Inquiring Minds Topic--September 9, 2016
Moderator: Melissa Butler

The Robots Are Coming! The Robots Are Coming!

These articles bring together a couple of recent Inquiring Minds topics. In past weeks we looked at Driverless Cars and at the Middle Class. This week, we consider the impact of technology on the middle class. Some questions:

- *Is the "automation bomb" David Ignatius discusses presenting different challenges than those of other periods "creative destruction" our economy has experienced?*
- *Is technology responsible for replacing a "bell-curve" with a large middle class by a "power-curve" where most of the rewards go to a very few? Is this a problem?*
- *If you've answered "yes" to either of the above, what, if anything, should we be doing to address the problem?*

David Ignatius, "Brave New World of Robots and Lost Jobs," *Washington Post*, August 11, 2016.

Job insecurity is a central theme of the 2016 campaign, fueling popular anger about trade deals and immigration. But economists warn that much bigger job losses are ahead in the United States — driven not by foreign competition but by advancing technology.

A look at the numbers suggests that the country is having the wrong economic debate this year. Employment security won't come from renegotiating trade deals, as Donald Trump said in a speech Monday in Detroit, or rebuilding infrastructure, as Hillary Clinton argued in Warren, Mich., on Thursday. These are palliatives.

The deeper problem facing the United States is how to provide meaningful work and good wages for the tens of millions of truck drivers, accountants, factory workers and office clerks whose jobs will disappear in coming years because of robots, driverless vehicles and "machine learning" systems.

The political debate needs to engage the taboo topic of guaranteeing economic security to families — through a universal basic income, or a greatly expanded earned-income tax credit, or a 1930s-style plan for public- works employment. Ranting about bad trade deals won't begin to address the problem.

The "automation bomb" could destroy 45 percent of the work activities currently performed in the United States, representing about $2 trillion in annual wages, according to a study last year by the consulting firm McKinsey & Co. We've seen only the beginning of this change, they warned. Currently, only 5 percent of occupations can be entirely automated, but 60 percent of occupations could soon see machines doing 30 percent or more of the work.

The McKinsey analysts sharpened their argument in a paper released last month. Their estimates, based on U.S. Bureau of Labor Statistics data covering more than 800 occupations, draw a shocking picture of the future. In manufacturing, 59 percent of

activities could be automated, and that includes "90 percent of what welders, cutters, solderers and brazers do." In food service and accommodations, 73 percent of the work could be performed by machines. In retailing, 53 percent of current jobs could be lost.

White-collar workers may imagine that they're safe, but that's wishful thinking. If computers can be programmed to understand speech as well as humans do, 66 percent of jobs in finance and insurance could be replaced, the most recent report says.

Robots are replacing workers around the world. The density of robots per 10,000 workers is actually higher in Japan and Germany than in the United States, according to the White House Council of Economic Advisers. In the "Economic Report of the President," released in February, they cited research noting that "middle-skill" employees, such as bookkeepers, clerks and assembly-line workers, have been replaced first, but that "big data and machine learning will make it possible to automate many tasks that were difficult to automate in the past."

Workers are already reeling from the job implosion we've seen so far. A study released last week by Bruce Stokes of the Pew Research Center found that 89 percent of Americans surveyed thought that "the loss of U.S. jobs to China" was a serious issue. That anxiety translates into growing skepticism about free trade. As of March, 51 percent of Americans still thought free trade deals were a good thing, but that was down from 59 percent two years ago.

Pew data show that the people most likely to oppose trade deals are older white men, the people whose former job security has probably been most affected by the modern, global economy. Free trade agreements are supported by 54 percent of women; 55 percent of blacks; 67 percent of young adults between 18 and 29; and 72 percent of Hispanics. Young, diverse Americans seem to accept the disruptions that are part of the global, high-tech economy.

This campaign has distilled the populist rage at elites who are seen to have benefited from globalization while some blue-collar workers have suffered. This anti-elitism is only likely to grow as vast new sectors of the economy are transformed by the Silicon Valley technologies that have created a new class of American billionaires. People shouldn't hate the future, or the technologists who are building it, but this anger could become a polarizing fixture of the national mood.

Politicians need to begin thinking boldly, now, about a world in which driverless vehicles replace most truck drivers' jobs, and where factories are populated by robots, not human beings. The best way to cushion this future is to start planning for how Americans will be able to take care of their families — and find meaningful work — in a world where most traditional jobs have vanished.

Robert J. Samuelson, "The Robot Invasion That Isn't Yet Here" *Washington Post,* June 1, 2016.

The robots are coming — but not in numbers that would imperil most Americans' jobs.

Few subjects have inspired as much hype as robots. Consider some sample headlines: "Robots and Computers Could Take Half Our Jobs Within the Next 20 years," "Robots Could Put Humans Out of Work by 2045," "Why the Highest-Paid Doctors Are the Most

Vulnerable to Automation."

Here's why you should be skeptical, at least in the near term.

First, there's little evidence that robots have yet had much effect on job creation in the current recovery. Since a low point of payroll jobs in February 2010, the economy has added 14 million jobs. These figures surely obscure countless thousands of jobs lost to automation, but that's a normal part of a dynamic economy.

Second, the actual number of robots doesn't suggest a huge impact either. In 2014, American firms installed 26,200 industrial robots, according to the International Federation of Robotics. That's tiny compared with present payroll employment of 144 million, including 12 million manufacturing jobs. Even making generous assumptions about robots in stores or service jobs, the total remains modest. (In 2014, the U.S. industrial robotics market was the third largest, ranking behind China with 57,096 installations and Japan with 29,300.)

Finally, robots aren't new. In his monumental study of U.S. innovation ("The Rise and Fall of American Growth"), economist Robert Gordon notes that General Motors introduced industrial robots in 1961. "By the mid-1990s, robots were welding automobile parts and replacing workers in the lung- killing environment of the automotive paint shop," he writes. But the adoption of robots outside the manufacturing and wholesaling sectors will be a "long and gradual" process.

The alarmist headlines at the start of this column appeared in various publications and are quoted in an essay by Richard Freeman, a Harvard labor economist. As he notes, "most economists" (including Freeman) doubt the gloomy predictions of mass unemployment. True, robots enjoy some advantages over humans; they can work 24 hours a day and don't have fringe benefits. Still, the economists have history on their side. It's all happened before.

There is no conceptual difference between robots and earlier labor-saving technologies, including the switch from steam power to electricity and the adoption of the assembly line. Although innovation hurts some industries and workers, it helps others by inspiring new products or reducing prices. Low prices spurred demand for both the Model T and smartphones. Meanwhile, new satellite industries arise — say, cybersecurity now.

Finally, there's inertia. Some innovation occurs slowly, because it encounters practical problems. Take driverless vehicles — self-propelled robots — which have received huge publicity. They are unlikely to become widespread soon. Dozens of regulatory issues need to be settled. Nor is it clear what the demand for driverless

Consider. An opinion survey by Brandon Schoettle and Michael Sivak at the University of Michigan found that only 16 percent of respondents wanted self-driving vehicles; 39 percent preferred "partially self-driving" and 46 percent wanted no "self-driving" features. Safety is one anxiety. Cost may be another. Presumably, car prices would be higher, reflecting the costs of software, sensors and electronics. Will drivers pay the premium, especially when today's cars last longer than ever? (The average age of today's vehicles is 11 years, up from five years in 1969, reports the Transportation Department).

All these factors argue against the doomsday specter of robots creating mass

unemployment. Of course, dramatic increases in the minimum wage will quicken the pace of automation. More jobs will be lost.

Still, the real problem, suggests Harvard's Freeman, is not jobs, but wages. The added competition from robots will depress workers' wages and salaries. This could happen, but it's an open question and overlooks an important countervailing force. As baby boomers age and retire, growth in the labor force is slowing. Workers may become scarce, pushing up their wages.

Richard Cohen, "Technology disrupting the American Dream," *Washington Post*, January 19, 2015

Mercedes-Benz wants to develop a driverless car. Google already has one. This is exceedingly bad news for auto body shops, ambulance-chasing lawyers and others. Soon, truck drivers might be replaced by driverless trucks. What then will happen to the nation's 3.5 million truck drivers, not to mention truck stops, of which there are 276 in Texas alone? (You can Google anything.)

The conventional answer is retraining. Truck drivers will become something else, maybe teachers or dental hygienists, which is, of course, possible. It's also likely that many of them will sink into the funk that is the loyal companion of unemployment. Family life will shred, and possibly an army of former truck drivers will enlist with others of the digitally ditched and wreak political havoc. Shippers will sing "Happy Days Are Here Again." For truckers it will be, "Brother Can You Spare a Dime?"

It's clear by now that the fruits of automation, computerization and outsourcing are being reaped by the top 1 percent — in this case, shipping companies and not drivers. The old bell curve with the middle class bloating comfy in the middle is being replaced by what's called the power curve, in which something called the 80/20 rule applies: 20 percent of the participants in an online venture get 80 percent of the rewards. Think Uber. It's not the drivers who are getting rich. Something new and possibly awful is happening.

Many books have been written about this phenomenon, and in 2012, the Aspen Institute convened a meeting on this topic, with the resulting report bearing the jaunty title of "Power-Curve Society: The Future of Innovation, Opportunity and Social Equity in the Emerging Networked Economy." One participant was Kim Taipale, a leading thinker in this field. I quote from the Aspen report on its summary of Taipale's thesis: "The era of bell curve distributions that supported a bulging social middle class is over. . . . Education per se is not going to make up the difference."

What will make up the difference? President Obama is giving it a shot by proposing to raise taxes on the very rich and relieve the tax burdens of the middle and lower classes. This makes so much sense that the Republican Party recently rose as one to oppose it, denouncing the proposal, as always, as a nonstarter. The GOP's monomaniacal mantra is always to lower taxes because that supposedly produces jobs (Oh, yeah, where are they?), as well as billionaires. (No problem finding them.) Many of the jobs currently being produced are part-time and low-wage, but even when the pay is good, the jobs are often evanescent — gone in a year or so.

For the past several weeks I've been accosting captains of industry and asking how the American economy is going to both raise incomes and retain jobs. One told me that the

rich are going to have to carry the not-so-rich — a vast and expensive welfare program. Another suggested make-work of the sort that FDR tried during the Depression: goodbye self-service gas stations, welcome back attendants and someone to wipe the windshield.

Still others insist that all this worrying is about nothing particularly new under the sun. The United States and, indeed, the industrialized world, has weathered this sort of thing before — the assembly line replacing all those cool artisans making carriages, horseless or otherwise. New jobs are just over the horizon. Innovation and education will create them. Just you wait and see. The app, as Google's executive chairman Eric Schmidt pointed out in a recent talk, is only six years old.

To my ears, the optimists sound Panglossian. I have watched Uber (which I use) chew up the taxi industry. Office buildings are being erected for a new age of fewer employees. The law library is online, the back office is overseas — and steno exists only in old movies. ("Miss Jones, take a letter") The middle class has flat-lined; unemployment is down but wages aren't up.

Much of this is ultimately supposed to be good. The term "disrupter" has become an accolade, like first-responder or something. Yet there could be an awful political and social price to pay, and that, for the moment, is being discussed only in whispers — largely limited to forums like Aspen and not the political arena. The stirring will likely have severe political repercussions. After all, what is being disrupted is not the occasional industry but the American Dream. The disrupters disrupt sleep itself.

Catherine Rampell, "The robots aren't threatening your job," *Washington Post*, April 9, 2015

The Great Robot Freakout of 2015 has begun, and it looks a lot like the robot freakouts that came before it.

In a new survey by CNBC, Americans were asked how concerned they were, if at all, that their jobs could be replaced by technology in the next five years. The level of automation angst was astonishing: About 1 in 8 workers indicated was worried about being displaced. Among those earning less than $30,000, it was a whopping 1 in 4.
No doubt these workers have seen travel agents, bank tellers, typists, mid- skilled manufacturing workers and other occupations of yore dissolve into a pixelation of zeroes and ones, causing them to worry about their own livelihoods. Media fear-mongering about the rise of our robot overlords feeds the anxiety. But there are reasons to be optimistic about the role that technological progress will play in our economy and in helping our workforce, provided policymakers get their acts together.

Droid dread is nothing new. It goes back hundreds, arguably thousands, of years. Sometimes it has manifested itself in science fiction and other narrative lore, such as Kurt Vonnegut's dystopian 1952 novel "Player Piano" or the 16th-century legend of the Golem of Prague. Often it has been voiced by workers and their intellectual champions. During the Great Depression, John Maynard Keynes fretted about the possibility of "technological unemployment." Nineteenth-century textile workers and farmers, including the original "Luddites," smashed the power looms and threshing machines that stole their jobs during the Industrial Revolution. Even Aristotle mused that if "the shuttle would weave and the plectrum touch the lyre without a hand to guide them, chief

workmen would not want servants, nor masters slaves."

Then, as now, such premonitions embraced the so-called Luddite Fallacy: that technological developments would permanently reduce or even eliminate the need for human labor. But again and again such fears have been proven wrong. Across history, technological developments have caused certain skill sets and jobs to obsolesce, yes, but they have also created demand for new skill sets and types of jobs, typically higher-paying ones that are complementary to technological advances. In 1900, 41 percent of the U.S. workforce labored in farming; those jobs disappeared, but new ones sprang up in their place, mostly in occupations that could not have even been imagined in 1900.
This track record makes today's automation fears look somewhat silly, or at least shortsighted. Some have argued that a greater share of all jobs today are vulnerable to simultaneous displacement compared with past episodes — given Moore's law about the inevitable advance of computing power — but so far we haven't seen this fear materialize. If anything, layoffs have fallen to record lows in recent years.

That said, today, as in the past, being displaced by technology is excruciatingly painful — particularly since the types of new jobs being created may not fit the skill sets of those being displaced. A laid-off autoworker will not as easily find work as, say, a software engineer.

Technological progress is inevitable, and we cannot turn back the clock. What we can do is help displaced workers transition to new jobs and provide some financial cushion in the meantime. That means shoring up our unemployment insurance system, investing in retraining and making sure that retraining programs align with employer needs. It also means nudging high school and college students toward skills that are expected to complement, rather than be rendered obsolete by, new technologies.

There's also a role for policymakers in helping workers who have not been displaced by technology, per se, but who have not exactly seen much upside from it either, at least in their paychecks. That CNBC poll also asked Americans whether they had become more productive at work because of technology, and a majority answered yes. But of those, only about 1 in 3 said their wages had risen as their productivity increased. This perception is confirmed by government economic data, which show that starting in the 1970s, productivity gains have disproportionately been captured by holders of capital rather than workers.

To some extent this pattern probably reflects the specific kinds of technological improvements we've seen in recent decades and the nature of the digital revolution. But to some extent it also reflects policy choices we've made as a society: to dismantle unions, to let the minimum wage inflate away, to let politically connected corporations stack the deck in their favor.

Can't blame any of that on the robots, alas.