

GMO-Luddite debate: Are anti-technology “progressives” promoting poverty or preserving traditions?

200 years ago, sporadic riots roiled Great Britain. The marauding men, some wearing dresses, aimed at destroying textile machines invented to make cloth faster and easier. Some of these machines helped create jobs, but the rioters, who became known as “[Luddites](#)” after a fictional leader, were concerned about the [cheap, unskilled work](#) these contraptions were also creating. The protest movement was the leading edge of a rising tide of English working-class discontent against the disconcerting changes brought on by the emerging industrial revolution.

The term Luddite eventually took on a meaning of its own, the terms used to describe those suspicious of or slow to adapt new technologies. They are often referred to as “neo-Luddites”—a term often slapped on anti-GMO activists by scientists and others more embracing of agricultural genetic [panic and hysteria](#) engineering and other forms of genetic research.

Putting “GMO” and “Luddites” in a search engine yields more than 650,000 hits. [Anti-GMO activists a bunch of luddites?](#) asks one blog post? That label irritates GMO opponents to no end. In a response, [We Are Not Luddites](#), Richard McCarthy, executive director, Slow Food USA, claimed that GMO opponents are actually more progressive because they respect and want to preserve accumulated wisdom—assertions that echo arguments made by Luddites two centuries ago.

When we abandon agricultural knowledge that has accrued from generation to generation for new, centralizing short cuts, we limit our choices ... We should be championing traditional knowledge and those who possess it.

The slow food movement’s ironic postings aside, is it fair to draw a comparison between the allegedly technology-eschewing Luddite protestors and today’s opponents of genetically modified crops? And can we explain why anti-GMO activists seem to have no problem with biotech drugs?

Today’s debate

A recent article on [“The Conversation”](#) by Andrew Maynard, director of the Risk Sciences Center at the University of Michigan, drew parallels between the popular reactions against 10 paradigm-changing “disruptive” technologies and the initial response to the introduction of textile machines in England that helped usher in the Industrial Revolution. Of the 10, are closed link to breakthrough genetic research and a third involves computer chips that may mimic the brain (known as neuromorphic technology). These [“Top Ten Emerging Technologies”](#) from the World Economic Forum include:

- **Precise/new genetic engineering techniques.** [Zinc finger nucleases](#) (ZFNs), transcription activator-like effector nucleases ([TALENs](#)) and the [CRISPR-Cas9](#) system can more precisely “edit”

a genome to insert a protein-encoding gene or DNA that can regulate gene expression. These innovations improve upon current genetic engineering techniques, which rely on insertions made by genes carried by *Agrobacterium tumefaciens*. Current techniques have not shown any harm (but plenty of controversy); next-generation techniques offer a powerful ability to manipulate gene expression, raising concerns among the precaution-minded.

- **The digital genome.** Today, nearly any genome can be not only sequenced, but also turned into digital information that is easily and cheaply stored on a USB memory stick. This means that healthcare information can be more easily accessed, indeed carried around in a pocket or a car's cupholder. Doctors and researchers would be able to develop therapies for cancer or heart disease that are based on each individual's make up (as well as their cells). For agriculture, this means that plants could be bred according to very local conditions.

Maynard warns that people often recoil at new technologies because their complexity and capability to roll out social connections and create new ones can dramatically affect society, and are often under appreciated. Could a digital genome encourage discrimination based on our DNA? Does precise genetic engineering allow for a complete redesign of a living organism?

There's no question we need technological innovation. And the impact of new technologies is complex, with various benefits and disruptive challenges. Many Luddites of old England were skilled technicians, much more concerned about being priced out by cheap labor than by the machines themselves. And, yet those machines helped create a middle class that created a market that allowed such technicians to exist in the first place.

There is no question that cutting edge advances are desperately needed in the food and agricultural sector. Population in the poorest sections of the world are booming and developing countries are becoming more affluent, increasing daily caloric food demands, putting pressure on already strained food supplies. Modern technology can help the world's one billion people without sanitation, the six million children who die before age five and the countless millions who go every day without adequate food and nutrition.

Sustainable, responsible innovation?

A number of economists, ethicists and philosophers have looked at how innovations are introduced and accepted. The term "[disruptive innovation](#)" was coined by Harvard professor Clayton Christensen to explain why certain technologies are accepted and others aren't. He found that true disruptions are not often accepted by people happy with current situations and technologies (and there are a lot of those people).

In 2013, three British (and decidedly un-Luddite) business school researchers published the keys to "[responsible innovation](#)," that offered their thoughts about what questions we should be asking as new technologies emerge:

- Do developers anticipate emerging issues?
- How well will existing technologies and methods cope with new technology?

- Who is involved with making decisions?
- How well can developers respond to risks and opportunities as they arise?

Recently, [an online discussion](#) between Nobel Laureate Daniel Kahneman and Israeli historian Yuval Harari emphasized that innovations should be evaluated in a social and historical context. And sometimes, that context can be very old—it can reflect religious beliefs, moral standards and perceptions people have about their role in society. This doesn't mean we should encourage “anti-vaxxers,” or try to feed billions by using only organic tomatoes, or “go off the grid” and dispense with running water and electricity. All the Luddites wanted was to continue being skilled textile-makers. We have to ask: What traditions, practices, technologies and skills do we want to preserve and for what reason?

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