

Guillaume Pitron, **The Dark Cloud: How the Digital World Is Costing the Earth**, Melbourne, Australia: Scribe, 2023, 290 pp., \$25.99 (hardcover).

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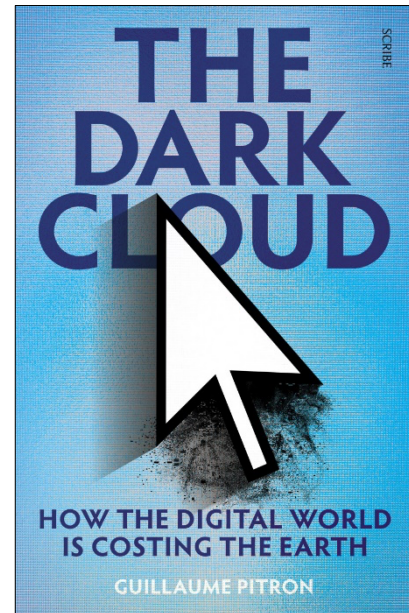
Guillaume Pitron's ***The Dark Cloud: How the Digital World Is Costing the Earth*** is about the high cost—environmentally and otherwise—of seemingly free online platforms, emails, websites, and virtually all other forms of Internet communication. French journalist Guillaume Pitron investigates the environmental impact that comes with Internet use and global communication. His “pleasure-to-read” book is divided into ten short chapters, followed by an even shorter conclusion and notes, but no index.

To make sure that we understand what we are talking about, Pitron opens up with:

Making the biggest contribution to this pollution are the billions of interfaces (tablets, PCs, smartphones)—our point of entry into the internet. Also weighing in is the data we produce at every moment. It is transported, stored, and processed in massive, energy-hungry infrastructures, and used to create new digital content requiring even more interfaces . . . the global digital industry consumes enough water, material, and energy to give it a footprint triple that of a country such as the UK. Digital technologies currently use 10 per cent of the world's electricity, and account for close to 4 per cent of global carbon dioxide emissions. (p. 6)

Most interestingly he stays away from an old French favorite—GAFMA, Google (Alphabet), Amazon, Facebook (Meta), Microsoft, and Apple—instead preferring FAANG—Facebook, Amazon, Apple, Netflix, and Google. Perhaps these things change like teenagers' behavior, particularly those he calls *digital natives*—the generation born *with* the Internet. Yet, it is not just them but many others who contribute to the fact that “here are some 34 billion pieces of digital equipment in circulation on the planet, representing a total of 223 million tones, or 179 million cars” (p. 26). It is getting worse when Pitron notes that, “the decades of digitalization in our societies have also seen the highest increase in our ecological footprint” (p. 29).

And this most perfectly describes what Pitron has to offer—the more you read the worse it gets. For example, he says:



The batteries of billions of telephones around the world each contain little more than two grams of graphite to have electric conductivity. But its manufacture comes at great human and environmental expense because of the residue emitted from the nearby mines and factories that . . . can spread into the atmosphere for dozens of kilometers in all directions. Mashan has lost its greenery, its clear water, and, unfortunately, the manufacturers do very little to prevent that. (p. 36)

To this, Pitron adds the following:

The raw materials needed to manufacture the 34 billion mobile phones, tablets, and other devices in circulation in the world . . . for 4.5 billion users, the gateway to the global information-technology network and its infinite services. Look no further than the standard smartphone, whose features now include two cameras, three microphones, an infrared sensor, a proximity sensor, a magnetometer, multiple GPS antennas, Wi-Fi, 4G, and Bluetooth. (p. 37)

On this, we come to understand how absurd, even semipathological, it is to talk about dematerialization when it comes to Internet communication. Online communication may appear immaterial, but it comes with a huge amount of material and an adjacent level of environmental vandalism. Just consider this: "Over the last three decades, the lifespan of a computer has dropped from eleven to just four years. *Homo sapiens* becomes *homo detritus*—producing the equivalent of 5,000 Eiffel Towers of electronic waste (e-waste), every year" (p. 49). Children on waste tip in Accra (capital of Ghana) can testify to that.

All of these items contain a microchip. Yet, manufacturing these chips demands "sixty raw materials, including silicon, boron, arsenic, tungsten, and copper, all of which are 99.999999 per cent purified . . . a microchip can contain up to 20 billion transistors" (p. 64). Worse, extracting and refining silicon and casting wafers at 1,400°C requires exorbitant amounts of energy. An integrated circuit needs to be rinsed with deionized water, purer than distilled water, at every step of the manufacturing process. In other words, it takes a lot of water to develop chips. Taiwan's semiconductor company TSMC has a water consumption of 156,000 tons per day—mind-numbing numbers. That is not all: "TSMC's factories in Taiwan supposedly require the equivalent of three nuclear reactors to operate" (p. 67).

The things that use chips—phones, tablets, computers, etc.—have yet another hidden cost. It is the submerged part of the iceberg: unaccounted for, invisible to our senses, and therefore largely ignored. Those are run by Equinix, Interxion, EdgeConneX, CyrusOne, Alibaba Cloud, and Amazon Web Service. They are the data centers where servers run not just the Internet but also what is euphemistically called *the cloud*. The author calls this "the heart of our computerized life" (p. 77). Yet, rarely do people give a thought to the existence of these spacious buildings. For some reason, there are no open days. "And there is nothing to distinguish a data center from any other old building, factory, or warehouse. In fact, you've probably walked past dozens of them without noticing" (p. 77).

On all this, Pitron comments that the “digital industry no longer thrives from selling computers or software, but from commercializing information” (p. 87). What remains unmentioned is that corporations do this commercializing for one reason only—to make a profit. In other words, all this has something to do with capitalism (Klikauer, 2022)—a term conspicuously absent from Pitron’s book. Meanwhile, at the environmental level, Pitron notes, “Cooling an average-sized data center can take as much as 60,000 cubic meters of water per year—enough to fill 160 Olympic-size swimming pools or meet the needs of three hospitals” (p. 91).

Such data centers are set to become “the most important electricity consumption elements of the 21st century” (p. 105). This is already happening, when, for example, in “Dublin . . . data centers now consume more energy than the city’s population” (p. 108). With “Internet of Everything” (p. 141) or the “Internet of Things” (p. 142), this is set to get worse. Virtually, the same thing will occur once we have moved to the 5G network. Pitron says, “If 5G has become a priority for the principality, it is because it can transfer 10 times more data 10 times faster than 4G” (p. 143). And it gets worse; the author continues with, “It takes less than 10 seconds to download a two-hour film, instead of seven interminable minutes on 4G” (p. 143). It is hard to imagine that consumers would not want this and corporations would not sell it.

In the area of LED (light-emitting diodes) lighting, energy consumption looks very similar. Pitron writes that “with the introduction of LEDs, we have made no energy gains. These were canceled out by the fact that more energy is consumed . . . digital technologies are no exception” (p. 147). Furthermore, “digital players” are astutely aware “that these new technologies will increase our digital consumption and that, far from solving the problem, it is energizing it” (p. 148). Those Pitron euphemistically calls “digital players” are large multinational profit-seeking corporations (Bakan, 2004).

In monopoly capitalism, the same applies to the companies that transmit information. Interestingly, “close to 99% of the world’s data traffic travels not through the air, but via the cables deployed underground and at the bottom of the sea” (p. 182). Pitron explains that an undersea cable called “TAT-8 was laid between the United States and Europe in 1988” (p. 183). The author continues by saying that it “allows over 40,000 telephone calls to be made simultaneously. Today, Dunant can handle five billion telephone calls, or three times the information contained in the US Library of Congress, per second” (p. 183). Yet, putting those cables down cost hundreds of millions of dollars. Meanwhile, “overall turnover worldwide is growing by 11 per cent annually and is expected to reach \$22 billion by 2025” (p. 186). Typically, for capitalism, the owners of the cables are a handful of corporations—Deutsche Telekom, AT&T, Telecom Italia, Vodafone, and Orange—while cable manufacturers are, for example, Alcatel Submarine Networks, SubCom, and NEC (p. 187). Beyond all that, there are also “zombie cables” (p. 195).

In the end, Pitron concludes that “the internet is a new instrument in the quest for power and money” (p. 209). The author closes with: “The Internet and online communication are nothing more than a tool created in our image. They are—and will be—no more and no less environmental than we are” (p. 224). Yet, all too many people happily “waste food and energy resources, digital technologies will serve to accentuate that inclination” (p. 224). In the end, and despite not linking all this to capitalism and corporations, Pitron’s captivating book delivers an illuminating and exquisitely written insight into the hidden

world explaining the often hidden environmental costs that come with, for example, downloading this book review *for free!*—or not so free after all.

References

Bakan, J. (2004). *The corporation: The pathological pursuit of profit and power*. London, UK: Free Press.

Klikauer, T. (2022). *Media capitalism*. London, UK: Palgrave.