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contained within the wide range of social-anarchisms, even while transcending the failed ideological dogmas that many followers are obstructed by.

Expanding the range of both high and low tech social coordination mechanisms in conjunction with community directed and controlled value signals systems, we can put forth a distinctly futuristic and yet historically grounded neo-mutualism of sorts. Through a combination of honest reckoning, experimentation, and technical innovation we can create a truly futuristic economic mesh that leverages the strengths and insights of a wide array of economic philosophies and practices. After all, each individual's wisdom, preferences, and needs are what ultimately lies at the heart of any economic system worth living in.

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use that as a constraint on top of whatever hair-brained algorithm and democratic process we try to implement. Everything above or beyond those numbers would then need to be determined by some form of fully distributed process of value signal feedback loops analogous to the way that markets are supposed to work.[8] That is the calculus of how much of a safety net a community can plan for and what they need accurate signals for in order to allocate at scale. Designing with an eye towards solving this core set of problems means not handwaving things like: problems of revealed versus stated preferences, scarcity of material inputs, contextual scales of preferences, and coordination/knowledge problems in collective decision making. We should build as many free stores as is humanly possible but without suicidally relying on them to provide for every need of a society.[9]

The anarcho-communist commune may, at least theoretically, provide some basis for a more complexly networked hybrid mutualist society even if in and of itself it is incapable of transcending the problem-space issues of economic coordination at scale. Ultimately, moving the locus even further to the individual makes the problems maximally tractable, but that need not preclude various forms of interdependency and community planning. We can use the tools and wisdom

[8] The Value Flows project (being now implemented on Holochain) is an interesting example of a project that acknowledges the need for value signals while trying simultaneously to create an economic vocabulary that recognizes the many ways we interact with each other and the web of their externalities.

[9] Okay, maybe you've been to a punk house. Maybe you live in a punk house. You know that ratty falling apart cardboard free box of exclusively black clothing with sweat-stains and holes? Imagine you rely on a bigger version it for all of your basic human needs every day and if it doesn't have what you want, there are no other options except for hoping someone 'gifts' it to you (but you also can't communicate directly that you want it or it will kill the gift altruism). : (Free boxes and free stores are unambiguously good but dangerously incomplete as complete solutions go.

> delayed until 1881, due to Maori opposition, and even then trouble had continued. Maori initiative at Maungatautari [the collective banking system and currency printing] was unlikely to be well received by the Pakeha [sic] press…
>
> And whereas the Maori people so banking have been grievously wronged in their dealings with these Europeans, who have largely profited thereby; And whereas our hearts being greatly grieved at this robbery of our people: Be it known, therefore, that we the chiefs of the tribes aforementioned, in Council assembled, have decided to start a bank for the use of the Maori people.

The author then goes on to describe how profits from the collective bank were used to support a mission to Europe to renegotiate the 'the Treaty of Waitangi [the founding document of Aotearoa New Zealand] — that old subject so dear to the heart of every Māori orator'. Efforts to create Māori collective banks or utilize modified cryptocurrencies for sovereignty and decolonization work continue to this day despite the complexities and obstacles they may entail.

Acknowledging the experiences of those who have struggled against authority means opening up a new layer of both complexity and simplification in achieving the socialist intention of equal access to the necessities and delights of life for all persons.

Embrace the Difficulty of Mutual-Aid

If the goal is to make economic planning solvable in order to maximally provide for everyone's needs, then it should be the subsidiary goal of every radical society to determine exactly what and how much can be acceptably optimized for with planning and for how many people at any given moment. Then

Note: I've tried to minimize the math and computation theory to make this more generally readable but where it gets more complex I just wrote (math paragraph) before the paragraph and you can read or skip it and still understand the piece.

I'll open with a potentially contentious take. Most of the decentralized and left-leaning economics ideologies such as p2p, social ecology, Game-b, parecon, more modern post-work anarchisms, the co-op movement, etc. are just, to varying degrees, deviations or evolutions of social-anarchism (itself built in many ways upon various Indigenous economic practices). As such, I will focus on social anarchism as the hub of many spokes of related ideologies.

The two main difficulties any social-anarchist project will face in trying to fairly and efficiently allocate goods are getting reliable data about supply and demand, and then solving for distribution of scarce resources with rivalrous preferences especially at higher scales of complexity. Whatever local social safety nets can be decentrally planned through dual-power and the like should be. Robust social safety nets should be planned up to the limits of what we can coordinate. Beyond that however, there must be other scalable methods for economic coordination. These methods must utilize accurate value signals and feedback mechanisms to solve for rivalrous conditions in a way that utilizes people's local knowledge. This is true whether these methods use a medium of exchange like currency or not. Determining how much we can plan is part of the essence of the debate between not just the Austrians and the communists, but also between the social anarchists and the market anarchists (of whatever sub-affinities) as well as any other economics. Figuring this out to the best of our ability helps us to radically expand the areas of coordination beyond the market and cash nexus, without sacrificing overall efficiency.

Desire Is Personal and Contextual

> Marx had drawn a nightmare picture of what happened to human life under capitalism, when everything was produced only in order to be exchanged; when true qualities and uses dropped away, and the human power of making and doing itself became only an object to be traded. Then the makers and the things made turned alike into commodities, and the motion of society turned into a kind of zombie dance, a grim cavorting whirl in which objects and people blurred together till the objects were half alive and the people were half dead. Stock-market prices acted back upon the world as if they were independent powers, requiring factories to be opened or closed, real human beings to work or rest, hurry or dawdle; and they, having given the transfusion that made the stock prices come alive, felt their flesh go cold and impersonal on them, mere mechanisms for chunking out the man-hours. Living money and dying humans, metal as tender as skin and skin as hard as metal, taking hands, and dancing round, and round, and round, with no way ever of stopping; the quickened and the deadened, whirling on. … And what would be the alternative? The consciously arranged alternative? A dance of another nature, Emil presumed. A dance to the music of use, where every step fulfilled some real need, did some tangible good, and no matter how fast the dancers spun, they moved easily, because they moved to a human measure, intelligible to all, chosen by all.
>
> – *Red Plenty by Francis Spufford*

ences. Finding the balance of these trade-offs is the great problem of economics.

Exchange Can Support Resistance

All of what I'm saying can be empirically verified when we look at how revolutionary societies actually organized themselves. The Zapatistas, Rojava, and the CNT-FAI all introduced or utilized officially and unofficially sanctioned currencies to lubricate allocation in parallel to their more social-anarchist structures. Even Gelderloos, a stridently anti-market anarchist, acknowledges this need in Anarchy Works (p.76):

> Anarchist economic models range from hunter-gatherer communities and agricultural communes to industrial complexes in which planning is carried out by syndicates and distribution is arranged through quotas or a limited form of currency.

Similarly, many people opposing colonization and feudal peasants have introduced their own illegal rebel currencies in order to resist the attempts at legibility of an encroaching state and their mandatory royal currency.[7] The following Māori currency was seemingly part of several initiatives to form Indigenous financial solidarity and collective banks to resist Pākehā (colonizer) settlements. The author states:

> It should be noted that Maungatautari was a major centre of Maori [sic] settlement, and had long been sought by Europeans eager to farm its land. The land was purchased in 1873 but settlement was

[7] See this interesting exchange between William Gillis and Peter Gelderloos for more complexity on this debate. (The Tangled Paths Of State Formation And Resistance and Defying Power: Different Views on How Best to Understand the Evolution of the State)

skin in the game to prioritize are generally not exactly the same things. Accurate reporting of revealed preference without some way of having skin in the game for your choices would require some sort of elaborate brain-scanning surveillance of the vast contingencies of every thought in someone's skull. Probably not a desirable or near-term feasible solution. The revealed preference problem is especially difficult when we're dealing with abstract preferences such as feelings. As these inaccurate stated preferences scale, they lead to a range of perverse incentives and inefficiencies.

In the most benign case this means that large scale anarchist projects see cost overruns and inefficiencies similar to what we have today. In the most dystopian case it means unpopular individuals are unable to get basic necessities like medication, food or shelter from their commune. Just as corporations reward the most cutthroat and manipulative, collective resource allocation can become more tightly coupled with informal social capital as the popular charismatic comrade's' needs get more easily heard than the awkward and shy loner who has not mastered or otherwise opposes in-group social positioning.

The same goes for a commune trying to communicate to the next direct democratic federation level up, a state-like legible snapshot of the preference vectors of their territory. But again, even within the commune each person who petitions the collective for a medication must express the depth of their desire with words and hope that the representatives can and do communicate that need effectively to the federation coordinating committee.

All of this disastrously slow coordination and forced pleading happening at the scale of the world, is... well, terrifying and sad. It's also a subtle recreation of the competition that is so awful in capitalism and markets. Competition then, whether in the commune or at the level of the individual, serves two masters: it serves greed/in-group preference and meta-level coordination of revealed prefer-

Central-economic planning is as horrifyingly and disastrously intractable as it is politically prone to authoritarianism.[1] This is true even without the assumptions of many market-fetishizing, bourgeoisie Austrian capitalists a la Ludwig von Mises Institute. These types often fail to account for the numerous obvious implications of their critiques on their own proposals such as within massive corporate firms and or the noise caused by absurd economic inequality.[2] And yet, Marx and his successors were right about how fundamentally alienating the capitalist market form is, but just like the Austrians, he didn't consider how equally true that was of a centrally planned economy (or really any massive centralized scheme for knowledge/coordination problems).

These tensions create a desire for something deeply human that accounts for the needs of all persons while simultaneously maximizing efficiency and minimizing negative externalities. To these ends many aspirational activists and theorists have proposed (if not always by name) some version of anarcho-communism as a means of decentralizing both the hard math of coordination as well as the political problems of authoritarian-centralization. These proposals have merit worth exploring even as they break down in other fundamental ways.

[1] More on this in the resources at the start of this MES but it's worth saying that although many of the Austrian economists made fascist apologetics clear and made absurd conclusions even by their own arguments, it is worth reading broadly on the calculation debate because unfortunately even questionable characters make important points sometimes.

[2] Kevin Carson's Organization Theory or Desktop Regulatory State look at this but also this article on how corporations are centrally planned economies

The History of an Idea: Or How an Argument Against the Workability of Authoritarian Socialism became an Argument against Authoritarian Capitalism, Roderick T. Long

The Crooked Timber piece of which this article is something of a niche extension.

Within Marxist thought, the Labor Theory of Value is the alternative to the later conceived Subjective Theory of Value as a means of returning our focus to the experience of the laborer and away from the alienation of exchange and commodity based society.[3] Or more specifically, Marx was concerned with the way that labor is commodified under capitalism and through the cash nexus as more and more of our lives are consumed by it. This makes sense when we consider things like how much work sucks, especially under capitalism. But Marx realized the many fundamental coordination problems this created in developing a new economic model and so plugged in the concept of "use value" as sort of a hand-waving solution.

The problem is that use-value is essentially another term for subjective value.[4] In earnestly asking a lot of communists about this over the years and trying to read what I can, the best response I've gotten had to do with the way in which, at the level of a small neighborhood, you generally know who most needs a new house amongst your neighbors. Unfortunately for this person, that interpretation disproves central economic planning.

Does the Tsar of Economic Planning personally know everyone's needs in every neighborhood with the subtlety of a neighbor? Of course not! Much less could any centralized authority (even of just the neighborhood) understand your more complicated desires. In the worst case scenario, the community votes on whether you actually care sufficiently about the things you care about. Accurate neighborhood reporting of such complex preferences runs into the many knowledge and revealed versus stated preference problems labored upon by the Austrians and emphasized in need for "discovery" (more on

[3] Kevin Carson attempts to transcend this divide with ideas like subjective disutility of labor in Studies in a Mutualist Political Economy whether he does so is left as an exercise to the reader (sorry, math joke).

[4] Excepting those who believe in an objective intrinsic metaphysical use-value for any object, which if that's you… ahhhhhh.

spells trouble for our friendly commune. Namely, again what happens when you need a product that comes from outside of your locale? Or what happens when 100,000 communes need 10 million products from each other and that preference matrix changes every second? Very quickly you can see the likely NP-hard complexity knowledge problem of resource coordination begin to congeal again.

We Are Selfish and Selfless

The problems at the individual scale of performing resource distribution repeat themselves fractally as you move further and further away. The same way you can't wish away all selfishness, you can't wish away ingroup preference at increasing scales. They are issues in the problem space even if people are simultaneously selfless and selfish. Because these issues are in the problem space itself, the best we can hope for is to have better incentives for people to be cooperative. Cooperation and competition work together in many respects even as they are different.

Even in a context of relative equality and mutual respect between all parties, you still have the thorny question of deciding upon the best course of action. Trying to remove the market here does not eliminate competition, but rather obscures it and makes it more insidious. Even if people are acting in an altruistic manner, there still exists questions around the distribution of scarce resources that are hidden behind democratic arguments over ill-defined needs. Because deliberation without currency makes it difficult to signal demand with any fidelity, individuals, communes and federations are incentivized to drift in the direction of stockpiling resources simply because accurate evaluation is extremely difficult. This problem is commonly referred to as a 'revealed preference' problem in the sense that what we say or think we want, and what we're willing to put

but rather that the mechanisms used to make economic decisions are simply not flexible enough to accommodate all concerns and as such *the only way the system can thrive* is through violently simplifying the problem.[6]

With the risks understood, any form of simplification of the problems helps to solve them in some given constraints such as time. But should a given village or mesh of villages decide that they want something beyond subsistence economies and the constraints of their local geography and human resources, then you start to run into all the same complexity problems again.

(math paragraph) Without getting too far into the math weeds, we might be tempted to break the intractable economic planning problem into the parallel processors in order to simplify them. However, this depends fundamentally on their independence. So we could assume independence and hope for a reasonable outcome a la Naive Bayes (remember, inefficiency = death and suffering in economic planning) or we could try to find areas that were independent enough as to warrant a sub-sectioning in order to use parallel computing making the communes into something like a how a GPU computer works. This parallelization would probably be something like geography or independent demand goods. The basic idea that the commune could act as these subsections gets quickly dicey though. In the simplest example, this is because they often require the SAME goods from different places and so aren't actually neatly partitioned. We could then assume that with the added constraint of distance from producer to final consumer added to our horrifying puzzle, that these similar products are actually different products based on their location of origin. This increases the scale of the problem in a necessary way but

[6] Though it nearly goes without saying, for more on this read "Seeing Like a State" by James C. Scott. In it he shows the various tradeoffs and risks inherent to simplified "legibility" schemes without dismissing the value of quantification or standardization altogether.

this in a later section). But this admission does not necessarily disprove anarcho-communism or parecon in and of itself.

Scaling up Our Preferences Is Complex

When we move from the level of a nation-state to a small neighborhood as in many social-anarchist proposals, we push the knowledge problem several steps closer to the individual and cut down on the number of variables. This does make the problem more tractable. Central economic planning of an absurdly over-simplified and relatively small economy with linear programming (or even non-linear machine learning on a quantum computer) may take thousands of years even with an order of magnitude greater computational power than Moore's law says we'll have in the next 100 years (and never mind that Moore's Law is running out).

(math paragraph) While non-linear machine learning intuitively makes more sense than linear programming and Cockshott's reactionary conservative socialism ever will, it's actually less, not more tractable. Linear and convex programming are in set P while economic planning is often considered at least NP and machine learning is generally more resource intensive than either LP or convex programming. Even if Cantor's diagonal doesn't hold (which it might) and we do not need a set of all possible products and prices (and weather, sickness, geography, etc local knowledge) as **X** and y in our neural network, it can still be infeasible in the next few millennia (assuming Moore's "Law" holds), if not Turing incomputable on its face.

(math paragraph) You also need an unambiguous objective function like in linear programming. Profit and prices work well for this (even if not for things like… environmental sustainability) but since you would not have access to this in communist utopia you could use shadow prices. But again, this runs into intractability of setting the accurate and dynamic prices

for an entire economy. It's a bit tautological as well because that's likely the goal of the neural network. To avoid this you could set the objective function as what Kantorivich calls the "given assortment" of goods. An important bit to this is that just setting the biases as the relative desired proportions of every product in the economy is itself intractable as a pre-step to running the network.

Frankly, which is worse, having a central planner vote on how much porn you consume relative to figs, or having all of the demos make decisions about 10 billion items for you? Both should seem deeply unsettling.

The closer we can get to the individual as a source of planning, the more optimizable the problem becomes. So at a small scale or when dealing with fairly simple questions, planning is surmountable: a parent may be able to allocate resources with feedback mechanisms and an acknowledgement of scarcity to their household with relatively minimal dissatisfaction (though maybe some toddler screaming). A matriarchal Iroquois longhouse system can allocate subsistence food and building supplies at the level of a small village. A socialist government could probably keep well-stocked food banks in every major neighborhood and provide pretty decent public transportation. But the complexity of the problem scales exponentially with the number of people and variables we add, especially if our goal is to replace monetary exchange altogether.

We see similar exponential complexity in an economy in which individuals have more choice, both in terms of consumption and in terms of production, as each new choice must then be weighed against all others. Ten-thousand more people or choices takes not 10,000 more bits of computation, but instead 100 million more because the preferences of each new agent or choice has to be weighed against all others. As such we believe that even with an assumption of massive increases in computational power, we may still not be able to substantially

expand the reach of central-economic planning (much less of the democratic systems that would need to accompany them). This is why Stalinist economics tended to reduce complexity in every possible way, including just by limiting the choices available to consumers.[5] This is also why left-communists like Rosa Luxembourg critiqued Lenin's repression of democratic and locally accountable labor unions.

Communes Only Partially Simplify the Problem

Much of the mathematical and political hardships of centrally planned economies comes from the fact of not being able to save time by solving different parts of the problem at the same time instead of one after another (parallelization of processing). So doesn't the commune, to some extent, do this in at least a metaphorical way to how an idealized vision of "free markets" would? Well, yes and no.

Yes, insofar that anything we can do to simplify the problem is good and this parallelism is indeed faster. A commune can work similarly to a firm in localizing decision-making to make the problem more tractable. Limit the number of variables. Limit the number of constraints. Maximize the amount of acceptable noise. However, we should keep in mind that noise in economic planning is things like people dying from not getting vaccines or unnecessary negative externalities we allow for in proportion to demand for goods (such as pollution). Such simplification of course occurs under capitalism and its consequences have been studiously critiqued by Marxists and anarchists. The problem isn't that people are necessarily bad,

[5] Obviously at least some degree of degrowth is necessary and not all consumer choice is necessary or sustainable. However, leaving that reduction of complexity to a centralized body is a dangerous choice and also stifles a range of forms of innovation in the margins.