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GenEthics and Religion

An invitation to confront the complexities of life with a little less fear in our hearts

Ulrich Goetz

Dear Reader,

Ethics in medicine has been an issue of particular concern to me ever since I took over the family business 50 years ago. Maybe it is part of my genes and upbringing – both my father and grandfather never lost sight of the concept throughout their business lives as publishers.

The idea of organizing a symposium devoted to this topic had been at the back of my mind for some time, but only finally began to take shape during chance meetings with the theologian Professor Stegemann and Dr. Pierre Jaccoud of Hoffmann-La Roche. Over time the emphasis shifted more to religious and genetic aspects and new partners were included. In the end, Klaus Lindpaintner of the Science and Ethics Advisory Group at Roche, Georg Pfleiderer, Dean of the Theological Faculty in Basel, and my son Steven, with his deep and abiding interest in the Jewish perspective, took up the project. Thanks to their efforts, this symposium on GenEthics and Religion could be held in Basel in May 2008.

Sadly, two months before the event, my son Steven passed away after a long struggle against cancer. Georg Pfleiderer commemorated him with a minute's silence at the opening of the symposium.

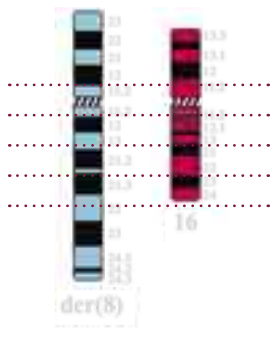
Such a far-reaching, interdisciplinary topic can never be exhaustively discussed. Nevertheless, the symposium succeeded in highlighting many important aspects, which are covered by this congress report offered as a special edition of the Karger Gazette.

Thomas Karger

What are human beings? What is life? At what point does human life become generally regarded as being worthy of protection? What role can religion and religions play in establishing ethical guidelines to protect human life in the face of rapid advances in biology and especially in gene technology? Is there any need or public demand for restrictions on genetic research? On May 22/23, 2008, representatives of the Christian, Jewish, Islamic, and Buddhist world views, together with human geneticists, philosophers, and lawyers, discussed these and related questions in Basel at a conference titled *GenEthics and Religion*, which was also open to the public. The conference was held jointly by the Faculty of Theology of Basel University, the Science and Ethics Advisory Group of F. Hoffmann-La Roche Ltd. and S. Karger Publishers.

Basel is a compelling choice as the venue for a coming together of divergent world views. As **Antonio Loprieno**, Rector of Basel University, pointed out in his welcome address, this city situated on a bend in the Rhine has always been open to new currents of thought and has been moulded by humanism over the centuries. Over the past hundred years or so, Basel has been driven by scientific and economic impulses arising from the chemical and pharmaceutical industries. This duality in the intellectual life of the city is also reflected in the particular intellectual agenda that Basel University has set itself by focusing its activities simultaneously on life sciences and cultural studies. According to Antonio Loprieno, the area where these two often conflicting disciplines are most likely to be able to come together in a fruitful dialogue is that of applied ethics or bioethics – the subject of this conference.

Equally understandable is the commitment of F. Hoffmann-La Roche Ltd. to the holding of this conference on *GenEthics and Religion*. This, after all, was one of the first companies in the world to recognise the central role that new knowledge acquired via genetic research could play in medicine both today and in the future. At the same time, Roche was quick to become aware of the ethical questions raised by the use of gene technology in humans and for this reason set up a 'Science and Ethics Advisory Group' for advice on its activities in this area. Human beings have not just a bodily, but also a spiritual existence, said **Klaus Lindpaintner**, Director of the Roche Center for Medical Genomics and in this capacity also Coordinator of Roche's Science and Ethics Advisory Group. In this way the company hoped to give new meaning to the old cliché 'a healthy mind in a healthy body'.



'Gene therapy is not to start tomorrow'

Sandro Rusconi, a professor of biochemistry who since 2005 has been Head of the Department of Culture and Higher Education of the Swiss canton of Ticino, was assigned the task of describing the present state of knowledge and lack of knowledge in the field of human gene technology. He used this opportunity to recall that humans have always used genetic and biotechnical principles in intuitive fashion, whether they be for cultivating food-producing plants and breeding livestock or for brewing beer and fermenting grapes to produce wine. Only in the past 40 years or so have they done this consciously and with specific aims in mind, and it is precisely now that we understand the mechanisms of genetics that debates have arisen.

Rusconi defines the gene, composed of DNA, as a 'regulatable nanomachine for the production of RNA' and thus of proteins. This regulation or reorganisation of the DNA can occur both in nature and as a result of human intervention, 'like a Lego kit'.

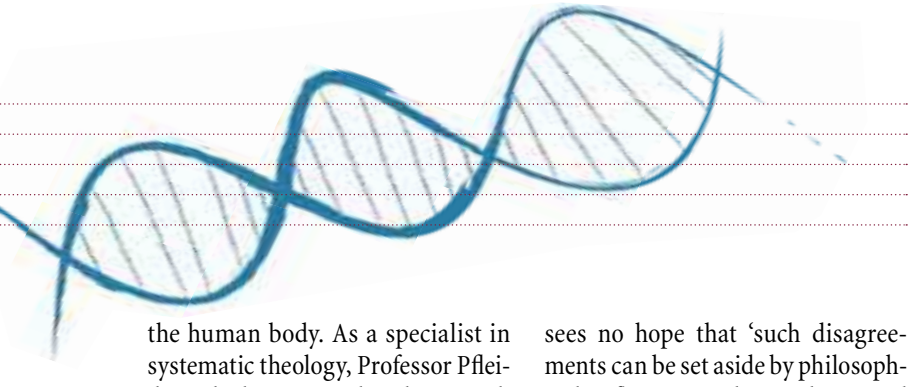
The pace of development in this field has been breathtaking: whereas in the 1980s gene technology was used only as an analytical instrument, 10 years later the use of altered genes to produce specific proteins in bioreactors had become standard practice. Since about the turn of the millennium, projects aimed at using genes directly as medicines have been developed. Genome-based tests now permit presymptomatic assessment of whether an individual is at increased risk of developing diseases such as cancer, Alzheimer's disease, or Parkinson's disease. Similar tests can suggest which drugs a patient will best respond to, thus providing information that is useful especially in the treatment of chronic diseases.

Does this mean that a brave new world of medicine has arrived? Not by a long way, suggests Rusconi. In gene therapy, successes are still few and far between despite a decade and a half of research efforts. Rusconi predicts a similar fate for stem cell therapy, against which a storm has been raised on ethical grounds because of the initial belief that it would inevitably entail the use of embryonic cells. He points out that this technology enjoys a media presence out of all proportion to its concrete prospects for success, and that, realistically, in the near future gene therapy may just bring about a small increase in human life expectancy, improve the quality of life of older people, and prove useful for the production of designer drugs. As for the fears that are being propagated about gene therapy, Rusconi considers these to be at least partly 'constructed'.

In the subsequent discussion he conceded that the advent of gene technology is indeed a special case that cannot be likened to the triumphant march of the steam locomotive (though this too was greeted with concern at the time). This is because gene technology is at least potentially able to have very direct consequences for the individual. 'No wonder it provokes so much debate,' he said. Nevertheless, it must be remembered 'that a human being in whom a foreign gene has been implanted remains a human being'. By its very nature, the human genome is already about 10% non-human, being partly derived from bacteria and viruses. Horizontal gene transfer is thus the most natural thing in the world, said Rusconi in conclusion.

> Religion provides a language for thinking about humanity that can also be understood by people who are not religious …

How can religion contribute to this debate? Should it even attempt to do so, given that it is generally regarded as having more to do with the spirit than with the body? **Georg Pfleiderer**, Professor of Systematic Theology at Basel University and a co-organiser of the conference, has a very definite view on these points. In a personal discussion, he explained that although it would not occur to any representative of Christianity to reduce human beings down to their body, let alone their genes, 'according to Christian teachings that follow the Old Testament in this respect, each human being is a unique physical entity' and thus the Christian religion has an obligation not only to the human spirit, but also to the human body. As a specialist in systematic theology, Professor Pfleiderer deals among other things with ethics, i.e. with the motives and consequences of human actions, and is therefore convinced that religion most certainly does have something to say about bioethics. Because ultimately, he says, over the course of its history religion has created a 'language for thinking about humanity' that can also be understood by people who are not religious.



In his introduction, Professor Pfleiderer pointed out that gene technology has given rise to great hopes, but at the same time great concern. He felt that many people are worried about the sheer pace with which this branch of science has developed since its birth only about 40 years ago and how it has now begun to affect everyday life. 'Faced with the pace of this development, ethics and religion find themselves in a difficult position.' Yet the question of what humans ought and ought not to do with their genetic material and where the limits should be drawn to the human mania to do whatever it is technically possible is a deeply religious one. As Georg Pfleiderer explained, the ethics of gene technology have been vigorously debated in religious communities for years. 'It is now the time to take stock and make the discussion more objective,' were his final words of introduction to the conference participants.

> … yet the classical religious traditions do not deal with questions of genethics

However, even Georg Pfleiderer's colleague **Friedrich Wilhelm Graf**, Professor of Systematic Theology and Ethics at Ludwig Maximilian University Munich, Germany, doubts the ability of religions to make a worthwhile contribution to the bioethics debate. 'How can we speak of bioethics based on religion? The classical religious traditions do not deal with questions of genethics. They have nothing to say about the moral value of embryonic stem cells, for example.'

Tristram Engelhardt, Professor of Philosophy at Rice University, Tex., USA, questioned the very possibility that the world could ever agree on any set of concrete bioethical guidelines governing the use of gene technology in human beings. 'Our societies are marked by culture wars, struggles among partisans of different moral, religious, and metaphysical views as to which view should constitute the dominant or leading culture, and what the content should be for a bioethics of human genetic engineering.' Worse still, Engelhardt sees no hope that 'such disagreements can be set aside by philosophical reflection and sound rational argument, in that the disputing parties do not agree about basic premises and rules of evidence'.

In other words, there is no worldwide ethics, nor does it help to look to religion for a solution, since 'those who recognise the existence of God are for their part divided, for not all are in agreement as to Who exactly God is, much less what He requires of us'. As a result, religion is of no use as a guiding light for bioethics, since the only point of agreement between, and even within, religious communities is that they disagree on fundamental questions.

> Religious language may be the most dangerous mental material that we humans always have to deal with

'I can only agree with Tristram Engelhardt on that point,' said Friedrich Wilhelm Graf, in relation to the diversity of opinions among religions. To explain this phenomenon he cited some figures: around the year 1900 there were about 1,800 Christian churches, whereas a hundred years later there were 36,000. Graf also sees a completely different dimension to the problem. In his view, the debate about the role of religion in bioethics is a sort of surrogate war whereby old religious conflicts and claims to authority are continued. He feels that religious language is used quite deliberately in this debate, even by non-religious participants, and that this should give us cause to analyse such language critically. 'Because religious language is an extremely dangerous language, it is possibly the most dangerous mental material that we humans always have to deal with.' No limits are placed on the range of possible interpretations. People use religious terms in order to represent their own special interests as a form of higher authority that cannot be questioned. As an example, Graf refers to the religious term 'the Creation', 'with which a lot of dirty tricks are played'. This catch-phrase can be used to support any point of view, from defending nature against attacks by dastardly bioengineers to proclaiming the birth of New Man in a genetically engineered world. In his view, the Creation is not a source of ethical norms from which a set of instructions for human behaviour can be derived. Graf also takes issue with the use of the term 'human dignity', saying that 'this term is used in relation to all sorts of trivial matters'. Before the 1940s this term scarcely existed in religious writing. In fact, up to that time both Roman Catholic and Protestant theologians considered the postulation of human rights to be an expression of 'a liberalistic misorientation, a delusion of human autonomy'. Yet '50 years later, the religious participants in this debate have taken up a position on the basis of which they claim a monopolistic right to interpret terms such as "human dignity" and "human rights". This seems to me to be an extraordinary development.'

From all of this, Graf concludes that the current debate about bioethics is 'no more than a new staging of very old conflicts about justice and the limits of human autonomy. We are not arguing about anything new, we are merely continuing a debate that we have been having for 250 years.'

> Is the Church's claim to guardianship of life essentially just a bid for more power and terrain for itself?

This proposition was put forward by **Petra Gehring**, Professor of Philosophy at the Technical University of Darmstadt, Germany. In her view, the Church's contribution to the bioethics debate blends seamlessly with its contribution to the abortion debate of earlier decades. 'The power of the Church has always been directed against the individual.' Under the guise of helpful advice on how to look after one's own body, the supposedly caring pastoral authority has always surrounded the sinful flesh with moral prohibitions and in this way created and nourished fears.

Particularly remarkable, in Gehring's view, is the solidarity shown by Christian churches against women and in favour of unborn life. This development, she said, has occurred over the past 50 years and now dominates the Church's contribution to the bioethics debate. In her view, the Church has been very successful at practising power biopolitics, 'especially since the 1980s in the context of the development of applied ethics'. The Church's claim to guardianship of life is essentially just a bid for more power and terrain for itself. 'It is evident that to pastoral workers bioethical questions are a key to the individual which once obtained is not so easily relinquished. A demand for advice is created by the churches and then satisfied by the churches. But I doubt whether patients, for example, really need bioethical advice. When they are unwell and unable to come to a decision, what they need above all are good friends – not a discussion about ethics.'

> Biopower is a fact; however, it is secular; churches play only a secondary role – they either concur, retreat, or resist

This was the response of **Dietmar Mieth**, Professor of Theological Ethics at the University of Tübingen, Germany. He sees biopower as being structurally determined, as 'an alliance between society and scientific, technological, and economic progress'. Biopower also arises as a result of 'the application of the argument of usefulness to international competition: public funds flow towards those who promise much'. In Dietmar Mieth's somewhat resigned view, ethics has a chance only 'if it serves biopower'.

On the other hand, he felt that ethics must 'maintain a reflective distance from what is the case and what is strategically efficient'. He called for more honesty and transparency on the part of the natural sciences: advances in what we do not know must be communicated in just the same way as scientific breakthroughs; potential risks must be disclosed, and language must be used responsibly, including in the sense that the hopes of ill people should not be instrumentalised. Above all, he felt that before embarking on a new project, researchers must show how their work could lead to an increase in knowledge. In the subsequent discussion, however, this last demand in particular was said to be unrealistic, since especially in basic research nobody can really know in advance where research will lead.

Back to the principal topic of the conference, namely where do the various religions stand on the question of bioethics? Is it possible – notwithstanding the great diversity of possible religious views on bioethics referred to by Tristram Engelhardt – to identify a pattern? The conference provided a unique opportunity to acquire an overview of the various standpoints as expressed directly by their proponents. Let it be said at the outset that at this conference the representatives of Eastern religions, which generally have little time for Western technical civilisation, showed themselves to be extraordinarily open to the use of gene technology in humans.

> The Orthodox Church takes a positive view of medicine and hence also of the use of gene technology in humans

As described earlier, Tristram Engelhardt is sceptical about a possible role of religion in the field of bioethics. Nevertheless, as a practising member of the Orthodox Church, he outlined the position of his Church when giving his talk, namely

The Fall of language

The topic of misuse of language in the bioethics debate was then taken up by two more speakers at the conference. **James F. Childress**, Professor of Ethics at the University of Virginia, USA, tore into the term 'human dignity' – and left it in shreds. The term, he said, originated in the USA and is now being used by opponents of gene therapy as a pretext for imposing restrictions. 'It is a "loose cannon" that can mean anything or nothing. The concept of human dignity is used both to justify euthanasia and to condemn abortion.' Human dignity, he said, is a worthless concept that deserves to be abandoned – and that above all has no place in legislation. Instead, suggested Childress, terms such as 'respect' and 'autonomy' should be used, though these, too, are subject to multiple interpretations.

'Is the human genome sacred?' asked **Ted Peters**, Professor of Systematic Theology at Berkeley, Calif., USA, in his talk, which he illustrated by showing a projection of Salvador Dali's painting *Homage to Crick and Watson*. 'In this painting, honouring the discoverers of the double helical structure of DNA, the genetic substance appears to have been sent down from heaven into the body of Dali's wife and then to ascend back up to the angels.' Peters interpreted Dali's painting to mean that 'molecular biology is now a religion and molecular biologists are its prophets'. In his view, the responsibility for this quasi-religious glorification of gene technology lies at least to some extent with molecular biologists themselves. It was they, after all, who exalted the genetic substance DNA in the first place by using such terms as 'the secret of life', 'the book of life', and even 'the language of God'.

This has now reached the point, says Peters, where defendants in court attribute their actions to their genes: 'My genes made me do it!' Genes are being held responsible for all the ills of the world. This, of course, is nonsense. 'We remain responsible for our actions regardless of what is in our genes,' says Peters.

Peters also put paid to the myth that moral philosophers have failed to keep pace with developments in gene technology. He says that as long ago as 1990, when the Human Genome Project got under way, and again in 1996, when stem cell research became an issue, philosophers at Berkeley started to consider the ethical implications of these new techniques. In relation to the use of embryos, for example, they proposed a 14-day rule. According to this, up to the 14th day after fertilisation the embryo still has no individual genome and if implanted into a uterus still has the capacity to form twins or quadruplets. Up to that time, therefore, the use of embryonic stem cells would be ethically acceptable.

To get back to the question of whether the human genome is sacred, Karl Barth would have exclaimed 'No!'. Of this Ted Peters is convinced. 'Because there is no point of contact between heaven and earth, between the transcendent God who created the world and Creation itself.' Though DNA is a magnificent and exciting substance, it is neither holy nor sacred. 'Personally, I am against the idea that genes should be placed above people.'

Galacidalacidesoxiribunucleicacid ('Homage to Crick and Watson'), oil on canvas (400 × 500 cm), by Salvador Dali (1963). Dali focused on the religious subject of the resurrection in order to express both his interest in modern science and his awareness of current events. The title refers to the discovery of DNA by Francis Crick and James Watson in 1953, for which they were awarded the Nobel Prize in 1962. Life, death and rebirth are represented by the spiral-shaped, life-bearing DNA molecule on the left, the cubic structure consisting of figures with guns in their hands on the right, and the arm of God reaching down to lift the dead Christ up to heaven in the middle, watched on by Dali's beloved wife Gala standing in the foreground. (Prolitteris©, Zürich, 2008)

that it takes a very positive view of medicine and hence in principle also of the use of gene technology in humans. It would appear that in this field the tone was set by Saint Basil, whose writings emphasised the value of medicine in the struggle against the diseases that have plagued mankind since Adam's original sin. In this sense, the Orthodox Church allows more or less anything that helps return mankind to the Garden of Eden, including the use of gene technology. However, there are exceptions: the concept of man/woman is inviolable, the blurring of species barriers is taboo, and anything that requires unusual and all-consuming effort and thereby distracts people from striving for salvation 'must be avoided by Christians'.

> In Roman Catholicism the responsibility of human beings for all of Creation is of primary importance

Roman Catholicism sees things differently, explained **Eberhard Schockenhoff**, Professor of Moral Theology at the University of Freiburg im Breisgau, Germany. According to Catholic teaching, the biblical belief in the Creation reminds mankind both of its mission to rule and of its responsibility for the wellbeing of all of Creation. From this, says Schockenhoff, is derived, among other things, the intrinsic value of animals as God's creatures, which consequently must be preserved in all their genetic diversity and not reduced to the function of high-performing races or bioreactors. In the Roman Catholic view, prenatal diagnosis is liable to expose parents to the widespread abortion mentality 'which few have the strength to resist'. The Church rejects cloning of human beings because it violates the right of the individual to be created by random genetic recombination. According to this view, a human being produced by a process of cloning would thus be denied existence as an end in itself – though this line of reasoning was disputed in the subsequent discussion.

> In Judaism the injunction to 'be fruitful and multiply' is accorded high status

Judaism, by contrast, is extraordinarily open in terms of its attitude to the use of gene technology, whether this be for choice of partner or for prenatal diagnosis – and this despite the fact that scarcely any other group has suffered more as a result of 'eugenic' measures than have Jews. According to **Ronald M. Green**, Professor for the Study of Ethics and Human Values at Dartmouth College, New Hampshire, USA, this began in the 1980s with screening tests to identify carriers of the gene for Tay-Sachs syndrome (a hereditary disease that manifests itself as congenital mental retardation and is particularly common in Jews of Eastern European origin). Since the screening test became available, the number of cases of Tay-Sachs disease has fallen by 90%. Screening has proved to be particularly effective in ultra-orthodox communities, in which arranged marriages are common and screening is consequently easy to perform before marriage. In these communities, the first question is often 'Have you been tested?'

According to Ronald Green, this attitude has been carried over to the entire range of genetic medicine. Medicine as a means of preserving life has always been highly valued in Jewish tradition, especially when placed in the service of the injunction to 'be fruitful and multiply' – if necessary with the aid of gene technology. This pragmatic approach to the use of gene technology in medicine is also supported by Halacha, Jewish religious law. According to this, a human embryo possesses scarcely any moral value until the 40th day after fertilisation. Judaism therefore has no objection to the use of embryonic stem cells for medical purposes.

> In Islam, religion, ethics and law are inseparably linked

In Islam, religion, ethics, and law are inseparably linked. Here, too, conflicts can arise about the permissibility of new medical techniques such as genetic preimplantation tests on embryos. **Siti Nurani Mohamed Nor** is professor at the University of Malaya, Kuala Lumpur, Malaysia, where among other things she is coordinator in the area of bioethics. At the conference she described how her country has been working since the 1980s to develop a scientific culture that is compatible with Islamic ideology. There appears to be no contradiction in this, since by no means do Sharia and the Koran need to be interpreted as rigidly as they often appear to be to Western observers. This is because problems for which no useful directives on behaviour can be derived from the Koran can be solved by reference to the concept of Maslahah (public benefit). A hierarchically organised set of norms ranging from 'the norm of compelling necessity' through 'the norm of needs or convenience' down to the 'norm of enhancement, improvements, or refinements' is applied. Religion, life, intellect, and family lineage come under the category of 'compelling necessity' and have priority in all ethical deliberations. On this basis, according to Siti Nurani Mohamed Nor, the use of medical innovations derived from gene technology is acceptable according to Islam provided that it brings demonstrable benefit to human beings. Therapeutic cloning and stem cell research are permissible on this basis and abortion is allowed provided that the foetus is malformed or less than 120 days old. In all cases, however, the lesser evil should be chosen.

> Buddhism does not regard nature as the work of a Creator, but rather as an open and dynamic process that generates its own ethical rules

'The Buddha was a teacher and not a law-giver. The precepts are to be observed voluntarily. It is up to each individual to keep the precepts according to his capacity and decision. Ordinary Buddhists use these precepts to form an all-important motive for moral life and as means to accumulate merit to ensure good rebirth.' This, more or less, is how **Pinit Ratanakul**, of Mahidol University, Bangkok, Thailand, describes the essence of Buddhism and in so doing explains the favourable attitude of this religion to the use of gene technology in humans. This favourable attitude is also based on the very open concept of nature that prevails in Buddhism. Nature is not the work of a Creator, but rather an open and dynamic process that generates its own ethical rules. That which becomes alive is allowed to live. Thus, if reproductive cloning succeeds, it, too, is permissible.

'Buddhism is an ally of science in the search for knowledge to maximise human wellbeing and happiness and to minimise suffering,' says Pinit Ratanakul. The benefits of gene technology are greatly appreciated; however, the practical application of gene technology must be brought into harmony with human values, and in particular human rights. In this sense, the use of somatic stem cell therapy for medical purposes is permissible; however, germ lines must not be manipulated in any way because of the potentially harmful effects that this could have on the human species. Similarly, Buddhist teaching has no objection to research into or use of stem cells provided that these are not taken from an embryo. To destroy an embryo or to deprive an embryo of its right to life is 'not acceptable. Killing is killing, no matter for what purpose.' According to Pinit Ratanakul, 'Buddhism has confidence in Man and his potential for altruism – despite human weakness.'

In reality things are quite different

In the final discussion, **Hansjakob Müller**, Emeritus Professor of Medical Genetics at the University of Basel, said that he had found the conference interesting and that he had learned a lot. Apart from Sandro Rusconi, he said, he was the only person on the podium who had actually worked with the material that had been the topic of discussion for 2 days. His first objection concerned the use of language: 'The word "genethics" in the title of the conference bothered me right from the start, because reproductive medicine and stem cell research, the topics most talked about at the conference, have basically nothing to do with genetics.' Müller said he would be glad if in future the term 'bioethics' could be used instead of 'genethics'.

Also, he appeared to agree with Petra Gehring, who questioned the idea that patients in the real world need a debate about ethics. In a newspaper interview given prior to the conference, Professor Müller expressed the view that 'the autonomy of people seeking advice must always be respected. It is easy for a professor of ethics to define high ethical precepts at a conference table or from a great distance, but as a doctor one is confronted with day-to-day reality, and that is generally full of contradictions.'

> Descriptions of the genetic substance DNA as a blueprint, code, 'book of life', language, etc. may be very appealing, but are scientifically implausible

The power of language in the debate about bioethics was already touched upon by Friedrich Wilhelm Graf. Language, or more precisely an analysis of the use of language, was then the subject of the first part of the second day of the conference. It was interesting to learn from **Christoph Rehmann-Sutter**'s talk that the conventional metaphors, though still used in the current debate about bioethics, have long since been rendered obsolete by reality. Rehmann-Sutter, who is Professor of Philosophy and Director of the Office for Ethics in Biological Sciences at the University of Basel, forcibly expressed the view that while descriptions of the genetic substance DNA as a blueprint, code, 'book of life', language, etc. may be very appealing, they are scientifically implausible, because such metaphors are based on an understanding of DNA as a program, a primary active substance. According to this understanding, genetic information is identical with the genome sequence. Bodily structures and abilities are the result of the carrying out of instructions contained in the DNA sequence. 'It can be observed, however, that genes function differently from this,' said Rehmann-Sutter. Using examples, he explained that genes are not always read in the same way, that a number of different messenger RNA molecules and thus proteins can result from the same DNA sequence.

Rehmann-Sutter argued that we should move away from the concept of the genome as a program and instead refer to 'system genomics'. 'This term makes more sense in terms of natural science.' Moreover, in principle it has more implications for our view of life and nature, and thus also for the bioethics debate. In 'system genomics' DNA has no ontological privilege, it is simply a part of the organism like any other component or cellular process. Genetic information is produced continuously from the interaction between DNA, cells, and the environment. Structures and abilities are thus more than just the result of developmental steps, but themselves initiators of further developments.

Such a reinterpretation of the role of DNA puts some things in a new perspective. For example, from the perspective of program genomics the body is a *product* of its gene sequences, whereas in system genomics the body is seen as the *author* of its genetic information. Similarly, program genomics regards a mutation in a gene linked to cancer as *information* that can cause cancer, whereas in system genomics such a mutation is seen as an *indicator* of an increased likelihood that the body will produce information that may lead to the development of cancer. All this shows that gene technology must be accompanied by an ethics that is both sound in terms of natural science and true to the principles of 'armchair philosophy'.

> The task of theologians could be to help us to 'confront the complexities of life with a little less fear in our hearts'

Doubts as to the role that the natural sciences can play in the debate about ethics were then expressed by **Klaus Tanner**, Professor of Systematic Theology and Ethics at the Martin Luther University in Halle-Wittenberg. Ultimately, 'bioethics is not something developed in a laboratory, but a cultural phenomenon.' Only when scientific results find their way to the general public are major controversies triggered, and only then does 'religious language enter the public debate'. For this reason, it was probably no coincidence, felt Tanner, that protestant theologians in the USA were the first to take up the question of bioethics. Historical knowledge plays an important role in this debate, said Tanner, since 'in the absence of a certain cultural tradition it's impossible, and in our case this cultural tradition is to be found in the symbolic repertoire of Christianity'.

To Tanner it seems clear that the concept of the Creation has acquired new plausibility in association with increasing concern about the environment: 'It is essentially about worry, anxiety, and feelings of insecurity engendered by constant exposure to new developments. It is also about the question of trust and lack of trust.' People are afraid of being degraded into mere objects by industrialised society, 'and this fear can be mobilised at any time'. For his part, Tanner finds it difficult to say whether people's concerns about questions such as gene technology are really justified. On the one hand, he said, a lot of attention is paid to fears that the use of gene technology for embryo selection will leave no place in society for handicapped people. On the other hand, he said, 'at no time in history have more resources been made available for the wellbeing of handicapped people than are being made available right now'.

What, then, can theologians – notwithstanding the pluralism that exists in religions – contribute to this debate? According to Tanner, they can contribute hermeneutical, interpretative, and explanatory competence. Hermeneutics, said Tanner, always comes into play when multilayered problems need to be considered. 'Theologians have always had to deal with insoluble problems and consequently are used to grappling with complex questions.'

Ethics committees could start by describing the nature of the problem with appropriate precision. Because, said Tanner, descriptions and terminology form the basis for a normative approach: 'The normative imperatives that arise when we refer to an embryo as a cluster of cells differ from those that arise when we refer to it as a miniature human being.' Pluralism of opinions does not mean arbitrariness; classification should still be possible. 'Scarcely anybody says "It's all the same to me". Instead, on every street corner there's a prophet who says what's right and wrong. That's the problem.'

Nonetheless, Tanner concedes that it is impossible 'to derive a prescription for behaviour directly from an ecclesiastical-religious statement'. That, he feels, would be theologically wrong. The responsibility of the individual human being cannot be delegated, 'that is the burden we have to bear'. The task of theologians must therefore be to help us to 'confront the complexities of life with a little less fear in our hearts'.

Ulrich Goetz is a freelance science journalist based in Basel (www.ugtexte.ch).

Legislation in Switzerland

Referring to legislators in Switzerland, Friedrich Wilhelm Graf expressed the view that it is not very clever to use religious language in constitutional texts. 'By referring to the dignity of living beings and clothing the animal protection act in religious semantics, Swiss politicians have created many problems for themselves.' (One such problem has already emerged, namely that the Federal Ethics Committee on Non-Human Biotechnology now claims that the term 'dignity of living beings' also applies to plants.)

Two speakers at the conference then described the extent to which Swiss legislation has taken account of the demands of religion, theology, and ethics.

Ruth Reusser, until recently Deputy Director of the Swiss Federal Office for Justice, identified an increasing juridification of medicine and research: 'The law is increasingly assuming the role of an arbitrator of ethical-moral issues.' The essence of all the lawmaking of recent years, said Reusser, is the fundamental right to an unaltered genome, and it is on this that the prohibition of cloning, among other things, is based. Reusser is proud of the fact that Switzerland's laws on genetic experiments in human beings have made it an international trailblazer in this field. She concedes, however, that the 'half-life' of legislation on scientific research and medicine is brief: 'If these laws can serve their purpose for 10–20 years, they will have been a success.'

Andrea Arz de Falco, Head of the Department of Biomedicine at the Swiss Federal Health Office, then referred to the results of the preliminary consultation phase of a Swiss bill governing research in human beings. She said that she had read through the various submissions in order to assess the extent to which they were based on religious and theological viewpoints and linguistic notions. Not surprisingly, she found that most of the submissions dealt with the relationship between human dignity and freedom of research. The general tenor of the submissions was that freedom of research must not be placed above, or on a par with, human dignity. Overall, however, Arz de Falco concluded that use of religious or theological arguments was the exception. The points of view and arguments expressed did not differ greatly from those put forward by explicitly non-religious people.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For a complete list of speakers and an overview of the symposium program, please see www.karger.com/gazette.

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