In Defense of Mathematics and its Place in Anarchist Education

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Abstract: This article reclaims mathematics from the measures of profit and control by first presenting an anarchist analysis of mathematics' status quo societal uses and pedagogic activities. From this analysis, a vision for an anarchist math education is developed, as well as suggestions for how government school practitioners sympathetic to anarchism can insert this vision into their current work. Aspects to this vision include teacher autonomy, freedom from hierarchical curriculum structure and math class as a non-coercive, happy place. Finally, mathematics is argued to be essential knowledge for anarchistic society for three potentialities: in solving social and technological problems through application, as an analytic technology and for increasing individual happiness via the aesthetic dimension.

I am sympathetic to the bad reputation mathematics often endures. Some of society's well-known uses of mathematics cloud our understanding of the knowledge and its place in a visionary, anarchist society; similarly, the status quo pedagogy of mathematics education might suggest that mathematical knowledge should be left out of an anarchist education. I describe this situation with a heavy heart, however, because I also happen to have passion for mathematics as a knowledge for myself to use and enjoy, and as something I can share with others. In this article, I argue that mathematics finds a home in anarchist education, and again that mathematical knowledge is not in conflict with anarchist society. To begin, I offer a handful of examples from such societal uses and status quo pedagogy that work against three commonly agreed on anarchist values: collectivism, fraternity, and freedom from social hierarchy. These representations will guide an understanding for what anarchist society and education are and are not. Next, the article discusses the role mathematics can play in anarchist education and finally society. Put another way, this article first presents an anarchist analysis of current mathematical behaviors, both pedagogic and otherwise, and then develops an anarchist mathematics.

Before I proceed with the connections between mathematics/mathematical behaviors and anarchism, I describe briefly the anarchist theory that informs this article. One definition describes anarchism as "a political theory which aims to create a society within which individuals freely cooperate together as equals" (McKay 2008, 19). In particular, I am highlighting three tenets related to this definition: collectivism, fraternity, and freedom. Collectivism denotes the curtailment of property rights, especially as they relate to ownership of capital. Fraternity describes an inclination for individuals to recognize the needs and desires of all other people, and accordingly to act in the spirit of mutual aid. Freedom indicates a lack of coercive actions by any person, group, or social institution on any one person, as well as individual autonomy within the boundaries of imposing on another's freedom. I review these anarchist tenets when I describe an anarchist math education, but first I use them to expose problematic mathematical activities in society.

Antianarchist Mathematical Activities in Society

As much as anarchist theory presents possible goals for society to work toward, it also offers a framework with which to critique institutional arrangements and activities in society. In this section, I offer a handful of mathematical activities that, when viewed through an anarchist lens, can be considered for their contributions to societal ills. Specifically, I review the role that mathematics has played in the exploitation of labor, or economic inequality, and warfare. These mathematical activities highlight two tenets from anarchist theory: collectivism and fraternity.

The first of these representations concerns the societal use of mathematics for unequal distribution of resources. Apple (1992, 1995) suggests that mathematical knowledge is often utilized for its "technical/administrative" relevance that is "convertible ultimately into profits" (Apple 1992, 420). The recent use of mathematics by numerous Wall Street hedge funds for grandiose profits (Patterson 2010) describes this relevance quite accurately. In this case, mathematical knowledge was highly regarded for its ability to analyze, dissect, and predict outcomes for capitalists seeking to turn their money into more money. How this activity leads to economic inequality rests initially, of course, on Marx's (1976) critique of capitalism in which labor is not paid the value it adds to the capitalist. Harvey (2005) updated this exploitation in explaining today's financial markets: "The strong wave of financialization that set in after 1980 has been marked by its speculative and predatory style… Deregulation allowed the financial system to become one of the main centers of redistributive activity through speculation, predation, fraud, and thievery" (161). Sadly, mathematics is an integral part of such redistributive activity.

Also indicating this relevance of mathematics to profit is the often-cited connection between mathematics and economic growth/security/superiority. For example, as Gutstein (2006) notes, the National Council of Teachers of Mathematics' (NCTM) *Standards* 1989 frames mathematics education as one means to continue US economic growth. Generally, economic growth is understood to mean an increase in the gross domestic product (GDP), which measures goods and services output (whatever these may be) and does not necessarily indicate balanced income or distribution of legitimate needs among the population. To this point, the last quarter of the twentieth century saw both a steadily increasing GDP and a four percent increase (from two to six) in the share of national income of the top one percent of income earners in the United States. However, the "ratio of the median compensation of workers to the salaries of CEOs increased from just over 30 to 1 in 1970 to nearly 500 to 1 by 2000" (Harvey 2005, 16–17). Therefore, mathematics education and with it mathematical knowledge are rhetorically linked to economic inequality in documents such as the NCTM *Standards*.

Before continuing with the next representation of status quo mathematical contradictions to anarchism, I highlight the first anarchist value that has been presented by the capitalist use of mathematics. Among a variety of anarchist theorists, most agree on an economic system with collectivist properties, or economic equality. Whereas early anarchist theorists like Proudhon did not fully assert the need to abolish private ownership and capitalist economic organization, Bakunin later established the anarchist tenet for a "social revolution which transforms private property into collective property… Only 'those things which are truly for personal use' would remain private property" (Geurin 1970, 56). Current society witnesses mathematical knowledge as a powerful tool for some people to take from others, a program regarded to be anticollectivist.

The next representation of mathematics' antianarchist tendencies comes from another of its infamous applications: for modern warfare. During World War II, US Military officials claimed that the young men and women who were enlisting lacked the most basic of skills in math and this would greatly determine the war's outcome. Two documents from history provide a clear picture of this, the first of which being a letter from Louis Bredvold, an academic, to Captain F.U. Lake, in which he asks for more information regarding the "difficulty in finding students in American colleges other than engineering who were sufficiently prepared in mathematics to make them available for training for commissions in the Navy" (Garrett 1991, 191). Admiral C. W. Nimitz's response elaborately answers this request, making a number of claims so as to demonstrate the military's need for back-to-basics math instruction in public schools: "A carefully prepared se-

lective examination was given to 4,200 entering freshman at the leading universities, 68% of the men … were unable to pass the arithmetical reasoning test;" "Almost 40% of the college graduates applying for commissioning had not in the course of their education taken … trigonometry;" "Requirements [for commissioning] had to be lowered in the field of arithmetical attainment," and "Mathematics is … necessary in fire control and in many other vital branches of the naval officer's profession" (Garrett 1991, 192–194). As authors began to cite the Nimitz letter, more military officials openly criticized math education and called for change. Letters, written by military university officials and directed toward teachers, parents, and supervisors, were published in journals such as *National Association of Secondary School Principals Bulletin* and *Mathematics Teacher* (Garrett 2003, 288).

This trend of military interest in math education continues today. For example, the drafting process for the new de facto US national math standards, the *Common Core State Standards*, included financial support from two large-scale engineering firms who happen to provide weapons to a number of nations: Boeing and Battelle. These firms provided monetary support to Achieve, Inc., the not-for-profit which was organized by the National Governors Association and Chiefs of School State Officers for drafting national standards (Achieve, Inc. 2010). Their funding suggests that mathematical knowledge is needed to engineer military products that will be purchased by nations for warfare.

Related to society's use of mathematics for warfare, the knowledge also falls prey to societal attempts to subjugate populations. Gould's *Mismeasure of Man* (1996) recounts the activities of many innovators of statistical methods whose primary goal was to scientifically prove White supremacy. These efforts continue in modern times and extend to include both classist and racist arguments, notably with the much discussed work of Herrnstein and Murray (1994). Advanced mathematical thinking dominates the perspectives in this and similar works, leaving in the mouths of those with radical sympathies a sour taste vis-'a-vis mathematics.

The trend that mathematics aids in weapons engineering and subjugation of populations brings to the front the second agreement among anarchists that I highlight in this article: fraternity and mutual aid. Suissa (2010), quoting Patricia White, describes fraternity as an attitude comprising respect for all peoples' needs and individuality. In other words, the self-satisfaction of others, or others' happiness, is of paramount concern to individuals in anarchist society. Kropotkin's (2006) mutual aid, derived from evolutionary evidence in humans and other species, puts forth benevolence as a primary determinant of individual and community success. Anarchists view warfare as antithetical to the fraternal spirit. Analyses of war from anarcho-pacificists, such as de Ligt, suggest that armies and wars between nations maintain the rulers' power by facilitating hostility among the working people (e.g., de Ligt 1938). Similarly, efforts to prove one person's worth over another (or indeed, the value of one entire group as greater than that of another group), as the case with the use of mathematics for proving racial inferiority, clearly conflict with fraternity among persons.

Thus far, societal uses for mathematics have exposed some ways that mathematical activities work against the anarchist vision, specifically collectivism and fraternity. These examples do not comprise an entire list of mathematics' dark side, but have been selected because they are particularly contrary to anarchism and are popular choices for expressing a negative view of mathematics. For now, I abandon the societal uses for the ways that pedagogic behaviors similarly dismiss anarchist principles and perhaps foster the negativity many hold for mathematics. As

with the societal uses, I continue to articulate anarchist tenets by way of these negative pedagogic activities.

Antianarchist Activities in Mainstream and Marxist Math Education

In the previous section, I outlined two mathematical activities in society that contribute to societal ills, when viewed in the light of anarchist theory. Here, I attend to typical activities and behaviors in math classrooms that also can be considered counteranarchist. As before, I continue to use anarchist theory as a framework to study society, this time math teaching and learning. Specifically, I study ideas from both mainstream and Marxist math education within an anarchist context. Mainstream math education counters anarchism's notion of fraternity, especially as demonstrated by the prevalence of anxiety in students learning mathematics. Both mainstream and Marxist math education present an issue regarding anarchism's tenet of freedom, because each lacks student and/or teacher autonomy to fully explore mathematical knowledge.

Beginning with mainstream math education activities, the first pedagogic situation is perhaps better described as a consequence of pedagogic activities, but is included here for extending the argument that mathematics, in this case math education, counters the anarchist principle of concern for individual well being, or fraternity. I am talking about math anxiety. This phenomenon is well documented across cultural contexts, for example Ho et al. (2000), and generally is taken to mean the documented emotional responses in individuals when subject to learning or being tested on mathematics. Math class is often an unhappy place for many of its students; fraternity does not seem to exist here. The attention by scholars on its cognitive or affective aspects, as in Ho et al. (2000), places the blame for this experience on the students, rather than the situation in which the unrest occurs. On the contrary, it is not unreasonable to suggest that this phenomenon exists for the circumstances of math education, such as the rush to learn one aspect of mathematics in order to master the next, or risk being left behind.

Indeed, the concern to master one idea before moving to the next presents another aspect of math education in contrast to anarchist principles. Curriculum structure in math education is hierarchical, whereas hierarchy and anarchism are antithetical. The introduction to the *Common Core State Standards for Mathematics* (2010) includes the following quote from Schmidt and Houang: "standards and curricula are coherent if they are 'articulated over time as a sequence of topics and performances that are logical and reflect, where appropriate, the sequential or hierarchical nature of the disciplinary content from which the subject matter derives'" (3). The argument that mathematics learning sequentially builds from one topic to the next should be familiar to anyone who has completed a standard math education program. Although it may be true that some mathematical knowledge does build from simpler to more complicated ideas in a linear fashion, it is an extraordinary, although commonplace, idea that all mathematics and an individual's mathematical development will progress in one direct fashion. For instance, students must master the division of fractions before beginning to solve algebraic equations. This particular example is chosen because it simply has no mathematical logic behind it: Division of fractions is not necessary for a student to understand how to solve an algebraic equation.[1] However, writ-

[1] To be sure, the student could not solve an equation requiring division of fractions without knowing division of fractions, but they could solve a host of equations that does not require division of fractions.

ers of the curriculum consistently construct this and other false hierarchies among elements of mathematical knowledge that facilitate a hierarchy of students. Certain students continue to master each of the steps, whereas others who miss a particular one are doomed to miss all the resultant knowledge higher along this hierarchy. Lockhart (2009), a published mathematician who also teaches high school, also disagrees with the hierarchy in curriculum. He calls it the "'ladder myth'—the idea that mathematics can be arranged as a sequence of 'subjects' each being in some way more advanced" (56). Instead, he favors a variety of topics/inquiries that arise from teacher and student interest.

Beyond the curriculum, hierarchy also exists among the adults invested in pedagogic activities. Most clearly this is seen with the act of teacher compliance with standards for curriculum, which notably does not occur in higher education and happens less so in other K–12 content areas. Teachers are expected to develop lessons that will satisfy curricular goals not decided by them, and mathematics has more rigid standards than other subject areas. Math teachers are considered less able to make such decisions than mathematicians and math educators. Indeed, a common research agenda for math education is the endeavor to prove what math teachers do not know. Research on this topic comes from such influential scholars in math education as Ma (2000), who served on the federal government's National Math Advisory Panel in 2008. Citing whatever deficits teachers of math may have asserts authority over them and reinforces the need for rigorous control. From the anarchist perspective, this lack of autonomy for teachers may point to the reason that Ma and others find teacher knowledge deficits.

Often referred to as the defining feature of anarchism is its principle of freedom from hierarchy. Bookchin (2005) writes of hierarchy as "the domination of young by the old, of women by men, of one ethnic group by another, of 'masses' by bureaucrats who profess to speak in their 'higher social interests,' of countryside by town, and in a more subtle psychological sense, of body by mind, of spirit by a shallow instrumental rationality, and of nature by society and technology… Hierarchy is not merely a social condition; it is also a state of consciousness, a sensibility toward phenomena at every level of personal and social experience" (68–69). Anarchism exposes the various social practices that subject people (and other living things) to the control of other people. Status quo math education practice promotes Bookchin's "sensibility toward phenomena" in its presentation of curriculum, as described previously. Students move up the ladder in a race-like fashion with "some students 'ahead' of others, and parents worry that their child is 'falling behind'" (Lockhart 2009, 56). Ultimately, students are ranked by how high up the hierarchy of knowledge they climb, thereby functioning to sort people into above and below.[2]

Standing against hierarchical practices in society highlights one major difference between anarchism and Marxism. Although Marxism exposes economic hierarchies and seeks to replace these with economic equality, the project to eradicate other hierarchies is not considered, and what is more, Marxism asserts the need for a hierarchy in the educational process that will move society toward equality. Marxist education relies on an enlightened elite who hold what they consider an objective truth for how society currently functions and how society will be transformed. It "is seen as primarily the means by which the proletarian vanguard is to be educated to true (class) consciousness. Once the revolution is over, it seems, there will be no role for education."

[2] The assumption that all have equal opportunity to climb up the hierarchy is essential to its acceptance by individuals, yet equal opportunity has been disputed by the Marxist critiques of schooling (e.g., Bowles and Gintis, 1976).

On the other hand, anarchist education "is aimed not at bringing about a fixed end-point, but at maintaining an ongoing process of creative experimentation" (Suissa 2010, 39).

Gutstein (2006) represents the Marxist educational perspective in the context of mathematics education, when he draws upon Freire's critical pedagogy for example. His goal of "liberation from oppression" (22) utilizes a pedagogy comprising "teaching mathematics for social justice" (29). Aspects to the pedagogy include (a) "reading the world with mathematics" (26), or looking at racial and economic inequality with mathematical analyses, (b) "writing the world with mathematics" (26–27), or seeing the power in mathematics for social change, (c) "developing positive cultural and social identities" (28–29), or learning both the language/culture of power and personal language/culture (as in Delpit 1995), (d) "reading the mathematical word" and "succeeding in the traditional sense," (29–30) or learning the standardized mathematics curriculum to perform well on tests and (e) "changing one's orientation to mathematics," (30–31), or appreciating mathematical power as both its dominant role in society and its capacity to change the world. Gutstein used these objectives to develop several classroom practices, and he discusses their success in his own classroom.

Anarchism has a lot to say about Gutstein's (2006) approach. In his project, he envisions an enlightened leader who designs an education for specific goals. Although authority is not necessarily in conflict with aspects of anarchist education or child-rearing, Gutstein's prescribed experiences for his students remove the anarchist process of creative experimentation from the educational process. Gutstein controls his students' use of mathematics; they are expected to learn and know mathematics primarily for its capacity to critique racial and economic inequality instead of other possibilities relevant to both its nature and application. From the anarchist perspective, Gutstein's activity can provoke resistance from at least some students and can perhaps develop negative relationships with mathematics and/or social justice in some individuals, an outcome contrary to Gutstein's goals. The limited view of mathematics use resonates with Suissa's second note on Marxist education, that "once the revolution is over, it seems, there will be no role for education," or in this case, no use for mathematics (Suissa 2010, 39). If students are indoctrinated to view mathematics as primarily useful for analyzing oppression and for playing the power game, then once they achieve the goal of liberation, they may not understand the continued use for mathematics. Furthermore, by adopting the traditional hierarchical math curriculum, Gutstein's project continues to promote hierarchies and fails to critique such authority established outside the classroom walls. As the teacher, he accepts the authority to which he is subjected, and this acceptance, along with the hierarchical structuring of the knowledge to be learned, indoctrinates students in hierarchical phenomena described earlier.

To be sure, Gutstein is to be applauded by anarchists for his excellent work developing social justice lessons for the mathematics classroom. He has certainly taken society to task for its problematic relationship with mathematics, which I have suggested by the examples I included at the beginning of this article. However, the lack of student autonomy in his pedagogy is, indeed, too significant for those of us with anarchist sympathies. Suissa (2010) discusses these issues more generally in outlining differences between Marxism and anarchism and in her articulation of a philosophy of anarchist education. She reminds us that anarchism is the political philosophy that discusses both individual freedom and social equality. Individual freedom must be of equally paramount concern, yet one individual's freedom cannot take away another's, hence the staunch opposition to capitalism. However, individuals are to be otherwise free to govern themselves.

In the educational context, this dance between individuality and equality exists, as well. Tolstoy, a religious anarchist, put the words "Come and Go Freely" above the doors of his experimental school at Yasnaya Polyana (Tolstoy 2000, 1). However, Gutstein's students do not get the chance to choose whether they want to learn both the mathematics he is teaching and the social context in which he is teaching it. To be sure, Gutstein's efforts do embrace one aspect of anarchist education. Suissa (2010) argues that anarchist education does not refrain from "the very attempt by educators to pass on any substantial beliefs or moral principles to children" (98). So Gutstein's work properly addresses this aspect to anarchist education, but I argue does so with too much authority and too little fraternity. He suggests the math classroom's primary function as liberatory pedagogy, yet this limits student exposure to mathematical knowledge. In turn, students have less potential to gain a variety of math knowledge and, as I argue later, precludes some students from developing a happy, self-fulfilling relationship with mathematics.

Defining Anarchist Math Education

In the previous section, I considered the elements of Marxist math education that embrace anarchist tenets and those that do not. Marxist math education includes exposure to anarchist morals of equality and fraternity, but does so at the expense of student autonomy. What then, would an anarchist math education look like? First, in taking a cue from Goldman that education "must insist upon the free growth and development of the innate forces and tendencies of the child" (quoted in Suissa 2010, 77), no student should be forced to learn mathematics as happens in both mainstream and Marxist pedagogy. An earnest effort to develop such innate forces, however, requires anarchist educators to present mathematics in a variety of ways and comprise its various behavioral forms so that students can determine if they would like to acquire the knowledge. The term mathematics captures a wide variety of cognitive and physical behaviors, three of which are mathematics as the art of abstract reasoning, mathematics as abstract and automatic procedures, and mathematics as an applied science. Before detailing their differences, I want to present two caveats: (a) None of these are suggested to be more authentic mathematics than the other; each is mathematics, and (b) these conceptions do contain common elements, thus interacting and intersecting with each.

Each of the three behaviors agree that mathematics can consider a variety of topics (e.g., numbers, geometric figures) but each requires a different type of effort when undertaken by an individual or group. For example, in the mathematical arena commonly called number theory, mathematics as abstract procedures takes place when some friends who are out to dinner add up their tab and divide it by the number of people to determine how much each person must pay; mathematics as the art of abstract reasoning takes place when an enthusiastic student taking an elementary number theory course attempts to prove that every integer greater than 1 can be written uniquely as a product of primes (called the Fundamental Theorem of Arithmetic); and mathematics as an applied science takes place when a team of computer scientists might use modular arithmetic and large prime numbers to develop a public key cryptosystem to use when needed to keep digital information private even when intercepted by a third party. In the first example, the party is indeed applying arithmetic to a situation, but I hesitate to say that this is mathematics as applied science. The application is automatic without conscious reference to

mathematical properties or theorems, whereas computer scientists are actively working with mathematical properties and theorems to develop new applications.

These three behaviors are not intended to capture all of mathematics but do exhibit its variety. Anarchist math education would allow students to be exposed to the variety of mathematics, to see whether certain aspects are more interesting for an individual than others. Students and teachers are free to choose among the mathematical behaviors that are most interesting to them, possibly resolving for themselves the "Math War" (Schoenfeld 2004, 253–254) debate over skills versus concepts. This debate has focused little on whether some students prefer learning mathematical skills and algorithms by rote, whereas others prefer proving mathematical ideas. I would be surprised if other experienced teachers would disagree with my observation that students, indeed, often favor one of the mathematical behaviors over another. Different from the math wars, anarchist education would place no comparative valuation on one mathematical behavior over the other.

Lockhart (2009) comments on what he perceives as a sad omission of the abstract reasoning behavior in today's schools. Most students do not get a chance to know that mathematics can be "dreamy and poetic"; "radical, subversive, and psychedelic"; and a discipline that allows "freedom of expression" (23). Lockhart presents mathematics as an art, and in this sense mathematics education will, for some students, be appreciated for its aesthetic qualities because the artist (mathematician) plays in completely imagined worlds. This resonates with Marcuse's (1978) assertion that "art breaks open a dimension in which human beings, nature, and things no longer stand under the law of the established reality principle… The autonomy of art reflects the unfreedom of individuals in the unfree society" (72). Both traditional and Marxist approaches to math education lack this autonomy of art by instead controlling student mathematical behaviors; authority chooses which behaviors are favored (usually abstract procedures and applications) and limits these behaviors to only specific avenues of inquiry. In an anarchist math education program, the art of abstract reasoning would be one avenue for students to explore in mathematics.

In an anarchist math education practice, freedom from hierarchy would include a teacher's capacity to choose her own path for the class experience. Aspects of a moral education, such as those in Gutstein (2006), as well as the aesthetic dimension would probably be a part of her thinking. However, end goals would not necessarily be determined in advance, although they could, depending on her particular disposition and pedagogic approach. For those who are worried about accountability to cover material, an anarchist education might include advanced methods of accountability via group decision making, subjecting one teacher's performance to review by other math teachers and the students and parents that are involved.

Suissa (2010) makes the important point that perspectives on anarchist education often cloud what education will look like within a state society that hopes to become stateless versus an education in an already stateless society. So far I have perhaps described the anarchist math education in a stateless society, so I'd like to suggest how aspects of this vision could be incorporated into current teacher practice.

Current math teachers with anarchist sympathies can still experiment with anarchist math education despite working within a state-run education system. DeLeon (2008) suggests direct action and sabotage as useful activities for anarchist teachers. Anarchist math teachers should first assert their personal knowledge of mathematics and then work together to develop alternative programs that engage freedom of curriculum supported by a community of accountability. Specific to the curriculum, the current system mandates that all students be subject to mathe-

matics education. Anarchist math teachers can at the least recognize that some students will appreciate some mathematical behaviors more than others and strive to determine and emphasize these for their particular students. Anarchist math teachers can also avoid any activities that cause students unrest, deemphasizing the competitive forces at play given the hierarchical curriculum structure. Math class should be a happy place.

Mathematics' Role in Anarchist Society

I began this article outlining several societal uses of mathematics that work against the anarchist vision. The majority of the article then described the ways that math education is not, and then could be, anarchist. I conclude by suggesting the worth of an anarchist math education via a return to its societal use, this time within the anarchist vision. By presenting the confluence of anarchism with mathematics, I strive to reclaim it from its associations with inequality, militarism, and unhappiness.

To conclude, I briefly describe three aspects of mathematical behaviors that have a place in the anarchist vision: its use as an analytic technology for maintenance of equality and fraternity, its ability to solve technologically sophisticated problems, and the aesthetic quality that can increase human happiness. As an analytic technology, various branches of mathematics can work to keep equality and fraternity in check. For instance, Marx's (1976) critique of capitalism is greatly aided by his use of algebra to generate such abstract concepts as the rate of exploitation, expressed as the ratio of surplus labor to necessary labor. Proper statistical methods and analyses can also aid in efforts of equality and fraternity, through, for example, proper sampling methods and utilizing theories regarding sampling distributions to generate accurate confidence intervals. Second, it seems trivial to comment on or provide examples of the application of mathematics for technology, but it should be noted that in the anarchist vision society will have no need for technology that exploits or harms people or nature. Instead, as Schumacher (1973) suggests, technology will be enjoyed by all to "lighten the burden of work man [sic] has to carry in order to stay alive and develop his potential," not increase our work as technology often does today (148–149). Finally, some people find happiness in the aesthetic experience of mathematics. Lockhart's (2009) passionate arguments on mathematics and math education indicate his enjoyment with this knowledge; for Lockhart and others out there, mathematics is an art form that can be enjoyed and would thus find a place in anarchist society merely for increasing happiness and the fraternal spirit.

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