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**The Birth of the Idea of Perfectibility:
From the Enlightenment to Transhumanism***

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Abstract

Starting from the Age of Enlightenment, a person's ability of self-improvement, or perfectibility, is usually seen as a fundamental human feature. However, this term, introduced into the philosophical vocabulary by J.-J. Rousseau, gradually acquired additional meaning – largely due to the works of N. de Condorcet, T. Malthus and C. Darwin. Owing to perfectibility, human beings are not only able to work on themselves: by improving their abilities, they are also able to change their environment (both social and natural) and create favorable conditions for their existence. It is no coincidence that perfectibility became the key concept of the idea of social progress proposed by French thinkers in the Age of Enlightenment, despite the fact that later it was criticized, above all, by English authors, who justified its organic and biological nature and gave a different evolutionary interpretation to this concept, without excluding perfectibility from the philosophical vocabulary. In this article, we address the opposition and mutual counterarguments of these two positions. Beyond that, we draw a parallel with some of the ideas of S. Kapitsa, who proved to be not only a critic of Malthusianism but also a direct disciple of Condorcet. In the modern age, the ideas of human self-improvement caused the development of transhumanist movement.

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Condorcet is more relevant than ever, and today his theory of the progress of the human mind, which influenced the genesis of modern historical science, needs a re-thinking in the newest perspective of improving the mental and physical human nature with the help of modern technologies.

Keywords: Enlightenment, perfectibility, idea of progress, philosophy of history, Condorcet, Malthusianism, transhumanism.

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Рождение идеи *perfectibilité*: от Просвещения к трансгуманизму*

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Оригинальная исследовательская статья

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Аннотация

Начиная с эпохи Просвещения, способность человека к совершенствованию, или *perfectibilité*, обычно называют его основополагающей чертой. Однако этот термин, введенный в философский словарь Ж.-Ж. Руссо, постепенно приобрел дополнительный смысл в немалой степени благодаря работам Н. де Кондорсе, Т. Мальтуса и Ч. Дарвина. Так человек, обладающий *perfectibilité*, не просто способен к работе над собой, но, совершенствуя свои способности, изменяет и окружающую его среду – как социальную, так и природную, – создавая более благоприятные условия для своего существования. Неслучайно именно *perfectibilité* стала ключевой категорией в теории общественного прогресса французских мыслителей в эпоху Просвещения, несмотря на то, что позднее она была подвергнута критике, прежде всего английскими авторами, обосновавшими ее органицистскую и биологическую природу, не исключив при этом *perfectibilité* из философского словаря, но дав этой категории иную эволюционистскую трактовку. О противопоставлении и взаимных контраргументах этих двух позиций и идет речь в данной статье. Кроме того, проводится параллель с некоторыми идеями С. Капицы, оказавшимся не только критиком мальтузианства, но и прямым последователем Кондорсе. Идеи совершенствования человека в современную эпоху получили развитие в трансгуманистическом движении. Кондорсе оказался как никогда актуален, а его теория прогресса человеческого разума, повлиявшая на становление современной исторической науки, сегодня нуждается в переосмыслении в новейшей перспективе усовершенствования ментальной и физической человеческой природы, в том числе с помощью современных технологий.

Ключевые слова: Просвещение, *perfectibilité*, теория прогресса, философия истории, Кондорсе, мальтузианство, трансгуманизм.

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The concept of perfectibility in Jean-Jacques Rousseau's philosophy

The author of the concept of perfectibility (called “scholar neologism” by J. Starobinsky [Goldschmidt 1983, 288]) is J.-J. Rousseau, who used it in his treatise *Discourse on the Origin and Basis of Inequality Among Men* (1755) for the first time. Later, due to N. de Condorcet, this concept became one of the key characteristics of a person and of the human society in the idea of social progress.

If there were not the ability to self-improve, the human being would forever remain in his natural state of the noble savage. Thanks to this ability, individuals learned to contemplate, to be resilient, agile and provident. It is precisely perfectibility and the ability to act freely that are the main qualities that distinguish human beings from animals [Rousseau 1969, 54]. Rousseau also associates coalescence of people into communities with the desire of human beings for improving their own nature. It stands to note that V. Goldschmidt in the book *Anthropology and Politics. The Principles of the Rousseau System* suggested that Rousseau formed the word *perfectibilité* by analogy with *sociabilité*, meaning the ability to live in society as opposed to the natural state of individuals [Goldschmidt 1983, 295]. Introducing the concept of perfectibility into his idea of progress, Rousseau made it self-sufficient, it means that “the term perfectibility... expresses the ambitions of a human of Modern Times... May be said Rousseau legalized the ambition of his time” [Goldschmidt 1983, 290]. This ambition was seen by Rousseau in attributing to human beings and to mankind entirely a certain unlimited ability to perfection. At the same time, he provides a rather negative assessment of perfectibility, as far as “this distinctive and almost unlimited faculty is the source of all human misfortunes; that it is this which, in time, draws man out of his original state, in which he would have spent his days insensibly in peace and innocence; that it is this faculty, which, successively producing in different ages his discoveries and his errors, his vices and his virtues, makes him at length a tyrant both over himself and over nature” [Rousseau 2018, 14].

In such a way, Rousseau notes the indefiniteness of this inherent human ability, which always “remains connected (and subordinated) to the exigencies” of the individual [Goldschmidt 1983, 290]. However, overcoming his natural state in consequence of perfectibility, a person becomes part of a community, which distinguishing features are gradual

degradation and tendency to tyranny: “And if Rousseau insists on the detrimental effects of perfectibility, it precisely shows that, far from being up to now the theater of perfection and the exercise of freedom, human history has produced and continues to produce the sad spectacle of human degradation of its condition” [Le Dévédec 2015, 31].

Rousseau connects the development and improvement of the human mind with the formation of new acquisitions, but at the same time those acquisitions contribute to elaborate destructive human needs and passions [Rousseau 1969, 55]. As a consequence, if in the state of nature an individual has only physiological needs and fears (to which Rousseau refers, for example, the fear of being hungry or suffering from pain), then perfectibility, which should lead to the improvement of human nature, practically puts him back to an animal state, and “. . . a consequence of perfectibility that Rousseau defines (and criticizes) is imbecility, due to which a person returns to the psychology of the animal” [Goldschmidt 1983, 291]. In other words, “opposing animal instinct, perfectibility is more empty of content than the former: it is neither invention nor reflection, it is neither reason nor freedom. It is only the prerequisite and formal condition that makes all these faculties possible” [Goldschmidt 1983, 290].

Simultaneously, for Rousseau, perfectibility has an ambivalent character, manifested in the fact that, in addition to its negative consequences, it evidently intends to maintain the free will of humans, without which there is no capacity of constructing their own nature. According to the Canadian sociologist Nicolas Le Dévédec, “far from being synonymous with progress and any natural law of history, the concept of perfectibility presupposes the fundamental indeterminacy of being human” [Le Dévédec 2015, 29]. That is why, for Rousseau, this self-improvement ability is an exceptional human’s “privilege of sculpting one’s own nature” [Le Dévédec 2015, 30]. Perfectibility is “a fundamental and categorical condition for freedom, which is a biological quality, inseparable from humans, even at the beginning” [Goldschmidt 1983, 288]. Then “freedom, for its part, remains riveted to ‘instinct.’ It is not a power of good and evil, not a faculty of ‘fall.’ ‘Depravity,’ later, is not due to his initiative but due to the circumstances alone” [Goldschmidt 1983, 290]. We could understand this freedom both as free will and freedom of choice, inasmuch as perfectibility is “the quality of opposites,” that it has both positive and negative sides: “from lights to errors, from vices to virtues, from grandeur to decadence, from humanity to imbecility” [Goldschmidt 1983, 292].

The merit of Rousseau was, among other things, to indicate how important the ability of betterment is for the progress of mankind: “. . . in all the nations of the world,” he writes, “the progress of the understanding has been exactly proportionate to the wants which the peoples

had received from nature, or been subjected to by circumstances, and in consequence to the passions that induced them to provide for those necessities” [Rousseau 2018, 14]. Later this idea was accepted by Condorcet and developed by him in his famous theory of the progress of the human mind.

The concept of perfectibility in the theory of progress of Nicolas de Condorcet

Condorcet’s *Sketch for a Historical Picture of the Progress of the Human Mind* (1795) is often called “the testament of the Enlightenment” and “a real philosophical hymn of progress” [Bouton 2004, 38]. The purpose of this work was “to show, from reasoning and from facts, that no limit has been set to how much the human faculties can improve; that the perfectibility of man really is indefinite; that the advances in this perfectibility – from now on they’ll rise above every power that would block them – have no limit except the duration of the planet that nature has placed us on” [Condorcet 2017, 2].

Inspired by the *Discourse* of Rousseau, Condorcet asks the following questions: Does the progress of the sciences and arts menace the happiness of mankind in any way? And could progress cause an increase in social inequality, despotism and tyranny?

For Condorcet, the progress of science and the arts is inextricably linked, on the one hand, to the progress of legislation and, on the other hand, to the progress of education, or to the “art of education”: “The advances of the sciences,” he writes, “guarantee advances in the art of education, which then speed up those of the sciences; and this reciprocal influence, whose action is ceaselessly renewed, must count as one of the most active and powerful causes of the perfecting of the human race” [Condorcet 2017, 107]. Progress in these two areas makes it possible to pull through an inveterate social disease, which comprises natural inequality: “...properly directed education corrects the natural inequality of the faculties rather than increasing it, just as good laws remedy the natural inequality of the means of subsistence” [Condorcet 2017, 100]. The progress of necessary arts leads to the adoption of even-handed laws and to the development of such political decisions that ensure humanism, welfare and public justice. Without such progress, it is impossible to overcome “a big gap between the rights that the law grants to the citizens and the rights they really enjoy, between the equality that political institutions establish and the equality there is among individuals...” [Condorcet 2017, 97–98].

Relying upon Rousseau, Condorcet emphasizes that it is not at all perfectibility that provokes social inequality. The difference between the rights of people and inequality in society is due, in his opinion, to three fundamental reasons: “inequality of wealth, inequality of status

between someone whose means of subsistence are secure for himself and will be inherited by his family and someone whose resources depend on the length of his life or rather of the part of his life in which he can work, and lastly inequality of education” [Condorcet 2017, 98].

Condorcet agrees with Rousseau that humanity should aim to eliminate all inequalities, but, in contrast to the Genevan, believes that it is impossible to achieve this goal by returning to the state of nature and refusing the progress of the sciences and arts: “Our hopes for the future state of mankind come down to three points: the destruction of the inequality among nations, advances in equality within individual nations, and the real improvement of mankind” [Condorcet 2017, 94].

According to Condorcet, perfectibility is the unique basis of any progress, by which he implies the “real improvement of our moral, intellectual and physical faculties... That last one might result from any of three improvements: in the instruments that increase the power of those faculties, in the instruments that direct the faculties’ use, or in the natural organisation of the faculties themselves” [Condorcet 2017, 95]. From the perspective of the French philosopher, the main characteristics of perfectibility are the absence of any restrictions on its projections and its perpetual increase: “All these causes of the improvement of the human species, all these means that ensure it, must from their very nature exert an always active influence and continually broaden their scope” [Condorcet 2017, 109]. Its main consequences will be “truth, virtue and happiness” [Condorcet 2017, 110] of individuals and society as a whole, in which the direct result of progress is “to bring the common interest of each individual closer to... the common interest of all” [Condorcet 2017, 105].

In his doctrine, Condorcet defines two directions for the boundless improvement of humanity: the physical improvement and the moral and intellectual improvement. If the moral development includes the progress of the human mind, improving the quality of education, eliminating inequalities and extirpation prejudice, the physical enhancement involves amelioration of the quality of life (“advances in conservative [conservatrice] medicine, healthier food and housing, a life-style that develops physical powers by exercise without ruining them by excess, and lastly eliminating degradation’s two most active causes, extreme poverty and extreme wealth, are bound to prolong man’s average life-span and secure for him better health and a sturdier constitution” [Condorcet 2017, 109]) and a constant increase in life expectancy. Condorcet writes: “Would it be absurd now to suppose that this improvement is capable of indefinite progress; to suppose that the time must come when death will be due only to extraordinary accidents or to the decay (slower and slower down through the generations) of the person’s vital forces, and that eventually the amount of time between a

person's birth and this decay will have no assignable value? Certainly man won't become immortal; but can't the interval between a man's birth and his death – i.e. the usual time at which naturally, without illness or accident, he encounters the difficulty of staying in existence – become ever longer?" [Condorcet 2017, 109].

One of the first opponents of Condorcet's theory of progress was the English economist T. Malthus, who, four years after the first publication of *Sketch*, published his *Essay on the Principle of Population, as it Affects the Future Improvement of Society with Remarks on the Speculations of Mr. Godwin, M. Condorcet, and Other Writers* [Malthus 1980], whose title already indicates the polemical nature of this work.

Thomas Malthus's criticism of the perfectibility

The main thesis of Malthus is that the population of the Earth increases with a force far exceeding the ability of the Earth to produce means of subsistence. In other terms, the population of the planet is growing at geometric rate, and the means of subsistence are multiplying at arithmetic rate: "Malthus' *Essay on the Principle of Population* was published at exactly the right moment to capture the prevailing mood of England. In 1793, the mood had been optimistic; but by 1798, hopes for reform had been replaced by reaction and pessimism. Public opinion had been changed by Robespierre reign of terror and by the threat of a French invasion" [Avery 1997, 63].

This work was a direct reply of Malthus to the optimistic theories of William Godwin and Nicolas de Condorcet, who predicted positive political reforms and progress of the human mind. As far as Condorcet put a person's ability to improve on the basis of his theory of progress, Malthus understandably criticized this idea, devoting three chapters of his work to it: the eighth ("...Mr Condorcet's sketch of the progress of the human mind – Period when the oscillation, mentioned by Mr Condorcet, ought to be applied to the human race") [Malthus 1998, 45–48], the ninth ("Mr Condorcet's conjecture concerning the organic perfectibility of man, and the indefinite prolongation of human life – Fallacy of the argument, which infers an unlimited progress from a partial improvement, the limit of which cannot be ascertained, illustrated in the breeding of animals, and the cultivation of plants") [Malthus 1998, 49–54] and twelfth ("...Mr Godwin's and Mr Condorcet's conjecture respecting the approach of man towards immortality on earth, a curious instance of the inconsistency of scepticism") [Malthus 1998, 69–78].

In the eighth chapter of *Essay*, Malthus consistently represents Condorcet's ideas about the forms of social support for people living by their labor and, at the same time, dependent on the upper classes, and then he argues against giving them any guarantees from the State.

Among other things, for the support of such a class of people Condorcet proposed to establish special funds (in the name and under the protection of the State and society). However, objecting to the French philosopher, Malthus notes that among the working population there are unscrupulous workers, “the idle and the negligent” [Malthus 1998, 47], who, counting on social support, would stop working at all or would begin to produce a substandard product that does not require large expenditures. Furthermore, there is a high risk that the majority of workers would not carry out “that animated activity in bettering their condition which now forms the master spring of public prosperity” [Malthus 1998, 47], for the reason that for them the public wealth is not an absolute value, and labor always perceived as a need due to poverty but not internal necessity. And then the idea of Condorcet will be irrelevant to reality.

The second objection of Malthus to the formation of social funds is that confidence in social welfare will lead to an increase in the number of marriages and a demographic explosion. Whereas financial resources tend to only decrease but not to increase. And since the periods of exceeding the population over the means of its existence “will for ever continue to exist” [Malthus 1998, 48], the Condorcet’s idea to create special funds is misguided and devoid of any meaning, according to Malthus.

In the ninth chapter of his *Essay* Malthus analyzes the “organic perfectibility” in Condorcet’s telling. While Condorcet himself never called this human ability in such terms, Malthus was based on its natural character, that is, the inherent immanence of human nature. From Condorcet’s perspective, the disappearance of poverty and excessive riches, which previously inevitably contributed to the degradation of society, needs to happen in a natural way due to the development of science, technology, the arts and, along with them, the morals, which ultimately will inevitably lead to an increase in human longevity.

Malthus totally disagrees with the concluding observations of Condorcet, indicting him of a logical falsity. First of all, according to Malthus, the thesis about the infinity of human amelioration has a non-scientific character and is not supported by natural laws: “The average duration of human life will to a certain degree vary from healthy or unhealthy climates, from wholesome or unwholesome food, from virtuous or vicious manners, and other causes, but it may be fairly doubted whether there is really the smallest perceptible advance in the natural duration of human life since first we have had any authentic history of man” [Malthus 1998, 49–50]. In the second place, “the observable effects of climate, habit, diet, and other causes, on length of life have furnished the pretext for asserting its indefinite extension; and the

sandy foundation on which the argument rests is that because the limit of human life is undefined; because you cannot mark its precise term, and say so far exactly shall it go and no further; that therefore its extent may increase for ever, and be properly termed indefinite or unlimited” [Malthus 1998, 50–51]. For example, species of flora (flowers, fruit plants) cannot grow in size *ad infinitum* even as a result of the most careful selection [Malthus 1998, 82–83]. However, Malthus himself could be reproached with a skewed nature of a way of thinking, for focusing on quantitative changes, he gives little weight to qualitative transformations in organic nature. This way, following Condorcet, we can talk not only about increasing the size or volume of the fruit but about increasing the duration of flowering plants, about the constant improvement of the taste and smell of fruits, etc. Perhaps Condorcet was not as inconsistent as it seemed to Malthus?

D. Todes in his book *Darwin without Malthus: The Struggle for Existence in Russian Evolutionary Thought* [Todes 1989, 14] indicates that for Malthus the processes that represented an unbalanced progression were the cause of stagnation in nature and society, for that reason he considered any predictions of reforms and social progress unattainable, so he proposed to remove obstacles to free competition between people rather than pursue unnatural and impossible goals: “I see no way by which man can escape from the weight of this law which pervades all animated nature. No fancied equality, no agrarian regulations in their utmost extent, could remove the pressure of it even for a single century. And it appears, therefore, to be decisive against the possible existence of a society, all the members of which should live in ease, happiness, and comparative leisure; and feel no anxiety about providing the means of subsistence for themselves and families” [Malthus 1998, 5].

Malthus proposed to distinguish the idea of the endlessness of historical progress and the progress, the limits of which cannot be precisely defined and for which there are no scientific prerequisites [Malthus 1998, 53]. For him, the “infinity” of progress lies in the actual lack of knowledge of the border, passing on which, the improvement of the human species really takes place. Condorcet, on the contrary, argued that by accumulating useful knowledge and not forgetting the lessons of the past, mankind is constantly pushing its “boundaries,” and if the process of learning has no limits, due to this the progress is inexorable.

When speaking of the incoherence of Condorcet, Malthus pays regard to another thesis about the “infinite duration of human life” from a religious point of view, considering it groundless for the reason that Condorcet himself held the atheistic views. For Malthus, Christian priest, this position was completely alien, the immortality of the human soul for him is a religious dogma that does not require proof: “...the resurrection of a spiritual body from a natural body, which may

be merely one among the many operations of nature which we cannot see, is an event indefinitely more probable than the immortality of man on earth" [Malthus 1998, 76]. And although improving the quality of mortal life was important for Malthus as a social thinker, for him as a clergyman, achieving the immortality of the human soul was a more crucial task, and that is why he called the Condorcet's idea of infinite extension of the human's physical life on Earth "the most absurd" and "curious" [Malthus 1998, 75].

During his lifetime, Malthus had many opponents, and it is clear that his criticism of Condorcet gave even greater significance and relevance to the ideas of the French thinker, as it is evidenced, for example, by the works of the Russian physicist S. Kapitsa. More than two centuries after Condorcet's death, Kapitsa demonstrates a surprising shared understanding with his theory of progress, manifested, above all, in Kapitsa's controversy with Malthusianism.

Condorcet's heritage in the works of Sergey Kapitsa

In the work *Global Population Blow-Up and After. The Demographic Imperative in a Changing World* (2006), Kapitsa claims that the population of the Earth will not increase exponentially but hyperbolically: "On a semi-logarithmic plot growth up to the population explosion is hyperbolic and when it approaches year 2000, it goes off to infinity" [Kapitsa 2006, 3]. Therefore, the theory of Malthus, progressive for its time, has now lost its relevance: "Malthus's approach and understanding of the world is directly related to the development of classical mechanics in the 18th century and corresponded to the mechanistic, Newtonian methodology and views of the Enlightenment as well as to the views of the Physiocrats" [Kapitsa 2009, 11]. At the present stage of the development of society, science and technology, "only by rising to the global level of analysis, by overestimating the scale of the problem, considering the entire population of the world as a single object, as an interconnected system, was it possible to describe the development of humanity altogether" [Kapitsa 2009, 13]. In other words, Kapitsa considers it necessary to make an analysis in "non-additive and non-linear" way [Kapitsa 2006, 19] and to use the physics of nonlinear phenomena and non-equilibrium processes that were developed in the science of the 20th century to estimate the phenomena described by Condorcet and Malthus. Analyzing the hyperbolic growth of humanity, he proposes to link the population growth with its development, "when development is the square of the world's population" [Kapitsa 2009, 26], believing that "collective interaction is determined by the mechanism of distribution and reproduction of generalized information on a human scale, defining its self-similar development. Therefore, the origin and nature of the quadratic law of human growth should be

explained by the transmission and reproduction of information. There is no need to refer to a particular mechanism, in particular economic, which leads to an increase in numbers. This follows from a consistent phenomenological analysis of the hyperbolic growth of the population of our planet” [Kapitsa 2009, 26]. Kapitsa refutes the thesis of Malthus about the endless exponentially increase in population, considering that population growth has not only the explosive nature of development (along hyperbola) but also its limit. He calls this phenomenon “the principle of the demographic imperative” [Kapitsa 2009, 29], according to which “growth is determined by the internal processes of human development, unlike the population principle of Malthus, according to which population growth is limited by external resources. This is a significant conclusion that has far-reaching consequences in determining the paths of human development, since not quantitative growth but its qualitative development is now becoming a central factor in our social evolution” [Kapitsa 2009, 29].

In other words, refuting Malthus’s thesis on limiting population growth by external resources, Kapitsa simultaneously confirms Condorcet’s idea that internal development is the decisive factor in the evolution of humanity. The “internal development” presumes the improvement of the quality of education, medical services, the development of social policy, which are based on the desire of mankind to improve their own abilities and create a healthy environment. To describe the present and predict the future of humanity, it is necessary to “fundamentally change the research method, point of view both in space and in time, and consider humanity from the very beginning of its appearance as a global structure” [Kapitsa 2009, 14]. Historicity, globality and continuity – these are the three fundamental principles that lie at the heart of this new method, according to Kapitsa. But after all, in essence, Condorcet writes on the same thing: “This progress is governed by the same general laws as can be seen in the development of the faculties of individuals, because it is just the upshot [résultat] of that individual development considered at once in many individuals united in society. That upshot at any instant depends on the upshots at the preceding instants and has an influence on future ones. So this picture is historical, because it is a record of continual change based on the successive observation of human societies in the different eras they have gone through” [Condorcet 2017, 2]. Kapitsa, aided by mathematics, was able to develop and confirm the correctness of Condorcet’s intuition, which turned out to be untimely and misunderstood for his times.

Thus, the ideas of globality and continuity are common to Condorcet and Kapitsa. In such a way, Kapitsa’s reasoning is based on the idea of “collective interaction of all factors,” whereas Condorcet spoke about “linking and linking facts,” or “a continuous series of facts and

observations.” According to Kapitsa, “...the global population not as a mere sum of all countries, but as an entity, as a dynamic system. This and the recognition of the collective nature of the interaction, driving the growth of the global population, were essential. These connections became the main factor in uniting people in organizing their cooperation synchronizing development and setting up common patterns of action” [Kapitsa 2006, 15]. Condorcet writes the same: “From the era when alphabetical writing was first known in Greece through to the present state of mankind in the most enlightened countries of Europe we have an uninterrupted series of historical facts and observations, so that our picture of the journey and the advances of the human mind becomes strictly historical. Philosophy no longer has to guess at anything, has no more hypothetical surmises to make; it has only to collect and arrange facts, and exhibit the useful truths that arise from their inter-connections and from them as a whole” [Condorcet 2017, 5]. That is what Kapitsa did, “...we will turn to the phenomenological, holistic description of growth and we will consider humanity as a single, strongly connected system, in which the general mechanism operates for the development, and thus we will understand what is happening” [Kapitsa 2009, 14].

Working on this subject, Kapitsa set himself two goals: on the one hand, to determine why human development and population growth should be associated not with external factors (according to Malthus, such as epidemics and wars) but with internal ones; and, on the other hand, “to express this conclusion in the language of mathematical models and physical theories, which... are based on facts of history and basic concepts adopted in economics and social sciences” [Kapitsa 2009, 17]. Analyzing in *The General Theory of Human Growth* three models of human growth (linear, exponential and hyperbolic), Kapitsa concludes that it is the latter that most accurately reflects the real state of affairs: “At the end of anthropogenesis, the hyperbolic growth of the world’s population began, and since then it has increased in direct proportion to the square of the world’s population up to our time. Slowly at the beginning, as the population grows, the growth rate increases, and as a result it goes faster than exponentially, rushing to infinity at a finite time around 2025” [Kapitsa 2009, 21].

The growth rate of the world’s population with hyperbolic (“explosive”) development is proportional to the square of the world’s population, and not just the population size (as with exponential growth, which reflects each person’s ability to reproduce). Comparing the hyperbolic nature of growth with branched chain reactions in chemical physics, as a result of which a nuclear explosion occurs in an atomic bomb, Kapitsa notes that “... the quadratic term was decisive in determining growth all through our history and expresses the contribution of the

informational component to the global production factor. This can be seen as the domination of the ‘software’ of global development, input, which is associated with culture, science and all those factors, like co-operation, communication, consciousness and memory in contributing to the meta-economic growth of mankind... The model suggests that information is not a minor component of macroeconomics, but in global meta-economics it is becoming the controlling factor of growth. In the emerging information and knowledge society a new set of values and priorities will develop, which can have a significant impact on our future, changing attitudes towards the environment, consumerism, population growth and control, and the quality of life itself” [Kapitsa 2006, 11].

The difference between the exponential and hyperbolic growth trajectories lies in the fact that exponential growth implies only an individual’s ability to reproduce, independent of other people and external factors. Hyperbolic growth occurs as a result of a collective mechanism [Kapitsa 2009, 4] of population multiplication, and it is associated with the development of mankind, which, in turn, is subordinated to human consciousness, his culture and advanced knowledge transfer system: “Therefore, if the mind selects a person among of all other species of animals that are comparable with us, then it is in the appearance of the mind that the answer to this riddle of human evolution should be sought” [Kapitsa 2009, 28].

Thus, Kapitsa’s reasoning and conclusions are in line with the Condorcet’s theory of progress: “... if we consider this same development’s results for the mass of individuals living at one time in one region, and follow it down through the generations, that gives us the picture of the advances of the human mind” [Condorcet 2017, 2].

Charles Darwin and the “biologization” of perfectibility

The ideas of Malthus had not only opponents but also direct successors. So, his *Essay* became one of the theoretical sources of Charles Darwin’s ideas, who was impressed with his views on social philosophy, religion and scientific methodology [Todes 1989, 15], his concepts of “populational arithmetic” [Todes 1989, 18], the “superfecundity principle” [Todes 1989, 18] and the idea of “struggle for existence” [Todes 1989, 13]. Twice in his work *On the Origin of Species by Means of Natural Selection* (1859), Darwin described his own concept of struggle for existence as “the doctrine of Malthus, applied to the whole animal and vegetable kingdoms” [Darwin 1936, 13]. But Darwin puts his special meaning into this concept, for him the “struggle for existence” is “an effort to overcome a difficulty (through relations of dependence, chance, variation or competition)” [Todes 1989, 20], while

Malthus rather argues about “zero-sum competition for a scarce resource (subject to the law of diminishing returns)” [Todes 1989, 20].

Reasoning about the influence of Malthus on Darwin [Todes 1989, 18], we note that, firstly, Malthus “radically changed Darwin’s attitude towards the balance of nature” by shifting the evolutionist’s attention from “the final equilibrium prescribed by the balance of nature to the dynamic process that creates the equilibrium”; secondly, that it was Malthus who first described scientifically substantiated and documented cases of intraspecific competition; and, thirdly, that due to Malthus, it became obvious to Darwin that the adaptation of living organisms is a result of a fierce struggle between them.

A common place in the research literature is to highlight the three main elements of Darwin’s concept, which make it possible to see him as the inheritor of Malthus: first of all, Darwin actively uses the term “struggle for existence” and reproduces a number of Malthusian arguments related to this concept; secondly, the integration and extensive use of the so-called “populational arithmetic” and other demographic mechanisms that allow describing the process and the results of this struggle; and, in the third place, a special attention to the “emphasis of intraspecific conflict” [Todes 1989, 19]. We would like to add to these three elements the fourth one – the capacity for perfection and constant progress, perfectibility in a biological sense. What Malthus calls “organic” perfectibility.

Darwin develops his own idea of progress as a consequence of the evolution and amelioration of the race in his books *On the Origin of Species* and *The Descent of Man, and Selection in Relation to Sex* (1871). In these works, he introduces two concepts as fundamental to his theory of evolution: the struggle for existence and natural selection [Darwin 1936, 51–52]. He obviously relies on the theory of Malthus in substantiating his principle of the struggle for existence in relation to the plant and animal worlds. But the concept of natural selection, arising from the struggle for existence, he proposes to refer to the “selection made by man”: “This preservation of favourable individual differences and variations, and the destruction of those which are injurious, I have called Natural Selection, or the Survival of the Fittest” [Darwin 1936, 64].

And even if the struggle for existence and natural selection “are not likely to be driven by the idea of progress, they still have a progress effect. In the Darwinian doctrine of evolution, there is no internal prescriptive need for biological progress, but it seems inevitable that this gradual process will result in some progress” [Le Dévédec 2015, 95]. The idea of biological progress is a natural result of the process of natural selection, which inevitably leads to amelioration and improvement of species and individuals: “And as natural selection works solely by

and for the good of each being, all corporeal and mental endowments will tend to progress towards perfection" [Darwin 1936, 373].

The concept of natural selection, which in Darwin's theory is a source of improvement of species and individuals in the animal world through the extinction of the weak and the survival of the strong, can be equally successfully applied to the evolution of human communities. Calling a human a "social animal" because of "his wish for society beyond that of his own family" [Darwin 1936, 480], Darwin believes that this struggle is an integral part of his nature, and "of all the differences between man and the lower animals, the moral sense or conscience is by far the most important" [Darwin 1936, 471]. He explains the ability for self-improvement in a person by the presence of social instincts, which, becoming a measure of good and evil in society, formed the moral level of members of this society and helped them develop their own mental abilities: "It is, therefore, highly probable that with mankind the intellectual faculties have been mainly and gradually perfected through natural selection" [Darwin 1936, 497]. In other words, according to Darwin, it is the presence of social instincts that contributes to the self-improvement of individuals and social progress, so that we can talk about a new, biological concept of progress, which allowed us to look at the history of society from the point of view of evolution. And Darwin's works provide an opportunity to reframe not only the concept of perfectibility but the whole concept of historical progress in the context of its "biologization": "Through this biologization of history, the entire political and historical horizon underpinned the idea of Enlightenment perfectibility, which was shaken in favor of an evolutionist and necessary view of historical change" [Le Dévédec 2008].

However, according to Darwin, although social instincts are an integral part of the progress of human society, these are not its only driving factors because "progress seems to depend on many concurrent favourable conditions, far too complex to be followed out" [Darwin 1936, 500–501]. Like Condorcet, Darwin connects the idea of progress and improvement of a person with his education and upbringing: "The more efficient causes of progress seem to consist of a good education during youth whilst the brain is impressible, and of a high standard of excellence, inculcated by the ablest and best men, embodied in the laws, customs and traditions of the nation, and enforced by public opinion" [Darwin 1936, 143].

Another significant phenomenon, the impulse for which also served as the development of Darwin's theory, was social Darwinism. Drawing attention to the fact that in a civilized society, people are trying to delay the process of extinction of its members, creating "asylums for the imbecile, the maimed, and the sick," making laws for the poor and prolonging the life of the sick to the last opportunity, Darwin

concludes that “this must be highly injurious to the race of man” [Darwin 1936, 133–134]. As a solution to this problem, he proposes to use one of the principles of demographic control, drawn by him also from the work of Malthus, who spoke not only against the Condorcet’s idea of creating social funds to help the poor but also against the possibility of unsupervised reproduction of the poor: “We must therefore bear the undoubtedly bad effects of the weak surviving and propagating their kind; but there appears to be at least one check in steady action, namely that the weaker and inferior members of society do not marry so freely as the sound; and this check might be indefinitely increased by the weak in body or mind refraining from marriage, though this is more to be hoped for than expected” [Darwin 1936, 134].

In the Darwin’s opinion, the biological improvement of the human species is promoted, firstly, by the selection of “well-endowed individuals” and, secondly, by the “elimination of the worst” moral inclinations in society (execution or imprisonment for criminals, isolation of the insane, suicidal melancholic, etc.) [Darwin 1936, 136–137]. Thus, in the context of social Darwinism, the natural selection and the struggle for existence in human societies become the main factors of history.

Nicolas de Condorcet’s idea of perfectibility as the basis of the concept of transhumanism

The idea of perfectibility described as a conductor, a goal and at the same time an instrument of progress of the human mind can be called very progressive and avant-garde for its time. And today it is embodied in the concept of transhumanism, the ideologues of which push forward to proclaim Condorcet as one of its spiritual mentors.

From this perspective, N. Bostrom, a Swedish philosopher, apologist of transhumanism and one of the founders of the international organization Humanity+, calls Condorcet one of the ideologists of this movement, believing that transhumanism is an extension of the humanistic tradition of the Enlightenment with its idea of endless improvement of human individuals [Bostrom 2005, 3]. Transhumanists believe that defining perfectibility as improving “by real improvement of our moral, intellectual and physical faculties... That last one might result from any of three improvements: in the instruments that increase the power of those faculties, in the instruments that direct the faculties’ use, or in the natural organisation of the faculties themselves” [Condorcet 2010, 222–223], Condorcet that way predicted the future of the human race with its tendencies to improve itself with the assistance of transhumanist technologies.

At first glance, the goals and objectives of improving the human race are similar for Condorcet and modern transhumanists. For example, the statute of the Russian Transhumanist Movement enshrines the following goal: “With the help of science and modern technologies, to develop an

infinite personality, going beyond the limits of human capabilities that are now considered natural” [Russian Transhumanist Movement 2008, paragraph 2.1]. Two key characteristics perfectibility in the Condorcet’s interpretation, which are the continuous improvement of human qualities and the absence of limits for this improvement, are declared the foundation stone of a transhumanism [Coenen 2009, 24].

However, calling *Sketch* “a possible scientific and technical program for improving human nature” [Le Dévédec 2015, 31], we should not forget that this idea in Condorcet’s works has more likely a socio-political substantiation, where the perfectibility, first of all, is a source of free will of each individual. The French philosopher, who is called the “philosopher of freedom,” is not ready to sacrifice his own democratic concept of perfectibility for scientific and technological progress, conceived as the embodiment of the key principles of the Enlightenment (freedom, equality, rationality, autonomy, humanity, striving for truth, etc.). That is why, trying to interpret Condorcet’s idea of a perfectibility in the context of transhumanism, we should not forget that while addressing the prospects of “real human improvement,” Condorcet meant first of all “the destruction of inequality between nations” and “the progress of equality between different classes of the same of the people” [Condorcet 2010, 221], thereby indicating that the socio-political side of perfectibility prevails over the scientific side.

Conclusion

In summary, the concept of perfectibility as a symbol of the Enlightenment, is the distinctive characteristic and foundation of the human race, its ability to improve. Perfectibility is not a meta-quality, a personal capacity that determines the productivity of cognitive, intellectual or social processes (such as, for example, learning, adaptability, intelligence, etc.) but rather a condition (or circumstance) that opens up the prospect of development of other qualities of a person, and thus contributing to the improvement of men and mankind as an integral unified system. Therefore, perfectibility, to one degree or another, becomes the fundamental category not only of the theory of progress of each of the authors reviewed but also the basis for understanding the genesis of transhumanism.

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