

ETHICAL CHALLENGES IN BIO-SCIENTIFIC PROJECTS

**A study of ethical and societal aspects of
animal disease genomics**

Gitte Meyer

PROJECT REPORT 7

DANISH CENTRE FOR BIOETHICS AND RISK ASSESSMENT

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Project report 7

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1 Introduction

This report is a study of ethical and societal issues connected with EADGENE. Its overall objective is to provide an overview of such issues. The report focuses on three important areas of interplay between the Network and the public at large. We label these (i) Public Relations versus public relations, (ii) openness versus confidentiality, and (iii) parties unable to voice their concerns: animal welfare. These areas present challenges that must be dealt with by the Network.

It is the task of WP 12.1 to facilitate deliberation on questions of values, social interests and moral disagreement, relevant to the Network issues. The efforts of the team from the Danish Centre for Bioethics and Risk Assessment, CeBRA, have been aimed at providing a qualified input for ethical reflection within the Network, relating to questions of values and social interests. Such deliberation should be seen as a precondition for entering into a public dialogue about the efforts of the Network. A summary of the report was presented to Network members for discussion at the EADGENE in Brussels in May 2005.

Official EADGENE documents, including the so-called Technical Annex, website and the newsletter, are the primary sources for the report. It must be noted though that the Technical Annex is the outcome of a negotiation with the EC and therefore contains various compromises. However, the report also draws on the opening meeting of EADGENE in Paris in October 2004; and it is influenced by a series of interviews with scientists undertaken by the CeBRA team. We say ‘influenced by’, because these interviews were still in progress when this report was written and in fact form the basis of a separate report (*Principles for ethical deliberation in bio-scientific projects*).

No direct reference will be made to the interviews in the present report.

Ethics and genomics

EADGENE is a, so-called, Network of Excellence. It aims primarily to develop and integrate knowledge of mechanisms at the molecular - level that affect the host-pathogen interactions in farm animals; and to find ways to modulate those mechanisms so as to combat various infectious diseases in farm animals. Thus, the focus of EADGENE research is, and must be, on genuinely fundamental and applied scientific problems — problems that can be approached through scientific methods and admit of technical solutions. At the same time, however, EADGENE research takes place in a broader, social context that does not in the same way render itself open to scientific investigation and technical solutions. In this broader context, ethical reflection and discussion are needed: reflection and discussion that inquire into basic assumptions, beliefs, attitudes and moral values.

Controversies over modern biological science and biotechnology can be traced back to differences in such assumptions and values. More often than not, discussions that appear, at first glance, to be rather straightforward debates about risks and benefits prove to be less straightforward on closer inspection. They disclose a more basic disagreement about values, about what is good, and what is bad, and what is important and why it is important: what do we mean by ‘better’ and ‘healthier’ animals? What means, and what ends, are right, or at least acceptable? Is it, for instance, acceptable to use challenge tests — to infect animals in order to study them — to understand the genetic mechanisms behind specific infectious ani-

mal diseases and, possibly, to identify ways of combating those diseases? Different answers to these questions may reflect differing values.

To contribute in a reasonable way to discussions on controversial questions like this, one must be as clear as possible about one's own values. It is a demanding task: in everyday-life people do not go about reflecting on their assumptions and values. As a rule, assumptions and values form the basis of action, and are not subjected to scrutiny. One must also be willing both to acknowledge the existence of other values and to enter into a dialogue that might result in the value-adjustment. That is what ethical reflection is about.

Ethical reflection aims to cope with aspects of human life that scientific endeavours seek to keep at a distance in order to get the scientific facts right. While science aims to get the scientific facts right, ethical reflection on science takes into account the context in which people question the purpose of producing those particular facts in the first place. While the development of technology aims to find workable solutions, ethical reflection on technology takes into account the context in which those solutions may or may not be deemed acceptable. Thus, ethical reflection on science and technology is crucial to decisions on how to integrate the work of scientists into the practical life of society.

In connection with the use of genomics in animal breeding and livestock production, different technological options no doubt will present themselves as science moves on. Choices will have to be made. They may inspire controversy; they are certain to involve value-based judgements. Dilemmas will have to be faced. When — besides our concern for fellow human beings — we have to take animals (or even 'nature') into account, the dilemmas are bound to increase, and it will be impossible to identify exact and clear, scientific answers to the questions of how to make right choices.

There are many legitimate concerns to attend to, and some of these are likely to be at

odds with each other. The consideration of ethical and societal aspects of scientific and technological enterprises is all about coping with ambiguity, mastering one's own ambivalence, understanding the ambivalence of others, listening and, at the end of the day, seeking out and arguing for a certain balance that involves priorities: to acknowledge the existence of disagreement and ambivalence is not to preclude the possibility of discussing disagreement in an open and civilized way, provided that all parties involved are willing to take the trouble of reflecting upon their own values and ideas as well as on those of others. It is time-consuming. Given that science is a part of society, it is also inescapable.

Doing the 'right' thing and doing it the 'right' way

In the pages that follow, ethical questions of two distinct, although interrelated, categories will be presented. One category concerns the content of scientific research; the other concerns the way research and deliberation is conducted. Thus, the first category relates mainly to the product and is concerned with doing the right thing, whereas the second category mainly relates to the process, and is concerned with doing things in the right way.

There is no universal agreement on what is the right thing — although widespread support for the ideal of pluralism can be seen as an expression of agreement that there should indeed be room for moral disagreement. Consequently, nobody can be expected to prove that they are actually doing the right thing. That someone is doing the right thing is beyond proof, but it is certainly not beyond argumentation. Thus, members of the Network are not faced with the task of proving that the research questions posed, and the technological paths pursued within the framework of EADGENE, are the only valid questions and solutions. They must, however, try to explain on what grounds specific questions and solutions have been chosen. Moreover, they face the challenge of

acknowledging that differing views may exist and cannot simply be ignored.

Consequently, even though there is no universally accepted right thing there is a demand to do things properly in order to make room, at the same time, for disagreement and co-existence. On this condition, dialogue and discussion become keywords, and the task of the Network in relation to ethical challenges can be summed up in a very simple chain of ‘wh-questions’: that is, questions that members of the Network must consider:

- what they are trying to achieve
- why they are trying to achieve it
- what basic assumptions and values they adhere to
- whether there is disagreement on this within the Network as well as between the Network and other groups in society
- what kind of potentially conflicting concerns and values can be identified
- in what way such conflicting concerns may be balanced

Three significant ethical issues

Three ethical issues — relating to the ‘product’ as well as to the ‘process’ — will be highlighted in the present report. As mentioned above, the three challenges will be presented under the headlines of:

- 1. Public Relations versus public relations**
- 2. Openness vs confidentiality**
- 3. Parties unable to voice their concerns: animal welfare**

The first issue is associated with how scientists relate to, and should relate to, the public at large, considering that scientists are not above *self-interest*. Key themes are: PR versus public relations; overselling versus sincerity; the aim of being attractive versus the aim of contributing to dialogue.

The second issue is associated with the commercialization of science and scientific

research. Thus, the spotlight is on the relationship between science and *vested interests*. Key themes are: traditional scientific and academic values; openness versus confidentiality; different ideas about knowledge as a common good.

The third issue is associated with a group which has not been addressed by the first two issues, i.e. animals. It is concerned with animal welfare. Key themes are: use of animals and *care for animals*; different ideas about animal health; differences between genetic modification and the use of genomics in animal breeding and livestock production; *purposes of research*.

The three issues are interrelated. Each relates to fundamental questions about purpose, and about the consequences and limits of scientific knowledge and its possible technological applications. This means that themes underlying one issue may be relevant to the other issues as well. It also means that although the presentation is as systematic as possible, neat separation of the issues is not achievable. The presentations complement each other and should be read in succession. That is so because the challenges form part of an overall challenge: that is, the challenge of developing a professional ethics for science within the framework of society, and, paradoxically, on the basis of traditional scientific values that have been shaped by assumptions about science being, in many respects, outside society.

At present, as scientific research becomes ever more important to society, many other groups of scientists and fields of science face a similar challenge. It is not EADGENE specific. But it is highly EADGENE relevant. The presentation of the issues will, for this reason, look at general as well as specific aspects, first pointing to the EADGENE-specific issues, then to the underlying themes, and finally summarizing questions for further deliberation.

2 Public Relations versus public relations

EADGENE specific

EADGENE is faced by a temptation to oversell the potential outcomes of its research in order to attract investment and future funding. Consequently, the Network is also confronted by the challenge not to oversell, and to try to be realistic and sincere. This is an issue that is hardly confronted at all in the EADGENE documents. Indeed, no distinction seems to be made between Public Relations and ethical reflection.

To illustrate: it is stated that attempts should be made at “teaching the scientists and stakeholders to speak to consumers and society in an understandable, transparent and attractive way”.¹ Here there is a mixture of the two different purposes of ‘transparency’ and ‘attractiveness’. In practice, they may go well together — or they may not; but is unclear from the documents how these purposes are supposed to be balanced. Moreover, problems relating to scientific uncertainty and complexity — transparency about which may be contrary to the aim of appearing attractive — go unmentioned.

Along the same lines, there is ambivalence in the sections of the documents describing relations with the public. On the one hand, the documents point to a need for a dialogue with the public, and they argue in terms of a public right to know what is going on. On the other hand, the documents are rich in statements about the aims of persuading the public, of making people confident and “comfortable with” the kind of research pursued by the Network. Moreover, it is argued that, in this way, science and industry will be able to achieve “greater identification with livestock production”, improved sales and, thereby, “a greater sustainability and competitiveness of European livestock production industries”. But to enter into a dialogue and to achieve identification is not the same thing. Again, although in practice

these purposes may fit well together, they may also be in conflict. Dialogue may disclose substantial disagreement.

In today’s culture of PR and pressure on scientists to show themselves to be useful to the point of being indispensable, the purposes of attractiveness and of persuasion into identification are likely to become dominant. Transparency and dialogue are likely to become marginalized, unless efforts are made to prevent this.

One way of stimulating reflection, among members of the Network, on how to adhere to a principle of sincerity and a purpose of dialogue with the public at large may be to re-enter, for internal purposes, discussion on the aims of the EADGENE network itself. The project documents contain a long list of reasons and purposes. Are all of these of equal importance? Are they compatible?

The overall goal of the Network appears to be to try to understand the host pathogen interaction at the molecular level using a genomic approach. This knowledge may be applied: to combat food-transmitted zoonoses and to render superfluous much of the present antibiotic treatment of animals to reduce residues of antibiotics in food for human consumption. Thus, there is a focus on human health and on more efficient processes of production. However, a host of other purposes are mentioned as well:

- Strengthening the competitiveness and sustainability of European agriculture and aquaculture by applying genomics
- Creating a new market for breeding, husbandry, diagnostics and animal health industries
- Improving the public image of European agriculture, thereby increasing the consumption of European agricultural products

¹ Annex I to Network contract: Description of Work, p.11

- Securing continued European influence on animal breeding on a global scale
- Furthering communication and cooperation between ‘science’, on the one hand, and ‘technology and society’, on the other
- Promoting the use of genomic tools
- Becoming the best in the world in the Network’s field of research
- Producing healthier and more robust farm animals

Furthermore, hope is expressed that the knowledge generated could be used so:

- Improved treatment of human beings may be facilitated by way of research findings regarding host-pathogen relationships in animals
- The research will improve readiness to fight new, infectious diseases that may evolve

The documents mention a wide spectrum of efforts that may result from the knowledge to achieve the goals, comprising:

- Development of vaccines
- Improved prognostics
- Improved diagnostics
- Improved surveillance
- Improved treatment, including medical treatment
- Improved breeding techniques that may be used to increase the immune defence and/or to improve responses to vaccination
- Improved conditions for the animals (this refers to the aim of disease prevention by means of strengthening the immune defence)

Furthermore, there is an *internal* goal for the research field — which may be very important to some Network members and of little importance to others — of securing future funding for research. Thus, it is foreseen in the documents that members may “negotiate an in-

creasing financial participation of industrials”² to continue the research effort after the expiration of the Network. It is the wish of EU to have a sort of European Centre of Excellence on this subject, also after 4/5 years helping to set priorities at the EU level and to prevent fragmentation in research and research policies. The same abundance of aims and means is presented both on the website and in the newsletter, and in a press release the Network has been described as aiming at the improvement of “*animal health*”. Thus, the Network appears to have: economic and commercial aims; internal scientific aims (relating to the specific research field of the Network and to the field of genomics, and indeed science, in general); aims of improving animal health; and aims of improving human health. It is nowhere discussed, however, whether and to what extent these aims are compatible with each other.

Before the public sphere is entered, the compatibility and the priority of these various purposes should be reflected upon: it should be asked to what extent, for instance, is the aim of improving animal health compatible with the aim of strengthening the competitiveness of European agriculture?

Again, on entering the public sphere, it is very important to reflect on the role that is ascribed to the public. The EADGENE documents refer to the purpose of dialogue with the public. The term ‘dialogue’ involves the assumption that the public are potential partners and on equal terms with the researchers. There is, however, ambiguity here as well. In other sections of the documents, industry seems to be perceived as an active partner (supposed to play a major role in the use of the knowledge generated and the implementation into practice), while the public at large — referred to randomly as ‘society’, ‘citizens’ and ‘consumers’ — appears to be seen as a collection of passive recipients of the products of scientific research. This latter idea of the public seems, for instance, to underlie the intention of making a “Communication Plan to

² Annex I to Network contract: Description of Work, p 15

reinforce citizens' public awareness and easy understanding of science".³ But this is an idea of the public that fits rather badly with the aim of dialogue. Rather it is about providing information.

Key questions are: is the purpose dialogue, or is it merely the provision of information? Is the public perceived to consist of consumers (having certain rights, but no responsibilities) or of citizens (having both rights and responsibilities)? The latter question is crucial, because interaction with citizens is different from, and much more demanding than, interaction with consumers. A dialogue with citizens is a dialogue resting on an assumption of shared responsibilities. It is closely related to ideas about civil society and public discussion as important societal elements. One does not have to subscribe to these ideas, but the terms of dialogue indicate a commitment to them. Such commitment is not easily reconciled with the notion that the public are consumers and passive recipients of information.

In conclusion: a principle of sincerity vis-à-vis the public and society at large should be formulated. It is, however, insufficient simply to adopt such a principle. Sincerity presupposes that one is aware of what to be sincere about. A careful reading of the project documents indicates that, in order to adhere to such a principle, some basic reflection on purposes (of communication) and on assumptions (about the public) needs to be undertaken.

Underlying themes: dialogue and sincerity

There is pressure on scientists to deliver solutions to problems and to develop new technologies that will boost economic growth on a national or a European scale, providing society with wealth and with hope. At the same time, there is intense competition for research

funding. A growing number of researchers are competing for public and private funding, and as a rule scientific research is becoming ever more costly. Scientists may therefore feel compelled to give lofty descriptions of the expected outcomes of their research projects. Such overselling may be looked on as no more than an illustration of traditional scientific optimism. But it can also be seen as representing a breach of sincerity — as a departure from a norm that is central to (at least) western culture. It is a powerful norm. Thus, probably almost all readers of this report will find it quite superfluous for us to argue that insincerity is wrong.

Boasting with a view to gain has been looked down on for thousands of years of western history. More than 2000 years ago the Greek philosopher Aristotle warned against boasting — in particular, boasting motivated by self-interest, with a view to gain⁴. In the sixteenth century, the influential French essayist, Michel de Montaigne, argued that insincerity is one of the very worst vices. He observed that speech is what binds humankind together, and argued that falsity in speaking destroys human community.⁵

In more recent times, in the 1970s, Hannah Arendt, a German-American thinker, has argued that there "always comes the point beyond which lying becomes counterproductive. This point is reached when the audience to which the lies are addressed is forced to disregard altogether the distinguishing line between truth and falsehood in order to be able to survive". From her discussion of lying, Arendt made a smooth transition to the phenomenon of PR. She suggested that PR was linked to an assumption that "half of politics is 'image-making' and the other half the art of making people believe in the imagery",⁶ and she argued that

³ Annex I to Network contract: Description of Work, p 40

⁴ Aristotle; book II, vii, pp 45, 105 and 107

⁵ Montaigne in "Wenn man einander des Lügens bezichtigt"; p. 508, vol. II

⁶ Arendt; p 7-8

this perception of politics is detrimental to public and political life.

Recently, an international group of researchers from the field of ‘science studies’ has focused directly on boasting in science. They have stated: “Today insubstantial promises, which are based upon a potential that is difficult to assess properly and which will take time to develop fully but which are amplified through the media, excite the imagination of industry and the public and influence decisions about which parts of basic research are to be funded and which lines of inquiry are to be pursued”. The group refers to “a thin line between authentic belief in the future potential and mere rhetoric of ‘selling’ a particular line of research to politicians and the public”, and they argue that, increasingly, researchers adopt ‘sales techniques’ when trying to obtain funding for what are in reality no more than ‘options’ or potential spin-offs of unknowable research results.⁷

What is the point of the above quotations? The point is *not* to make the case that insincerity and boasting is wrong (since most people would readily agree to a principle of sincerity), but rather to show how deeply ingrained in European culture this code of conduct is. Even though we live today in a pervasive culture of PR — which, incidentally, has been turned into a quasi-scientific discipline in its own right — the moral requirement of sincerity persists in the minds of citizens. Insincerity is particularly disliked in scientists, because science is expected to comply with the highest standards and to be above self-interest. Belief in scientific claims and trust in scientists are very much based on that assumption.

Consequently, the widespread habit of adopting commercial sales techniques may be seen as a threat to science, a practice that is likely to undermine trust in scientists. Sales techniques are linked to a good deal of cynicism, not the least at the receiving end. Where ideals are seen to be invoked as mere rhetorical devices and as means to further

vested interests, they are likely to inspire suspicion. At the receiving end they are likely to inspire the suspicious question ‘what does he try to sell?’ rather than the interested question ‘what has he got to say?’

In conclusion, there is a schism in European societies of today between the principle of sincerity and a practice of boasting. First and foremost, this schism is a challenge to science and scientists. Unconfronted, it may, in the longer term, undermine trust in science and scientists, and it may erode belief in the very ideas of knowledge and truth that form the foundation of science.

For further deliberation in the Network

In concrete terms there is a question for the Network of how to draw a line between having and presenting a vision, on the one hand, and embarking upon overselling, on the other.

To answer this question, the purposes of the Network have to be considered. We need to ask:

- What is the main purpose of the Network?
- To what extent are the declared purposes compatible with one another?
- Is EADGENE a private, commercial network, suited to the adoption of PR exercises modelled on the sales techniques of commercial companies; or is it, rather, a public network, faced with the task of finding alternative ways of relating to the public?
- What is the purpose of communicating with the public, and of the website and the newsletter?
- What kind of public is envisaged?
- And finally, how should aspects of scientific uncertainty be taken into the public sphere?

⁷ Nowotny et al; p 38

3 Openness vs confidentiality

EADGENE specific

The value of openness — ‘transparency’ — is important to the EADGENE network, judging from the project documents. Thus, there are frequent references to a principle of transparency. However, these references are somewhat blurred by the reservation that there should be as much transparency “as possible”.⁸ Paragraphs starting with a reference to openness may end up with a reference to a need for confidentiality. For instance, it is stated that the “global strategy will be focused on the need to use and disseminate the knowledge, but also to protect it where industrial or commercial exploitation is possible, in accordance with IPRs to be granted”.⁹

There seems to be a commitment to openness and concealment at the same time. There may be good reasons for taking such a stance. Those who deliberate on the value of openness, informed by the present conditions under which research is undertaken, cannot simply ignore that confidentiality is crucial to some stakeholders. Deliberation is likely to lead to the formulation of principles guiding the balancing of conflicting concerns. Such deliberation is, however, not made explicit in the documents. Rather, the documents seem to by-pass the fact that concerns about openness and concerns about confidentiality are indeed conflicting concerns.

It may be argued that there are no conflicts at all, because the system of intellectual property rights should be seen as a guarantee of openness. To what extent, and under what conditions, that is actually the case has, however, to a growing extent become a controversial issue. Consequently, there is a need for the conflicting concerns to be confronted and spelled out.

Ambivalence regarding a concern for openness and a concern for confidentiality — and, more broadly, regarding conflicts of interest — appears also in relation to the Network’s Club of Interest. This group, it is stated, is supposed to provide advice on “the industrial and citizen needs”.¹⁰ Elaboration on the relationship and potential conflicts between the needs of industry and the needs of citizens — not to mention different groups of citizens — is absent. While this may, in the short term, create a feeling of consensus, it leaves the Network unprepared, in the longer term, to cope with such conflicts if, or when, they actually materialize: in the end, the pretence of consensus may bring about much deeper and more bitter conflicts than would have emerged if it had been acknowledged from the outset that there is a potential for conflict to be dealt with.

Conflicts of interest and disagreement about values form part of the reality of societal life. Ignoring conflicts is not the same as dissolving them. On the contrary, it is likely to inspire suspicion, and to pave the way for explosive and unsolvable conflicts. To confront them, instead, in an attempt to find ethically acceptable ways of dealing with them, may inspire mutual respect and dialogue — within the Network and in relations between the Network and the public at large.

Underlying themes: knowledge as a common good

The present drive towards confidentiality and private ownership of scientific knowledge represents a breach of specific academic and scientific values; that is, values of openness and disinterestedness, and of knowledge as a common good. These values have been of enormous importance in the history of science, and they

⁸ Annex I to Network contract: Description of Work, p 59

⁹ Annex I to Network contract: Description of Work, p 45

¹⁰ Annex I to Network contract: Description of Work, p 9

have been crucial to science gaining a very high status in today's societies: science has been, and is expected to be, above, not only self-interest and the promotion of self-interest, but also vested interests in general.

In the 1940s the American sociologist Robert K. Merton described the ethos of modern science as universalism, disinterestedness, organized scepticism, and communism. (By the latter he meant that scientific knowledge was to be regarded as common property. Contrast the definition of technology as private property.)¹¹

Clashes between the ideals of openness and knowledge as a common good, on the one hand, and private property rights, on the other hand, are not a new phenomenon. Probably, this schism has been part of the development of modern science all along. So have close — although never uncomplicated — relations with the marketplace.¹² That is part of the background to the statement, made by European university rectors when they met in 1988 in Bologna to word and sign The Magna Charta of University, that: “To meet the needs of the world around it, its [the university's] research and teaching must be morally and intellectually independent of all political authority and economic power”.¹³

In short: ambivalence about the ideals of openness, disinterestedness and of knowledge as a common good appears to be a basic feature of science — a challenge that scientists must live with and try to come to terms with over and over again. At present, however, there seems to be a tendency within the scientific community to ignore the challenge.

More than a decade of heated debate in the EU about whether or not to allow patents on genes, plants and animals bears witness to the fact that the ideals are still very much alive, not only in the scientific community — as undoubtedly they are — but also more widely in

society. The scientific community has, however, not been very outspoken, and has certainly not taken the lead, in such public discussions; and some findings suggest that the political and ethical aspects of opening these new fields to patenting have not been much discussed among scientists themselves, not even among scientists working in areas of direct relevance to the discussion.¹⁴

One almost gets the impression that the ambivalence has dissolved: that is, that it is in practice no longer necessary to take the traditional, scientific ethos into account. European policies and legislation, on a national level and at EU-level, give a similar impression. Following the model of American legislation, scientists who are employed by universities and other public research institutions are obliged to apply for patents whenever possible, and universities are enabled to own patents. Moreover, researchers are urged to enter into close cooperation with commercial companies, but there are no incentives whatsoever to encourage scientists to deliberate about how to reconcile new working conditions with traditional values.

Again, scientists are trapped by a conflict of conscience; a conflict which — if it remains unfronted — might in the longer term result in deteriorating relations with the public at large. This is likely to occur in so far as citizens still expect science and scientists simply to adhere to the traditional values in a straightforward manner. In the UK the Royal Society has been concerned about this. In 2002 it asked Market and Opinion Research International, a market research company, to do a survey of science-related issues that caused concern to the public. More than half, 55 percent, of the 1001 interviewees (interviewed by telephone) agreed to the statement that the funding of scientific research is becoming too commercialized. 27 percent disagreed. As to the relative importance of issues causing concern, biological weapons was on top of the list (74 percent of the respondents); global warming came next (70 percent of respondents), followed by genetic

¹¹ Merton; p. 607. See also pp 610-612

¹² See for instance Butterfield; p 185

¹³ The Magna Charta of University may be found at www.unige.ch/cre

¹⁴ Meyer & Sandoe; p 7

modification of food and animals (60 percent of respondents).¹⁵

In today's policies the values of openness and disinterestedness appear to be seen as obstacles to another old scientific ideal — that of science as a means to further economic growth, thus securing the foundations for material welfare: knowledge as a common good in another sense. These different ideas about knowledge as a common good — common in the sense of openness, and in the sense of securing material welfare for everybody — have actually co-existed; but today's mainstream argumentation runs: 'You cannot have your cake and eat it. Either you have openness, or you have economic growth. Either you insist on openness or you get your research funded'. Facing this dilemma, scientists seem to opt for economic growth, confidentiality and funding, arguing that the purpose of keeping scientific research going must overrule all other considerations — because scientific knowledge is a common good.

As already highlighted by Merton, there is "a tendency for scientists to assume that the social effects of science must be beneficial in the long run. This article of faith performs the function of providing a rationale for scientific research".¹⁶

The article of faith alluded to by Merton has always carried a question: is science beneficial in the long run, just like that, regardless of any other consideration and conditions? Is the common interest in the production of more scientific knowledge so strong as to render conflicts of social interest irrelevant and to permit such conflicts to be ignored? In what sense should knowledge be seen, and dealt with, as a public good?

The millennia-old idea about the common good has always been a controversial one, open to different and, indeed, conflicting interpretations. Nevertheless, it cannot be taken to

mean just about anything. There are limits to interpretations. The very existence of a notion of 'the common good' implies that a distinction should be made, a distinction — in some way or another — between the common good and private goods. Moreover, it should not be ignored that suspicion towards private interests — in particular commercial ones, and in particular concentrated economic power — is deeply rooted in European culture.¹⁷ Intimate relationships between scientists and commercial companies are simply bound to fuel concern, in society as a whole — and among scientists.

In the early 1970s Jerome Ravetz — a scientist who made the switch from physics into studies of social problems of scientific knowledge — found that "the conditions of the industrialized science of the present" were eroding the maintenance of traditional scientific values¹⁸. Ravetz feared moral corruption and the degeneration of science, and he described a nightmarish vision of future science as "gigantic confidence-games, producing pseudo-property at a feverish pace, and resembling a stock exchange in a bull market rather than a collective endeavour on behalf of the highest human goals".¹⁹

More recently, the case has been made that although — or exactly because — conditions are changing "[t]he ladder of the university's value background has to be kept in place, not kicked away".²⁰ Today, the main task may be seen as one of adjusting traditional, academic and scientific values to new conditions. Scientists from a growing number of fields, and from the field of biotechnology in particular, are confronted with the task of bringing the mores of science into a situation where scientists not only "stand vis-à-vis a lay clientele in the same fashion as do the physician and the lawyer",²¹ but where they are also — as

¹⁵ www.mori.com/polls/2002/royalsociety.shtml

¹⁶ Merton; p 600

¹⁷ For illustration, see Schama; pp 327 and 341

¹⁸ Ravetz; p 310

¹⁹ Ravetz, p 311

²⁰ Barnett, p 83

²¹ In the 1940's Merton found that scientists did *not* stand vi-a-vis a lay clientele. For that reason he deemed them to

scientists — citizens among co-citizens. They are not only involved in business, being actors in the marketplace. They are also involved in politics; that is, they are — as scientists — members of the public, having a say on public affairs, and acting on matters of public interest. About how to organize the production of goods. About how to grow food. About how to raise and care for animals. In this situation, an updating of the traditional values of openness and disinterestedness and of knowledge as a common good is of vital importance.

In conclusion: science has re-entered society by embracing, and being embraced by, the marketplace. During this process an old schism has disclosed itself, a schism between different ideas of knowledge as a common good. Ideals of openness appear to a growing extent to be overruled by routines of confidentiality, because such routines are seen as necessary to keep the scientific enterprise and the development of new technology going. Ideals of openness are, however, crucial to the relationship between the scientific community and the public at large.

For further deliberation in the Network

A key question for the Network is: how much priority should be given to the principle of openness, and on what grounds and under what conditions — and at what cost — should the principle of openness be overruled by the concern for confidentiality?

Some related questions are likely to prove helpful to the deliberation:

- Should the idea of knowledge as a common good imply that scientific knowledge should be publicly accessible?
- Or should it be taken to mean that the production of scientific knowledge is so important to society — because scientific

knowledge and technology are good in themselves or as means to improve economic growth — that the purpose of keeping research going must overrule other concerns such as the concern that there should be openness about knowledge?

- What should be considered public and private in the context of EADGENE?
- What conflicts of interest may arise from the EADGENE research, and how may such conflicts be dealt with?

be less tempted to fraud and irresponsible claims.
Merton; pp 613-614

4 Parties unable to voice their concerns: animal welfare

EADGENE specific

In an early press release the Network was launched as a network on “animal health”. In internal, veterinary usage this may be seen as a proper description. The Network does concern itself with animal health as something that, if unattended to, may cause problems of production, inefficiency and harm to consumers. Nevertheless, from the perspective of ordinary, everyday language, the reference to animal health may seem misleading. Health, be it in human beings or in (other) animals, may either be understood in a narrow sense as “absence of illness” or in a broad sense to connote a general state of well-being. A Network that is presented as a network on animal health may be expected by many to be aimed, primarily, at ensuring the well-being of animals. That is not the primary aim of EADGENE. But how, then, does the Network relate to those animals that are some of the most important objects of the research?

A closer look at the documents does not provide very much of an answer. There are several references, not only to animal health, but also to animal welfare, but these are merely references, and they have not been elaborated. The pathogens to be investigated during the Network cause very different levels of suffering in animals, but this is not mentioned and does not seem to be regarded as relevant. Improved conditions for the animals, in order to strengthen their immune defence, are mentioned among the lines of action that may be pursued, but the actual research efforts seem to be focused on exploring the possibilities for using precise, genetic knowledge in breeding in order to develop new selection strategies.

The documents characterize the aims of breeding in terms of effectiveness and sustainability, and a discussion opens on how to understand the notion of ‘sustainable breeding’. The notion of sustainability, it is observed on

the EADGENE website, may be interpreted in a variety of ways and applied to a variety of fields.

In general discussions, it is often noted that there are countless definitions of sustainability. It is true that attempts to define sustainability involve innumerable *wordings*, but many of these wordings are alternative ways of saying the same thing. Unfortunately, this mixture of conceptual and merely nomenclatural variation can be rather bewildering. Many papers on farm animal breeding and sustainability do not treat sustainability in a way that would provide breeders and other stakeholders in breeding and reproduction with practical guidance.

Little has in fact been written directly on the subject. In the SEFABAR (Sustainable European Farm Animal Breeding and Reproduction) project – designed to identify sustainable practices in farm animal breeding and running for nearly three years from 2000 – commercial breeders and breeding scientists were required, with the assistance of bioethicists, economists, social scientists and NGO representatives, to develop a definition of sustainable farm animal breeding.²² However, the *requirements* of sustainable farm animal breeding still await clarification. Within the breeding and reproduction sector there is still a real need to define sustainability more clearly, and in more practical terms.

The concept can be much more than a marketing ploy or an empty rallying cry of interest groups. If pursued sensibly, it may be developed into a powerful managerial device and a facilitator of communication that opens up discussions among stakeholders. However, certain distinctive features of sustainability need to be recognized.

Firstly: it is a value-laden concept. Definitions of sustainability will depend heavily on

²² Gamborg & Sandøe

the values and priorities of the person, or group of people, doing the defining. Consequently, when we try to spell out the practical detail, we find that there is no single, correct account of the requirements of sustainability. Conflicting concerns about animal welfare, productivity, food safety etc. cannot be by-passed. They will appear as elements of a discussion on sustainability.

Secondly: sustainability as a framework for breeding animals as resources for future generations can hardly be stretched to cover concerns that are based on criticism of, precisely, the attitude towards animals as mere resources, mere means of production — rather than living beings in their own right. As regards ethics in relation to farm animals, sustainability is a necessary concept, but it is not sufficient to catch the ethical concerns.

Regarding the issue of genetically modified animals, the project documents assure that there is no intention to genetically modify animals “for food production”.²³ The assurance may be taken to indicate an assumption that the public’s concerns relate, first and foremost, to fears for their own safety. Probably, this assumption represents a very unhelpful reduction of the public concerns that science and industry will have to deal with. Much more than concerns about risks and safety are at play.

On the other hand, it would also be mistaken to overlook the existence of concerns that relate to scientific uncertainties. Scientists from the field of genomics are themselves eager to acknowledge the complexity of their research field and to emphasize that there are considerable gaps in their knowledge of genes, their functions and how they are regulated. Indeed, the general fact that consequences of technological action cannot be foreseen *in toto* appears to be pronounced in the fields of gene technology and genomics.

The idea of genomics delivering “permanent” solutions in relation to animal disease

²³Annex I to Network contract: Description of Work, p 47

resistance²⁴ and “improvements” that “add up generation after generation”²⁵ is a powerful one, but is it also realistic? How may this idea be linked to an acknowledgement that complexity and uncertainty are ever-present facts of life in genomics? How may overselling of the idea be avoided? How may the idea be prevented from spurring action that is too rash and over-optimistic? And how may the idea be connected to concerns about sustainability and biodiversity, and to other ethical concerns about animal integrity? Moreover, to what extent is there consensus on questions like these among scientists from the field of genomics? And how may the questions be publicly discussed?

In conclusion: there are several ideals at play in our dealing with nature and animals. One is that of wise use, allowing us to make good use of renewable resources of nature. Another is that of respecting individual animals in their own right. It is important to distinguish these two values from one another and to acknowledge that they may in some cases lead in opposite directions. This calls for reflection and the identification of a balance.

Underlying themes: using animals, caring for animals

The breeding of animals is as old as farming itself. Only in fairly recent times has it grown into a very controversial, public issue. Farm animal breeding involves the selection of the most suitable animals in order to produce future farm animals. The tremendous growth in, especially, the productivity of the farm animals has added to human wealth. It has also allowed farmers to make good use of the natural resources at their disposal. At the same time, however, farm animal breeding has had nega-

²⁴ Annex I to Network contract: Description of Work, p 17

²⁵ Annex I to Network contract: Description of Work, p 11

tive impacts — on animal health and welfare, and on genetic diversity. In relation to breeding programmes focusing on a single trait, typically a productivity-related trait, the point is frequently made that other characteristics are likely to be neglected. This may have a negative impact on, for example, animal welfare and genetic diversity — an impact likely to give rise to concerns and complaints from within, as well as from without, the agricultural sector.

Concern and criticism along those lines have been spurred by the development of modern biotechnology and, not least, by the actual demonstration that somatic cloning and the production of transgenic animals are technically possible. New technologies have been opposed. The argument, made by many scientists, that these new technologies are in principle not different from — just smarter than — earlier technologies of breeding, has opened the door to a whole host of more fundamental questions about animal breeding; questions, that is, that earlier went largely untouched and were not to the same extent regarded as matters for public discussion. It would, however, be mistaken to link this development in a simple way to the development of modern biotechnologies. In particular, it would be mistaken to explain it as a result merely of public fear of hitherto unknown technologies.

It is widely assumed, not least among scientists from the field of biotechnology, that the public is scared of the mystical qualities of some entities called ‘genes’. This is seen as the reason why people now oppose genetic modification in plants and animals and have even begun, in a seemingly irrational way, to ask questions about routines that, in principle, have been going on, largely unquestioned, for centuries or even millennia. This line of reasoning depicts societal conflicts about the development of new agricultural technology as mere problems of explanation. There are, however, several flaws in the assumption upon which the reasoning has been based. Prominent among these are that it ignores public concerns about animal welfare and, more broadly, that it

ignores concerns about the purpose of developing and using agricultural technology.

As to the first point about concerns about *animal welfare*: in 1965, long before gene technology had become a reality and an issue for public discussion, the British writer Elspeth Huxley published an inquiry into modern food production. The publishers presented the topic of book as “a matter which concerns us all”, and part of the opening statement ran as follows: “People care [...] deeply about the treatment of animals. Some believe that, by keeping them intensively, we are subjecting them to intolerable cruelties and abuses; others, that in believing this we are giving way to a sentimental emotionalism which will lead to more cruelty, not less, because animals, like humans, if properly looked after, will be better off indoors than out in all weathers, and because more humans will go hungry if we do not, by these and other methods, do our utmost to produce more food”.²⁶

These remarks were made in the days when the green revolution was taking place in the developing world, and when, in the industrialized countries, agriculture was marked by a wave of industrialization. Large steps were taken away from traditional husbandry towards modern livestock production. The public reaction to this development was to a large extent interpreted as one of fear, not of genes, but of chemicals. However, as alluded to by Huxley, the reactions of the 1960s against new and efficient technologies in agriculture should not be seen simply as triggered by self-interested fear. Rather, ethical concerns about attitudes towards domestic animals and about care for domestic animals were crucial.

This leads to the second point: The *purposes* behind the use of new technologies were seen as disturbing. In more recent times social scientists have encountered and described similar concerns in relation to gene technology. In the decades since 1965 classical techniques of breeding have been used in a context of ever more industrialized agriculture. Efficient breed-

²⁶Huxley; p 9

ing of production animals, aimed at making them grow fast and produce more meat, milk and eggs has resulted in cheaper food. As already mentioned, it has also resulted in health and welfare problems among animals. It seems reasonable to assume that current reactions to gene technology — understood to be a continuation of efforts to industrialize agriculture — have taken this experience into account. Moreover, it seems reasonable to assume that such reactions may be extended also to the use of applied genomics in breeding — at any rate, in so far as the *purposes* of breeding and the attitudes to the animals are not seen as clearly different from the purposes and attitudes of the agro-industrial rationality.

At present, the idea that applied genomics might represent an ethically acceptable alternative to genetic modification is being tried out. It is tried out as a third way, so to speak, between genetic modification and classical breeding; but much closer related to the latter and free from the supposed hazards of the former. As these attempts to find an alternative way of making new genetic knowledge useful are being presently unfolded, they seem, however, to be connected, still, to an assumption that public opposition to genetic modification is based primarily on self-interested fear of the unknown. As argued above, this assumption carries the risk that we shall ignore ethical concerns that relate to the care of animals (regarded as more than means of production) and to the purposes of new, agricultural technology.

As scientists doing research on the use of genomics in breeding are, of course, well aware, genomics is not genetic modification. The techniques and the technical options are different from those of genetic modification. Committing themselves to stay within the field of applied genomics, scientists abstain from using certain technical options. Nevertheless, the aims of research funding agencies — and, in effect, the aims of the research that actually obtains funding — may be similar to those economic and commercial aims that genetic modification has been seen to be committed to. That might provoke opposition. In order to be

able to discuss such criticism, and in order to further ethical reflection within the scientific community, the focus of internal discussions among scientists must shift *from* technical aspects and assumptions about a frightened public *to* the issue of purposes.

For further deliberation in the Network

Public opposition to new biotechnologies should not simply be explained as a fear of genes as mystical and incomprehensible entities. Much more down-to-earth worries matter; that is, worries about possible harm — that may be done inadvertently or because of hubris — to animals and to the environment. In any response to such concerns, questions of ‘why’ — and not only those of ‘how’ — must be seen to matter to scientists.

Applied genomics helps to ensure that several parameters can be taken into account at the same time in order to make better selection strategies, but such techniques do not in themselves say anything about what the term of ‘better’ should be taken to mean. In other words, the techniques cannot be used to decide which parameters should actually be taken into account, or how to prioritize conflicting aims.

It has been stated as an aim of the EADGENE network that the EU should be enabled to maintain a leading position as regards defining the standards of farm animal breeding. It may be that an assumption, that Europe is committed to the highest ethical standards on the treatment of animals, underlies that specific goal. The ethical principles have, however, not been made explicit. Making them explicit is a task for the members of the Network: why and how should the EU maintain a leading position in this field? To answer this question we also require answering the following questions:

- In some situations concerns about animal growth and concerns about animal welfare may be at odds: which concern, then, should overrule the other?

- What significance should be given to animal welfare in the research of the Network?
- What should be done in order to ensure that breeding aimed at reducing the occurrence of certain pathogens in animals does not in other ways reduce animal welfare?

5 Conclusion: Network discussions as a first step

This report has outlined some key ethical issues that must be confronted by the Network. Background information has been provided, and questions have been posed. Answers have not been delivered. That is so because the questions posed are meant for reflection and discussion within the Network. The set of questions posed in relation to each of the three main issues should be regarded as means of identifying those issues that should be taken into the public sphere for broader deliberation — and as tools for uncovering consensus as well as disagreement among members of the Network on the mores and means of the research.

Thus, the questions should not be seen as questions on which the Network *must* find a consensus to present to the public at large. A group of scientists is not a political party and cannot be expected to present a united front. Being frank and sincere about substantial disagreement may indeed be advantageous in

involving other citizens in serious deliberation on challenges of huge complexity.

It should be noted that there may be little to gain directly, here and now, from taking the trouble to engage with the above questions. Accordingly, there may be little to lose from ignoring them. The public sphere is crowded with groups of people — including groups of scientists — seeking attention. Most of these attempts go largely unnoticed. As a rule, they are neither rewarded nor punished.

It is unlikely to cause a revolution if some scientists try to go public with another and more demanding agenda — trying to involve rather than to sell, being open about uncertainties and disagreement, and aiming to engage broader groups of citizens in deliberation on the ethical and societal challenges set by scientific research and technology. In the long term, however, it may be detrimental to science to ignore the challenge.

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