecosystems to allow them to revive; that means reversing sprawl, and constructing dense, comfortable human habitats. And in order to do that, we would need to create a social system that guaranteed a comfortable standard of living for everyone – globally, or else desperate people will keep trying to sell animals filled with viruses, for example.

Thus we see that we can create a way of looking at the economy, focusing on production, that can lead us to envision a better structure for our civilization. This structure must be consciously designed, using scientific understanding. If left to the market, systems will keep breaking. That leaves one alternative: the state must take the leading role in transforming the global civilization. This transformation must be planned, with a design for various sectors of the economy, in such a way that they all fit together in a sustainable way.

For instance, I have been writing about what we are now calling a Green New Deal for many years, and I have proposed the reconstruction of much of the structure of the American economy, which in combination will lead to a society that does not emit greenhouse gases that lead to global warming, eliminates pollution and most mining, makes housing affordable, and provides a good job to everyone who wants one. These outcomes *emerge* out of the interaction of the following systems, designed and owned by the Federal government: an Interstate Renewable Electricity System, which provides all electricity in the form of wind and solar; an Interstate High-Speed Rail System, that is built along the same routes as the Interstate Highway System; a huge housing program to create and expand walkable neighborhoods in city and town centers, along with extensive transit systems that such neighborhoods make possible; a Federally-supported transition to regenerative agricultural systems that do not use pesticides or artificial fertilizer, set up close to cities and towns; and a Federal system of replacing all industrial machinery so that the machinery does not pollute and generate emissions, and uses and generates recyclable or reusable goods.

The construction of these systems would add about 20% to the economy, in other words, the market would still control most activity, but the *structure* around which the market operated would be different. The government would not intervene in the economy by promulgating economy-wide measures, like a budget deficit or controlling the money supply, or even by relying on regulation, although all these policies could be pursued, the government would direct the way particular sectors were designed. This is a form of planning, and planning for economic growth has always been perhaps the most important way that governments have intervened in economies.

In fact, I would even define civilization as the set of economy-wide infrastructure systems, both physical and social, that a central government creates in order to enable and encourage economic activity. After all, the first civilizations were made possible because a government formed that could construct the irrigation, grain storage and transportation systems need to create the economic surplus that is necessary in order to support large numbers of specialized people, whether priests, soldiers, craftsmen, or scribes. The more extensive civilizations, such as the ancient Romans, constructed huge water works, ports, and road systems, and when those fell apart we entered a ‘dark age’ in Europe, even as the Chinese and other civilizations were building their own continental systems. Governments in Europe encouraged scientific and engineering innovations, until Great Britain birthed the Industrial Revolution which required new kinds of industrial machinery that was advanced enough to achieve the economies of scale that we see in factories.

However, just as the Industrial Revolution was starting, there was as yet no economic theory discussing the critical role of government, so that Adam Smith was able to concentrate on the workings of the market without much reference to government. Alexander Hamilton’s Report on Manufactures argued that the government needed to encourage manufacturing, lest the United States become an economic colony of the country she had just freed herself from. Hamilton’s arguments influenced the German economist Friedrich List, who understood the importance of manufacturing for national power and wealth, and Abraham Lincoln and many other original Republicans followed their lead because the new industrialists in the middle of the 19th century needed ports, canals, trains, and colleges if they were to compete with Europe in an emerging global industrial economy. Even in the depths of neoclassical policy making up to the Great Depression, large scale engineering projects, like the Panama Canal and the Hoover Dam, were going on because it was clear these projects would lead to economic growth – even if there was no theory to back them up.

Making all of this infrastructure building possible was the industrialization of the economy, particularly what is called the second industrial revolution, involving electricity, steel, and mass production. People in the 1920s could see with their own eyes how important changes in manufacturing were to their lives and the prosperity of the nation. In turn, public works like electricity grids made possible the further development of industrial technology. There was a virtuous circle of economic growth created by public works and manufacturing.

However, Hamilton’s original theorizing about manufacturing and the role of government had not been expanded upon, eventually to be overwhelmed academically by neoclassical economics. Thorstein Veblen talked about a ‘soviet of engineers’, and the 1920s saw probably the zenith of an effort by engineers to affect economic debate, but after WWII, instead of building on the accomplishments of the New Deal, which had revitalized much of American infrastructure, economic debates focused on sterile arguments about fiscal policy. New Deal Democrats turned into Cold War Democrats, eventually alienating much of the left of center of the country. By the late 1970s, manufacturing and government policies to directly intervene in the economy were both declining. Neoliberalism, along with Reagan conservatism, has monopolized the debate ever since. The ‘deconstruction of the administrative state’, as Steve Bannon put it at a CPAC conference, has led to a situation in which the only sectors of the state that have been allowed to grow are the military and police, leading to the spectacle of a state that cannot produce enough PPE’s to handle a pandemic as the nation convulses from the excesses of the police, all while multi-billion dollar aircraft carriers can’t do anything to protect the country from its real threats, and instead have turned into Covid carriers.

The dominance of neoclassical economics is not all due to intellectual arguments; it also justifies the actions and policies of large corporations and the most wealthy individuals. But the lack of an alternative has made it very difficult for the Left as a whole to offer a clear alternative that could attract widespread support. Most policy recommendations are ‘tweaking’ to use Feffers’ term, leading to what we now call ‘wonky’ proposals that only excite certain sectors of the Democratic Party, but elicit almost no mass enthusiasm.

If you accept the neoclassical paradigm, then you can’t really argue for anything ‘transformative’, a word that is going around these days, because the neoclassical paradigm teaches that there is not much the government can do except for tweaking. The only well-developed alternative for much of the 20th century was the Soviet central planning model, which is simply impractical from a computational point of view. But if we build on an understanding of the reality of government involvement throughout economic history, and use concepts from ecological theory as our building blocks for an understanding of our current predicament, our prospects become more hopeful.