



Destructive Production

Can we really expect to manufacture complex technologies in an anarchist society?

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The modern manufacture of computers, automobiles and other complex technological products requires an exorbitant amount of waste and pollution, a dramatic division of labor, and an international hierarchy. As anarchists, regardless of whether or not we adopt the viewpoint of primitivists, we must either develop brand new ways of manufacturing complex technologies which circumvent these problems, or we must understand that an anarchist society will be unable to produce complex technologies without compromising our principles. I will examine the personal computer as an example of the problems posed by manufacture of complex technologies – a process I call "destructive production." The heart of a computer – the tiny part which makes modern computers so fast and small – is the semiconductor chip inside. You may have heard of various brand names like Intel Pentium, Motorola, and so forth.

Manufacturing these chips requires approximately 400 steps in a complicated process that begins with mining silicon dioxide (silica). It's the most abundant substance in the Earth's crust, so it's not too

difficult to find or extract. The silica is then heated along with carbon to form carbon dioxide and silicon. That silicon is then heated again with hydrochloric acid and hydrogen in the process of forming a pure rod of silicon which is then sliced into millimeter-thick wafers and shipped to the chip factory.

This factory is over twice the length of a football field and contains over 100 different brands of machinery from around the world. The chips must be manufactured in "clean rooms" that use powerful air filters to reduce airborne contaminants to only 1 particle per cubic foot of air (hospitals have 10,000 particles per cubic foot and normal outdoor air contains 500,000 particles per cubic foot). However, these filters do not work on the toxic vapors created by the chipmaking process.

Workers in the chip factory use microscopes, ultraviolet light, photosensitive chemicals and chemical baths (all toxic), and precision instruments which carve tiny patterns and implant phosphorus and boron on each chip wafer. Workers also apply microscopically thin coatings of copper and gold to the chips, then ship them off to the factory that makes circuit boards.

The circuit board factory uses copper, fiberglass and epoxy resin to make the boards, then coats the boards with copper and tin-lead solder, then etches them with circuit patterns using techniques similar to those in the chip manufacturing process. This generates acidic fumes and other toxic wastes.

The plastic used in making the computer's exterior comes from oil which requires extensive refining, not to mention the complicated process by which it is extracted from the Earth.

Finally, all of these parts are put together in yet another factory and shipped around the world to various distribution centers.

As you can see, the manufacture of a single computer requires a great deal of division of labor. From mining (for copper in Chile, gold in South Africa, tin in Brazil) to oil drilling to manufacturing to assembling, complex technologies such as these required alienated labor supposedly anathema to anarchism. And yet many anarchists,

unwilling to confront the reality of ecological destruction and hierarchical structure behind complex technology, assume that manufacture of computers can continue as normal "after the revolution."

I have heard anarchists attempt to circumvent the division of labor issue by saying that we can "take turns" doing the various jobs, but that seems nearly impossible for practical reasons. Would we take turns traveling from continent to continent to mine resources and refine them into usable parts? It seems doubtful.

Another proffered solution is to assign the various tasks of computer manufacture to people who volunteer because they want one of the final products. However, it seems unlikely that anyone would volunteer for such a task given the health risks involved (workers in computer factories report higher incidences of lung disease, skin rashes, and miscarriages). And how much would one have to work to "earn" a single computer? 20 hours, 40, 80, six months, an entire year's worth of full-time work?

Are there anarchists willing to engage in that much work just to get their own newly manufactured computer? In addition, anarchists who don't mind living without computers might not be excited about dealing with the pollutants and byproducts that come with making the machines. Silicon Valley, where many computers are currently manufactured, has vast areas of contaminated groundwater and the largest concentration of Superfund cleanup sites in the United States. Computer manufacturers generate millions of pounds of toxic waste each year – manufacturing one computer chip creates 90 pounds of waste and uses nearly 3000 gallons of water alone! And the process of refining copper used to create chips contributes to acid rain. Since the non-computer-users aren't going to tolerate living with that waste and pollution, are the pro-computer types willing to live with it? A lot of manufacturing-generated pollution, such as contaminated groundwater and acid rain, can't be limited to one location either. What will the non-computer-users do when their drinking water is ruined by the computer-makers upstream?

Suppose that an ecologically sound method of producing computers is developed that requires virtually no division of labor. The process would still be unimaginably complex and certainly would be geographically diverse, requiring workers and materials from around the world. It is conceivably possible to coordinate a global effort based upon anarchist principles, but such an effort would likely be less "efficient" (in other words, no Fordist concept of tyrannical schedules and division of labor) and thus produce less than desired. It also seems unlikely that people would be willing to jump through all these hoops (copper and gold mining, exposure to dangerous chemicals, painstaking factory-line assembly, etc.) in order to have their own personal computer, and so there would be even fewer people to actually take part in the process, which again means less efficiency. Management positions would invariably develop in order to deal with the "problem" of inefficiency, and the managers would probably receive the latest and greatest versions of computers as compensation for their efforts.

Thus, when it comes to complex technology, we cannot be satisfied merely with occupying factories, taking over mining sites, and seizing (instead of destroying) these horrific means of production. And so, there are only two ways for computers to exist in an anarchist world:

1. Manufacture no new computers, but use existing resources to maintain current machines.
2. Develop new, non-polluting, non-alienated methods of manufacturing computers (unlikely, but remotely possible – however, the process of researching new methods of manufacture would generate its own pollutants, division of labor, etc.). And computers are not the only (or worst) example of destructive production. Cars are far worse, for example, and a similar analysis of automobile manufacturing could easily become a lengthy book.

I hope I've shown that you don't need to be an anti-tech primitivist to see why we cannot expect the production of complex, modern, technological conveniences to continue in an anarchist soci-

ety, as they require ecological destruction, division of labor, and pronounced hierarchy.

(A major source for the factual information presented here was the book *Stuff: the Secret Lives of Everyday Things*, by John Ryan and Alan Durning, published by Northwest Environmental Watch. This book also discusses cars, coffee, newsprint, t-shirts, shoes, and other artifacts from our daily lives.)