

## The Monster in the Public Imagination<sup>1</sup>

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As modern biotechnology intervenes in existential matters such as reproduction, food, life, death and destiny, it not only challenges our everyday life, but also touches and interferes with our deep-seated cultural ideas about how the world is put together and why it should be so. Both in the form of technological innovation and in the form of more or less fantastic future scenarios, modern biotechnology brings the cultural categories of yesterday into question while challenging our ability to imagine order in the world of tomorrow.

For contemporary society, biotechnology provides new answers to old questions such as what is a human being, what is nature and what is culture. In particular, modern biotechnology challenges our ideas about what is the natural and what is the unnatural order. It proposes new ways of categorizing the world. It is, therefore, no wonder that both fascination and fear characterize the European public's attitudes towards biotechnology (Gaskell and Bauer, 2001).

This chapter is about one of the cultural sources that guide our thinking as we enter the era of genetic engineering. As we will show, it has as much to do with cultural categories and their boundaries as it has to do with monsters. In other words, there is a particular way of thinking about violated natural kind boundaries in general and the widely unfamiliar products of genetic engineering in particular.

### **Matters out of place, monsters and monstrosity**

In the Bible, as in most creation myths, the first activity is to bring about order, to put chaotic material into categories. Humankind continues to do that. But when we categorize to create order, deciding whether something is socially and morally

acceptable or unacceptable, proper or improper, clean or unclean, there will always be something that falls between categories. Be it a hair in the soup or pork meat on a Muslim's plate; it is a matter out of place. It is disturbing – and we experience it as unclean. It disturbs us because the contradiction between the clean and unclean articulates deep-seated ontological contradictions between order and disorder, cosmos and chaos. The hair in the soup is one of those things that oppose categorical division (Douglas, 1966).

Such matters out of place provide privileged access to investigating both order and the cultural premises of order. They are outside the categories and thereby define the culturally set boundaries themselves. In transcending the boundaries of order, these things also signal danger and are perceived with ambiguity (Douglas, 1966).

In cultural history, the idea of monsters is a point in case. Monsters fall between categories. They are usually regarded as dangerous but with an ambiguous fascination. In European history, monsters were familiar to both scholars and lay people. Monsters existed both in folk stories and in the classical books of writers like Aristotle, Augustine and Pliny. All three writers paid much attention to monsters. For the pre-modern researcher of nature, these three were the main sources concerning monstrosity.

Etymologically, the word *monster*, or *monstrum*, comes from Latin *monstrare*, meaning both 'that which reveals' and 'that which warns'. It is about demonstrating, to present something, to show something off (Friedman, 2000).

There is an important difference between the terms *monster* and *monstrosity*. The monster is a specific expression belonging to and reflecting a particular time and place, a particular culture. Of necessity, it is always changing. Monstrosity is about the very 'essence' of the monsters, about what makes the monster a monster: the change. Over the centuries, monsters have had different expressions, functions and explanations. But monstrosity never changes. Where there are people, there are monsters.

### **The ever-changing monster**

In pre-modern times, a monster was a common description for what was not part of God or Nature's order, and as such it did not have a single or specific name. It was a common description given to what could not be described, an explanation for what could not be explained. The monsters themselves could never be fully explained or properly categorized. The reason for this was that the monster was treated as a message. It could be a warning about hubris or catastrophes, but it could also be a reminder of the greatness of God or the divine order imposed by natural law. It could be a powerful political, religious and social tool for those who knew how to interpret it, had the power to tell and a public to listen.

As late as the 16th and 17th centuries, the monsters and prodigies represented a specific category about the knowledge of the world (Park and Daston, 1981). To Ambroise Pare and Francis Bacon, both surgeons, the unnatural was still a

part of nature. The discovery of unknown worlds also provided evidence of earlier ideas about monsters, and gave new life both to imaginations and to moral and religious power struggles about how to interpret these messages.

In the age of modernity, when God and Nature disappeared as the reference point for explaining the world, so did the monster. Essentially, monsters were reduced to images. Their function became aesthetic; something for people to gaze at or to be scared about (like the ape woman Julia Pastrana or the Elephant Man). They were no longer understood as messages or warnings. This brought about a change in how monsters were to be understood.

During the period of enlightenment, monsters became the shadow following the light of reason and science and took their place in novels. Horace Walpole's *The Castle of Otranto* from 1756, often considered to be the first horror novel in history, was soon accompanied by the English Gothic novel and a little later by the German *Schauerroman* and the French *roman noir*. These novels and the numerous films about horror in later times opened up a new tradition and interpretation of the shape and expression of the monster. Monsters disappeared as parts and categories of the visible nature, and were increasingly connected to the hidden and dark sides of the human mind. Consequently, the monsters were given new looks – like Janus, the doubling of the human being, addressed in *Dr. Jekyll and Mr. Hyde*, there is Nosferatu, the overwhelming sexual desire, depicted in Bram Stoker's *Dracula* (Skårderud, 2000).

What about today? Our claim is that the monsters are still here, posing questions and carrying messages. As in older times, monsters and monstrosity can be found wherever categories and the boundaries of natural kinds are challenged. One place to look is in modern science and technology. The monster pops up in representations of biotechnology, such as in cartoons and newspaper photographs, and in the popular imagination of possible 'new species' resulting from genetic engineering. These representations are empirically illustrated in the next two sections. First, we present results from a study analysing pictorial material collected from Austrian newspapers and magazines over a period of four years. We show that the monstrous can be depicted directly or indirectly, for example through its absence in a suggestive context. Second, experimental studies show how respondents imagine genetic hybrids relative to natural animals. Here it is shown that, besides considering genetic hybrids as having mixed essences, people seem to endow hybrids with certain 'monstrous' attributes that are absent in natural animals. Finally, we place and discuss the findings within the wider context of western cultural history.

### Monsters in newspaper photographs and cartoons about biotechnology

The following description of pictorial material concerned with the issue of modern biotechnology is based on a sample of cartoons, photographs and other pictorial material published in Austrian daily newspapers between 1997 and 2000. The material was categorized according to common themes. In this section, different

ways of depicting the danger emanating from monsters and from the monstrous are illustrated. Generally speaking, danger emerges in two forms: as the visible or the invisible monster.

### The visible monster

#### The monster as a hybrid

Just as in the imaginations of earlier eras such as the ubiquitous gargoyles on ancient cathedrals, as well as in children's drawings, depictions of visible monsters in newspapers (cartoons and drawings) blend one or more natural kinds. The resulting monster then possesses organs from different species where some body parts are exaggerated and others absent. Like those well-known monsters in cultural history, such hybrid beings are the enigmatic visible expression of what the products of biotechnology can be in terms of blurring the boundaries between natural kinds in Douglas's (1966) sense (Figure 10.1).



SCHON DIE ALTEN GRIECHEN...

Source: *Der Standard*, 15 September 1997, online version

**Figure 10.1** Cartoon – 'Even the ancient Greeks . . . Of course we have to keep them in a hidden place, otherwise this uproar about ethics and genetic engineering will start again!' by Dieter Zehentmaier

**Frankenstein or 'the monster hitting back'**

A subtheme of the visibly monstrous is articulating the monster with its creator, mostly mad scientists happily crossing the borders. Sometimes the monsters are depicted as deformed, representing only a mountain of flesh bereft of shape. Such shapeless monsters reduced to pure function are inactive and passive patients of the scientist's doings. More frequent, however, are monsters getting out of control and turning on their creators, just as the young Frankenstein became a victim of his creation. Such monsters do not cross the boundaries of natural kinds but are characterized by excessive size. They are monstrous not only in appearance but also because they turn the moral order upside down: it is no longer humans who control animals, but enormous mice, rats or other creatures with humanlike intentions and gestures, who control humans. The cartoons symbolize hubris and failed experiments that threaten life *per se* and turn against the taken-for-granted social order (see Figure 10.2). Frequently it is not clear which is more monstrous:



Source: Neue Kronen Zeitung, 12 April 1997, p1

**Figure 10.2** Cartoon – 'News from the (gene-)lab: I'm curious whether Professor Fleischmann was successful with his new growth formula' by Harry O'Feem

the creator or the created. The overconfident and naive attitude of scientists who have lost their sense of reality appears to be more dangerous than the monster itself.

**Invisible monsters**

What is striking in the pictorial material on biotechnology in these two Austrian newspapers is how difficult it is for writers and cartoonists to capture the message of biotechnology. The new 'monster' of genetic engineering is actually invisible. The material conveys a strong sense that there is something dangerous about biotechnology, but what is the danger and how can it be addressed? In Figure 10.3, the reasonable or unreasonable fear of fiddling with genes is anchored in the standard joke of arachnophobia or fear of mice. Unfortunately, however, genes are not as visible as spiders and mice ('Genes? Where?' screams the woman on the chair).



Source: Der Standard, 15 September 1997, p21

**Figure 10.3** Cartoon – 'Genes? Where?' by Jean Veenbos

### Highlighting the monster through its absence

The most frequent way of illustrating the monstrous aspect of biotechnology is to depict examples where danger is *absent*: salespersons happily smiling in front of piles of organic food (see Figure 10.4), innocent children enjoying explicitly 'natural' food or policemen safeguarding crop fields.

By labelling Figure 10.4 as 'Retailers react to the consumer's request, which is: genetechology-free food', allusion is made to the risks of biotechnology or at least to something undesirable. Similarly, the heading of a picture showing Prince Charles, a declared opponent of genetic manipulation, wandering across his land reads 'Enjoying the True, the Beautiful and the Honest: Great Britain's Prince Charles does not allow GM plants on his property' (*Der Standard*, 12–13 June 1999, p8). The tension between picture and labelling refers to the false, the ugly and the dishonest in the new technology. The more trusting, happy and easygoing the actors depicted in the pictorial material, the more we become aware of a diffuse danger of the unknown.

Especially with food, there is also the idea of infection or contagion; incorporating the monstrous leads to monstrosity from within. This is well depicted in a cartoon showing a maize-eating woman giving birth to a maize cob with human feet. The manifestation of the monster is delayed.



Source: *Neue Kronen Zeitung*, 11 January 1998, p9

**Figure 10.4** Picture – 'Retailers react to the consumer's request, which is: genetechology-free food'

### Constructing the monster by emphasizing the 'normal'

Another way of capturing the invisible monster is to describe the 'normal'. By paying attention to the taken-for-granted in the pictorial 'text', the abnormal is sensed in the 'subtext' of the picture. Under normal circumstances, we would not find half-page photographs of common maize cobs in newspapers and magazines. Generally, sheep and calves are not depicted in a portrait format. We rarely read and hear about such animals being born or giving birth, about their kinship relations and about their name, such as Dolly the sheep, or George and Charlie the clone-calves, for example.

In reports about biotechnology, the seemingly normal takes on a different meaning. Take, for example, the well-known pictures of Dolly the sheep. When we see that Dolly's wool has been used for knitting a pullover, when we are informed about Dolly's pregnancy and giving birth, when we hear about Dolly's well-being (even poor Dolly has problems with getting fat and suffers from psychological problems) and about other genetically manipulated sheep (like Polly, Molly, Holly, Olly and all the others), the message lies in the subtext. The photographs of ordinary-looking animals and plants are described in an anthropomorphic way akin to that used for celebrities. There is something fascinating and at the same time alarming about this news. By describing the normal in unexpected detail some anomaly is implied (e.g. *Der Standard*, 19 August 1998, p20; *Der Standard*, 5 December 1998, p35).

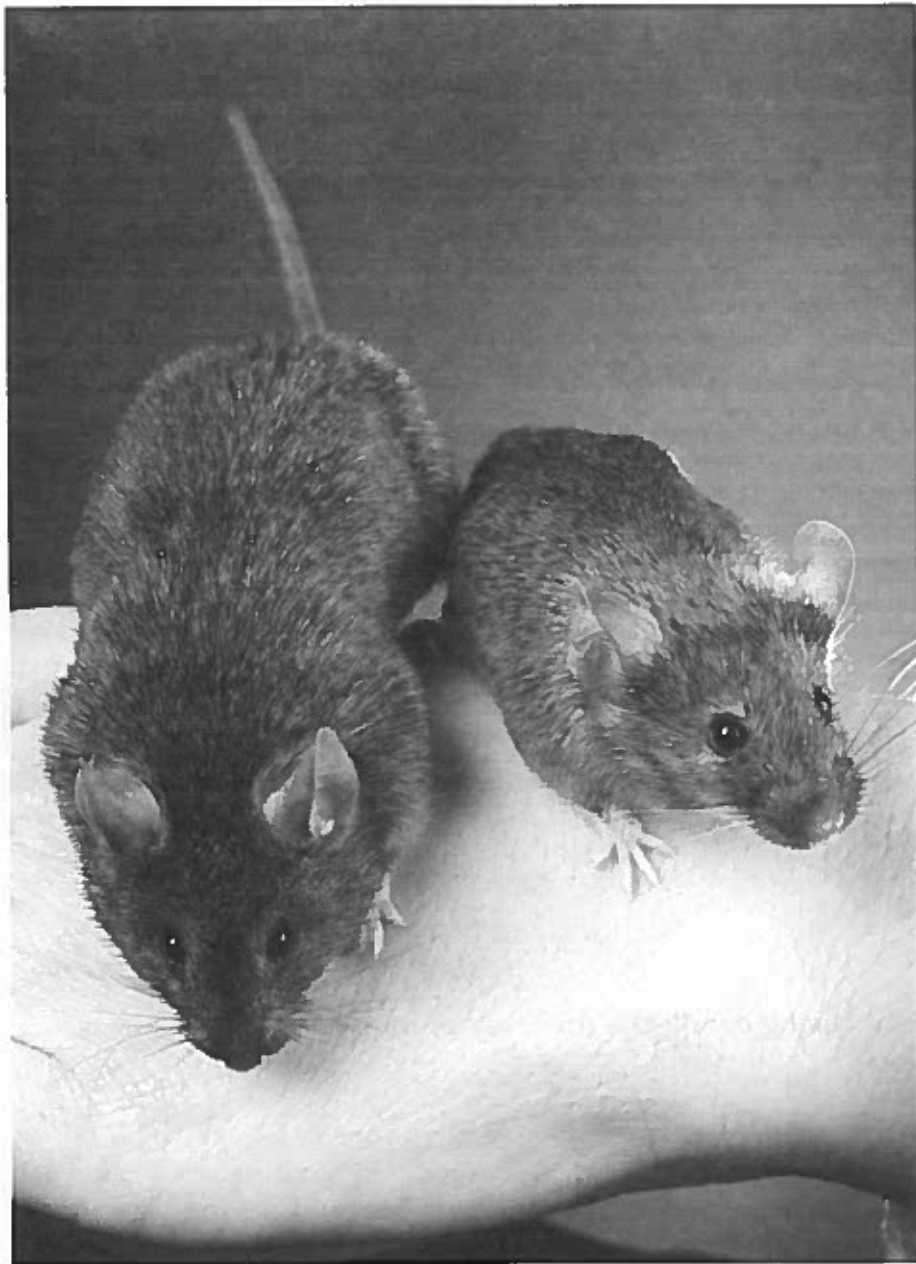
The conspicuous difference between the normal and the imagined threat residing in its shadow is perhaps a better illustration of monstrosity than any explicit cartoon and, above all, is politically very potent. The 'monster in absence' figures in the invisible difference of its creation.

Similar in their message but more explicit are pictures where two readily identifiable exemplars of a natural object such as mice or plants are presented side by side: cob beside cob, mouse beside mouse (see Figure 10.5). Usually the GM version is the larger one, but in a photograph, size can only be conveyed in contrast to the 'normal'. Without a point of reference, the monster escapes.

### The 'living dead': the monster as multiplication

When humans are the objects of biotechnology, an image of 'the living dead' (*Der Standard*, 13 June 1997) is often used. Humans become monsters when they apparently are artefacts (e.g. *Profil*, 3 March 1997, front page). Although these beings have human shape, they lack essence, identity and uniqueness. The 'copy-humans', though living and with movement, are bereaved of 'real' life.

The monstrous is captured either in the idea of mass production or in their reduction to pure function (being human is just being a body). Crowds of copied baby faces or multitudes of superstars, bad guys or geniuses (like Claudia Schiffer, Adolf Hitler or Albert Einstein) allude to the horror of the faceless masses (e.g. *Der Standard*, 15–16 March 1997, p25). The original disappears among its copies. In the copy-shop theme, the monster therefore enters as a *lack of difference*. A living being's identity as a unique entity is violated in his or her multiplicity.



Source: *Neue Kronen Zeitung*, 4 May 1997, p5

**Figure 10.5** Picture – ‘A normal mouse beside the two to three times stronger genetically manipulated one’

### The monstrous is when the monster is accepted as normal

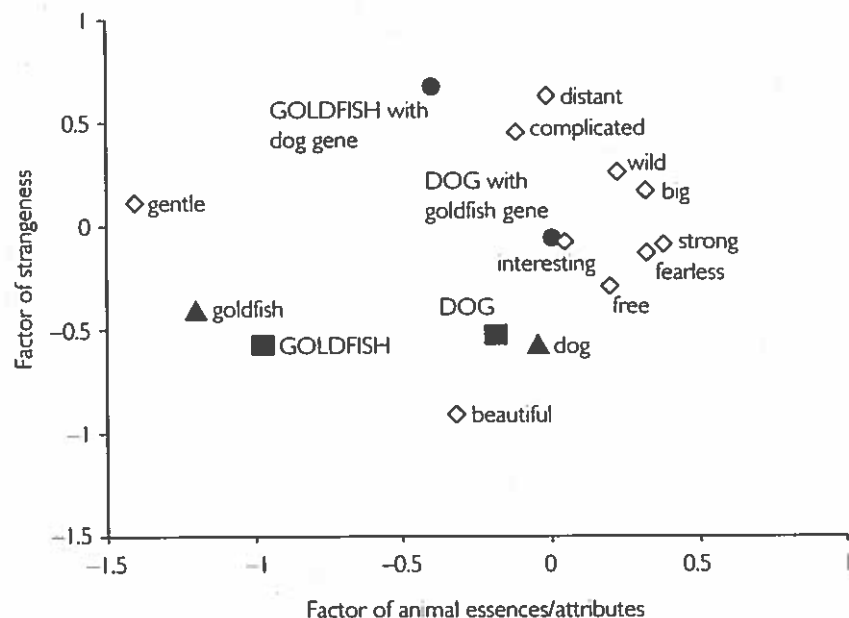
In the sections above, it has been pointed out that the invisible monster is frequently depicted by presenting the ‘normal’ in an attractive way. One message of such pictures is the horrifying idea that people could *get used* to the science fiction scenarios of biotechnology and that they could finally accept this unfortunate development. If, in a copy-shop cartoon, Frankenstein orders ‘100 clones 1:1’ and the employee in the copy shop asks: ‘black and white or colour?’ (*Der Standard*, 4 March 1997), the monstrous is in the normal reaction of the employee to the order. With a changing technological reality, it could follow that we might also lose our capacity to judge what is good and what is not, what is desirable and what is to be avoided. If future developments lead us to conclude that such conditions are good, then our sense of a moral order is lost. At that point, humans will be reduced to stupid, self-satisfied creatures that can be modelled to whatever standard anybody desires.

### Imagining genetic hybrids: Blended essence and emergent monstrosity

In the previous section, diverse ways of depicting the monstrous were shown to be used in newspaper and magazines’ reporting of biotechnology. Is it this media reporting alone that gives us the idea that biotechnology results in monstrous acts, or do people see biotechnology in this way when they think of genetically modified organisms? To address this question, we investigated what is going on in people’s imaginations when thinking about genetically manipulated animals in two experimental studies. A total of about 400 respondents were asked how they rate natural animals and hybrids resulting from genetic manipulation on attribute scales. The same scales were used for natural and hybrid animals. They included pairs of opposite attributes such as dangerous–gentle, small–big, ugly–pretty, weak–strong, passive–active, slow–fast, simple–complicated, ordinary–noble, tame–wild.

When people are asked to imagine an animal that has been implanted with the gene of another animal, at least two effects can be observed in the judgement they make. The first is the mixing of animal essences, making the hybrid’s characteristics a mix of the gene recipient’s and the gene donor’s attributes. The second is the emergence of a set of attributes that the hybrid does not share with the gene recipient and the gene donor. The detailed findings are shown in the following figures.

As an example, Figure 10.6 shows the positions of a dog, a goldfish and the resulting hybrids in a two-dimensional space of a correspondence analysis using the average attribute judgements for all animals and hybrids as correspondence measures. Each animal is depicted twice, once judged as a gene donor (triangles, small letters) and once judged as a gene recipient (squares, capital letters). There are two hybrids in this example, a dog having received a goldfish gene and a goldfish having received a dog gene. Additionally we show the points of some



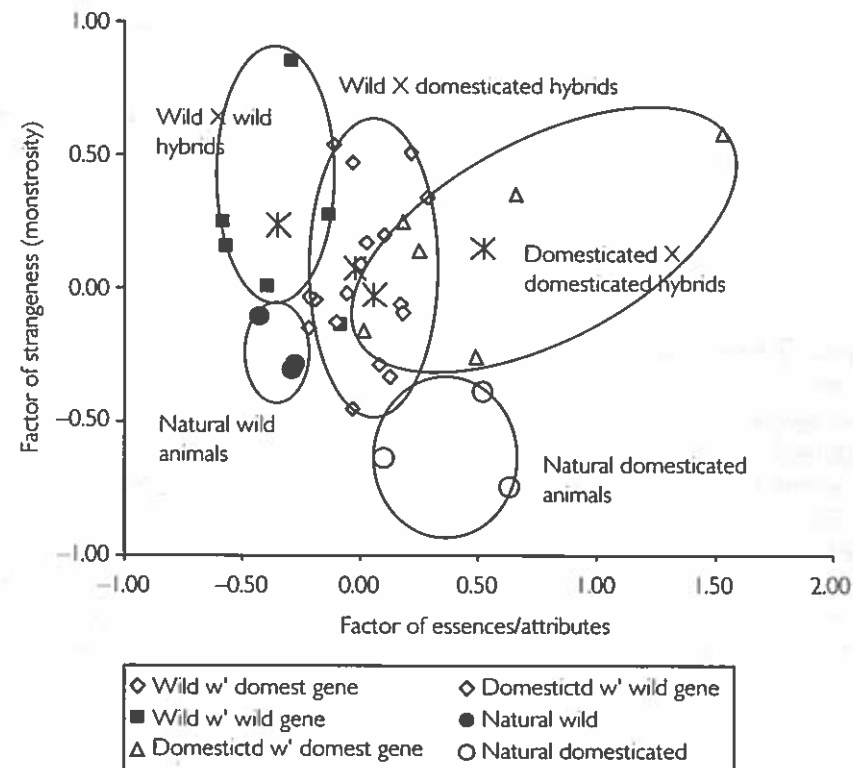
**Figure 10.6** Locations of dog, goldfish and the resulting genetic hybrid in the two-dimensional space of a correspondence analysis (Experiment 1)

characteristic attributes. Among others, goldfish are perceived as gentler than dogs while dogs are perceived to be more fearless and stronger than goldfish.

The horizontal dimension (*x*-axis) contrasts the different attributes of the natural goldfish and dog. As seen on this axis, a goldfish gene transplanted to a dog does not change the characteristics of the resulting hybrid very much. The dog's essence seems to be perceived as more or less inert with regard to the goldfish's gene. A goldfish with a dog gene is perceived to be more of a mix of essences, as shown by its intermediate position between dog and goldfish on the *x*-axis.

The vertical dimension (*y*-axis) contrasts the natural animals against the two hybrids. The higher up on this dimension and the further to the right on the *x*-axis, the more an object is being judged as distant, complicated, wild, big and not beautiful. This set of characteristics captures an idea of monstrosity that is unrelated to the natural animals. This point can be seen even more clearly from the scatter plot of all animals and hybrids in the correspondence space (see Figure 10.7).

Figure 10.7 shows all six natural animals receiving genes and their 30 hybrids located in the same correspondence space. The cloud of hybrid points is located higher up on the vertical dimension than the natural animals, showing that monstrosity is a feature that emerges from the mixing of the natural animals' genes.



Note: Asterisks mark the average position of each set of comparable hybrid points

**Figure 10.7** Locations of three wild and three domesticated natural animals as gene recipients or gene donors and their genetic hybrids in the two-dimensional space of a correspondence analysis (Experiment 1)

The same point is illustrated by a second experiment where respondents imagined the genetic manipulation of humans, chimpanzees and a set of three domesticated animals (not reported here). As in the first experiment, the monstrosity dimension emerging from a correspondence analysis is clearly independent of the blending dimension and determined by attributes such as strangeness, particularity, complexity, wildness and, to a lesser extent, large size. Above all, hybrids are definitely not beautiful.

The findings provided by correspondence analyses were replicated by path models showing that hybrids are seen to possess an attribute dimension that is not determined by the natural animals' attributes (not reported here).

Both the path model and the correspondence analyses of the two independent experimental data sets corroborate the proposition that monstrosity is an emergent property of genetic hybrids. Our respondents perceive genetically manipulated animals as possessing both a mixture of the natural gene donors' and recipients'



essences and an independent essence of monstrosity. While the mixed attributes of the hybrids may be the result of essentialist thinking or of a semantic transfer of attributes from the natural to the hybrid animals, such thinking does not explain the strangeness or monstrosity factor. While the idea of mixed attributes illustrates the betwixt and between characteristic of genetic hybrids, monstrosity emerges as a set of attributes that is quite independent of the original animals and a proper essence of the genetic 'monster' itself. As such, it can be taken to express the creation of a new kind of animal that transcends hitherto known categories that structure our familiar world of living beings.

### The contemporary message of monsters

These empirical studies have three main results. First, monsters can be visible or hidden, and it is often the hidden aspects in the seemingly 'normal' that convey the strongest sense of the monstrous and the threat emanating from it. Second, and as outlined in the Introduction, the idea of the monstrous is strongly linked to a sense of violated natural boundaries between kinds. Third, the terms of monstrosity that emerge autonomously when imagining the new cannot be accommodated within the taken-for-granted order of the familiar world.

There are several dimensions along which we can attempt to compare and contrast traditional with modern representations of monstrosity in the context of biotechnology.

They are *comparable*, first, because both representational systems are cultural products; second, because both challenge our traditional way of seeing the world; third, because both elicit fear, repugnance and curiosity; and fourth, because, at least during the late Middle Ages and today, they are taken as *portents* of future harm.

They are *contrasting* conceptions; fifth, because traditional and modern representations differ with regard to the agents involved in creating monstrous organisms; sixth, because monstrosity in the traditional understanding is visible whereas genetic monstrosity is invisible in many cases; and seventh, because traditional monsters were rarely encountered in everyday life, whereas biotechnological 'monstrosity' may eventually be ubiquitous in the post-biotechnology world. Each of these points will be discussed in turn.

### Cultural products

*First*, there is no doubt that monsters and monstrosity are part of mentality and cultural convention. They are a received cultural topic that is present even in our scientifically enlightened times and even if monstrosity is no longer labelled as such. This cultural convention is a way of collective symbolic coping with the unfamiliar and, as such, a response to perceived threat (Wagner et al, 2002). It allows people to bundle judgements about causes and reasons as well as the consequences of natural or social events into one representation that is as

emotionally charged as it is cognitively rational and that allows a collective value judgement about a phenomenon.

### A challenge to our traditional way of seeing the world

*Second*, monstrosity is called upon when the common categories of cognition collapse. The idea of monstrosity, whatever its particular make-up may be, is evoked when the 'ordinary' categories about *what is and what is not* are challenged by innovations in the technological or cultural realm. When traditional ways of understanding the world in terms of familiar categories are challenged, so are their boundaries or the field in between order and disorder (Carroll, 1990). The monstrous signals an epistemological problem and is a harbinger of Category Crisis (Cohen, 1996). During the past centuries, malformed babies or creatures from faraway regions were such deviations from the received structure of the world. In biotechnology, it is the idea of mixing unfitting natural species that entails monstrosity, as was shown in the earlier reported experiments. The monstrous 'mixing' of neighbouring species in works of art such as paintings was, for Jean François Marmontel, in his *Encyclopédie* article, just indicating a deranged artistic imagination (Daston and Park, 2001, p212). Today it is the scientifically planned design of living beings. No surprise, hence, that in cartoons the 'emblem' of mixed species is used to characterize biotechnology, just as the experimental respondents imagined genetic hybrids to be a mix of the natural animals.

The idea of monstrosity 'dwells at the gates of difference' (Cohen, 1996). It pops up where the boundaries between taken-for-granted natural kinds break open and the difference between species, such as in our experiments, is being blurred. There, our respondents were not content to characterize genetic hybrids as beings with mixed essences, but, and perhaps unwittingly, added a factor of monstrosity to the hybrids that sets them radically apart from the natural animals. It is not simply a 'form suspended between forms' (Cohen, 1996, p6). To imagine this, genetic hybrids would only need to be imagined as animals with blended essences. It is the additional and autonomously emerging property of monstrosity that signifies the cultural fact of 'monsters'.

This fact has a parallel in risk debates of the 1980s and early 1990s about whether genetic engineering would produce additive or synergistic effects. The concept of additive effects would predict that the outcome of introducing a foreign gene, for example a *Bacillus thuringiensis* (BT) gene, into a recipient organism, for example conventional corn, would only result in a BT-producing corn without any other properties. The concept of synergistic effects would predict that the resulting BT-producing corn could be expected to also possess hitherto unknown properties that transcend the known attributes of the original species and the property conveyed by the gene. Synergistic effects would by definition be unknown and therefore unpredictable (Idel and Katzek, 1991); they were often depicted as potentially catastrophic. Many advocates of genetic engineering discard the synergistic concept, while opponents tend to support it. Interestingly, the respondents in our experiments are clearly more inclined towards the synergistic view, as shown by the emergence of the strangeness or monstrosity factor.

### **Traditional and modern representations evoke fear, repugnance and curiosity**

*Third*, the affective side of the representation of monstrosity is horror, repugnance and avoidance. Across the many shades of dealing with monsters that are recounted at the beginning of this chapter, the emotional charge of monsters always implied avoidance, even when they served as attractive exhibits for the curious. They could be enjoyed because they were on a stage or in an exhibition that was markedly offset from everyday life. Had the contemporaries of the 14th and 15th centuries encountered these 'sources of pleasure' in everyday life, their reaction would most probably also have been avoidance. Until today, the contemporaries of the age of biotechnology have also encountered their monsters only in newspaper and electronic mass media reports. However, the political and economic reality is such that regulatory activity requires opinions and decisions from everybody. This need to act makes the idea of monstrosity and its associated fear more real (Wagner et al, 2002).

However, there is ambivalence present in the emotions. Take the pictures of Dolly, the cloned sheep. She is a sheep and, as such, not more attractive than any other. If the picture deserves a place in the prime pages of newspapers, this is only because of Dolly's embodying some monstrosity due to the way she was created. This is what makes her more attractive than other sheep. To a certain extent, monstrosity is attractive and repelling at the same time (Einsiedel et al, 2002).

### **Portents of future harm**

*Fourth*, the times when priests interpreted monsters as signs of God's wrath and impending punishment are long past. Alive and well, however, is the belief that tinkering with nature in producing genetic monstrosity will eventually bring us disaster (Kronberger et al, 2001). Nowadays, people believe in the scientists' sin of hubris and the ensuing revenge of an animistically interpreted nature in the long term (Wagner et al, 2001). The monstrosity in genetically engineered organisms is taken as a sign of future harm in the form of long-term ecological disaster.

Being positioned at the very limits of our knowledge, 'the monster polices the borders of the possible' (Cohen, 1996). In former times, monsters were positioned at the borders of the geographical world, such as Africa and the Far East. In myths, monsters are often used as guardians (the giants of Patagonia, the dragons of the Orient, the Sirens and the Cyclops in Odysseus) and warn that curiosity will be punished, or that specific knowledge is required to pass (the Sphinx). The monsters in these cases prevent unrestricted mobility and secure stability and order. To step outside this 'official' geography of the accepted epistemology was to risk attack by some monstrous border patrol or, even worse, to become a monster oneself. The role of monsters is to guard the limits of knowledge beyond which the land of hubris and therefore existential *danger* begins (Douglas, 1966). Today it is positioned at the borders of the thinkable and used as a warning of an uncertain future that biotechnological products might harbour for us. In

contemporary debates about biotechnology, projecting monstrosity onto this technology serves a similar purpose in political propaganda of the technology's opponents.

### **Differences resulting from traditional and modern means of creation**

*Fifth*, here ends the plain analogy between traditional and modern representations of monstrosity. The greatest difference between present-day genetic monstrosity and its traditional idea is their very *raison d'être*. They are no longer seen as accidents of nature or God's will as an answer to sinful doings, but as monstrosity by design. It would not have made sense for medieval people to reject or to 'vote' against God's will. This makes sense only today, when the creators of uncategorizable organisms are human themselves, as the often forceful rejection of certain biotechnological applications shows (Gaskell et al, 2000).

Another and, at first sight, paradoxical difference is the lack of a possibility to sustainably instrumentalize the monster. Modern monsters come to life intentionally, and only for the purpose of serving their human creator. But unlike their medieval brethren that could be tamed for eternity and taken to service the higher glory of God by giving them a subordinate position, nowadays monsters are unlikely to be enslaved for good. Modern myths, from *Frankenstein* to *Star Wars*, again and again invoke the fear that artificial creatures will eventually reverse the relationship between themselves and their human creator who had wanted to make use of them. Hence, benefit can be expected only for the few and for a short period, and the relation is bound to end in catastrophe or the enslavement of humankind.

This marks a rupture within society that juxtaposes, on the one hand, science and the biotechnology industry profiting in the short term and, on the other hand, the common people, who would have to bear the risk. Monstrosity, as it is vividly depicted in the media pictures, is a signal of a potential social problem as well as a cultural problem.

### **Genetic monstrosity is often invisible**

*Sixth*, contrary to traditional monsters, genetic engineering and biotechnology present us with a new world of monstrosity, where the causes of monstrosity – the manipulated genes – are invisible to the eye of the average person. The phenotype, that is, the everyday appearance of a genetically altered organism, rarely carries a visible mark of the genetic changes. Examples whose phenotypes are nearly unchanged with regard to the normal organisms are Roundup Ready soya, BT-corn and lactoferrin-producing cows. Visibility that made 'traditional' monsters frightening is no longer a criterion in everyday cognition. The danger lurks in the dark and is therefore the more frightening (Wagner and Kronberger, 2002). Instead of understanding the monster through its appearance, people are required to understand monstrosity in the invisible realm of the organisms' genetic



make-up. While the genesis itself is horrible, it gives rise to a seemingly normal creature; the monster is not easily detected as such and even with the most familiar beings you can never be sure who is who. Just as with those elegant vampires, beyond the shiny surface horror may prevail.

### The ubiquity of biotechnological monstrosity

*Seventh*, and this needs only brief mention, biotechnologically tailored organisms are likely to become ubiquitous. Once genetically modified cows and sheep are procreated through cloning, are producing pharmaceuticals on a widespread level, and once the majority of humankind's crops are resistant to pests and pesticides due to genetic modifications, there will be no need to see these organisms as monstrous. The loss of monstrosity of some biotechnological organisms will mirror a similar process in the past, when congenital malformations ceased to pose a threat as a prodigy. As common sense dictates: habituation makes monsters familiar. From today's perspective, however, the prospect of our becoming accustomed to such facts is perceived as a moral threat.

By searching for the cultural bearings of monsters and monstrosity in the image of modern biotechnology, we hope to shed some light on our contemporary culture and how we deal with technological innovation. What the monstrosity that emerges in people's imagination of genetic hybrids as well as in pictorial material of mass media shows is that our category system of what is and of what is thinkable is deeply challenged by the new technology. This is the real message of imagining the monstrous in biotechnology, filling us with ambiguity, with fascination and fear. Thus, our culturally constructed ideas of monsters and monstrosity link us to a cultural past long bygone and make us human in the deepest sense.

### Notes

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## Part 3

# Global Perspectives

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