HUMAN GENETIC ENGINEERING AND THE PROBLEMS OF DISTRIBUTIVE JUSTICE

Introduction

Many people nowadays do not consider the problem of the ethical implications of human genetic engineering (hereafter: HGE) a serious subject of discussion. There are both theoretical and practical reasons for adopting this sceptical attitude. As far as the former are concerned, our present knowledge of HGE is very modest: we cannot be sure what the limits of possible genetic transformations of human beings are and of the consequences of these transformations. Hence, it may be claimed that the whole debate has more in common with mere speculation rather than with a serious discussion based on firm scientific evidence. The practical objection concerns the possible benefits of engaging in this discussion. It is often claimed that moral and social philosophers should deal with more urgent, and undoubtedly more 'tangible' problems, like the fair distribution of medical services in general, sexual discrimination, taxation etc. Being aware of the two aforementioned problems, we must acknowledge the fact that there is a fierce ethical debate on HGE. A wide spectrum of views on HGE has been developed: from the so-called radical trans-humanists to radical bio-conservatives. The mere fact of there being a debate on a subject is not a sufficient reason for treating this subject seriously. Nevertheless, I think that the discussion mentioned here is not without value. In consequence, the present paper has several aims. First, I would like to present the main theses raised in the context of the debate. In this respect, the following text may be seen as a kind of introduction to the moral problems of HGE. Second, I attempt to sketch a 'map' of distributive justice problems related to the development of HGE. I think these issues are worth discussing mainly for the following reason: the possibility of HGE poses moral challenges structurally different from the ones yielded by traditional social-moral issues. I will therefore try to elucidate these differences. The aim of the third part of the paper is to look at the discussed problem from the perspective of the Rawlsian theory of distributive justice. It is not a mainstream approach to the discussed issue, while it is typically analyzed from the perspective of human rights doctrine. I present and criticize the positions advanced by two prominent bioethicists, David Resnik and Colin Farrelly. Finally, some conclusions and perspectives for further research are formulated.

HGE as a subject of moral-philosophical discussion and research

As it has already been pointed out, many moral philosophers discard HGE as a problem which could be a subject for fully-fledged moral-philosophical discussion. On the other hand, such discussion actually takes place and engages prominent social scientists, ethicists and philosophers. Undoubtedly, the progress of biosciences will more or less quickly verify the predictions formulated by theorists, but nevertheless it seems necessary to develop some ethical framework to deal with possible scenarios. In order to discuss these issues it is necessary to introduce some important conceptual distinctions.

First, it is necessary to state what HGE amounts to. For the purposes of this article, I will refer to HGE as any medical procedure which involves the modification of the genotype of an individual leading to changes in his/her phenotype. This definition is purposely very broad. The types of HGE may be classified according to different criteria. The most important distinction makes use of a teleological criterion. It is possible, then, to distinguish negative genetic engineering (genetic therapy, GT) and positive genetic engineering (genetic enhancement, GE).[1] At first glance, the difference between the two is obvious. GT's aim is to cure diseases and disorders, while GE's is to increase human skills above a 'normal level.' The introduction of the concept of 'normality' here leads immediately to serious conceptual problems. Let us start from a trivial observation that human beings typically suffer from many diseases during their lives, and that more or less serious deterioration of functioning of the body is a common characteristic of the process of ageing. If we define GT as a process which leads from abnormal condition to normal condition of a human being, we ought to have some grasp of what a 'normal' or 'healthy' condition amounts to. Now, it would be unrealistic to demand the drawing of a sharp line here. In bioethics and in ethics in general, we are often forced to make use of vague terms and to ascribe great significance to them, although they typically generate the peril of a slippery slope based argumentation. It is sufficient to mention the concept of 'competence' employed in euthanasia/physician-assisted suicide debate.[2] Still, we need at least a working set of criteria which would enable us to distinguish between the normal and abnormal features of a human being. I think that the only criterion which can be operational here is the classification of diseases and disorders provided by a reliable source, like for instance the World Health Organization. Such a classification of normal and abnormal states of human beings can be easily distinguished now from more or less preferred states. On the one hand it may be claimed that modest deterioration of senses, for example of hearing, is a quite normal symp-

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[1] Cf. for instance D.G. Jones, *Enhancement: Are Ethicists Excessively Influenced by Baseless Speculations?*, "Medical Humanities" 2006, vol. 32, pp. 77–81. See also D. Resnik, *The Moral Significance of the Therapy / Enhancement Distinction in Human Genetics*, "Cambridge Quarterly of Healthcare Ethics" 2000, vol. 9, pp. 365–377.

[2] For a survey concerning this subject, cf. M. Araszkiewicz, *The Slippery Slope Arguments against the Legalization of Physician-Assisted Suicide* [in:] J. Stelmach, M. Soniewicka, W. Załuski (eds.), *Studies in the Philosophy of Law*, vol. 4: *Legal Philosophy and the Challenges of Biosciences*, Jagiellonian University Press, Cracow 2010, pp. 145–160.

tom of ageing, and consistently hold that this state is not preferred. Conversely it is consistent, although psychologically less plausible, for a subject to claim that although her state is abnormal (i.e., unhealthy), she prefers not to change it.

It is possible to provide several further distinctions within the scope of processes referred to as GE. Jones proposes to introduce three categories of enhancement. Category 1 comprises procedures belonging to the 'penumbra' of the concept, being in fact variations of therapies. Category 2 encompasses extensions of abilities, exceeding those possessed by healthy persons. It is worth emphasizing that GE belonging to the category 2 typically neither restores nor protects human health. Its aim is to add something to standard human endowment, however, not to such a great extent that the performance of the enhanced would be always better than the performance of non-enhanced, talented or hard-working people. And finally, radical human transformations are gathered under the label of category 3. The expected results of category 3 GE are for instance spectacular longevity, greater intellectual capacities, much better abilities to control one's emotions, or even completely novel abilities.[3] I would like to state that it is the third category which sometimes makes the discussion of HGE something closer to futurology, or even science fiction, than to a genuine moral-philosophical debate. However, there is one aspect in which more or less imaginary prospects of radical human transformation are relevant nowadays in bioethical debate. They are seen as factors which transform the traditional ethos of medicine, leading to perceiving the symptoms of ageing as a kind of disease, and therefore something which ought to be to a large extent eliminated by medical interventions.[4] This possibility may influence one's attitude towards HGE in general. Let me now turn attention to different possible ethical stances that can be taken towards HGE.

As it was noted above, the attitudes towards HGE constitute a spectrum from radical trans-humanism to radical bio-conservatism. Although these concepts are used also in debates which do not touch the problem we discuss here, for our purposes we will deal with them solely in the context of HGE. I think that the position of trans-humanism is plausibly captured by the following general theses, referring to the problem of HGE:

[TRANS-HUMANISM THESES]

TT(1). We ought not to oppose to the development and application of HGE (normative thesis).

TT(2). HGE is beneficial to mankind. In particular, the creation of post-humans is a prospect worth pursuing (assessment of consequences).

TT(3). Individuals should have broad freedom concerning the application of these technologies to themselves (the so-called morphological freedom).

TT(4). Parents should have freedom in deciding on the application of these technologies in the context of reproduction (reproductive freedom).[5]

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[3]   D.G. Jones, *op.cit.*, p. 79.

[4]   *Ibidem*.

[5]   The last two theses are borrowed from N. Bostrom, *In Defense of Posthuman Dignity*, "Bioethics" 2005, vol. 19, pp. 202–214.

Obviously, it is possible to formulate accordingly the theses of bio-conservatism:

[BIOCONSERVATISM THESES]

BT(1). We ought to oppose to the development and application of HGE.

BT(2). HGE is possibly disastrous to mankind. The possibility of there being transformed human beings poses a real danger.

BT(3). Individuals should not have an option to apply HGE technologies for the purposes of GE. GT should be available only in specified conditions.

BT(4). The procreation function of human beings should be free from HGE.

It is not difficult to see that the freedoms (theses (3) and (4)) are in fact more specific versions of normative theses (theses (1)) and that theses (2), referring to assessment of the consequences, provide the justification for the normative theses. In consequence, although the set presented above are instructive, I will narrow my analysis to theses TT(1) and BT(1) (normative ones) and TT(2) and BT(2) (related to the consequences).

TT(1) and BT(1) may be further refined according to Jones' distinction of three categories of HGE discussed above. Application of these considerations enables us to formulate three versions of TT(1) – the Weak, the Moderate and the Radical:

Weak TT(1). We ought not to oppose the development and application of HGE in the scope of category 1 of GE (although categories 2 and 3 are at least contestable).

Moderate TT(1). We ought not to oppose the development and application of HGE in the scope of categories 1 and 2 of GE (although category 3 is contestable).

Radical TT(1). We ought not to oppose the development and application of HGE in the scope of categories 1, 2 and 3.

Similarly, it is possible to construct three versions of BT(1). Let us now focus on TT(2) and BT(2). It seems quite obvious that the consequences which are subject to assessment of these theses may be also roughly divided into three groups: the results of category 1 GE, and GE's belonging to higher categories. Typically, BT(2) is formulated in the literature in a radical form, referring mainly to the results of category 3 GE. The following passage is instructive in this respect:

> In fact, cloning and inheritable genetic alterations can be seen as crimes against humanity of a unique sort: they are techniques that can alter the essence of the humanity itself (and thus threaten to change the foundation of human rights) by taking human evolution into our own hands and directing it toward the development of a new species, sometimes termed the "posthuman."[6]

As we can see, the detrimental effects of HGE discussed here consists of the 'alteration of humanity itself' and consequently we have to state that they stem from category 3 GE. Therefore, it is not clear from the outset whether results potentially brought about by category 1 and 2 GE would be also assessed so

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[6] Cf. G. Annas, L. Andrews and R. Isasi, *Protecting the Endangered Human. Towards an International Treaty Prohibiting Cloning and Inheritable Alterations*, "American Journal of Law & Medicine" 2002, vol. 28, p. 151. For a general overview of this attitude, cf. F. Fukuyama, *Our Posthuman Future: Consequences of Biotechnology Revolution*, Farrar, Strauss and Giroux, New York 2002.

negatively. However, the quotation below amply shows that bio-conservatives have an apparent tendency to treat slippery slope arguments seriously:

> The movement towards a posthuman world can be characterized as 'progress' and enhancement of individual freedom in the area of procreation; but it also can be characterized as a movement down the slippery slope to a neo-eugenics that will result in creation of one or more subspecies or superspecies of human. (...) It is the prospect of "genetic genocide" that calls for treating cloning and genetic engineering as potential weapons of mass destruction, and the unaccountable genetic researcher as a potential bioterrorist.[7]

As noted above, I cannot devote attention here to the problem of the structure and soundness of slippery slope arguments.[8] Let us only state that the mechanism of slippery slope leading from category 1 GE (for instance, the elimination of genes responsible for the Huntington disease from the genetic code of a foetus) to the creation of a group of hostile super-humans seems quite unrealistic. The link connecting the two states of affairs seems too remote. Therefore, the argument from destruction of human nature is not of great import when it comes to the assessment of GEs belonging to category 1, and, presumably, also to category 2.

Let us now try to summarize the topic of HE as an object of moral-philosophical debate. There is a common distinction between GT and GE and it is commonly claimed that although GT is generally permissible, GE is controversial. A closer look at the problem leads to the conclusion that the two concepts are not very informative, and it is fruitful to engage in a more detailed analysis.[9] The Jonesian distinction of the three categories of GE was introduced. These preliminary considerations enabled us to present two model attitudes towards the discussed problem, namely, the position of trans-humanism and of bio-conservatism. The mentioned distinction of three categories of GE makes it possible to present a refined picture of both model attitudes. Typically, bio-conservatives object to the development of HGE, because they believe it will lead to adverse consequences, resulting in creating transformed human beings and destroying the very essence of humanity. They associate such results mainly with radical enhancement, but they tend to see the whole problem as 'slippery-slope sensitive' and in consequence they also oppose minor and moderate enhancements. My claim here is that it is not necessary to take such dramatic scenarios into account in order to put the ethical justification of GE in question. However, it is worth noting that the possibility of HGE introduces new factors into the domain of bioethics. It should be emphasized that the development of genetic engineering leads to categorical changes concerning our natural endowments: up till now, they were seen as characteristics of subjects rather than (market) resources. However, the situation will probably undergo a substantial change. This issue demands a deeper commentary. The next part of the paper is, therefore, devoted to some problems of distributive justice arising in the context of HGE. They will

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[7] G. Annas et al., *op.cit.*, p. 173.

[8] See footnote 2 above.

[9] This point is discussed very thoroughly by D. Resnik, *The Moral Significance*..., especially p. 374.

be dealt with mainly from a utilitarian point of view, focusing on the adverse consequences generated by the problem of unequal distribution of scarce resources.

Genetic engineering, genetic enhancement and distributive justice

Genetic enhancements are a type of resource, so the issue of their fair distribution must be taken into consideration. It seems that the possibility of HGE leads to two separate groups of distributive justice problems. The first question: how should the enhancements be distributed?, is dealt with in the literature nowadays and I will comment only on the most important contributions here. However, there is also a second question, namely, the question of fair distribution in genetically transformed society. This issue is problematic for moral theory firstly for the reason of uncertainty concerning the possible results of genetic enhancements and the possibility of creation of groups of transformed humans. I only signalize this second issue in this place.

Let us concentrate, then, on the problem of the fair distribution of genetic enhancements. It is trivial to note that the posing of this question assumes the adoption of at least a weak form of TT(1) (or, conversely, the rejection of radical form of BT(1)). Keeping in mind that these assumptions may be contested, let us nevertheless focus on the merits of the problem. It is not surprising that also in the context of GE, the two model approaches are in tension: a liberal, efficiency-oriented approach and the more social, Rawlsian approach. It is not my aim here to discuss the conflict between these two major traditions in moral theory. For the purposes of this paper, I shall assume the soundness of the claim that naturalistic premises cannot serve as a foundation for a full-fledged theory of justice.[10] In consequence, the rest of the investigations here shall be devoted to the Rawlsian approach, and particularly to two attempt of application of Rawlsian theory to the problem of HE, formulated by Resnik[11] and Farrelly.[12] However, before that, although these issues are well-known, for the sake of readability I shall recall the most important principles advanced by John Rawls in his classic *A Theory of Justice*.[13]

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[10]   This view is presented and supported by a nuanced argumentation in W. Załuski, *The Limits of Naturalism. A Game-Theoretic Critique of Justice as Mutual Advantage*, Zakamycze, Kraków 2006.

[11]   D. Resnik, *Genetic Engineering and Social Justice. A Rawlsian Approach*, "Social Theory and Practice" 1997, vol. 23, pp. 427–448.

[12]   For instance C. Farrelly, *Genes and Social Justice. A Rawlsian Reply to Moore*, "Bioethics" 2002, vol. 16, pp. 72–83; *idem*, *The Genetic Difference Principle*, "The American Journal of Bioethics" 2004, vol. 4, pp. 21–28, and *idem*, *Justice in the Genetically Transformed Society*, "Kennedy Institute of Ethics Journal" 2005, vol. 15, pp. 91–99.

[13]   J. Rawls, *A Theory of Justice*, Harvard University Press, Cambridge 1971 (22nd printing 1997). I am aware of the fact that Rawls modified his views in his later work. However, the theory presented in *A Theory of Justice* has become an ethical conception of its own rights, and a major component of Rawlsian ethical tradition.

According to Rawls, a theory of fair distribution ought to adopt two basic principles. The first is referred to as the Equality Principle and the second one encompasses, in fact, two elements: the Difference Principle and the Principle of Fair Equality of Opportunity. Let us quote the according passage:

"First: each person is to have an equal right to the most extensive basic liberty compatible with a similar liberty for others. [the Equality Principle – M.A.]

Second: social and economic inequalities are to be arranged so that they are both (a) reasonably expected to be to everyone's advantage [the Difference Principle – M.A.] and (b) attached to positions and offices open to all [the Principle of Fair Equality of Opportunity – M.A.]."[14]

The Principle of Fair Equality of Opportunity (hereafter PFEO) is of crucial importance in the context of discussed problem and therefore ought to be presented more deeply here. An important assumption in Rawls' theory is that a fair distribution of resources is seen as not arbitrary. In other words, the distribution is fair if it is a result of the efforts of individuals, and not of their luck. Consequently, it the outcome of distribution process is affected by any arbitrary set of factors, the resulting inequality ought to be redressed in some way, for example, by means of redistribution. In particular, this refers to the outcomes of the so-called natural lottery. Since we do not choose form which parents we shall be born, our genetic endowment and social status are factors we are not in control of, and therefore they should be seen as arbitrary. Obviously, contemporary societies dispose of many mechanisms which are devised to mitigate the difference of social status resulting from birth. The prospect of HGE turns our attention to the genetic endowment of children as an arbitrary factor which possibly should be neutralized by social instruments governed by the PFEO.

Doubtlessly, our genes do influence our opportunities and are one of the factors generating inequality of opportunities. This statement does not force us to adopt some version of a flawed doctrine of genetic determinism. Although environmental factors often have a decisive influence on our success – or lack thereof – in our lives, the role of genetic endowment should not be underestimated. In consequence, a Rawlsian should presumably propose the adoption of some policies in order to decrease the amount of arbitrary inequalities here. Let me, then, briefly present the accounts developed by two prominent Rawlsian bioethicists.

According to Resnik, the technical possibility of manipulating our genetic endowment can be seen as a chance of decreasing arbitrary inequalities.[15] Of course, these inequalities can be dealt with by other means than GE, for example with social policies, for instance with positive discrimination. However, assuming that safe, effective and cost-efficient HGE would be at our disposal, it should be treated as an attractive method of compensation.[16] As the author puts it: "a highly advanced genetics would completely undermine the natural lottery as we know it and change many 'natural' resources into 'social' ones."[17]

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[14] *Ibidem*, p. 60.

[15] D. Resnik, *Genetic...*, p. 428.

[16] *Ibidem*, p. 431. Resnik even quotes a passage from *A Theory of Justice,* which can be read as an anticipation of the problems discussed here. Cf. J. Rawls, *op.cit.*, pp. 107–108.

[17] D. Resnik, *Genetic...*, p. 432.

If our genetically determined traits are qualified as social resources and we are in the position of controlling them, it becomes necessary to specify the rules of this control. At the point of departure, Resnik makes use of the concept of 'normal opportunity range' coined by another prominent Rawlsian, Norman Daniels, in his book *Just Health Care*.[18] Normal opportunity range is the spectrum of life plans reasonable persons in a society are likely to construct for themselves. Diseases are factors which result in complications, and even impossibility of the realization of such plans, reasonable for healthy people. In consequence, diseases should be seen as factors causing arbitrary inequalities and therefore society ought to provide some compensation for sick people. Fair distribution of resources should lead to increase of chances for the worse off. In consequence, health care institutions ought to promote equality of opportunities.

Resnik makes use of Daniels' framework by developing the following line of thought. PFEO, together with the concept of normal opportunity range, justifies HE as methods of treatment of genetic diseases. This is due to the fact that there are no reasons that would force us to treat genetic and non-genetic diseases differently. In consequence, Rawls-Daniels theory provides a solid ground for the application of GT. Moreover, GEs could also be acceptable, given that they do not lead to a 'levelling' of opportunities and that they are to the mutual benefit of everyone.[19]

However, the possibility of HGE introduces a new factor into the fore. Note that in the context of classical, i.e. non-genetic health care, we are able to state quite precisely what the normal species functioning of a human being amounts to. Now, in the context of HGE, this – previously fixed – assumption becomes a variable. Resnik rightly observes that in this new context we have to introduce a notion of 'genetic normality' and that this notion has to be normative;[20] if we omit to do this, we would not be able to make use of Rawlsian principles of fair distribution. The author discusses three normative versions of the concept of genetic normality and finally chooses the most moderate and reasonable one, namely, the concept of Genetic Minimums and Maximums (GMM).[21] According to this account, all new children will have genes that place their life prospects within a normal range between acceptable minimum and maximum genetic resources.[22] This stance has obvious advantages, because it is quite flexible, in principle allows for all kinds of GT and moreover does not preclude some reasonable GEs (presumably these which not exceed the category 2 in Jones' classification). On the other hand, it remains vague as to what this means for genetic resources to be at acceptable maximum. The same problem, although to a less extent, applies to a genetic minimum.

Resnik offers a plausible answer to this question. He claims that we face a similar situation when we take other types of primary goods into account, and somehow we have to cope with this situation. This argument may be referred to as a positive one. However, Resnik has a negative argument, too. According to

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[18]   *Ibidem*, p. 434.

[19]   *Ibidem*, p. 435.

[20]   *Ibidem*, pp. 437–438.

[21]   *Ibidem*.

[22]   *Ibidem*.

him, moderate restrictions on HGE are justified better from a moral point of view than a total ban of this kind of activity or no restrictions at all. In consequence, he formulates the following policy implications: (1) in principle, any discrimination based on genetic endowment should not be permissible, (2) all members of society, especially the worst-off, should be provided with some minimal level of genetic health, (3) HE should be in principle acceptable, excluding modifications that would exceed maximum genetic levels (this is similar to category 3 GEs in Jones' account) and (4) in consequence, there ought to be no general moratorium on HE research.[23]

The position advocated by Resnik may be summarized as follows. Genetic engineering is morally permissible and it can be even demanded for the sake of fair distribution of resources. In particular, GT is justified on the basis of the PFEO. The same applies, albeit with qualifications, to GE, although the scope of enhancement ought not to exceed some fixed threshold. It is the state (government) who ought to be responsible for the distribution of HE resources; in consequence, these resources should not be subordinated to any kind of free movement of goods principle. Prohibition of HGE may have very adverse consequences, and therefore it should not be adopted.[24] Some genetic inequalities are tolerable if and only if they do not interfere with the principles of distributive justice, most notably the PFEO.

Another well-known bioethicist, Colin Farrelly, advances a slightly different position, although he remains in the boundaries of Rawlsian framework. According to this author, there are three plausible candidate formulas for a proper principle of distributive justice in the context of HGE. Farrelly assesses them against two chosen criteria, namely, their ability to cope with the so-called currency problem and the so-called weight problem. The currency problem concerns the list of genetic advantages/disadvantages that are to be included in an account of the demands of distributive justice. The problem of weight deals with the relative importance of genetic disadvantages of the people as opposed to other types of disadvantages.[25] In other words, the currency problem touches the well-known distinction between GE and GT. The problem of weight, however, is not so often dealt with by bioethicists.

Farrelly compares the following three principles of fair distribution of genetic endowments:

1) GE – Genetic Equality Principle. Everyone should have the same genetic potential.
2) GDM – Genetic Decent Minimum Principle. Everyone should have genetic potential which exceeds some minimum threshold.
3) GDP – Genetic Difference Principle. Genetic endowments ought to be distributed to the greatest possible benefit of the worst-off.

These three principles are based on major ethical theories: egalitarianism, sufficitarianism and prioritarianism (Rawlsianism).[26] Farrelly dismisses the GE,

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[23] *Ibidem*, p. 441.

[24] *Ibidem*, p. 443.

[25] Cf. C. Farrelly, *The Genetic...*, p. 21.

[26] *Ibidem*, p. 23 ff.

for it does not deal satisfactorily with the currency problem (the very issue of equalization of genetic endowments is counterintuitive and potentially dangerous) and with the problem of weight (such equalization could be so costly that it would possibly preclude the equalization of other types of resources, which would be undesirable for most of the egalitarians).[27] The principles of genetic decent minimum (GDM) states that the fair distribution of genetic endowments should guarantee that everybody should have some genetically determined traits exceeding a certain minimal threshold. However, it is difficult to specify the catalogue of traits which should satisfy this minimum condition; in consequence, the currency problem is as least as problematic for the GDM as for the GE. Moreover, as Farrelly rightly points out, not all of the resources typically chosen by sufficitarianists as the most basic ones, are genetically determined.[28] But the GDM does even worse in the context of the problem of weight. The author emphasizes that when one takes scarcity of resources seriously enough (and, implicitly, if the chosen minimum threshold exceeds substantially the status quo) then the principles in question either requires the impossible, or involves prioritization of the factors which should pass the threshold test. The former option cannot be accepted for obvious reasons; the latter generates a plethora of additional problems.[29]

Taking the mentioned problems into account, Farrelly proposes a prioritarian account to the problem of the distribution of HGE. He formulates the so-called Genetic Difference Principle (GDP), which is a genetic-endowment-oriented version of Rawls' difference principle. According to the GDP, genetic endowments ought to be distributed to the benefit of the least advantaged.[30] Farrelly states that the GDP deals well with the currency problem. The genetic endowments advanced by the GDP are included in Rawlsian catalogue of 'natural primary goods' that all rational people are interested in, for instance health and vigour, intelligence, imagination.[31] Simultaneously, the author engages in a discussion with Rawls and he states that the *stringent* interpretation of the GDP, according to which the interests of the worst off are given *absolute* priority. He claims that this stringent version of the principle is untenable in the context of the problem of weight (assuming scarcity of resources). In consequence, Farrelly promotes a modified version of the principle, to which he refers to as the *lax* GDP. Let us formulate this principle:

Lax GDP. Inequalities in the distribution of genes important to the natural primary goods are to be arranged so that they are to the greatest *reasonable* benefit of the least advantaged.[32]

In consequence, the lax GDP does not ascribe absolute priority to the benefit of the least advantaged. Moreover, Farrelly does not want to place the principle into any order (like Rawls does in his *opus magnum* with the so-called basic

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[27]   *Ibidem*, p. 24. Let us note that Farrelly distinguishes two interpretations of GE (and GDM): broad and narrow. However, we shall omit this distinction here.

[28]   *Ibidem*.

[29]   *Ibidem*, p. 25.

[30]   *Ibidem*.

[31]   *Ibidem*. Cf. Also C. Farrelly, *Justice...*, p. 93.

[32]   C. Farrelly, *The Genetic...*, p. 26.

principles of justice). Rather, he insist on its *pro tanto* and discursive character. Moreover, he does not intend to define concepts which appear in the formulation of the principle in technical terms (as Rawls does). In consequence, his proposition remains quite indeterminate, but this result, according to the author, should be seen as an advantage.[33] Farrelly states that the lax GDP, as opposed to highly sophisticated principles of distributive justice, can be applied in non-ideal situations in practice. We will return to this problem in the remaining part of the text.

The most important value which has to be balanced with the benefit of the genetically least advantaged in the value of reproductive freedom. Farrelly proposes a set of postulates labelled "Reasonable Genetic Intervention Model" (RGIM), designed to protect the realization of reproductive freedom in the context of potential conflict with other important social objections. He eventually claims that the lax GDP, together with the RGIM, provide a good starting point for ethical discussions concerning the distribution of resources provided by HGE.[34]

Let us now comment briefly on the positions adopted by Resnik and Farrelly. Both conceptions are situated in between radical trans-humanism and radical bio-conservatism. It is a trivial observation that both of the authors are not bioconservatives: they adopt a moderately optimistic attitude towards the application of HGE in social practice. Resnik seems to adopt the Moderate Version of TT(1): we ought not to oppose the development and application of HGE in the scope of categories 1 and 2 of GE. This conclusion stems from the fact that Resnik does not oppose genetic enhancement unless it leads to a genetic caste society. In consequence, he rejects the idea of GEs belonging the third category. Resnik is a partial opponent of TT(2). He argues that HE is possibly beneficial to mankind, but he does not accept the possible emergence of genetic castes and, *a fortiori*, the creation of human superspecies. As far as morphological and reproductive freedoms (TT(3) and TT(4)) are concerned, Resnik adopts a refined and moderate attitude. First, he claims that the distribution of GE (and GT) ought to be regulated by the state. He is an opponent of market approach to genetic enhancements. Lack of proper regulation may activate slippery slope mechanisms and ultimately lead to the creation of a new species of humans. However, a general ban on HGE may lead to identical results. In consequence, Resnik advocates some form of cautious, governmental regulation of the problem.[35] Simultaneously, he is aware of the fact that governmental authority to regulate distribution of these resources is a controversial issue.[36] He adopts a moderate attitude towards the reproductive freedom, too. According to him, parental rights ought to be limited in order to prevent unintended, disastrous social effects.[37]

Farrelly's views seem to be a somewhat less determinate than those adopted by Resnik, and this seems to be a conscious choice of the former author. He also seems to accept a Moderate Version of TT(1), although within his conception it is not in principle impossible to accept a Radical Version of TT(1). In consequence, Farrelly's conception is open for acceptance of TT(2) in its entirety, although

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[33] *Ibidem*.
[34] *Ibidem*, pp. 27–28.
[35] Cf. D. Resnik, *Genetic...*, p. 443.
[36] *Ibidem*, p. 444.
[37] *Ibidem*, *supra*.

this prospect seems implausible, given the authors insistence of reasonableness in distributive justice decisions. It seems also that Farrelly is more ready to adopt at least partial market freedom of genetic enhancements (TT(3)).[38] As far as reproductive freedom is concerned, Farrelly proposes a view which considerably differs from the one adopted by Resnik. Let us recall that the author is an advocate of RGIM. One of purposes of this model is to allocate burdens of argumentation in a debate between proponents and opponents of HGE. Now we are in a proper position to comment on this issue more specifically. The RGIM presents itself as follows:

With respect to genetic interventions, the reproductive freedom of a parent can be limited if:

1. The objective behind the measure which requires limiting this freedom relates to concerns which are pressing and substantial in a free and democratic society.

and,

2. (a) The means chosen to restrict reproductive freedom are rationally connected to the objective.

(b) The measure impairs as little as possible reproductive freedom.

(c) There must be proportionality between the effects of the measure which are responsible for limiting reproductive freedom and the objective which has been identified as of sufficient importance.[39]

This exposition reveals clearly that, according to Farrelly, it is the opponent of HE who ought to argue for limitations of reproductive freedom of parents, and that this opponent is faced with a difficult task of proving four, quite difficult premises. If we look at the RGIM in the context of acceptance of possible free market regulation of the HGE, we may state that Farrelly's conception does not include an operational mechanism blocking the potential slippery slope, resulting in a genetic caste society and eventually the creation of a new human species. This is, undoubtedly, the most important practical difference between the two authors. However, there are also some important, methodological and theoretical discrepancies between them, which are worth discussing here.

First, Resnik develops his position assuming counterfactually that safe, effective and cost-efficient HGE is at our disposal. This enables him to concentrate on the issue of equality of opportunities in society. Farrelly, to the contrary, ascribes greater weight to the problem of costs. In this respect, the positions of the both authors are incomparable. However, it seems that Resnik's strategy is more proper from methodological point of view. Farrelly dismisses some principles of distributive justice due to the fact they would be too costly in realization. However, it is not clear why he assumes that the GDP, adopted by him, passes this test.

Secondly the most important theoretical difference between the authors is that while Resnik ascribes a central role to the Principle of Fair Equality of Opportunity (PFEO), Farrelly concentrates on his version of the Difference Principle, namely, the lax GDP. Resnik claims that GE (and, of course, GT) are

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[38]   This is emphasized mainly in C. Farrelly, *Justice...*, p. 91 ff.
[39]   Cf. C. Farrelly, *The Genetic...*, p. 27.

morally justified, unless they distort the equality of opportunities rather than support it. He makes use of the concept of 'genetic normality' and states that the use of HGE infringes the PFEO if it results in exceeding the boundaries of genetic normality. The scope of the latter concept ought to be defined, presumably in an authoritative manner. Farrelly concentrates on the benefit of the least advantaged; however, he relaxes this stringent postulate by introducing the criterion of reasonableness. He is aware of the almost hopeless vagueness of the term, yet he insists on its importance in the discussion. He claims that it is less difficult to specify what counts as unreasonable in the context of the distribution of resources.[40] In consequence, the lax GDP serves as a tool for determining boundary conditions for a distributive decision rather than a criterion for singling out a concrete conclusion. Moreover, it seems that there is a tension between the lax GDP and the RGIM. The former one seems to assume a cautious and limited approach to the distribution of HGE, while the latter undoubtedly supports broad distribution of genetic enhancements. While the formulation of lax GDP is distinct from the premises blocking reproductive freedom specified in the RGIM, the relation between the two remains unclear. Resnik proposes a well-defined default rule in his conception.

Thirdly, Farrelly's conception is, in fact, close to situation ethics. Resnik adopts rather a rule-based approach. The choice between these two model approaches yields difficult questions which cannot be discussed here in depth. Nevertheless, it seems that in the context of risky prospects (and the possibility of the broad application of HGE belongs to this class), it is more prudent to propose a set of coherent default rules, like Resnik does. Although Farrelly also attempts to provide such a set, unfortunately his proposition is internally conflicted. The introduction of the notion of reasonableness into the conception is not very helpful, too. Isn't it the case that almost every contemporary ethical conception adopts it, at least implicitly?

Our comparative analysis may be summarized as follows. David Resnik's proposal of application of Rawlsian ethical thinking to the problems of HGE seems to be more internally coherent and more operational than the approach formulated by Colin Farrelly. It is the role of an ethicist to provide argumentative tools for deciding important and difficult social issues. The criteria provided by Resnik seem to be more operative for practical purposes, although Farrelly claims explicitly that his modifications of original, Rawlsian account are motivated by realities of life. These observations enable us to present some more general conclusions in the next section of the paper.

Conclusions and further questions

There is a perplexing discrepancy in bioethical literature concerning distribution of HGE. Bio-conservatives, making use of the argument from human rights and human dignity, tend to look at HGE as a potentially devastating factor in

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[40] *Ibidem*, p. 27.

a society. However, once we engage in another type of discourse, particularly in a Rawlsian spirit, there is a tendency to allow for a wide range of genetic enhancement. David Resnik's conception is an example of a reasonable voice in this debate. This bioethicist is aware of the fact that fighting against the development of HGE may result in the emergence of black market here and narrowing the group of beneficiaries of HE to a small group of the most rich people. Governmental regulation of the research may rationalize the distribution of genetic enhancements and help in eliminating of arbitrary inequalities.

This does not mean that Farrelly's proposal, while in my opinion methodologically dubious, is worthless. The contrary is the case. This author indicates a very important problem of the costs of HGE. Although idealized assumptions help to make a conception more intelligible, these assumptions have to be relaxed in social practice and we have to be prepared to reason further after the relaxation of these assumptions.

In order to be able to perform well in this task, we have to be aware of the problems generated by the issue in question. One of the aims of this paper was to explicate these problems. Let us recapitulate the analyses with the following set of postulates.

If one wants to engage in the discussion of problems of distributive justice and HGE, one ought to:

   (1) provide for at least working definitions of genetic therapy and genetic enhancement employed in our line of argumentation. Moreover, it seems necessary to formulate some additional distinctions here, in particular, the distinctions referring to types of genetic enhancement,

   (2) state explicitly which types of HGE are acceptable and which are not acceptable,

   (3) specify the criteria of acceptability, or lack thereof, referred to in the previous point,

   (4) if one accepts consequentialist criteria of acceptability, one ought to specify the expected consequences. If the consequences are structured with a slippery-slope argument, one ought to specify the factors which could possibly block the slippery-slope,

   (5) provide for default rules concerning fair distribution of genetic endowments,

   (6) formulate an explicit position concerning the relation between fair distribution mentioned in the previous point and freedom of individuals, in particular, of reproductive freedom of (potential) parents.

Fulfilment of this set of criteria is not an easy task. However, it seems to be a necessary condition for a rational, fruitful debate on the subject. This does not mean that it is sufficient to resolve 'the myriad of issues' – as Farrelly puts it – which appear in the context of HE and distributive justice. In my opinion, the following topics ought to be, and very probably will be, the topics of relevant discussion in the nearest future.

First, it seems necessary to consider the legitimacy of the state to make distributive arrangements concerning genetic endowments and the possible risks of such arrangements. Although some bioethicists – like Resnik – assume that the distribution of HGE resources ought to be regulated by governments due to

enormous risks of free market approach in this context, the problem of the risks of ascribing this task to the state have to be considered. This problem is, in my opinion, urgent, given the problems of states related to protection of personal data.

Second, the problem of distributive justice of genetic endowments seems to be suitable for game-theoretic modelling. In particular, the tools of game theory and in particular of evolutionary game theory may be fruitfully employed for the prediction of the future development of HGE and the behaviour of agents. In my opinion, the problem of the fair distribution of genetic enhancements ought to be more intensively analyzed from the perspective of utilitarianism and the theory of rational choice. The possibility of radical genetic enhancement seems to be tempting because it potentially enables a group of transformed humans to dominate the 'naturals' in many aspects of life. This factor ought to be adequately included into a game-theoretic framework.

Third, as indicated above, the problem of the overall distribution of resources in a 'genetically transformed society' has to be taken into account. In particular, the policies against genetic inequalities have to be considered. One should note in this place, that genetically enhanced people would naturally be in a position to oppose such policies, because such policies would be counter to their advantageous status.