



Research Articles

Darwin and Inequality

ENRICO BONATTI

Columbia University, Lamont-Doherty Earth Observatory, Palisades NY 10964, US
Istituto Scienze Marine CNR, Via P. Gobetti 101, 40129 Bologna, Italy
E-mail: enrico.bonatti@bo.ismar.cnr.it

Citation: Bonatti E. (2021) Darwin and Inequality. *Substantia* 5(1) : 73-78. doi: 10.36253/Substantia-1121

Received: Sep 27, 2020

Revised: Nov 22, 2020

Just Accepted Online: Nov 23, 2020

Published: Mar 01, 2021

Copyright: © 2021 Bonatti E. This is an open access, peer-reviewed article published by Firenze University Press (<http://www.fupress.com/substantia>) and distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Data Availability Statement: All relevant data are within the paper and its Supporting Information files.

Competing Interests: The Author(s) declare(s) no conflict of interest.

Abstract. Charles Darwin during his travels on the Beagle noted the wretched primitive state of natives from Tierra del Fuego. He attributed it to their being egalitarians and to the absence of a leader among them. The Gini Economic Index suggests strong inequality today even among the richest, more developed countries. This paper discusses whether equality and civilization are really incompatible, as Darwin seemed to imply.

Keywords: Inequality, Darwin, Gini Index, Egalitarian Societies.

Charles Darwin during his 1831-1836 circumnavigation of the Globe on the British Navy brig “Beagle” had a chance to interact with the native inhabitants of the eastern and northern shores of Tierra del Fuego (Figure 1).

Darwin dedicated several pages of his “The Voyage of the Beagle” to the Fuegians, and already from the first encounter with the natives he expressed his amazement at their wretched primitive state (Figure 2). Here are a few citations: “I could not have believed how wide was the difference between savage and civilized man...it is greater than between a wild and a domesticated animal...”... “While going one day on shore near Wollaston Island we pulled along side a canoe with six Fuegians. They were the most abject and miserable creatures I anywhere beheld ...These Fuegians in the canoe were quite naked, and even one full grown woman was absolutely so. It was raining heavily and the fresh water together with the spray, trickled down her body...In another harbour not far distant a woman who was suckling a recently born child, came alongside the vessel and remained there while the sleet fell and thawed on her naked bosom and on the skin of her naked baby...these poor wretches were stunted in their growth, their hideous faces bedaubed with white paint, their skins filthy and greasy...”...Viewing such men, one can hardly make oneself believe that they are fellow creatures and inhabitants of the same world...”

Later on in his narrative Darwin offers an explanation of the wretched state of the Fuegians: “..... the perfect equality among the individuals composing the Fuegian tribes must for a long time retard their civilization. As we see, those animals, whose instinct compels them to live in society and obey a Chief, are most capable of improvement, so is it with the races of human-kind. Whether we look at it as a cause or a consequence, the more civilized

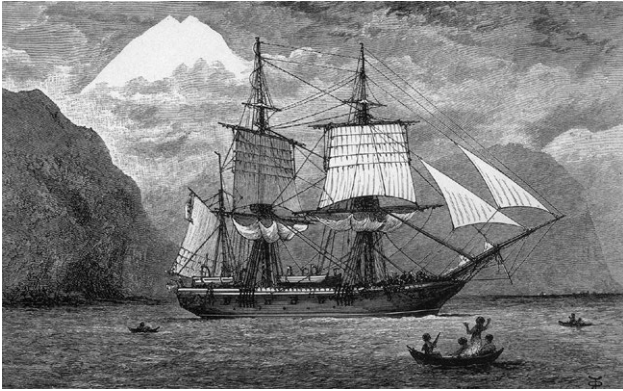


Figure 1. The Beagle in The Strait of Magellan, 1833. (from *The Voyage of the Beagle*, edition 1962, American Museum of Natural History).

always have the most artificial governments. For instance, the inhabitants of Tahiti, who when first discovered were governed by hereditary kings, had arrived at a far higher grade (of civilization) than another branch of the same people, the New Zealanders, - who, although benefited by being compelled to turn their attention to agriculture, were republicans in the most absolute sense. In Tierra del Fuego, until some Chief shall arise with power sufficient to secure any acquired advantage, such as ownership of domesticated animals, it seems scarcely possible that the political state of the country can be improved. At present even a piece of cloth given to one is torn into shreds and distributed; and no one individual becomes richer than another. On the other hand, it is difficult to understand how a Chief can arise till there is property of some sort by which he might manifest his superiority and increase his power.” (Darwin, 1962 edition, pages 205-231).

That Darwin would hold this opinion is quite understandable: after all, he was a member of the pre-Victorian England’s higher classes. Still, we ask: **ARE EQUALITY AND CIVILIZATION REALLY INCOMPATIBLE?**

The issue of inequality among individuals, social classes and nations has been debated widely in recent years (see Chien and Culotta, 2014). Economists use a “Gini Index” (Gini, 1912) to measure the level of inequality among the individuals of a group or a country. The Gini Index is a measure of the distribution of income across a population. It was devised early last century by Corrado Gini (1883-1965), an Italian statistician and economist who thought at the University of Roma. The Gini Index ranges from zero if all individuals of the group own and earn the same amount; to one



Figure 2. Native from Tierra del Fuego, drawn by Conrad Martens, artist on board of the Beagle, 1833.

if one individual owns and earns everything and everybody else owns and earns nothing. The Gini index estimated for various countries reveals strong variations in degree of inequality (Figure 3). We go from a relative equality in the Scandinavian countries (Norway and Sweden have a Gini index around 0.25) to a strong inequality in countries such as South Africa (index close to 0.7). European countries such as Great Britain; France, Germany and Italy have indices ranging between 0.28 and 0.35 while the US suffers from a rather high inequality (index ~ 0.45), as do China and Russia.

Figure 3 suggests that some of the richest countries on Earth suffer from high degrees of inequality. High levels of inequality (i.e., high Gini Indices) generally go together with a number of negative indices: for instance, they correlate with the percentage of children living in poverty (Atkinson, 2015) as shown by Figure 4. Inequality in a society predicts a higher degree of violence (Wilkinson and Pickett, 2009; Starness et al., 2017).



Figure 3. Gini Index of Inequality estimated recently (within the last 10 years) for various countries. The index for Cuba refers to the period 1980-1985. Scandinavian countries are the most egalitarian. Russia, US and China show a much higher “inequality”. The index reconstructed for the Roman Empire (Sheidel and Friesen, 2009) reveals an inequality comparable to that of modern US. Also shown is the Index for pre-agriculture hunters-gatherers estimated by Kohler et al. (2017).

Areas in the US with high income inequality tend to have higher divorce, bankruptcy and homicide rates than areas with more egalitarian distribution (Frank et al., 2014; Daly et al., 2001). In the United States people in the low-income bracket are plagued by mortality risk and rates of infant mortality higher than the general population (Underwood, 2014).

Are there in today’s Earth societies where inequality is negligible? Shostak (1981) and Pennisi (2014) describe the !Kung people of the Kalahary Desert in Africa. They are nomadic hunter-gatherers; they share their very few possessions (mostly food and hunting weapons): so nobody is “richer” than anybody else. Another group of nomadic hunter-gatherers are the Hadza people who live at the margins of the Rift Valley in Tanzania (Gibbons, 2018). They have been studied by several teams of anthropologists for over 50 years. They also were egalitarians; however, their way of life has been heavily infringed in the last several years by the encroachment of farmers and pastoralists but also of tourists and of the same anthropologists who studied them (Gibbons, 2018).

Before the invention of agriculture over 10,000 years ago, humans were mostly nomadic “hunter gatherers”; anthropologists believe their societies were generally rather egalitarian, as are today’s !Kung. The average Gini index for pre-agriculture “hunter-gatherers groups” has been estimated at 0.17; that for agricultural societies at 0.35 (Kohler et al., 2017). In his book “The Anatomy of Inequality” (2016), the Swedish social philosopher Per Molander suggests that the prevalence of egalitarianism among nomadic “hunter-gatherers” is mostly a consequence of their economy being close to subsistence level:

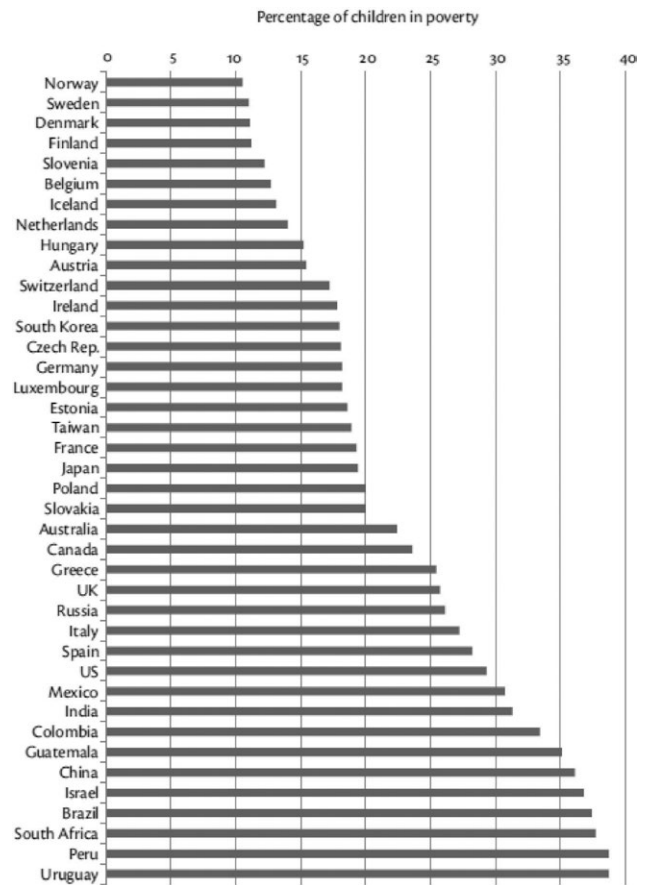


Figure 4. Percentage of children (persons < 18 years old) living in poverty from various countries in 2010 (from Inequality: what can be done? By Anthony Atkinson, Cambridge, Mass.: Harvard University Press, Copyright © 2015 by the President and Fellows of Harvard College). Note that countries with high index of inequality (see Fig.3) tend to have a high percentage of children living in poverty.

no significant surplus is there to be grabbed by an individual or group. However, archaeologists are finding traces of early inequality already in some “hunter-gatherers” groups, where a few individuals were able to take possession of patches of wild food and transmit them to their descendant, in what can be viewed as *the BIRTH OF PRIVATE PROPERTY*.

For instance, Price and Bar-Joseph (2000) found archaeological traces of inequality already in Natufian tribes, eastern Mediterranean hunter-gatherers that from 14,000 to 10,000 years ago gradually were converted to agriculture. The richness of a few of their graves and the ornaments on a few of their dead indicate that disparities existed early on, before the Natufians settled down in a society based on agriculture. Accumulation of wealth by a few, and consequent inequality, became

“normal” in societies based on agriculture. Molander (2014) cites 4,000 years old Sumerian and Egyptian texts that lament inequality in their society.

The transition from nomadic hunter/gatherers to stable societies based on agriculture has been regarded generally as a major positive step in the evolution of humans towards higher civilization. A dissenting viewpoint, voiced by Jared Diamond (1987) in an essay entitled “The Worst Mistake in the History of the Human Race”, argued that the advantages derived from this transition were more than balanced by negative effects. Diamond cited studies on the few remaining hunter/gatherers communities, as well as on fossil and archeological records of ancient communities, showing that the “quality of life”, including nutrition and health, did not necessarily improve as a result of the transition, except for a small elite group. With the advent of agriculture population density increased: quality was traded for quantity...an elite became better off but most people became worse off, with the result of developing deep class divisions. Descriptions of nomadic egalitarian societies such as the !Kung of southwest Africa (Shostak, 1981) and archaeological records from neolithic sites (Patou-Mathis, 2020), suggest that women were freer and less unequal than in later societies based on agriculture and private property.

According to Canadian archaeologist Brian Hajdess, the transition from egalitarian societies to societies rife with economic competition and inequality was “*the single most critical watershed in the 2.5 million years of human history*”. Since that watershed transition, stratified societies have prevailed among humans, although the extent and type of inequality changed in time and space and was different in different societies. In Europe and the Middle East we had strong inequality in the Persian and Egyptian Empires and even in the 400 BC quasi-democracies of Athens and Sparta, that allowed slavery. We had a strongly unequal society also in the Roman Imperial period. A Gini index of 43 was estimated for imperial Rome (Sheidel and Friesen, 2009), with a degree of inequality similar to that of today’s US. A few super rich Romans thrived: triumvir Marcus Crassus had an income roughly equivalent to one billion dollars per year, not far from that of Bill Gates!

Non-egalitarian societies continued to prevail in the European Middle Ages and Renaissance, sometime favoured by “holy” (or, better, “unholy”) alliances between religious (The Pope) and lay (The Emperor) leaders. Throughout Humanism, The French Revolution, The Industrial Revolution, and the rise of the bourgeoisie, the degree of inequality oscillated but overall did not decrease. A concrete modern attempt

to create something approaching an egalitarian society, i.e., the 1917 Russian revolution, ended badly due both to internal failures and to external pressure from capitalistic powers. Scholars such as A. Bergson (1984) have attempted to estimate the degree of equality in the Soviet Union before and after the death of Stalin. The results of these inquiries are ambiguous, in part because it is not simple to calculate a Gini Index for a Soviet Union-type economy. Even so, it appears the Soviet Union had a slightly higher equality than western countries. Cuba in the early eighties enjoyed a relatively high equality (Gini index 22 to 24), that however decreased more recently. It’s worth noting that the Gini index of modern post-socialist countries such as Russia and China is not very different from that of the foremost capitalistic country, i.e., the US (Figure 3). Chairman Mao would turn in his grave if he knew that many billionaires sit in today’s Chinese Parliament (NY Times, March 17, 2017).

Given that we are all born with different intelligence, physical strength and so on, and that most of us want the best for ourselves even at the expense of others, Pennisi (2014) asks: How has it been possible for egalitarian societies to survive among our ancestors? A widespread opinion is that inequality is an inescapable consequence of human nature: *Homo sapiens* basic instincts lead him/her to be competitive and possessive. How to reconcile this hypothesis with the evidence that pre-agriculture hunter-gatherers societies were mostly egalitarian? Studies of the few remaining hunter-gatherers egalitarian groups (they are disappearing fast!) hint at some sort of “non-aggressive” code promulgated in those societies: for instance in the !Kung (Shostak, 1981) and Hazda (Woodburn, 1983) people. Behaviour fostering inequality (boasting, self-aggrandizing, competitiveness) is discouraged even in young children while humility, downplaying one’s accomplishments and cooperation (for instance in hunting) were the accepted ways of behaviour. It is interesting that in most aspects of our western societies, for instance our school systems, exactly the opposite behaviour is encouraged. Then perhaps the drive towards inequality may not be due solely to our genes or to “human nature”, but rather to which aspect of human nature is being reinforced and encouraged, and which aspect neglected and discouraged. The degree of inequality has varied through time: for instance, it decreased in European countries during the years of the second world war but increased in the post-1970

period (Atkinson, 2015). It has varied from place to place depending on the social organization of each country. Moreover, small communities exist with little or no inequality (Israeli kibutz, monasteries of various religions...). All this supports the idea that inequality is not an inescapable consequence of human nature.

French economist Thomas Piketty suggested that, once even a small inequality has surfaced in a society (that is, once an individual or group have acquired wealth and power slightly over and above the rest of society), inequality is bound to increase with time. The simple reason, hinted at not only by mathematical models but also by common sense, is that in a competitive society who starts with more is likely to win the competition to acquire more. Modern “liberal” societies have introduced devices to avoid being overwhelmed by extreme inequality. *Constitutions* proclaim equal dignity and rights for all individuals. *Graded taxation* requires the richest to pay higher taxes. *Social security* and *healthcare* attempt to keep the weakest protected. *Tax on inheritance* and *universal education* attempt to avoid excessive accumulation of wealth and to approach equal opportunity for youngsters. On this last point: a strong correlation between income of parents versus income of their children (calculated when the children have become adults) indicates a low social mobility and a low degree of “equal opportunity”. Italy tops this ladder (Figure 5), followed closely by Great Britain and US, a sign of a relatively low “equal opportunity” for youngsters from those countries. Canadian economist M. Corak (2013) found that countries with high correlation between parents/children income tend to have a high Gini index of inequality (Figure 5).

According to Piketty, we are facing a sharp rise in inequality in the capitalist west. In fact, the trend in recent years in the western nations, particularly the US, seems to move even further away from egalitarianism: for instance, if it is true that new tax laws will shift wealth to the wealthiest (New York Times), the US Gini Index would be pushed even further up. In recent years, some of the guarantees against excessive inequality have been slackened in various countries of the west. Even “virtuous” Sweden has abolished its tax on inheritance and has seen its index of inequality go up in the last several years (Molander, 2016). On the other hand, studies summarized by Starmans et al. (2017) suggest that people are bothered non so much by economic inequality as by economic unfairness. They argue that people favour “fair distribution” over “equal distribution”, and prefer

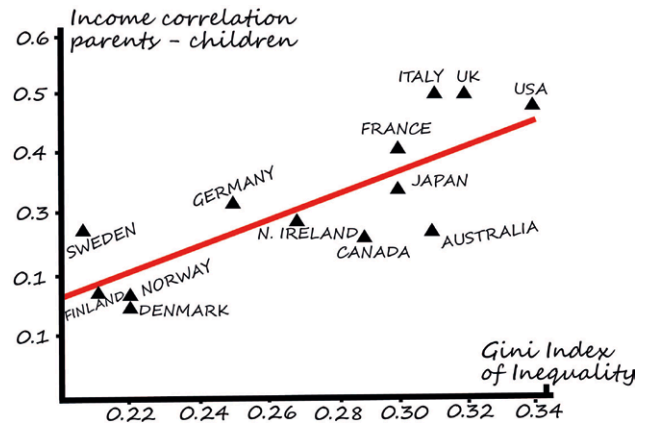


Figure 5. Gini index of Inequality for various countries versus Parents/Children Income. Correlation estimated after children have become adults (from Corak, 2013).

“fair inequality” over “unfair equality”. However, much depends on the definition of what is “fair”, that varies in different places and in different social classes.

In a review published by the New Yorker (March 31, 2014) of Piketty book “Capital in The Twenty-First Century”, J. Cassidy cites extreme examples of inequality in US corporations. The Chief Executive of Walmart Corporation earned more than 23 million dollars in 2012, while a typical Walmart worker earned less than 25,000 dollars a year. The Chief executive of Apple earned 378 million dollars in 2011, about 6,250 times more than the average Apple employee. The British organization Oxfam reports that the 85 richest people in the world own more wealth than the 3,5 billion people who make up the poorest half of world’s population!

Let’s go back to Darwin. Let’s imagine him sailing today on a modern cruise ship back to Tierra del Fuego: he would see the descendants of his ancient Fuegians, having abandoned their egalitarianism, working dutifully as janitors and dishwashers in the basements of Ushuaia luxury hotels owned by US or Argentinian tycoons. Perhaps Darwin would ask himself whether or not this can be construed as “progress”.

ACKNOWLEDGEMENTS

I am grateful to Vincenzo Balzani, Luigi Bonatti, Anna Cataldi, Gino Fontana, Luca Gasperini and two anonymous reviewers for helping improve the quality of this paper.

REFERENCES

- Atkinson A. B. (2015) *Inequality: What can be done?* Harvard University Press.
- Bergson A. (1984). Income Inequality under Soviet Socialism. *Journal Economic Literature*, 22, 1052-1099.
- Chien G. and Culotta F. editors (2014). *The Science of Inequality*. *Science* 344, 819-837.
- Corak M. (2013) Income inequality, equality of opportunity and integration. *Journal Economic Perspective*, 27, 79-103.
- Daly M. et al., (2001) Income inequality and homicide rate in Canada and the United States. *Can. Jour of Criminology*, 43, 219-236.
- Darwin C. (1860 edition) *The Voyage of the Beagle*, published in 1962 in a version edited by Leonard Engel, The Natural History Library, Doubleday and Co.
- Diamond J. (1987) The worst mistake in the history of the human race. *Discover Magazine*, May, 62-64.
- Kohler T. A. et al. (2017) Greater post-Neolithic wealth disparities in Eurasia than in north America and Meso-America. *Nature*, 551, 619-622.
- Frank R.H. et al. ((2014) Expenditure cascades, *Rev. Behav. Econ.*, 1, 55-73.
- Gibbons A. (2018) Hazda on the brink. *Science* 360, 700-704.
- Gini C. (1912) *Variabilita' e Mutabilita'*, book published by Facolta' di Giurisprudenza, Universita' di Cagliari.
- Molander P. (2016) *The Anatomy of Inequality*. Melville House, Brooklyn-London.
- Patou-Mathis M. (2020). *L'homme préhistorique est aussi une femme*. Allary Editions, Paris.
- Pennisi A. (2014) Our Egalitarian Eden. *Science*, 344, 824-825.
- Piketty T. (2014) *Capital in the Twenty-first Century*. Harvard University Press.
- Price T.D. and Bar. Yoseff O. (2010). *Traces of Inequality at the origins of agriculture in the ancient Near East*, in: *Pathways to Power: New Perspectives on the Emergence of Inequality*, T.D. Price and G.M. Feiman Editors, Springer.
- Sheidel W. and S. Friesen (2009). The size of the economy and the distribution of income in the Roman Empire, *Journal of Roman Studies*, 99, 61-91.
- Shostak M. (1981) *Nisa: The life and words of a !Kung woman*. Harvard University Press.
- Starmans C. et al. (2017) Why people prefer unequal societies. *Nature Human Behaviour*, 1, 1-7.
- Underwood E. (2014) Can disparities be deadly? *Science*, 344, 829-831.
- Wilkinson R.G. and Pickett K.E. (2009). Income inequality and social dysfunction. *Annual RevSoc*, 35, 493-511.
- Woodburn J. (1982) *Egalitarian Societies*. *Man, New Series*, 17, 431-451.