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TEXT AS LABORATORY: SCIENCE FICTION LITERATURE AS ANTHROPOLOGICAL THOUGHT EXPERIMENT

Abstract: Thought experiments in the physics of the 20th century played a crucial role in the development of theoretical concepts, especially in absence or unsuitability of experimental data. In social sciences, for ethical and other reasons, the very utilization of the experiment as a methodological tool has been highly disputed. Thus, it has not only been rarely performed, but its implications, if any, had almost no practical value. Science fiction as a genre is perfectly suited to complement an actual performing of an experiment in anthropology, providing hypothetical scenarios that serve to predict possible future(s) of humanity, but that are, at the same time, challenging prevailing theories and even trying to establish new ones, by moving current theoretical problems into another, more helpful and more constructive territory, the one of the thought experiment. The article examines a number of short stories belonging to the science fiction genre that deal with core anthropological issues such as the definition of 'human', the role of adaptation in human evolution, the development of social groups and establishment of complex societies, appreciation of other cultural systems and the relation of humans to the universe. By doing this, it promotes the utilization of science fiction not only as methodological tool for research purposes, but even more as a valuable tool for teaching anthropology.

Key words: anthropology, science fiction, thought experiment, methodology.

The phrase 'thought experiment', widely known under single German term *Gedankenexperiment*, was coined towards the end of the 19th century by physicist and philosopher Ernst Mach as denotation of certain thought processes of operational physicists and philosophers alike. He was in search for a succinct description of a scientific method which relies solely on cognitive capacities for making and analyzing mental models of the problem in hand. The intention was to explain the habit of scientists and philosophers to imagine various scenarios of the general "what if..." type, and extract as much as possi-

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ble relevant information for the problem they are addressing, as their standard method of inquiry. Such imaginative processes differ from the general progression of thinking and inferring conclusions about mundane trivia ("if we miss this train we would have to wait for the next one..."), due to the depth of detailed analysis and purposeful inclusion of one or several key hypothetical elements, which change the chain of conclusions in nontrivial and often unexpected ways. This kind of complete mental simulation of finding out possible steady transformations or abrupt changes of the object under inquiry bears some similarity with definite performing of an experiment with and on physically tangible things to find out "what would happen if we actually change this and that..." – hence the somewhat strange, oxymoronic combination of the words 'thought experiment' similar to, for example, 'iron wood' or 'giant dwarf' (Kuhn 1977).

The phrase "thought experiment" entered the intellectual vocabulary as a fashionable concept after various popular writings on special relativity, which gave credit to Einstein, allegedly the first in scientific circles to have used it in a theoretically profitable way. In spite of being an admirer of Mach, and careful reader of his books, Einstein himself has not used this particular term in his scientific writings; nevertheless his public lectures were not short of imagining trains approaching the speed of light, physicists dropping an apple in an elevator in free fall etc. For all these, and many others hypothetical constructions at the time of their invention it was not possible to actually perform them in a physics laboratory for various, mainly technical reasons – starting from "too dangerous for the experimenter", via "technologically demanding" to "too expensive," although some of them have been (and still are) performed with different degree of success sometimes later (the "dropping an apple example" was carried out on a space ship after almost 80 years of its first mental 'performance').

Soon the concept of "making mental experiments" had its debut in other scientific and humanistic disciplines following Mach dictum that "thought experiments are important not only in physics, but in every field" (Mach, 1905/1976: 144). With the introduction of thought experiments in social sciences one can easily spot changes in the scope and the reasons of application of something that has so far been a genuine theoretical physics invention, with a newly acquired freedom to change all the details of what kind of object/ system/ process/ phenomena we are looking at, providing that the two main characteristics of mental experiments are preserved: their internal and external coherence. According to Laymon (Laymon 1991) the role of the thought experimenter is to develop "natural transformation of the idealized premises so that what results from the thought experiment is an acceptable demonstration of the hypothetical scenario." As the standards of *acceptability* change from field to field and during time (for which the history of science has plenty of

examples), the sheer definition of the concept of thought experiments compares to a kind of metaphor.

The reasons researchers got hold on thought experiments in philosophy or social psychology were different from the reasons that theoretical physicists had. Some 'philosophical thought experiments' could never actually be performed at all (e.g. those imagined by Derek Parfit in his *Reasons and Persons*) and others may be socially unacceptable or plainly immoral. Still, the range of possible *experimental* methods clearly widened. Currently under the heading of *experiments* we are allowed to accept almost anything, from "unbounded mental games with arbitrary semantic rules, natural laws or moral behavior", to making mathematical models based upon them and running computer simulations, provided that we are confident in their applicability. The distinction and separation of plainly possible / morally allowed / logically acceptable reasoning of 'man of thought', from down to earth putting into action of those thoughts by 'man of action', have been blurred toward the end of the 20th century. Simultaneously with this profound transformation of the scope and meaning of the word "liability," changed the reasons for embarking on thought experimenting instead of simply conducting the "real thing". The main caveat of this plethora of *empirical opportunities* in the mainstream scientific activity (natural and humanistic as well) still lurks around moral issues. Researchers in the world today consider the (changing) opinions of their peers - members of advisory boards for their grants (almost always), of their colleagues next door (sometimes) and the public opinion (rarely), if they have some dilemmas: to start mixing the genes from three different species and put a virus in free circulation in biosphere, or just run a computer simulation of one-of-the-many theoretical models of the complex ecological system, improve statistical analysis of medical exposition to radiation, think about the effects of changing the human genome in this or that part of the DNA (probable but questionable thought experiment), or making mathematical model of these hypothetical effects.

How about intentionally changing/disrupting the social structure of a tribe in Amazonia, through a forceful introduction of monotheism, justifying the act with liberating their souls from paganism? How to predict the eventual effects upon the individuals and the society at large of a change of such proportions, especially in the light of the historically known, not merely thought, but practically implemented 'experiments' of such type? And to whom such questions should be addressed?

This article aims to show that science-fiction as a genre provides opportunities for performing thought experiments in the field of anthropology, serving as a perfect testing ground for hypothetical scenarios that predict possible future(s) of human societies. Simultaneously science-fiction works can be, and in many cases actually are, virtual laboratories where prevailing anthropo-

logical theories are challenged by moving current theoretical problems into another territory, the one of the thought experiment.

But which 'science-fiction works' do we actually have in mind when stating that they can be of anthropological interest? In 1968 the *International Encyclopedia of Social Sciences* introduced the term "social science-fiction", defining it as "narratives that extrapolate from current social science concepts in order to predict or speculate about the future shape of society" (Sills 1968, 474), thus marking a change in the classical understanding of science fiction as a genre that extrapolates solely from natural sciences. As noted by Geoffrey Samuel in his excellent article "Inventing Real Cultures: Some Comments on Anthropology and Science Fiction" (Samuel 2002, 3), the science fiction of the 1930s and 1940s of the pulp magazines paid little or no attention to the social or cultural aspects of alien life. These 'space operas' (the term being a paraphrase of 'soap operas') were only geographically moving terrestrial clichés to outer space, providing different scenery, as well as glittering and sexy costumes with lots of accessories, to the well known melodramatic heroes. But by the 1950s and 1960s the otherwise vague technological worlds of aliens began to acquire more or less elaborated social and cultural profiles, thus becoming 'alternative human cultures', with their own social structure, kinship systems, beliefs and rituals. In other words, aliens became a perfect example of the "Other" at a time when most of the "Others", non-Western and non-white human representatives, have already been colonized, analyzed or simply destroyed.

The same way many authors, especially from the ex-Soviet Union era, have used what is now labeled as 'political science-fiction' to present their critical and often subversive political stances, the social sci-fi genre now came handy for presentation of sometimes non-orthodox, non-mainstream anthropological stances, even if that was not the primary ambition of the authors of such sci-fi works. Sci-fi became an alternative territory, distant in space and time, for voicing opinions about the reality and the present, an artistic domain where things were allowed to be told while they would be censored or at least booed elsewhere. For example, a public reaction would hardly be expected if, even nowadays, a far away galaxy tribe that practices female genital mutilation is judged as 'brutal' and 'primitive', but an anthropological article commenting the same custom of an African, human tribe would have to show more sensitivity towards cultural differences. Still, no matter if the 'anthropologization' of the sci-fi story is done 'undercover' or more overtly, whether ethnography is used only as an aid in inventing the culture(s) in question, or whether anthropological themes are central or marginal to the plot and the 'moral' of the story, one thing is clear: science-fiction frequently makes the values of our own cultures relative, and points towards the destructive aspects of our interaction with other societies. In other words, as Samuel notes, many past

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and present science-fiction writers have been our anthropological allies in the long battle against ethnocentrism. (Sammuel 2002, 5)

This does not imply that authors of science-fiction works were or are aware of what they are doing, while they are actually doing it: science-fiction, no matter how scientifically based is - or aims to be - a work of art, and as such its merits should be validated on artistic, i.e. aesthetic, and not on scientific grounds. But besides being 'fictive', science-fiction works can serve as valuable ground for speculating about anthropological issues and as tools in teaching anthropology. This point has been a basis of a number of collections, that emphasize the relation between sci-fi and anthropology (Stover 1968; Mason 1974; Milstead 1974). It seems however that this relation runs even deeper, and that sci-fi works can in fact be an *experimental* ground for testing anthropological hypothesis.

Is natural logical?

As we emphasize at the beginning a number of taxonomies of thought experiments have been proposed, based upon different categorization principles. In terms of the causal reasoning implied (drawing of a conclusion based upon an 'if-then' proposition), science-fiction works generally fit into the prefactual, counterfactual and backcasting category, meaning that they usually speculate on possible future outcomes ("What will happen if event X occurs"); on possible outcomes of a different past ("What might have happened if Y had happened instead of X"); or they move backwards in time from the future to the present, explaining how that particular future came to be.

However, in order to be considered a thought experiment at first place, the scenario presented in a sci-fi work should be in some sense possible - either nomologically i.e. possible according to the laws of nature, or metaphysically, that is possible in terms of logic. This classic division of 'nomologically versus metaphysically possible' valid for thought experiments in general should be however reconsidered when it comes to sci-fi works. Namely, science-fiction as a genre is notorious for circumventing the limits of science, intentionally breaking natural laws, introducing the physically impossible light-speed spaceships and teleportation. Still, as numerous examples show, sci-fi has often turned into scientific fact: moon landings and submarines first appeared in Jules Verne fiction before they became a reality, H.G. Wells described fighter planes four years before the Wright brothers built the first functional airplane and made the first heavier-than-air human flight in 1903, Orwell predicted the Telescreens in his "1984", and one could hardly ask for a better prediction of internet than the one in the Hitchhiker's Guide to Galaxy, where an electronic book is a source of endless information, however "containing much that is apocryphal or at least wildly inaccurate". Thus, if a certain scenario in a sci-fi

work seems 'nomologically impossible' under the current technology, it might be only a matter of time when it becomes not only possible but also very 'normal'. As per metaphysical possibility, there are instances of sci-fi scenarios that are logically disputable, and thus could not be classified as 'thought experiments' - an example which is often quoted is the one of the Zombies, entities that are physically identical to humans, that present purposeful (conscience-driven) behavior, but at the same time *lacking* conscience. Even being 'illogical', the Zombies' scenario has served as a basis for numerous discussions related to philosophy of mind, to discussions about reason and ethics. Twisting the boundaries of logic is in principle the same as twisting the boundaries of natural laws: what we obtain is a caricature of current social construction of reality, whose analysis should serve some constructive purpose - either better understanding of the current, or predicting of a future, different world.

The oldest human questions

The collection of Mason, *Anthropology Through Science Fiction* (Mason 1974), offers a beautiful starting point for analyzing short sci-fi stories that deal with core anthropological issues, such as the definition of 'human', the role of adaptation in human evolution, the development of social groups and establishment of complex societies, appreciation of other cultural systems and the relation of humans to the universe. Each story has been chosen on the basis of its anthropologically related content, but not all of them are clear examples of thought experiments. We have chosen three of them that we think are good illustrations of testing an anthropological hypothesis using the sci-fi genre.

The first story is "Lost Newton" by Stanley Schmidt (Mason 1974, 263-285), which deals with two basic issues: what is the position of an extraordinary individual in a totalitarian society, especially the one facing crisis; and what, if anything, should anthropologists do when found in a position to change the destiny of a culture that is not their own. The planet is Ymrek, ruled by the priest-king Kangyr, at the moment of speaking faced with natural disasters and a barbarian invasion. A team of cultural engineers from another planet comes to Ymrek primarily to deliver 'humanitarian assistance', i.e. to repair broken communications. However, soon enough they find themselves involved in the conflict between Terek - the Ymrek equivalent of a combined Newton, Einstein and every other known terrestrial genius, and the Templemen, who are the regressive, conservative political force, that has brought the planet in distress at first place. Through using the latest, highly refined methodology for 'PFSU' (Psychocultural Field Survey), the team of comparative historians, xenologists and anthropologists, in the midst of the multicolored color bars and dots on their charts, identify that this unique man could save the planet and lead it into promising future. But what now? Should they interfere and

thus be responsible for all possible outcomes of this decision? Is it possible at all that the destiny of the whole society lies in the hands of a single individual? The resolution that Schmidt suggests is 'mild' interference through what in fact might be defined as - diplomacy. This is what the cultural engineers in fact do by the end of the story: they try to convince the Templemen that Terek's ideas are of everyone's benefit. "We'll leave these two boats here, but they're the last you'll get from us. Whatever else you want, you'll have to get for yourselves. Terek can get you started - and when we go he's your only chance", says one of the members of the team before leaving the planet with his colleagues. His last optimistic words are "I'll think they'll make it" - the same words that probably most of intermediaries in current political conflicts on the Earth want to believe in while hopping on the plane and driving home, far from the Middle East or the Balkans.

The second story is titled "Survival Ship" (Mason 1974, 185-194) and is written by, as many call her, "the little mother of science fiction" Judith Merrill. Born in 1923, first an American and then a Canadian citizen, Merrill was one of the few female members of the science-fiction writers, editors and fans club called *The Futurians*, which was active in the '40ties in New York city, but also an active Zionist and Marxist. It is probably due to her political engagement that this story, as well as a number of her other sci-fi works, concentrates on the issue of class, gender-related division of labor and family structure, all of which according to Merrill are not fixed categories but can change facing different ecological imperatives. Species, including humans, not only can but must show flexibility in the face of change if they want to survive - this is exactly what the passengers of the *Survival* go through while traveling to a distant star where conditions for settlement seem to exist. The trip is long and a number of practical issues have to be met. Most of them have been planned in advance and kept a public secret. One is the sex ratio of the ship's crew - there are twenty women but only four men. Women are in power not only because they are more numerous, but also because they are "longer-lived, less susceptible to pain and illness, better able to withstand, mentally, the difficulties of a life of monotony that we are placed as we are - and not alone because we are the bearers of children" (Mason 1974, 194). The only options that man on the ship have is to adapt to this new situation, do their non-stereotypical work and follow a dating schedule. Once babies are born from this dating sessions the family structure will have to be established and at that point the relativisation of its Western, monogamous and nuclear type will reach its pick. In other words, a social structure exists as long as it serves the purpose of perpetuation of a group's existence, and in the words of the ship's captain, which are pronounced not only as 'common law', but as a command, "Survival of the race is the first duty of every ethical man and woman". Thus, ethics is tightly related to the biological imperatives - at the moment when they are challenged

our basic notions of all social institutions might change. Survival is a must. Monogamy, class and gender division of labor aren't.

"The Cage" by Bertram Chandler (Mason 1974, 216-230) analyzes the very foundations of what it means to be a 'rational', human being, emphasizing the role of tools in human evolution and adaptation. A group of humans are shipwrecked on a dump planet, where everything non-organic rots due to a process of constant moldering disintegration. Everything related to technology deteriorates and people are left naked, reduced to biology, not much different from any other animal group, except for the ability to speak and to draw on their past experience, but without the ability to implement it. They not only lack sophisticated tools, but they are also not able to produce fire, the human evolutionary element *par excellence*. As in the previous story, female outnumber male, and thus 'primitive' fights, using only bare hands, are established as mating competitions - the one who wins gets the girl he wants. During one of such duels, followed by a large cheering crowd, a huge metal net dropped by a 'no Earthly' machine, catches few of the member of the human group and locks them in a cage, only to monitor their behavior, as man in laboratories usually do, when analyzing the behavior of guinea pigs or mice. The three men and one woman imprisoned by six-legged beer barrels try to convince their capturers that they are as rational as them, using sticks to write the Pythagorean theorem, and even create wooden baskets. But the eyes of the 'barrels' stay flat and dull. It is only when Hawkins, one of the inhabitants of the cage, creates a cage for Joe, a furry little equivalent of a mouse, to whom they become attached, that the aliens liberate the whole group, sincerely apologizing for the inconvenience and providing a more suitable accommodation for their rational human counterparts. What made them realize that they deal with rational beings is a simple but devastating truth - only rational beings put other beings in cages!

Confidence versus scientific truth

The sci-fi genre does not use strict scientific methodology, and its aim is not to resolve the usual dilemma of true/untrue when it comes to a certain social or natural phenomenon. However, the sci-fi works, especially the ones from the field of literature, are semi-rational, semi-intuitive constructions that yield confidence. Dwelling in the realms of the imaginary and being an artistic genre, sci-fi draws not only from natural and social science, but primarily from - intuition and imagination. Although calling thought experiments 'intuition pumps' in pejorative sense, claiming that they are simply appeals to intuition which fail when carefully analyzed, Daniel Dennet (Dennet 1991) has in fact stressed upon an aspect without which thought experiments would simply not be possible. The question "what if", and in fact the very speculation about the future, relies on human ability to imagine how things might be, basing this construction

not so much upon rational but upon intuitive grounds. Thought experiments in fact challenge the very dichotomy of *rational* versus *intuitive* - what seems possible on intuitive level seems also rational and vice versa. "Without imagination nothing in the world could be meaningful. Without imagination, we could never make sense of our experience. Without imagination, we could never reason toward knowledge of reality", says Mark Johnson (Johnson 1987, ix), who together with George Lakoff (Johnson, Lakoff 1999) strongly criticizes the dominating objectivist philosophy and its rigid separation of mind from body, cognition from emotion and reason from imagination, thus offering a radically new account of meaning, rationality and objectivity. Without imagination not only that nothing could be meaningful in this world, but also in all other, possible worlds, better than this one, "the best of all possible worlds".

Sci-fi is thus perfectly suited to meet even these radical conditions for bearing knowledge and meaning - it does not have to follow natural laws, it is sometimes illogical, and as an artistic genre is by definition based upon imagination. Could one ask a better, more liberal and yet constructive ground for testing hypothesis of any kind, especially the ones that concern social sciences, including anthropology? The very term "speculation" contains the Latin word for mirror - the imagined worlds are a reflection of our own, no matter how distorted the reflection might seem. But 'speculum' is also a medical instrument used to widen an opening - speculation is thus a tool for widening our perspective, and what could be wider than the realm of imagination that often takes us to distant and strange lands, as the ones in sci-fi works. "My father studied real cultures and I make them up, in a way it's the same thing", said Ursula Le Guin, daughter of the famous Alfred Kroeber (Le Guin 1977, 39). By making them up, writers of science fiction not only fantasize about these different worlds, but also use them to make this world a better one.

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**TEKST KAO LABORATORIJA: NAUČNO-FANTASTIČNA -
KNJIŽEVNOST KAO ANTROPOLOŠKI MISAONI EKSPERIMENT**

Misaoni eksperimenti odigrali su odlučujuću ulogu u razvitku teorijskih koncepata u fizici 20. veka, posebno u slučajevima nedostatka ili nepodesnosti eksperimentalnih podataka. Iz etičkih i drugih razloga, u društvenim naukama korišćenje opita kao metodološkog sredstva je bilo veoma osporavano. Stoga ne samo da su opiti retko rađeni, već su i njihovi rezultati bili (ako ih je uopšte i bilo) od gotovo nikakve praktične vrednosti. Naučna fantastika kao žanr je - savršena kao dopuna stvarnom izvođenju eksperimenta u antropologiji, i ona nudi hipotetičke scenarije koji služe predviđanju moguće/mogućih budućnosti ljudskog roda, a koji istovremeno osporavaju preovlađujuće teorije i čak pokušavaju da ustanove nove teorije, premeštajući aktuelne teorijske probleme na drugo, korisnije i konstruktivnije područje, područje misaonog eksperimenta. Članak istražuje nekoliko kratkih priča koje pripadaju naučno fantastičnom žanru, i koje se bave suštinskim antropološkim pitanjima kao što

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su određenje "ljudskog", uloga adaptacije u humanoj evoluciji, razvoj društvenih skupina i ustanovljavanje kompleksnih društava, razumevanje drugih kulturnih sistema, te odnos ljudi prema univerzumu. Na ovaj način, članak promovira upotrebu naučne fantastike kao ne samo metodološkog sredstva za istraživačke ciljeve, već još više kao dragocenog sredstva u predavanju antropologije.

Ključne reči: antropologija, naučna fantastika, misaoni eksperiment, metodologija.