1. Civilizations

The nature of our present civilization is one of constant consumption. We mine or drill material out of the ground, re-shape it or burn it for fuel, and ultimately turn it into toxic which waste we dump back into the environment. During the process from mine to landfill, we exchange "money" and this is what we call the "economy". The things which can be exchanged for money are called "property".

We seek to build a new civilization which is based not on a stream from mine to landfill, but on closed loops of material in equilibrium with living ecosystems. We look to the technological civilizations of indigenous people as an example of what mature technology should look like. In mature civilizations, technology is all self-replicating.

An example of technology in a mature civilization is traditional wooden boats. If people live in equilibrium with a forest, as old trees die or are harvested new trees grow. People carve logs into boats, and then use them to hunt and sustain their communities. A new generation of humans is born from the old, and they are taught all the skills to copy the construction of the boat, the stewardship and harvesting of the trees, and how to pass along the knowledge of boat building(as well as the hunting and fishing that sustains the whole society) to the next generation after them and so on. Unlike a consumer civilization, this type of self-replicating organic technology can continue in theory indefinitely. If it has the resilience built in to improve and change over time in response to changes in the ecosystem it can truly sustain itself without limits. Mature civilizations like this have existed for thousands of years all over the Earth.

Three things to note about a technology such as the one described above: everything replicates, everything can be modified, and everything dies. Every wood boat will rot, and eventually become soil again in the forest which will produce more trees. The technology is soft enough that people can modify it, carve and repair it over time, change it as needed, and evolve it as needed in response to changing conditions in the environment or new innovations in the technology. And of course, every boat can always be copied freely. In this context the idea of property doesn't make sense. Nothing is permanent. Everything is constantly going through a cycle from soil to tree to boat to soil again, growing, evolving dying, and being reborn.

When we build an economic system based on self-replicating geometric constructions from trash and organic material, money becomes a completely unusable system. To illustrate this, we consider a very simple thought experiment. Suppose I take a pile of trash and transform that into a robot which builds more robots out of trash, and which has media encoded in it which instructs others in how to copy the whole thing. If I and 100 people go from trash pile to trash pile and run the replication, converting all trash piles into trash-fed robot factories, we have created an ever expanding amount of value, with no property or mined materials going in. A vast amount of economic activity is being created, but without a central bank we have no way to denote all this added value. And if we somehow created a mechanism with some innovative new banking system to create enough currency to represent the added value, the instant we went and replicated the system again we would find that again, the numerical currency system breaks down, as it fails to keep up with the replication of value.

This contradiction is precisely the situation we currently find ourselves in. A small fraction of the population, namely the software industry, the media industry and the finance industry, can use replication to create value from nothing. With

billions of people having already bought smart phones or other networked devices, there is zero marginal cost to add some useful new feature. So when an app goes from running on just a single developer's computer to a whole software team to a beta test group to early adopters and ultimately to a billion smart phone users, this is replication of information, not actual production in the sense of a factory. Meanwhile, everyone else, who are compensated for labor or some type of physical material have to directly produce value to get money. As long as some people create value which freely replicates and others do not, with a finite money supply, over time a larger and larger fraction of money will always flow to the replicators rather than the people doing labor.

There is no way out of this trap. Not a new banking system, not a better government policy. The trap is the numerical aspect of money itself. No matter how fast a hypothetical banking system prints money and pushes it out into the economy, a fully networked replication-based society can create value faster, and continue to amplify the inequality until all value flows to the replicators. We have seen this during the 2020-2021 COVID-19 pandemic in the United States. The government poured trillions of dollars into "the economy" and at least half of it appears to have gone directly into the personal fortunes of people in the replication-based segments of the system. While these people also engage in massive exploitation of labor, this is beside the point. Labor can fight back and win some concessions from the capitalists, but as time passes, the power will always slip away as the replication rate of pure information-based value increases.

Some people have proposed universal basic income as the solution. This is especially popular with the group of people who have benefited the most from the current accelerating inequality: software engineers and their collaborators in the professional classes. In this system, the software people are allowed to accumulate unlimited and ever-accelerating wealth, and simply paying out money directly to everyone else will help the rest of humanity survive. But if a software person is making 1 million dollars a year, do you really want a 2k/month UBI? How about 5k/month? or 10k/month... but now the software people make $1 million/month? Is that really a working economy? If this sounds insane, look at what is happening to rents, look at who all the new housing is built for. This is happening now, but without any UBI to soften the blow, and it will continue to happen as long as we all cling to this failing economic model.

So what is the alternative? The alternative is a switch from an arithmetic to a geometric economy. This means that rather than an economy of exchange, where numbers are used to represent both property and labor, we have an economy of replication of geometric constructions. In this situation, the replication of information *is* the economy. It does not turn into numbers at any point. One can create a thing via a geometric construction from trash which contains information for its own replication. This then replicates out into the human network in a replication-based future descendant of the current Internet, and we all share the increased value. When we create value we do not "trade" it for something, because the amount of value will *increase* as it replicates, making any trade that truly represents the added value impossible. In a post-scarcity trash-sourced geometric economy, everyone benefits from the creation of creators because the best things naturally replicate to all of humanity, including the back to the creators themselves, but now amplified by the added benefit of billions of people potentially improving it.

The Geometron/Trash Robot system is an attempt to build an information technology system which serves this purpose: to build a purely geometric economy based on replication. In this system, everything replicates, everything evolves, and everything can be deleted at any time. In the beginning we source some parts from trash and some parts from common off the shelf consumer items that are easy to buy without any centralized company. In order to replicate successfully, however, this information networking system has to provide immediate value to the user, both within the existing money-based economy, and also outside that system.

In order for all this to work, we have to give up the three main elements of our existing system: mining, money, and property. As long as money exists, replication will break the economy. As long as mining exists, we will continue on a path to total destruction of the world and eventually scarcity and extinction. And as long as property exists, replication which could end all scarcity for all of humanity will be hindered by the people who control everything. The extension of property into the domain of pure information is another major reason that people in the replication industries have been able to so brutally exploit the rest of humanity. They claim to "own" most of the freely replicating information we rely on in the new economy, and they're effectively landlords who can create new land as many times as they want for free, but then can charge rent on all of it. Only by creating a new economic model from scratch which simultaneously abandons money, mining and property, can we build a just and sustainable future.

It is not immediately obvious that geometry can completely replace numbers-based thinking. But in most cases, our technology is already completely driven by geometry, we just choose not to look at it that way. What is a microchip? It is a geometric design imprinted in silicon. That design is made by a geometric program interacted with by a user thinking geometrically. Even the code itself, encoding into the physical circuits, is a geometric pattern of either magnetic or electric perturbations of physical objects. And "computers" are not used primarily to compute things, but to display graphical information, both text and pictures and graphics. The repeated actions of automation machinery represent geometric operations(e.e. move over, move up, move down, move over, etc...)

Saying "geometric economy" sounds abstract and to say it self-replicates sounds far fetched, but none of this is a new idea. Many of the oldest and most sustainable civilizations in the world have very very old technologies involving textiles made from natural materials woven into patterns. This is self-replicating geometry. It satisfies all the properties listed here: it dies of natural decay, is taught as a skill from the old to the young and is constantly replaced, and it can be modified and improved over time by the constantly-replicating group of experts in the technology within the community. So the transition to a geometric economy is not to some futuristic new idea but a return to ideas which predate the rise of industrial societies and nation-states.

All that said, we live in times different from any which came before. The Internet is the baseline information system now for all of humanity. Even the few people not connected to the Internet now have their lives completely molded by it, as all power networks exist on it now. And consumer society has injected every single element or type of finished product our civilization uses all over the planet. So while in times before now one group of people might discover the use of bronze and another of steel, now every single person on the planet can get aluminum sheet metal, titanium

reinforced steel, rare earth metals, ultra high purity silicon, etc. All these incredible materials, already shaped and processed into the most useful form, are simply sitting in piles of trash in every corner of every nation on the planet now, all directly adjacent to nodes on an information network which connects to every other part of the planet.

This combination of universal networking and universal access to identical, standardized, trash elements creates a formula for building a new information system from scratch from which a whole stream of new civilizations can rise. It is our task to build a seed from which such civilizations can be built. Geometron is an attempt to build this seed.