

DOSTOYEVSKY EXTENDED: ALDOUS HUXLEY ON THE GRAND INQUISITOR, SPECIALISATION AND THE FUTURE OF SCIENCE

“Knowledge alone will teach us (...), that man in fact does not have and never had neither will, nor wants, but is in fact something like a piano key, or an organ pin; that there are laws of nature beyond the world; and everything that man does is not happening in accordance with his will, but just happens, in accordance with the laws of nature. It is sufficient to discover these laws of nature and man will cease to be responsible for his deeds, and will lead his life with ease”.

– Fyodor Dostoyevsky, “Notes from the Underground”

1. INTRODUCTION

Aldous Huxley’s *Brave New World* (BNW) remains one of the most important books of the twentieth century. The phrase “brave new world” is rooted deeply in our culture: if one searches for it in academic databases or the Internet, thousands of results will appear, which are connected not necessarily to Huxley’s work itself, but to spheres ranging from the on-line cataloguing systems, entomology, economic innovations, development of genetics, information sciences, medical technologies or social sciences.¹ The secret of this popularity stems most likely from the conviction among readers that the course of history tends towards the reality presented in BNW, making the novel an adequate point of reference. The readers seem to believe that even if one cannot be sure whether the biological alteration of the human race will be stimulated by state or by private actors, one thing is clear at the beginning of the twenty-first century: the technological shift has already started and is likely to continue rapidly (see: Fukuyama, 2004; Kurzweil, 2000, 2005; Naisbitt 1990, 2003; also: section 6 of this paper).

Throughout his lifetime Huxley wrote three futuristic novels, of which BNW was the first. After the publication of BNW in 1932 came *Ape and Essence* (1948) with his final novel *Island* being published in 1962 (see: Huxley 1992, 2004, 2004b). As R.T. Sion puts it: “*Brave New World* shows how mental conditioning and drugs can produce a mindless society devoid of human values. In *Ape and Essence* a nuclear war causes mankind to degenerate into ruthless animals. Only in *Island*, the most idyllic of these utopian novels, has humanity learned to accept those technologies that promote human advancement and to discard all others” (Sion, 1999, p.iii).²

¹ See the resemblance of BNW to an anthill community system from an entomological perspective (Sleigh, 2002). The anthill analogy is suggested in BNW itself (“the social body persists although the component cells may change”, Huxley, 2004, p.84); in *Brave New World Revisited* Huxley explicitly compares the physiologically conditioned BNW citizen to a termite, saying e.g. “For the individual termite, service to the termitary is perfect freedom” (see: Huxley, 1958).

² The **evolution of thought** is clearly visible: (1) from the merely dystopian novel (BNW), with its passive vision of state-controlled society, Huxley went on in *Ape and Essence* (AaE) to reflect on the situation of humanity devastated by the atomic bomb, where only some refugees have the willingness and courage to establish society anew, to his final novel, in which the complete image of an isolated, happy society is presented (*Island*). Respectively, other ideas also evolved: (2) from the pure pessimism of BNW, via a mix of pessimism and optimism in AaE (Sion, 1999, p.159) to the final set of clues for humanity, allowing it to live in peace in *Island*; (3) from the satire of the drug-happy culture in BNW to the acknowledgement of the wise use of drugs as the

It should be noted that Huxley's scientific inspirations so far did not receive enough attention from the historical perspective.³ Peter Firchow's article (1975) later incorporated into the literary study of *Brave New World* (1984, reviewed: Fjellman, 1985) still remains an extremely useful source of reference when examining Huxley's antipathy toward the ideology of Freudianism. Unfortunately, it shows no wider context of the debate on science and society. The lack of a broader contextualisation seems to remain an intellectual gap in studies on Huxley who from the great synthesis of his fears presented in BNW up to the philosophical publications and last essays, was concerned with the social impact of technology and the moral lag between science and society - the human inability to use technological capacities wisely (com. Baker, 2001, p.37).⁴

2. HUXLEY'S IMAGE OF SCIENCE - INSPIRATIONS

When one searches through historical sources it is sometimes striking to find that all of the crucial issues raised in BNW were actually widely discussed at the time among intellectuals, many of whom were Huxley's friends or acquaintances. Some of the critics even wondered "if Huxley put any original ideas into his book" (Thody, 1974, pp.50-51). Huxley's ideas allegedly come from the works of J.B.S. Haldane and Bertrand Russell in terms of science and technology and Mathew Arnold, Eugene Zamiatin, H.G. Wells, Dostoyevsky, Shakespeare, and Einstein when it comes to literary form and his perception of metaphysics.⁵

Whereas the accusation of filching literary inspiration constitutes a common experience of famous writers⁶ and is hard to disprove since every writer assimilates the piles of literature from different periods throughout his life, the accusations of pilfering the perspectives of science and technology can be scrutinised, as the scope of analysis will be narrower.

The study of Huxley's biography reveals that Julian Huxley, Aldous' older brother, was probably the one who influenced his ideas on science the most. He was a successful scientist and surely was an authority and inspiration for the young Aldous, who wanted to follow his footsteps and become a doctor.⁷ However, Julian never mentioned this fact and emphasises his admiration for his brother as an independent researcher of scientific knowledge. As to

gateway to the ultimate reality in *Island*; (4) from the rejection of the possibility of change (*BNW*), through its acknowledgement in *AaE* to the description of possible change (individual, spiritual self-perfection and a somewhat pantheistic worldview); (5) from harnessing science and technology to establish and determine the fate of humanity (*BNW*), through a reflection on the destructive powers of technology (*AeE*), to the superiority of the quality of human life over some aspects of technological progress (p.178).

³ The author understands "scientific inspirations" as the intellectual and personal links that inspired Huxley's image of science in *BNW*, not as the elaboration of Huxley's ideas on science in general. The latter have already received some scholarly attention; the list of recent publications on Huxley is available at the webpage of the Centre for Aldous Huxley Studies: http://www.anglistik.uni-muenster.de/huxley/huxley_research.html.

⁴ One essay on the evolving image of scientist in Huxley's novels should be mentioned (Baker, 2001). The author quite reasonably seeks analogy between Huxley's critique of technology ("new romanticism", see: Huxley, 1960) and the notions like Max Weber's and Jurgen Habermas' "instrumental rationality" or Herbert Marcuse's "technical reason" (p.38). The analogies in the text remain purely theoretical, not historical, though.

⁵ Common features of some science-fiction utopias are elaborated in Szacki, 2000.

⁶ Jacek Kaczmarek, Polish poet, encapsulated this phenomenon in a poem describing his discussion with the muse (entitled: "Do Muzy suplikacja przy ostrzeniu pióra" [A supplication to the Muse while sharpening a quill]. "You are the daughter of man's memory

So many poems are remembered

Gatherings of wise men will tell me

Which my phrase from where has been taken".

⁷ The hopes of a medical career he dreamt of were precluded by a staphylococcal eye infection, which damaged his vision permanently, making him purblind and confining eye-perception to blurred light stains. This made him search for alternative treatment methods; he actually achieved some successful results thanks to the use of Bates Method, which he described in his *Art of Seeing* (see: Huxley, 1942).

Brave New World, he claimed elsewhere that Aldous never asked him to help with the novel (J. Huxley, 1965, p.22). He also recalled some situations when it was Aldous who made him familiar with the latest research results (J.Huxley, 1978 II, p.167).

J.B.S Haldane, a geneticist, evolutionary biologist, visionary socialist and Julian's collaborator also influenced the young Aldous who lived in Haldane's parental house, Cherwell, during his first year in Oxford (Firchow, 1975, p.305). Even if this influence was initially indirect it is logical that the flow of ideas between Haldane and Aldous took place before the 1920's through the discussions of the Huxley brothers. It is a similar case with Bertrand Russell, a philosopher and mathematician who frequently met Huxley in the late stages of war (p.305, see also: Dunaway).

The table below juxtaposes *Brave New World* with other published literary works which at least partially cover its content when it comes to technological foresight.

<i>Brave New World</i> and some other literary works containing a similar image of science					
Year	1921	1923	1923	1931	1932
Name	Aldous Huxley	J.B.S. Haldane	H.G. Wells	Bertrand Russell	Aldous Huxley
Title	<i>Crome Yellow</i>	<i>Daedalus</i>	<i>Men Like Gods</i>	<i>Scientific Outlook</i>	<i>Brave New World</i>

Table I, based on: Firchow, 1975, 1976

In *Crome Yellow* Huxley anticipated many of the ideas later incorporated into BNW, concerning the physiological and psychological control of the society. One of the characters in the novel envisions a future, when state incubators will exist and people will be made in bottles; the population will be bred in accordance with the needs of the current world situation; the family system will vanish, sex will be separated from reproduction. He also develops the principle of The Rational State which resembles caste separation and conditioning in BNW (Firchow, 1975, p.304). It seems these ideas were taken from J.B.S. Haldane, who in his 1923 essay (the substance of which dates back as far as 1912⁸) *Daedalus, or Science and the Future* put a small science-fiction reportage called: "extracts from an essay on the influence of biology on history during 20th century", written from the perspective of a student living in the future. Similarly to *Crome Yellow*, it introduces ectogenesis (*in vitro* breeding), elaborates on the social effects of behaviourism and psychology, free sex, the decline of religion, the abolition of disease, the possibilities of the world state and hopes that biologists may educate society by enabling it to use science wisely (see: Haldane, 1924).

One year later Bertrand Russell published *Icarus*, a pessimistic answer to *Daedalus* (Russell, 1924) and continued the topic in subsequent years, publishing inter alia *The Scientific Outlook* in 1932 (a few months before the publication of BNW), where he spoke of keeping people happy by chemical means, the central control of access to high culture (e.g. licenses for reading Shakespeare), the extermination of non-reconditionable citizens and a strict

⁸ "Although *Daedalus* itself did not appear until after *Crome Yellow*, the substance of its argument goes back as far as 1912 ... Nine years later, at just about the time Huxley was getting down to work on *Crome Yellow*, Haldane refurbished his essay and read it before the New College Essay Society. Haldane's friend and later collaborator, Julian Huxley, was also at Oxford at this time as a biology don ... The chances are extremely good that Aldous Huxley knew about the essentials of what was to become *Daedalus* by 1921 at the latest" (Firchow, 1975, p.306).

intellectual hierarchy (Firchow, 1975, p.308). Similar ideas are to be found among other science-fiction writers and philosophers of the times (e.g. Wells, 1923).⁹

It seems that whereas Julian was Aldous' first scientific educator, Haldane was the supplier of all illuminating vision, the framework of which Aldous reflected to develop a new, enhanced one on his own. Of course, this conclusion does not preclude the possibility that the final version of *Daedalus* was the result of common discussions of all three gentlemen (Lewicki, 2007). Moreover, it testifies that the ideas synthesised by Huxley in BNW were very much in the air in the 20's, regardless of whose imagination pictured them first. Of particular note, none of the involved intellectuals seem to have ever publicly claimed that *Brave New World* extensively borrows from any of their works (see: Firchow, 1975, p.302). Considering Aldous' friendship with Haldane and Russell, it is likely that they understated their influence on him to give credit to their young pupil, who developed their common vision.

3. HUXLEY'S INEQUATIONS

3.1. Huxley as Realist

The image of science in BNW is not as straightforward as it may at first seem. Although the majority of readers will definitely consider it to be gloomy, it should be known that this kind of assessment carries some inherent liberal presuppositions typical for the modern Western state of mind. The principle of freedom is philosophically flexible (see: e.g. Ortega, 2004); the question whether freedom is objective (realism) or subjective and dependent on the consciousness (nominalism) cannot be answered here, but it is clear that the modern reader blaming the drug-happy BNW society for the lack of freedom implicitly opts for realism (as nominalists would say the happiness of BNW cannot be false, as this statement would assume the external criterion of judgement).¹⁰

Moreover, his evaluation is based on a complete knowledge of the world, something which ordinary citizens of BNW do not have. Throughout the book the reader is introduced to the concept of conditioning and made aware of the existence of islands for the deconditioned, so he acquires a bird-eyes-view which allows him to stigmatise the universal happiness as false. Nevertheless, the question remains: is an individual, deprived of knowledge about the lack of certain possibilities objectively enslaved or is this statement only true in the eyes of an

⁹ H.G. Wells, who knew that BNW was originally intended to be a satiric answer for his *Men Like Gods*, never claimed Huxley was plagiarising him, as they both were probably taking scientific knowledge from the same sources. In fact, he felt deeply offended by the book, accusing Huxley of misunderstanding of his thought. BNW was surely a good piece of literature, as Well's aversion towards Huxley is said to have lasted more than ten years (Firchow, 1976, p.262). *Men Like Gods*, a utopian novel, developed an idea of a future, happy, spontaneously hierarchical society, with individuals doing physical and intellectual work in turns and with the voluntary aristocracy on the top (pp.263-264). Huxley, fearing that people may try to implement such an idea, ridicules it in BNW by showing it is based on the false anthropological assumptions. In letters from the period of his work on BNW, Huxley claimed explicitly that his aim was to expose the "horror of the Wellsian Utopia" and that "all's well that ends Wells" (quoted in Firchow, 1976, pp.260-261, p.278).

¹⁰ The relevance of the debate on universals ("realism-nominalism", can be paralleled by debate on "idealism-materialism) for the perception of technology is briefly explained *inter alia* in Sismondo, 2005, p.62. For elaboration and brilliant criticism see: Hacking, 1999, pp.63-99. It might be quite confusing for a non-philosophical mind that something called realism is called idealism elsewhere. The word "realism" is derived from "reality" - there is an external reality, no matter how people categorize it; the word "idealism", although it means the same, dwells more on the quality of this external reality, which is ideal, constant, non negotiable. In the same vein "nominalism" indicates the relevance of names and their subjective validity, whereas "materialism" on the priority of the judgments based on the material senses, not external abstractions. Some sources, when discussing Huxley's attitude use different terminology. In this text the dichotomy realism-nominalism will be kept. Philosophically, one can distinguish many types of nominalism and realism - this is not of great importance in this essay, though.

external observer, who has this knowledge?¹¹ Is freedom a relative, or objective concept? Huxley clearly opted for the latter. This problem re-emerged many times during Huxley's lifetime and was one of the main areas of philosophical debate in the realm of science in society.

3.2. First Inequation – Happiness opposed to Truth

This philosophical undertone is also crucial when it comes to understanding the image of science in BNW, which is inseparable from Huxley's assumptions about humans. The latter are wrapped around the utilitarian conviction that people value happiness over freedom. Huxley considered universal happiness and universal freedom to be contradictory ideas. The free pursuit of an ancient philosophical triad of values (Truth, Goodness, Beauty) always results in pain and will not give ultimate happiness to an individual. Therefore, the universal inequation, as Huxley implies, is: Happiness \neq Truth, Goodness, Beauty. One can choose only one side of the inequation simultaneously, never both.¹²

It is very probable that Huxley found this idea in Dostoyevsky's *Brothers Karamazov*, as in 1912, when Huxley was 18, the first English translation of the book (by Constance Garnett) was published, starting the period of Dostoyevsky's profound influence on the artistic consciousness in Britain (Kaye, 1999, p.1), forcing British novelists to either admire or hate the Russian writer. Huxley, as a future 'man of letters' must have been interested in these trends. Even if he did not read the book then many of his friends (like D.H. Lawrence) did so and may have exposed him to the ideas found within its pages.¹³

Nevertheless, it is certain that the abovementioned inequation (a prerequisite of the social order in BNW) is to be found in the "Legend of the Grand Inquisitor", a chapter from Dostoyevski's *Brothers Karamazov*. Huxley summarises the concept in *Brave New World Revisited* (1958), an essay which concluded that the modern world is closer and closer to the reality described in BNW. According to the parable man will be ultimately freed from the liberty he could never cope with in history, receiving in exchange happiness. The Grand Inquisitor, who oversees humanity, arrests a returning Christ for leading humanity into misery and explains the rationale for the introduction of paradise on earth. Christ's greatest fault is that he promised transcendence to man and granted him the freedom of choice between good and evil, but did not prepare him to choose well. The Inquisitor argues that if God was truly loving and powerful, He would not have given man the capacity to cause unspeakable suffering along with beauty and good. The most unhappy person in the future world will be the Inquisitor himself, who controls humanity and is aware of human flaws. Thus, for his own responsibility he sacrifices the freedom given to humanity by God for the sake of a stable universal existence and public sensational happiness. Christ would be dangerous in such a society (see also: Rozankow, 2004).

"The sort of table may be created, and indeed it will occur that we shape our needs in accordance with this table" (Dostoyevsky, 1992, p.26) said Dostoyevsky's character in *Notes from the Underground*, who regarded "sharpened consciousness" and individuality as a kind of sensational sickness that will cease to exist with the advance of knowledge. Huxley takes this Dostoyevsky's fear of the potential deconstruction of will a bit further by naming "**the table**" and showing that the key of control in the hands of the Grand Inquisitor will be science

¹¹ If one accepted the former answer, every child should be deemed to some extent enslaved by the genetic material and social circumstances inherited from the parents, if the latter, the BNW society is genuinely happy and free (as freedom is the matter of subjective feeling).

¹² "Inequation" (\neq) is a mathematical term that describes a lack of equality. It is used in this paper as a metaphor of the friction and lack of coherence in terms of some values/group of qualities, which are opposed to each other. If one chooses the former, the attainment of the latter becomes impossible and *vice versa*.

¹³ He first met Lawrence in 1915 (see: Vitoux, 1974, p.501).

and technology: “The older dictators fell because they could never supply their subjects with enough bread, enough circuses, enough miracles and mysteries. Nor did they possess a really effective system of mind-manipulation”. Hitherto efforts to ensure stability were always insufficient, there were no appropriate technologies, Plato’s ideal Republic did not come true.¹⁴ However, in a future “ruled by a scientific dictator education will really work - with the result that most men and women will grow up to love their servitude and will never dream of revolution” (Huxley, 1958). Whereas Dostoyevsky curses the future epoch in advance (see: Shestov, 1987, p.80) without describing it, Huxley paints its suggestive picture.

It is an exclusively human rational decision which causes the emergence of BNW: Huxley never blamed technology itself. It is the capacity for evil which should be feared; science is neither exclusively positive nor negative in his eyes. Technology may be evil in principle (e.g. atomic bomb) but it is humans who chose to create it. As man is an ambiguous creature, his creations are in principle the same.

3.3. Second Inequation – Pure Science opposed to Applied Science

Having in mind First Inequation, Huxley claims that happiness and the triad of supreme values cannot be attained simultaneously. Science can progress toward only one of these goals, leaving the other aside. For centuries people could not decide which path they should follow and pursued truth and beauty, but dreamed of happiness at the same time, or vice versa. In BNW the choice has been made for the ever indecisive humans: happiness was chosen, not arbitrarily, but in accordance with the will of the majority: “Whenever the masses seized political power, then it was happiness rather than truth and beauty that mattered” - justifies the regime World Controller (Huxley, 2004, p.201). Freedom and truth were lost, but stability and joy were given in exchange. High culture, religion and history were suppressed as they cause unease and their final goal is always truth, the phantom which stimulates but does not satiate. A steady, carefully-conditioned, predictable community-life triumphed over spontaneity and unpredictable individualism.

One of the most fascinating ambiguities is that science constitutes both a threat and a guarantee of the stability of the BNW regime: “I’m interested in truth, I like science” - says the World Controller. “But truth’s a menace, science is a public danger. As dangerous as it’s been beneficent. It has given us the stablest equilibrium in history. ... we can’t allow science to undo its own good work” (p.200). He indicates that the incentive for control was a world war: “What’s the point of truth or beauty or knowledge when the anthrax bombs are popping all around you? That was when science first began to be controlled—after the Nine Years’ War” (p.201), followed by the great Economic Collapse. “There was a choice between World Control and destruction ... People were ready to have even their appetites controlled then. Anything for a quiet life. We’ve gone on controlling ever since. It hasn’t been very good for

¹⁴ The advantages of servitude and totalitarian organization have long been known. When Plato wrote his *Republic* (see: Plato, 2006), he uttered the thought that the pragmatic state may have some totalitarian features for the sake of its efficiency and stability; this idea, interpreted as an invitation to totalitarianism was criticized in the 20th century by Karl Popper (1971). Certainly, the content of *The Republic* is nowadays largely outdated, as the modern state is based on a model completely different from the Greek polis (city-states). However, it seems Plato’s assumptions about human nature continue to stimulate minds. Huxley, just as Plato, assumed that the efficient ruler is always concerned with public stability and happiness rather than public freedom (see: Huxley, 2004, p.201). When one will be able to choose between the two, the choice will be clear. Soon, fears Huxley, this choice will be possible, because of technological advancement, which will make it possible to mould the behaviour of the masses with an almost God-like precision. It remains completely coherent with Huxley’s thought to say that if Plato had the modern technological means at his disposal then, the semi-totalitarian Republic would have not remained a merely theoretical concept, but might have been introduced to the Greeks (Plato himself explicitly suggested eugenics as a desired means of socialisation; see e.g. Sahaj, 2004).

truth, of course. But it's been very good for happiness. One can't have something for nothing. Happiness has got to be paid for" (p.29, 201).

After the war science concentrated on ensuring happiness. The elite realised that pure science, conducted without reflecting on its potential, utilitarian future role in society, but only for the sake of truth and the imperative of progress would be detrimental to their efforts. Finally, equilibrium was reached: social stability attained by satisfying human needs combined with the abolition of metaphysical fears. Paradoxically, science gave humanity the freedom to take freedom away from the majority. Thanks to genetics and behaviourist psychology mass manipulation became possible for the sake of happiness.

Therefore, Huxley's Second Inequation may be presented as: Pure Science ≠ Applied Science. The latter is the application of science done or social purpose, science which is harnessed for the sake of the society.

4. ANALYSIS OF THE IMAGE

In accordance with the already described ambiguity of human being, the image of science presented in BNW is also ambiguous (*Table II*):

SOCIALISED/APPLIED Science in the Society of BNW	
(1) associated with:	(2) opposed to:
Happiness (relative, not objective)	Truth
Stability	Freedom
Materialism	Spiritualism
Community	Individualism
Values and Purpose	Disinterestedness
Predictability	Spontaneity
Pragmatism and Specialisation	High culture (Humanism), Religion, History
Knowledge, Progress (are controlled but allowed in some spheres of scientific inquiry)	

Table II

Thanks to conditioning and physiological control the majority of the BNW society feels happy. For Huxley this happiness is a false one, though. "Well, I'd rather be unhappy than have the sort of false, lying happiness you were having here"(p.156) says Savage to Bernard. Desiring what somebody made them want, BNW citizens feel subjective happiness, satisfied by consumption, but at the expense of losing things like art and religion forever.

Huxley rejects the subjective meaning of happiness, implicitly associating true happiness with the freedom of choice between spiritualistic and materialistic values, personally advocating the moderate attitude. This conclusion comes to mind when one analyses the fate of the three nonconformists in the novel, above all that of the Savage. Having rejected materialistic values and opted for spiritualism, after the meeting with the World Controller he is eventually tempted by a group orgy and commits suicide afterwards. In contrast to this, other two find their way in the BNW reality. Both Bernard Marx's and Helmholtz Watson's experience "parallels that of the Savage, though without any of the Savage's intensity of feeling" (com. Firchow, 1975, p.314).¹⁵ The origins of their unorthodoxy are different though: Marx desires

¹⁵ The name of Helmholtz Watson is laden with meaning, alluding to two famous physiologists: Hermann von Helmholtz, the German physiologist, and J.B. Watson, the founding father of behaviourism.

acceptance within BNW while Watson's dissatisfaction stems from intuitions about the existence of transcendence. After knowing the truth about the sources of stability during their discussion with Mustapha Mond, they both are sent into exile on an island.¹⁶ In contrast to Helmholtz, who accepts his fate, Marx in a paroxysm of despair begs Mond on his knees to change his mind and is eventually carried out by force. It seems that sanity and a steady life in BNW is impossible when one is too individual.¹⁷

Bearing in mind the First Inequation, the World Controller deems spiritualism in its all forms to be pulling humanity towards the ultimate truths of existence (Religion, High Culture and therefore also History) and thus disruptive and incapable of serving stability. Searching for truth stimulates individualism and unpredictable behaviour that cannot be controlled with the usage of standard physiological and psychological schemes available to the World State thanks to the progress of science and technology. According to the scheme the state "can tolerate sensation but never feeling" (Firchow, 1975, p.315), small and primitive feelings based on the imperative of consumption, but not deeper, liberating incentives which disrupt the already-engineered order.

The controllers are aware that, in contrast to physiological satisfaction of human instincts, their sublimation and creative harnessing always leads to spontaneity and the search for truth (Firchow, 1975, p.314). This in turn leads to cultural progress and the creation of high culture, which actually ceased to be necessary in BNW. Civilization reached its peak as it ensured happiness for everybody - further progress is obsolete. The pursuit for truth carries a destructive and unpredictable charge which in the new world remains hidden thanks to the lack of spiritualism. As feelings blossom in the period between the occurrence of desires and their satisfaction, BNW society has to be kept busy. In other words, the scientifically acquired social equilibrium has to be constantly sustained and cared for. Applied science, in the hands of a ruling minority, is favoured: "the creation of highly organized and regimented society, whose members exhibit a minimum of personal peculiarities, and whose collective behaviour is governed by a single master plan imposed from above" (Huxley, 1946, p.35). An "orthodox theory of cooking" (a scientific knowledge of man), made the creation of the universal cookbook possible, which "produces food for the belly but not for the mind - technology, not science" (Firchow, 1975, p.314).

The distinction between "applied science" (Huxley's definition of technology) and "pure science" implies that through the process of application for certain social purposes science is being socialised. Thus, etymologically "applied science" is very close to "socialised science", which reveals Huxley's concern with the lack of value-neutrality in technology, highlighted by many scholars (see: Tiles, 1995; Cutcliffe, 2000).

It also seems that, for Huxley, technology serves materialist purposes, whereas pure science caters for the spiritual. This opposition is at least suggested by some passages in BNW. Although the Controller believes in God, he claims that nowadays He manifests Himself in His absence (Huxley, 2004, p.206), as "God isn't compatible with machinery and scientific medicine and universal happiness. You must make your choice. Our civilization has chosen

¹⁶ The name "Mustapha" refers to Mustapha Kemal Ataturk (Meckier, 2002, p.430), the world-famous Turkish statesman who started the revolutionary process of the modernisation and rationalisation of Turkey in the 20's (the separation of the state from religion, laicisation etc.), which required radical means to be implemented in a deeply religious Turkish society. Last name "Mond" alludes in turn to Alfred Mond (Lord Melchett), a Zionist and a member of a distinguished scientific and financial family, who was the head of Imperial Chemical Industries (1926), probably the second largest privately own corporation in the world at the time.

¹⁷ This conclusion was criticized by Huxley himself in the 1946 edition of the book as its most serious defect; he claimed the possibility of a refugee community perfecting themselves in isolation might have been added to the novel (Huxley, 2004, p.xxxi); this thought is developed in Huxley's last novel - *Island*.

machinery and medicine and happiness” (p.207). Spiritual values are in some way contrary to machinery, happiness and biological tinkering with human; thus religion cannot be reconciled with scientific progress.¹⁸

Of particular interest is that many of the qualities that socialised science is opposed to are in fact associated with pure science: the image of pure science is to some extent the mirror image of socialised science. In contrast to socialised science, pure science is associated with Truth, Freedom, Individualism and Spontaneity, but threatens Happiness Stability, Community and Predictability. Truth on the one side, Happiness on the other, in accordance with the First Inequation.

Why did socialised science triumph over the pure? Because, as the materialist paradise has been successfully engineered thanks to socialised science, “we don’t want to change. Every change is a menace to stability. That’s another reason why we’re so chary of applying new inventions. Every discovery in pure science is potentially subversive; even science must sometimes be treated as a possible enemy” (Huxley, 2004, p.198). By saying so, the World Controller implies that the technologically aware elites are carefully choosing the paths of development, as technological progress is always path-dependent and a lack of control will always bring harm. Of note is the fact that he does not elaborate on the possibilities of diminishing the moral lag, created by the uneven speed of technological and moral advancement, of which the former exceeds the latter. He already assumed that they will never harmonise and potentially destructive technologies will finally find their application in reality (this is a reference to the worldview held in 1920 by British conservatives).¹⁹

The imperative of stability and happiness also serves as the basis for stigmatising some technologies being of no use: “Technically, it would be perfectly simple to reduce all lower-caste working hours to three or four a day. But would they be any the happier for that? No, they wouldn’t. The experiment was tried, more than a century and a half ago. The whole of Ireland was put on to the four-hour day. What was the result? Unrest and a large increase in the consumption of soma; that was all. Those three and a half hours of extra leisure were so far from being a source of happiness, that people felt constrained to take a holiday from them” (p.197). The balance between leisure and work should not be interfered with.

When the behavioural *aurea mediocritas*²⁰ is disrupted and the masses have too much time, they either increase consumption or lose the feeling of self-satisfaction. In BNW technologies do not serve “the magic circle of leisure” (Ortega, 1961, p.117) anymore, they are not devoted to supplying humanity with additional leisure or personal freedom. They serve the opposite purpose: they are devoted to ensure “no leisure from pleasure” and the equilibrium between consumption and production. Only science which serves stability (the technology of breeding, socialisation and amusement) is being researched: “We don’t allow it to deal with any but the most immediate problems of the moment. All other enquiries are most sedulously discouraged. It’s curious... to read what people in the time of Our Ford used to write about scientific progress. They seemed to have imagined that it could be allowed to go on

¹⁸ It is clear he speaks of an exclusively materialist happiness that Savage regarded as false.

¹⁹ **Coherent action in relation to technology** requires a certain universal set of values and laws, which exist in the hierarchically controlled BNW, but will probably not exist in the real world, taking into account the variety of civilizations capable of technological advancement (Chinese civilization may serve as the example of a completely different set of values, where the implementation of BNW logics would not meet with moral dilemmas). Thus, Huxley’s dream uttered in later novels and essays, that potentially harmful technologies will be universally abandoned is very likely to be wishful thinking. “Internationally organized science” that he suggests in *Science Liberty and Peace* (Huxley, 1946, p.77) is at present times unlikely.

²⁰ *Aurea mediocritas* (“the Golden Mean”) - an optimal solution.

indefinitely, regardless of everything else” (Huxley, 2004, p.200).²¹ That is why the notions of Knowledge and Progress are put into a separate, overlapping area in *Table II*: although they are not supreme values in BNW, progress is allowed, but only in the carefully selected areas of biology, which are devoid of any potential threat to the equilibrium.

Research is being done by the members of higher castes; it is in fact the routine science controlled by the authorities. Scientists dreaming of pure science, not confined to the official directives might be deconditioned because of their free, disinterested pursuit. The World controller himself used to be a physicist, who realised that the BNW science “is just a cookery book, with an orthodox theory of cooking that nobody’s allowed to question, and a list of recipes that mustn’t be added to except by special permission from the head cook” (p.198). When the authorities realised his naughtiness, he was given a choice : to join them or to be sent to an island, where he could live among the other “too self-consciously individual” inhabitants and make pure science, but without any hope for its mass implementation.

It is significant that BNW does not need humanists. As with pure science, humanism and high culture can decondition and disrupt stability. Three people who finally meet the World Controller because of their disobedience are Bernard Marx (a scientist) the Savage (the naturally born primitive from reservation park, who read Shakespeare), and Helmholtz Watson (a journalist, who likes solitude, which makes him odd in the eyes of the majority).²² This conclusion is especially significant when tracing Huxley’s opinion about specialisation and humanism.

To sum up, it is clearly visible that science and technology, when controlled and socialised, support the regime However, pure science has the same liberating potential as humanism and high culture.

5. SPECIALISATION – HUMANISM

One scholar claims that “Huxley caricatured H. G. Wells and Sir Alfred Mond in the composite figure of Mustapha Mond because he considered both men to be proponents of anti-humanistic rationalisation - the reorganisation of society on an allegedly more scientific, more efficient, more technological basis” (Meckier, 2002, pp.432-433). This is true, but only partially. The society of BNW is truly, not “allegedly”, more efficient and more scientific. It is precisely this fact that makes the modernist reader feel so unnerved during reading, as he sees the inevitable cost of progress: true anti-humanism.

Long before C.P. Snow published his *Two Cultures* in 1959 (1998), the consequences of the growing specialisation in sciences were already perceived as a threat to cultural progress. Although it is hard to pinpoint the exact historical moment when it became perceived as an intellectual problem, the fear that the accumulation of knowledge would force scientists to specialise in very narrow areas of inquiry, resulting in the impossibility of creative synthesis, was somehow engrained in the word “specialisation” (or “specialism”). It entered standard written English in the mid- and late nineteenth century (Collini, 2006, p.454). The first

²¹ Huxley does not say it explicitly in relation to the technologies of amusement, but it is logical to imply that amusement is also being researched as it serves stability. In 1926, after Huxley discovered Henry Ford’s *My Life and Work* in the library of the ship on his way to the USA - and subsequently experienced that everything in the country is “perfectly in tune” with Ford’s principles - he started to describe the USA as “the nearest approach to Utopia yet seen on our planet” (Bradshaw, 1993). As a result, BNW became a seamless critique of socialism and capitalism. The phrase “Our Ford” is a reference to the religious cult of his figure - in the novel Christian faith (symbolised by a cross) has been supplanted by the ideology of fordism (symbolized by the letter T that refers to the Ford Model T automobile, the symbol of mass production).

²² Huxley agreed that Savage is too intellectually mature compared to the biography he received, though.

recorded definition of specialism, has it understood as a “restriction or devotion to a special branch of study or research” (quoted *ibid.*, p.455) and comes from 1860s and 1870s where after it entered British public discourse.

5.1. Professionalisation, Dehumanisation and Scientists

The reflection on the process of specialisation was generally pessimistic - the critiques did not highlight its potentially positive consequences, but they focused instead on negative aspects, such as the inability of the sub-divided scientific branches to be welded into a higher, coherent entity. This lament initially referred to natural sciences, but was also extended to the social sciences and humanities which increasingly started to specialise and use scientific methodology in their research in the nineteenth century (pp.456-457). The gradual specialisation was said to affect both society and the individual: as the latter becomes deprived of a wider sensitivity via his attention to one, abstract field of knowledge, he detaches himself from the society by losing emotional sensitivity and his more general interests.

Anxiety about specialisation was to certain extent in answer to the gradual **professionalisation of scientists** (p.454) and other social groups. As Gieryn et al. (1985) put it, the notion of professionalisation is derived from the so called “market model of professionalisation” (p.393) developed inter alia by J.L. Berlant (1975), D. Klegon (1978), R. Collins (1979) and M. Saks (1983). It describes “the historical ascent of professions (medicine and law are the prototypical) in terms of ideological and organisational manoeuvres designed to create occupational monopolies over markets for desired services and commodities” (Gieryn et al., 1985, p.393). In a manner similar to the guilds of the medieval age, the professions guard their epistemic authority from outsiders who want to breach the monopoly. The hypothetical manner of the advancement of a profession in society consists of the four steps: expulsion (of outsiders from the field), expansion, autonomy protection and monopolisation (Gieryn, 1995, 1999). The conclusion of Gieryn’s essay (1985) is that the 20th century witnessed gradual professionalisation of scientists, who began to guard their epistemic authority.²³

According to historian Gary Werskey (1971), the profession of scientist had quite low status in the public prior to 1939: scientists were treated by politicians, artists and social theorists as outsiders during social debates (pp.67-68). They were characterised by contemporary literature and the press as simple minded, insensitive fellows, who are capitalists first and scientists second, who do not understand art and do not care about the social impact of their research (pp.69-70).

To overcome these stereotypes, scientists attempted to influence the public by forming various pressure groups - needless to say, the idea of socialism was very helpful for them in advancing their goals thanks to its slogans of equity and the potential benefits for socialism which sprang from science. Capitalising on the respect they had in their own field, scientists tried to alter the public image of their profession. J.B.S. Haldane was among the earliest public advocates of scientific progress, presenting scientists as the hope for the future world in many publications (see: Werskey, 1978). Julian Huxley in turn contributed to this view in a more theoretical way, with his idea of scientific humanism.²⁴

²³ The authority to create knowledge and speak on behalf of science.

²⁴ As he defined it himself: “UNESCO ...must work in the context of what I call Scientific Humanism, based on established facts of biological adaptation and advance, brought about by means of Darwinian selection, continued into the human sphere by psycho-social pressures, and leading to some kind of advance, even progress, with increased human control and conservation of the environment and natural forces” (J.Huxley, 1978 II, p.11). This idea is elaborated in: Smocovitis, 2007; his involvement in UNESCO in: Baker, 1978.

Many humanists perceived the prospect of scientific specialists addressing social issues as posing the threat of dehumanisation and total rationalisation on human affairs, which were - according to them - irreducible to the cold scientific outlook. Partially as a response to scientists' gradual struggle for the public recognition, humanists started to lament that the lack of humanistic sensitivity (commonly attributed to scientists) can result in the false assessment of the social consequences of the impact of science on society. In the same vein, they started to treat the lack of specialist education as something one should be proud of. According to Collini, "the self-conscious cultivation, from the late-nineteenth century onwards, of the identity of 'the man of letters' was itself a form of deliberate resistance to the perceived operation of specialisation" (2006, p.455).

This kind of anxiety stimulated discussion about universities, both their internal organisation and their institutional impact on the society.²⁵ The issue of the **reunification of knowledge**, subdivided by specialisation, constituted a challenge for many intellectuals in the 20th century. Collini describes the final intellectual outcome of these attempts as constituting "ironically sententious, intellectually vapid mixture of holism and uplift which merely asserts that everything is connected to everything else" (p.458); thus he treats the topic ironically. For example, *Ends and Means*, Huxley's work which was described by himself as "a kind of synthesis, starting from the metaphysical basis and building up through individual and group psychology to politics and economics" (Ibid.) is for Collini nothing more than ambitious mumbling filled with some "vatic profundities".²⁶ Certainly, this kind of writing may be regarded as boring by a historian, but for philosophers and political scientists it still has some value thanks to its universalism and the mere fact that it attempts to create an a priori philosophical explanatory framework, something rarely attempted throughout history.

5.2. Huxley as Anti-specialist

The anxieties about specialisation and education are visible in BNW, where Huxley warns both (1) against the hijack of social theory by scientific rationalisers and (2) against the social impact of specialisation.²⁷

He implicitly accuses scientists of serving the political system of capitalism, of being merely tools in the hand of politicians; of blindly obeying the set of rules they are given for their research. In BNW scientists who believed in the god-like powers of their profession (like J.B.S Haldane, a specialist with ambitions to speak about society), ultimately became a tool to sustain a social equilibrium actually achieved by them. They do not care about the metaphysical questions of human existence, merely concerned with the smooth performance of the social tribes. If some distinctly human features are a constant cause of confusion, they are destined to be wiped out thanks to genetics. This is done without any social reflection: "You can't consume much if you sit still and read books" (Huxley, 2004, p.42) - says the Controller, showing that scientists, in the pursuit of maximising the efficiency of performance reject the potential usefulness of intellectual self-development, as it ceased to be needed after civilization reached the peak of happiness. Similarly, if freedom of choice results in both good and bad deeds, it can be supplanted by a new quality: the identity of freedom with necessity. Everybody wants what one has to want, because scientists, carefully observing human behaviour, produced the very table Dostoyevsky feared, the one which enables the conditioning of behaviour. Scientists do not have scruples, they do not protest against the tyranny of consumption and obedience, they only insist that it should not be based on force, as

²⁵ "Laments about the effects of specialization had become something of a critical commonplace by the second half of the nineteenth century, and by the early twentieth century universities were, with increasing vehemence, identified as the villains of the piece" and stigmatized as succumbing to too much specialisation which results in detracting from the unity of the common culture (Collini, 2006, p.454).

²⁶ Huxley, 1938. See also: J. Huxley, 1978 II, p.93.

²⁷ Com. "instrumental rationality" in footnote 4, this paper.

the research has proved that it will not be efficient.²⁸ Their dilemmas are not of an ethical, but a pragmatic origin. The Controller rejects violence as a behavioural tool only because “the Controllers realised that force was no good” and he proposes instead “the slower, but infinitely surer methods of ectogenesis, neo-Pavlovian conditioning, and hypnopaedia” (p.43).

The imperative of happiness undermines also the usefulness of high culture. “There were some things called the pyramids, for example ... And a man called Shakespeare. You’ve never heard of them of course ... Such are the advantages of a really scientific education” (Huxley, 2004, p.42, 44) - says the Controller. Cultural, aesthetic, religious and other contemplative experiences are, according to him, useless because they contribute to the “production” of spiritual experiences, which are immeasurable and do not translate into materialist welfare. Teaching history is obsolete, in contrast to specialist education - knowledge of Shakespeare and the pyramids can only stimulate free thinking, which will in turn allow individuals to contemplate everlasting human flaws, diminishing their feelings of happiness. “Most historical facts are unpleasant” (p.19) - he says, justifying the introduction of the sleep-teaching phrase “History is a bunk” (p.29) to the mass conditioning process. Education in BNW is confined to areas useful in individual’s future work. A bit of humanistic knowledge, which is needed for the Alpha citizens designed to be the leaders, occasionally results in deconditioning and supplies one more reason not to introduce it to the lower castes.

The citizens of BNW produce specific goods or do other specialised activities, with no time for contemplation, with no leisure from pleasure.²⁹ The media also does not mention humanistic values and any potentially liberating literature is banned. After the lecture of “A New Theory of Biology”, a book, where the author wants to prove the existence of transcendence mathematically, the Controller notes that although it “is novel and highly ingenious” it is also “heretical and, so far as the present social order is concerned, dangerous and potentially subversive” (p.154). He refuses to publish the book and orders the author kept under supervision.³⁰ No humanism is allowed in BNW, because it is not coherent with the desired outcome of behavioural research - happiness. Although high culture liberates, for the Controller it is more important that it simultaneously stimulates an unpredictable existential uneasiness; a good reason to ban it.

It is clear that Huxley did not approve of the dogmatic belief in science, which was characteristic of his friends and other influential contemporaries like Freud. A fascination with science is nothing bad, he seems to say in BNW, but the supplanting of metaphysics with science will bring disastrous effects. If science were to cross over into the arena of human affairs, if it wanted to replace a sensitivity for existential mysteries with its table, its recipe for sensational happiness, it may take away more from people than it is capable of giving, changing them into regularly maintained biological automatons. Huxley’s fear of the flaws of socialism and materialism is closely tied to a fear of dehumanisation, which would be the fruit of the common action of scientists obediently working for the benefit of capitalist principles of efficiency and stability. Adjusting the amount and quality of individual education to the

²⁸ See: section 3.2, this paper.

²⁹ It is interesting to note that Huxley, living in the industrial era does not mention services, the rise of which is characteristic for postmodern and postindustrial societies and does not elaborate on the impact of cybernetics on humans. The continuation of his book, picturing the advancement of his predictions in the 21st century would certainly be a challenge for contemporary writers.

³⁰ Clearly enough, the book Mond reads is an allusion to the writings of Eddington (1929, see also: O’Connor, 2003). It seems that Aldous assumed that transcendence, which thanks to Einstein came back as a scientific hypothesis, may once be proven to exist scientifically. Unfortunately, even this revolutionary discovery will remain concealed for the sake of social stability of BNW.

desired social role that happens nowadays is only the first step to BNW.³¹ Genetic manipulation will come next (pp.xxxv-xxxviii).

Finally, what is very intriguing and makes BNW even more ambiguous, is that the scientific dictator, the cold-hearted regulator introduces his ordered society of specialists because he possessed **the knowledge humanists had always wanted to obtain**. Mond often justifies the regime with behavioural facts and he uses history as empirical material to prove that a different order than the one he proposes will always collapse and result in tremendous suffering. Which of these two alternatives would be better? Constant breakdowns of a free society or the dehumanised but smooth performance? - Huxley could not answer unanimously.³²

6. HUXLEY TODAY

What makes Huxley interesting is his moderation and ambiguity which stems from his acceptance of the logic of the First Inequation. His vision of the world seems to resemble a play in an ancient Greek theatre - no matter which path humanity takes, it always has to pay for its choices; there are no ideal social solutions. Due to the flaws of human nature every human ideal degenerates and caricatures itself in the process of its application.

Despite some flaws in Huxley's vision, modern philosophers could benefit from a careful re-reading of Huxley.³³ They should be made aware that as long as one remains a nominalist, one cannot legitimately revolt against the implementation of voluntaristic serfdom, because one does not recognise it as serfdom. In other words, a nominalist lacks an external, transcendent perspective to stigmatise the happiness of BNW as false. The acceptance of the subjective validity of names makes it impossible to do that.³⁴

BNW remains one of the most adequate social prophecies ever written and is still meaningful regardless of the historical context, in which it was written. This is visible even more sharply at the beginning of the twenty-first century: "Current developments in genetic engineering, combined with foreseeable developments in nanotechnology and robotics, have the potential to redefine and extend human life. But if we follow this technology along the course favored by its advocates, some humans would acquire characteristics so superior to our own, or so entirely new, that what it means to be human, even for those left behind, would be forever lost" - wrote the author of *BioScience*, a monthly academic journal tracing current research in biology (Norgaard, 2004, p.255).³⁵

On the other hand, the rapid progress of technology may bring solutions to many contemporary social problems, the impact of specialisation on sciences included. Ray Kurzweil, a famous futurologist, who after the analysis of empirical data reached the conclusion that technological advancement progresses at exponential rate (see: Chart I), claims that thanks to science we will witness the **radical change of human constitution** (Kurzweil, 2005). According to him, the world is now reaching the "knee of curve" - a point,

³¹ This conclusion makes Huxley side with the theses put forward in Russell's *Icarus* (1924).

³² Huxley attitude towards behaviourism was ambiguous - he tried to revolt against its moral consequences, but he was also fascinated with its progress. As the philosophical and political questions related to behaviourism are extremely important in BNW, the issue would require a separate elaboration exceeding the scope of this publication.

³³ See: e.g. Toffler, 1990, p.466 and footnote 29, this paper.

³⁴ It is the will of the majority that makes BNW possible.

³⁵ A similar diagnosis is to be found in: Naisbitt, 1990, pp.241-269; Fukuyama, 2004; Galston, 2002; Rose, 2005 and many others.

where the impact of technology on society will be gradually more visible.³⁶ After the future successful integration of advanced technology into flesh (cybernetics), human capacities will extend, acting positively upon the whole species. The negative effects of specialisation will cease to exist, as the protein-based mechanisms of brain will be reengineered, resulting in the great memorisation capabilities. This will in turn make great, Renaissance-like syntheses (that will reunite fragmented knowledge) possible once again.

Linear vs. Exponential Growth

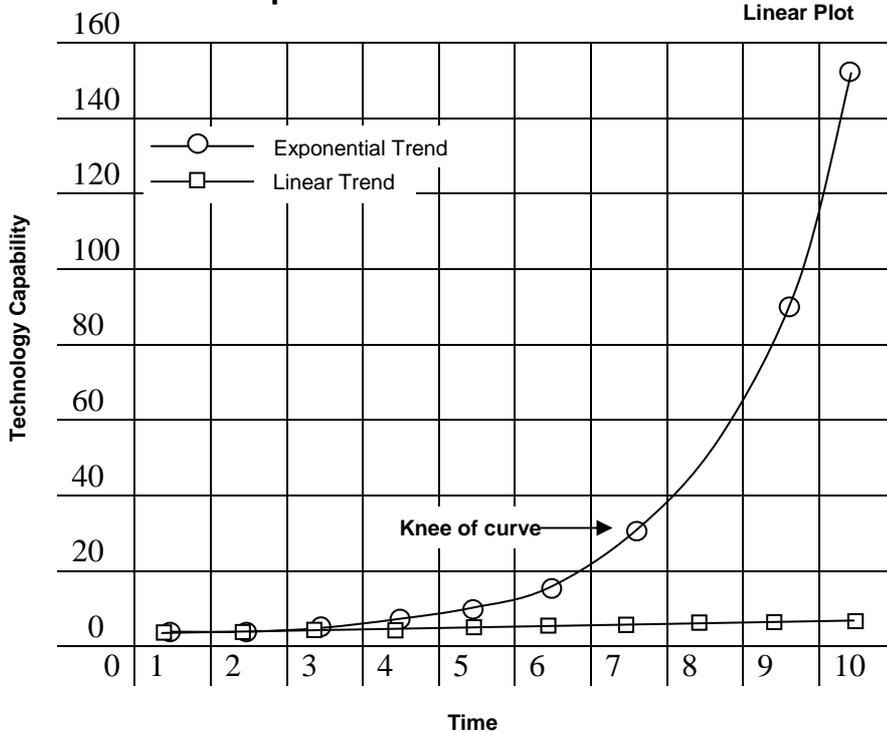


Chart I, from: Kurzweil, 2005, p.10

Nietzsche wrote in his visionary *Thus Spoke Zarathustra*: “The earth has become small, and on it hops the last man, who makes everything small. His species is ineradicable as the flea; the last man lives longest. ‘We have discovered happiness’ - say the last men, and they blink despicably” (Nietzsche, 2000). Consider nanotechnology, neuroscience, behaviourism, the Human Genome Project, Craig Venter’s first artificial organism (see: Salomone, 2007) to be the first steps to *theriaca maxima*³⁷, the ultimate antidote for the horrors of suffering... Would not BNW be better than the present world? After all, maximised happiness at the cost of minimised freedom would not be introduced by force. Huxley claimed that we are now undergoing an “ultimate revolution” in our souls, which will make us love our servitude (Huxley, 2004, pp.xxxiii-xxxviii; see also: 1962). Is suffering without surveillance better than the engineered happiness?

One thing is certain. Millions of African children dying from genocide, starvation, malaria and AIDS would definitely welcome the new order with joy.

³⁶ Of note is that, according to Baker (2001), Huxley had some similar intuitions as he “characterizes science in terms of a process of steadily increasing acceleration” (p.37).

³⁷ *Theriaca maxima* (“the total dose”) refers to the “maximum antidote” for a sick patient, who cannot be treated by any known means. All medicines available to a doctor are chaotically amalgamated into a new mixture with the hope that it may help the patient. *Theriaca maxima* is “invented in a state of despair about any single medicine” (Ortega, 1975, p.35). Analogically, the system of BNW is invented in a state of despair about any single social solution that would bring peace.

They would kneel down and kiss Grand Inquisitor's hands.

Grzegorz Lewicki
g.lewicki@onet.eu

REFERENCES:

- Baker, J.R. (1978), Julian Huxley – Scientist and World Citizen, UNESCO/Unipub
- Baker, Robert S. (2001), Science and Modernity in Aldous Huxley's Interwar Essays and Novels in: C. C. Barfoot (ed.) Aldous Huxley Between East and West, Amsterdam, pp. 35–58.
- Berlant, Jeffrey L. (1975), Profession and Monopoly, Berkeley: University of California Press
- Bradshaw, David (1993), an introduction in: Huxley, 2004, pp.v-xv
- Collini, Stefan (2006), Absent Minds: Intellectuals in Britain, Oxford University Press
- Collins, Randall (1979), The Credential Society. New York: Academic
- Cutcliffe, Stephen H. (2000), Ideas, Machines and Values: An Introduction to Science, Technology and Society Studies, New York: Rowman & Littlefield
- Dostoyevsky, Fyodor (2004 [1880]), Bracia Kramazow [Brothers Karamazov], ZNAK
- Dostoyevsky, Fyodor (1992), Notatki z Podziemia. Gracz [Notes from the Underground. Gambler], Puls, 1992
- Dunaway, David King (2004), Huxley, Aldous Leonard (1894-1963), Oxford Dictionary of National Biography, Oxford University Press, accessed 29 Dec 2004: <http://www.oxforddnb.com/view/article/34082>
- Eddington, Arthur Stanley (1929), Science and the Unseen World, Macmillan, New York.
- Firchow, Peter (1975), Science and Conscience in Huxley's "Brave New World", *Contemporary Literature*, Vol. 16, No. 3, Summer, pp. 301-316.
- Firchow Peter (1976), Wells and Lawrence in Huxley's Brave New World, *Journal of Modern Literature*; Apr76, Vol. 5 Issue 2, pp. 260-279
- Firchow, Peter (1984), The End of Utopia: A Study of Aldous Huxley's "Brave New World", Bucknell University Press
- Fjellman, Stephen M. (1985), Peter. E. Firchow, The End of Utopia: A Study of Aldous Huxley's "Brave New World", Bucknell University Press, 1984 (Book Review); *Science Fiction Studies* #36, Volume 12, Part 2, July, available also at: <http://www.depauw.edu/sfs/birs/bir36.htm>
- Fukuyama, Francis (2004), Koniec Człowieka [Our Posthuman Future], ZNAK
- Galston, William A. (2002), What's at stake in biotech?, *Public Interest*, Fall, Issue 149
- Gieryn, Thomas F., Bevins, G.M., Zehr, S.C. (1985), Professionalization of American scientists: public science in the creation/evolution trials, *American Sociological Review*, vol 50, June
- Gieryn Thomas F. (1995), Boundaries of Science, in: Handbook of Science and Technology Studies, Sage Publications
- Gieryn Thomas F. (1999), Cultural Boundaries of Science: Credibility on the Line, The University of Chicago Press

- Hacking, Ian (1999), Social Construction of What?, Harvard University Press
- Haldane, J.B.S. (1924), Daedalus, or Science and the Future, A paper read to the Heretics, Cambridge, on February 4th, 1923, E.P. Dutton & Company, NY; the content also available at: <http://www.cscs.umich.edu/~crshalizi/Daedalus.html>
- Huxley, Aldous (1938), Ends and Means: an Enquiry into the Nature of Ideals and into the Methods Employed for their Realization, Chatto & Windus, London
- Huxley, Aldous (1942). The Art of Seeing, Harper, New York
- Huxley, Aldous (1946), Science, Liberty and Peace, Harper & Brothers
- Huxley, Aldous (1958), Brave New World Revisited, retrieved 13.03.2007 from: <http://www.huxley.net/bnw-revisited/index.html>
- Huxley, Aldous (1960 [1931]), Music At Night, London: Chatto & Windus
- Huxley, Aldous (1962), The Ultimate Revolution, a speech given March 20, retrieved from the *Berkeley Language Center - Speech Archive SA 0269*, available at: <http://sunsite.berkeley.edu/VideoTest/hux1.ram>
- Huxley, Aldous (1992 [1948]), Ape and Essence. New York: Elephant Paperbacks
- Huxley, Aldous (2004 [1932]), Brave New World, Vintage
- Huxley, Aldous (2004b [1962]), Wyspa [The Island], Gdańskie Wydawnictwo Psychologiczne
- Huxley, Julian (1965, ed.), Aldous Huxley, 1894-1963 (London: Chatto & Windus. 1965), quoted in Firchow, 1975, p. 305
- Huxley, Julian (1978 [1973]), Memories, vol. I & II, Penguin Books
- Kaye, Peter (1999), Dostoevsky and English Modernism 1900–1930, Northwestern University, Illinois
- Klegon, D. (1978) The Sociology of Professions: an Emerging Perspective, Sociology of Work and Occupations
- Kurzweil, Ray (2000), The Age of Spiritual Machines: When Computers Exceed Human Intelligence, Penguin
- Kurzweil, Ray (2005), The Singularity Is Near: When Humans Transcend Biology, Penguin
- Lewicki, Grzegorz (2007), Huxley's Inequations - Brave New World in the Context of the Debate on Science, Technology and Society in inter-war Britain, a master thesis by the author at Universiteit Maastricht (Master ESST: European Studies on Society, Science and Technology). For details or discussion, please contact the author at: g.lewicki@onet.eu
- Meckier, Jerome (2002) Aldous Huxley's Americanization of the Brave New World Typescript, *Twentieth Century Literature*, Winter, Vol. 48 Issue 4; also available online: http://findarticles.com/p/articles/mi_m0403/is_4_48/ai_108194336/print
- Ortega y Gasset, Jose (1961), Man the Technician, in: History as a system and other essays toward a philosophy of history, W.W. Norton
- Ortega y Gasset, Jose (1975), An Interpretation of Universal History, W.W. Norton
- Ortega y Gasset, Jose (2004 [1930], first English translation in 1932), Bunt mas [The Revolt of the Masses], MUZA
- Naisbitt, John and Patricia Aburdene (1990), Megatrends 2000, William Morrow and Company
- Naisbitt, John , Nana Naisbitt and Douglas Philips (2003), High tech – high touch, [[EN] High tech – high touch], Zysk i S-ka)

Nietzsche, Friedrich (2000), Tako rzecze Zaratustra [Thus Spoke Zarathustra], Zysk i S-ka; an English quotation is based on the Polish (Wacław Berent) and English translation (Khalil Gabran), the latter of which is available at <http://www.kahlil.org/zarathustra-prologue5.html>

Norgaard, Richard B. (2004), Posthuman Enough?, *BioScience*, Vol. 54 No. 3, March

O'Connor, J. J., E. F. Robertson (2003), "Arthur Stanley Eddington", a webpage of the School of Mathematics and Statistics, *University of St Andrews*, Scotland.
<http://www-history.mcs.st-andrews.ac.uk/Biographies/Eddington.html>

Plato (2006), Państwo [The Republic], Marek Derewiecki (Publisher)

Popper, Karl (1971), Open Society and its Enemies, Princeton University Press

Rose, Steven P (2005), The Future of the Brain, *Chronicle of Higher Education*, 06/3/2005, Vol. 51, Issue 39.

Rozankow, Wasilij (2004), Legenda o Wielkim Inkwizytorze F. Dostojewskiego [The Legend about the Grand Inquisitor by F. Dostoyevsky], Wydawnictwo KR, Warszawa

Russell, Bertrand (1924), Icarus, or the Future of Science, London, E. P. Dutton & Company; the content of the book available also at: <http://www.marxists.org/reference/subject/philosophy/works/en/russell2.htm>

Russell, Bertrand (1931), The Scientific Outlook, Glencoe: The Free Press

Sahaj, Tomasz (2004), Eugenika społeczna w ujęciu Platona [Social Eugenics from Plato's perspective], *Archeus - Studia z bioetyki i antropologii filozoficznej*, Vol 5

Saks, Mike (1983). Removing the blinkers?: a critique of recent contributions to the sociology of professions, *The Sociological Review* 31: 1-21

Salomone, Monica (2007), Niech moc będzie z wami [May the force be with you], *FORUM*, 39/2007 (a reprint from *El Pais*, 08.09)

Shestov, Leo (1987), Dostojewski i Nietzsche. Filozofia Tragedii [Dostoyevsky and Nietzsche. The Philosophy of Tragedy], Warszawa

Sion, Ronald T. (1999), Aldous Huxley and the Human Cost of Technological Progress, Salve Regina University, PhD dissertation retrieved from a microfilm (UMI Proquest database)

Sleigh, Charlotte (2002), Brave New Worlds: Trophallaxis and the Origin of Society in the early twentieth Century, *Journal of History of the Behavioral Sciences*, Vol. 38(2).

Sismondo, Sergio (2005), An Introduction to Science and Technology Studies, Blackwell

Smocovitis, Vassiliki Betty (2007), The unifying vision: Julian Huxley, evolutionary humanism and the evolutionary synthesis, in: Somsen, G.J. & H. Kamminga (eds.) (2007). Pursuing the Unity of Science: Ideology and Scientific Practice Between the Great War and the Cold War, Ashgate Publishing.

Snow, C.P. (1998 [1959]), The two Cultures, Cambridge University Press

Szacki, Jerzy (2000), Spotkania z Utopią [Encounters with Utopia], Sic

Tiles, Mary, and H. Oberdiek (1995), Living in a Technological Culture: Human Tools and Human Values, London and New York: Routledge

Thody, Philip (1973) Aldous Huxley, London: Studio Vista; quoted in Firchow, 1975, p.305

Toffler, Alvin (1990), Future Shock, Bantam Books

Vitoux, Pierre (1974), Aldous Huxley and D. H. Lawrence: An Attempt at Intellectual Sympathy, *The Modern Language Review*, Vol. 69, No. 3 (Jul.), pp. 501-522

Wells, H.G. (1923), Men Like Gods; Project Gutenberg (Australia), retrieved from the webpage:
<http://gutenberg.net.au/ebooks02/0200221.txt>

Werskey, Gary (1971), British Scientists and 'Outsider' Politics, 1931-1945, *Science Studies*, pp. 67-83

Werskey, Gary (1978), The Visible College: the Collective Biography of British Scientists and Socialists of the 1930's, Holt, Rinehart & Winston, New York