

Public understanding and perception of plant biotechnology in the EU: Myth and reality

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Abstract

GM crops and GM foods have proved to be one of the most contentious public issues in European society. Technical and economic benefits are offset by perceptions of risk to human health, environmental impact, increase in economic power of multinational corporations, deterioration in food quality, threat to traditional farming and rural society, and general moral acceptability. These attitudes are shifting, but are still strongly hostile to GM technology. This paper reviews recent surveys of public opinion on these issues in Europe. The most extensive report is based on data from 11 surveys, published in January 2003 on behalf of seven biotech companies (KRC Research 2003). The second main source was the most recent Eurobarometer report, based on a survey of 16,500 respondents, March 2003. Broadly speaking, Europeans are supportive of biotechnology, with 43% being optimistic and only 17% pessimistic. However, a large number are uncertain. The attitudes are more favourable than, for example, towards nuclear power. While optimism about most technologies has been stable since 1991, optimism about biotechnology declined up to 1999, but has recovered since, mainly because of medical possibilities. Of six applications of biotechnology, food was the least supported (should be discouraged) and crops next least favoured. Conclusions on safety of GM food are presented in three sources from Royal Society (UK), Academie des Sciences (France) and National Research Council (USA). All conclude that GM foods are safe. In contrast, 56% of Europeans believe GM foods to be dangerous, 70% “do not want this type of food” and 95% want labelling and the right to choose. Opposition to both GM crops and GM food increased between 1996 and 1999, but in general, stabilised between 1999 and 2000. There were some significant national differences in the latter period, with opposition declining in the UK, but continuing to increase in Germany and Italy. Differences in attitudes between the EU and the US are not as great as is some-

times believed. In the period 1996 to 2000, opinions on usefulness, risk and moral acceptability were generally about 10 percentage points more favourable to biotechnology in the US. However, over that period the differences widened somewhat, generally because of declining support in the EU.

Introduction

In the two generations since the Second World War, the food chain in Europe has been transformed. In the 1950s, in most European countries, a high proportion of the population were engaged in food production, most food consumed was produced locally and the chain linking the primary producer to ultimate consumer was short and transparent. Today, the situation is very different. Less than 5% of the working population are involved in primary food production. Most foods go through a complex manufacturing process, and a high proportion contain mixtures of ingredients. Distribution to the consumer is largely in the hands of very large multiple (often international) retail companies. In the average European country, two thirds of all food sales are in the hands of less than five retail companies; the producers' share of the consumers' expenditure is dropping by about 1% per year, and prices to producers, in real terms, are declining by 3% per annum.

The consumer is therefore now largely disconnected from the sources of his or her food. Confidence in the integrity of the food chain is constantly challenged by recurrent scandals of contamination or misrepresentation, and by an ever vigilant press. The most important of these challenges has undoubtedly been the occurrence of BSE, initially in the UK cattle herd, and subsequently in almost all European countries. This had led to a collapse of confidence in the safety of foods, and to a great heightening of sensitivity in all matters relating to food safety (Cunningham et al. 2003).

Against this background, the issue of genetic modification of foods and crops has been played out. The purpose of this paper is to assemble the factual evidence on public perceptions of GM technology in Europe, and to put them in context.

Though some of the basic scientific developments underpinning GM technology were European, most of the development work has been American. As the technology spread, from 2 million hectares in 1996 to nearly 60 million hectares in 2002, it is not surprising that three quarters of the area planted with GM crops were in North America, with Argentina making up most of the remainder. For similar reasons, three quarters of the area were sown to crops where GM technology was used to induce herbicide tolerance, and most of the remainder was for insect resistance in corn. Finally, the target crops were dominated by soybean and maize, with cotton and oilseed rape making up the remainder (Figure 1).

A recent study attempted to quantify the benefits in economic terms to growers of six GM crops in the US in 2003. On average, the report indicated that GM varieties reduced production costs by 25%, increased yields by 41% and increased

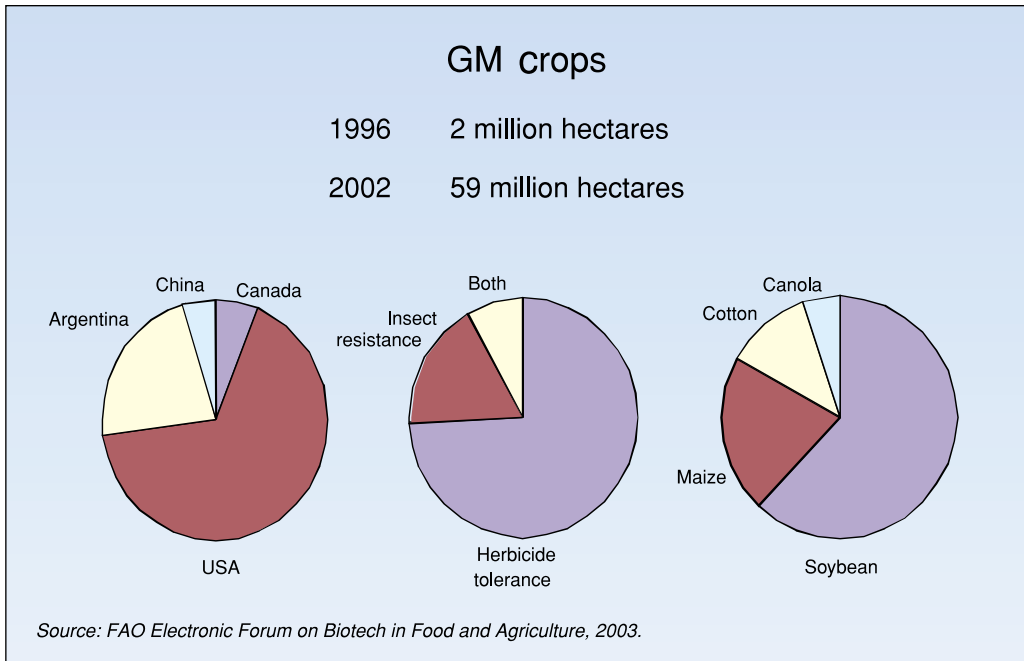


Figure 1. GM crops: Where, for what purpose, what crops.

grower income by 27%. Most of the gains were in corn and soybean, with soybean producers saving more than US \$1 billion through reduced use of pesticides (Sankula and Blumenthal 2004).

In Europe, there has been effectively no commercial use of GM crops. Apart from the fact that it was illegal, European producers do not grow soybean, so the use of GM varieties in the crop was not an issue. The same is true of cotton. In maize, where GM transformation has been used mainly for insect resistance, the principal interest has been to counter corn borer damage in Spain. So there are reasons beyond the EU ban which have kept producer interest in GM crops lower in Europe than on the other side of the Atlantic.

European attitudes

The attitude of consumers to GM crops and GM food is continuously being assessed. The two most comprehensive recent assessments are the Eurobarometer Survey carried out on behalf of the European Commission (europa.eu.int/com/public_opinion/archives/eb/ebs_180_en.bdf), and an extensive report based on data from 11 separate surveys, and prepared by consultants on behalf of seven major biotechnology companies (abeurope.dynamicweb.dk/images/files/

public_opinion_overview_on_biotechnology).

Over the past decade, European attitudes to several major technologies have been positive and stable. About 80% of people are optimistic about developments in telecommunications, computers and information technology (IT), and about 50% feel similarly about space exploration. The one major area of technology where opinions have changed is in regard to biotechnology. In 1991, over 50% of respondents felt optimistic, but this percentage dropped steadily in subsequent surveys, reaching a low of close to 20% in 1999. The Eurobarometer Survey of 2002 showed that optimism about biotechnology has, to some degree, been restored, with positive attitudes from some 50% or respondents (Figure 2). This broad pattern of response was echoed in individual countries, though with considerable differences (Figure 2). It is clear that confidence in biotechnology is higher in Spain, Italy and France than in Germany and UK, though all countries showed a recovery of optimism between 1999 and 2002. There is an element of paradox in the contrast between the low index of optimism about biotechnology in the UK and the fact that the UK has been a country where biotechnology generally, and GM foods in particular, have been more readily accepted by the public authorities.

Within biotechnology, attitudes differed substantially depending on whether the applications had medical or food benefits in view. The vast majority (80%) felt that genetic testing could be useful, and 60% felt that it should be encouraged. Some-

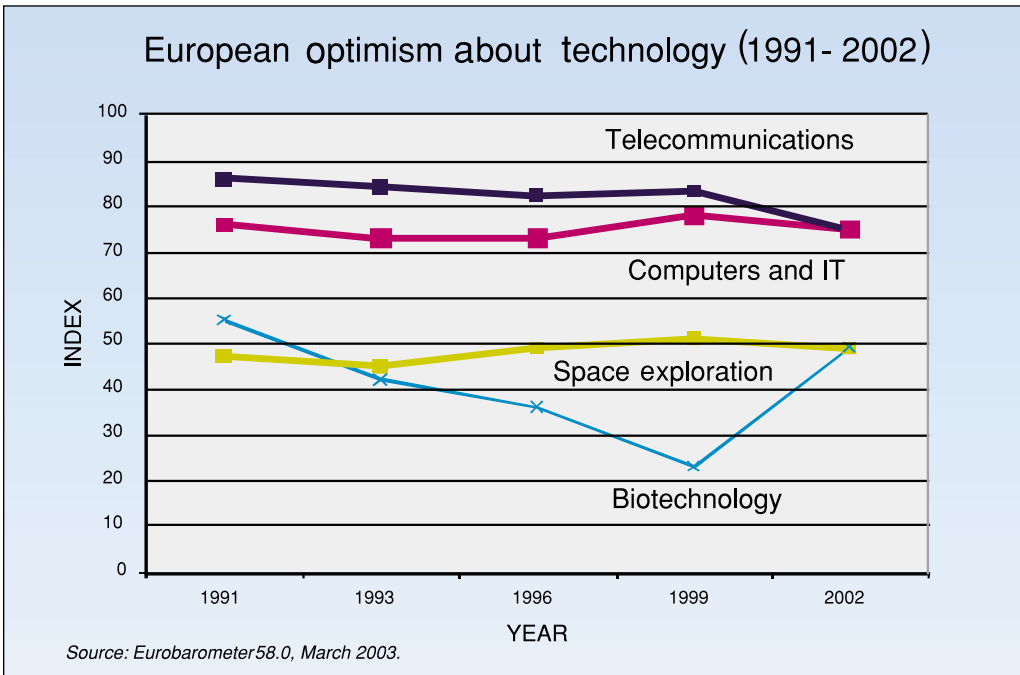


Figure 2. European attitudes towards technology.

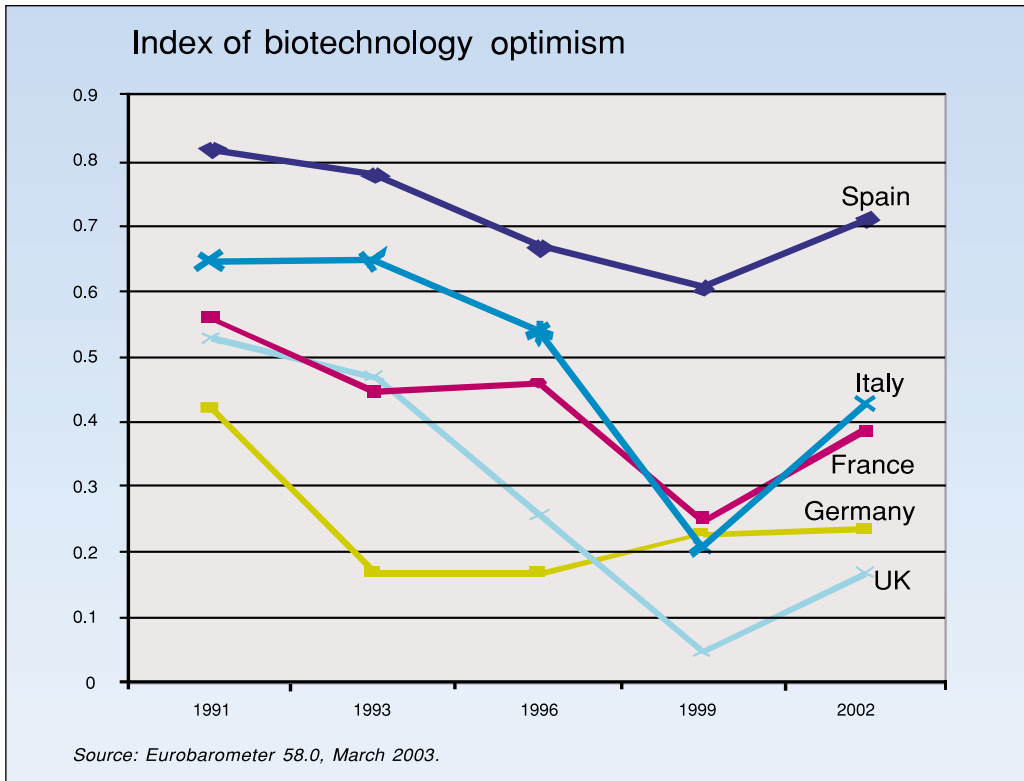


Figure 3. Changing attitudes to biotechnology in five European countries.

what lower percentages were in favour of cloning human cells, while only 40% felt that applications in xenotransplantation (i.e. techniques for transplanting tissues from other species into humans) could be useful, and only 10% felt that it should be encouraged. On crop biotechnology, some 38% felt it could be useful, and about 6% wished to have it encouraged. Finally, the application of biotechnology to food was viewed negatively, with some 30% feeling that it should be actively discouraged (Eurobarometer 58.0, March 2003).

A similar gradation was found in the survey of 11 surveys conducted on behalf of the agricultural biotechnology group of companies (ABE). This showed that 66% of the general public was in favour of biotechnology applications to develop new drugs, 47% for the development of new materials, 34% in favour of new crop varieties, and 16% in favour of the use of biotechnology to modify foods. "Opinion leaders" had a similar gradation in responses, but with about 10 percentage points higher on each issue.

Given this generally negative attitude to the use of GM crops, and particularly GM foods, the results of the UK opinion poll on attitudes to GM foods (MORI 2002) are of interest. They reported that 18% of respondents said they would never

Table 1. European attitudes to GM food.

Proposition	“Tend to Agree” %
Right to choose	95
Do not want	71
Negative impact on environment	59
Dangerous	56
Not dangerous	15
Dangers exaggerated by media	33
Dangers not exaggerated by media	55

Source: Eurobarometer 2001 (Bonny 2003).

eat GM food and 33% said they would prefer not to do so, giving a slight majority unlikely to buy GM food. However, a substantial 40% said they did not mind whether or not they ate GM food.

While European attitudes to biotechnology generally have become somewhat more favourable in the last few years, surveys consistently indicate that about 70% of people say they do not want GM food, 56% felt it was dangerous and 59% were concerned about the negative impact on the environment. Almost all (95%) felt the customer should have the right to choose between GM and non-GM foods (Table 1). The

concern about food safety seems to be declining, partly driven by the reality that widespread consumption of GM foods in the US and elsewhere has not appeared

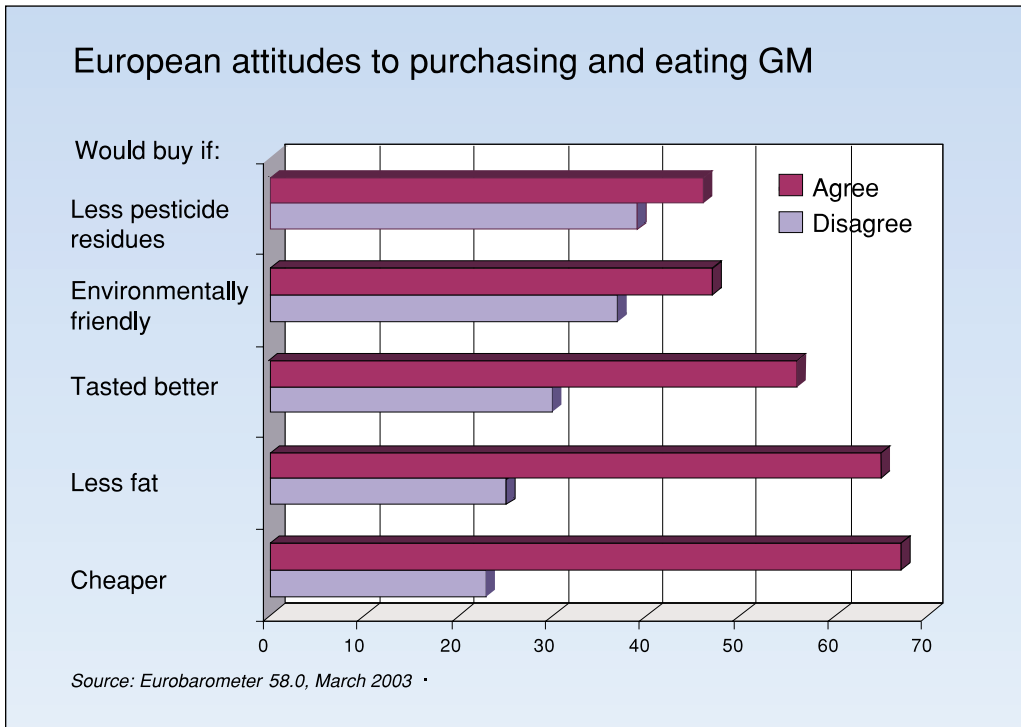


Figure 4. Factors affecting European willingness to purchase GM food.

to produce any negative effects on health, and partly as a result of the reassurance given by a variety of expert reports:

“In conclusion, although there is the potential for the adverse health effects discussed in this section, the committee is not aware of any evidence that foods on the market are unsafe to eat as a result of genetic modification.”
(National Research Council, 2000. *Genetically modified pest-protected plants: Science and regulation*. The National Academies Press).

“Les risques associés aux plantes transgéniques ... sont analysés. Cette analyse montre que toutes les critiques formulées contre les OGM peuvent être en grande partie écartées sur critères strictement scientifiques.”
(Académie des Sciences, 2002. *Les plantes génétiquement modifiées. Rapport sur la science et la technologie n. 13*).

“Claims that foodstuffs containing ingredients from generally modified plants are inherently less safe than their non-GM conventional counterparts remain unproven.”
(Royal Society, 2003. *Policy Statement*, May 8, 2003).

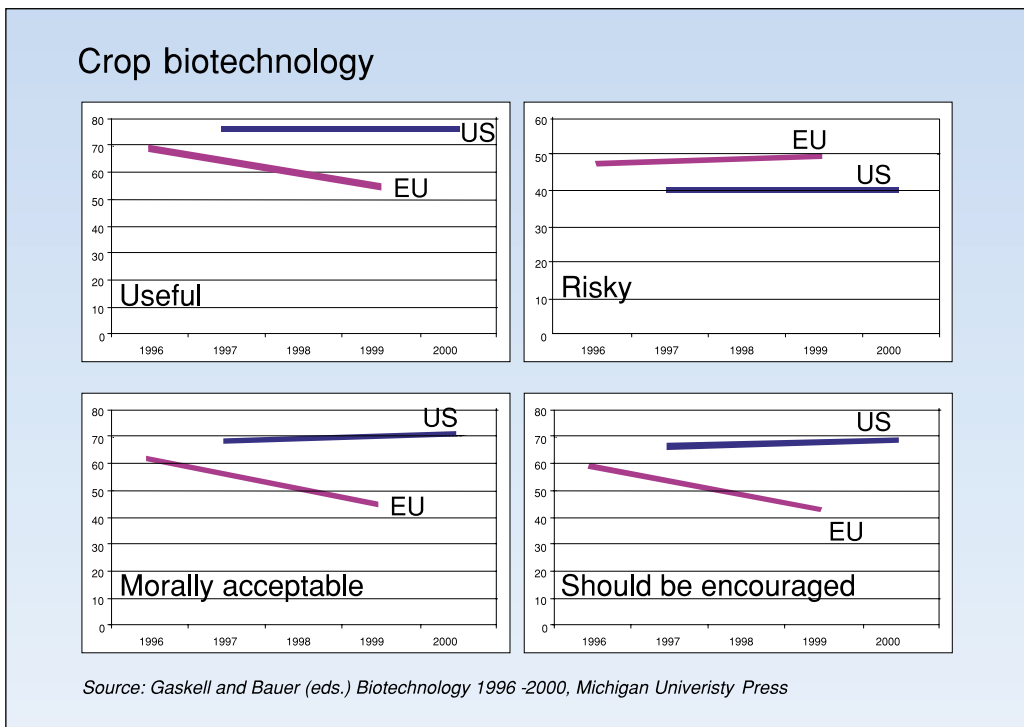


Figure 5. EU and US attitudes to GM crops.

Comparison of attitudes in EU and US

GM foods are now an accepted part of the American food supply. Once GM varieties of corn and soybean, the two major food ingredients, began to be widely grown, GM material inevitably found its way into most food products. In Europe, where labelling of foods containing GM ingredients is now required, the same process is underway. However, despite the different pace and extent of GM penetration into the food chain, there is a surprising degree of similarity in consumer responses to surveys on attitudes to purchasing and eating GM food.

In Europe, attitudes depended strongly on the purpose for which the GM technology was used. Among respondents, 22% said they would buy the GM food if it were cheaper, while 65% said they would not. The answers were similar if the objective was to reduce the fat in food. A slightly higher proportion would buy GM food if it tasted better (28%, with 54% saying they would not). However, if the objective was to reduce pesticide residues, or make food production more environmentally friendly, almost as many people were prepared to eat the product as those who were not (Figure 4).

In the US, attitudes to taste-modified GM food were surveyed in 1997, 2000 and 2002 (Bonny 2003). There was little variation over those years, with some 55%

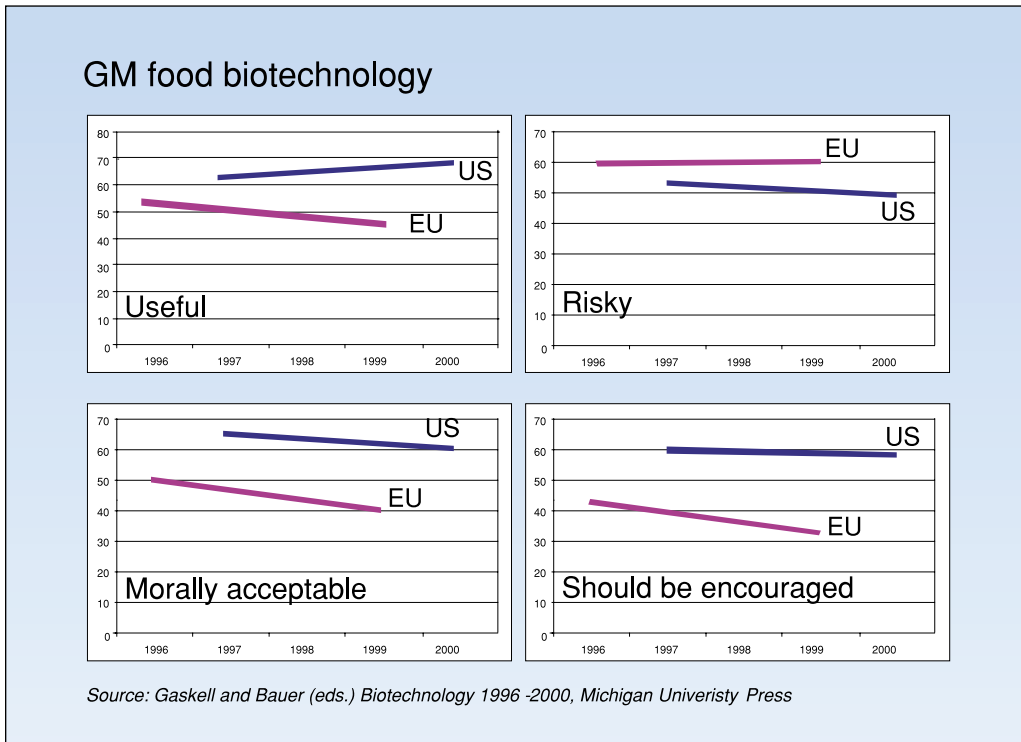


Figure 6. EU and US attitudes to GM food.

of people indicating they would be likely to buy taste-modified GM food, and 40% saying they would not.

Finally, an interesting comparison in public attitudes to plant biotechnology and GM food biotechnology contrasted attitudes in the US and the EU in the period 1996 to 2000 (Gaskell and Bauer 2001). As expected, attitudes in the US were consistently more favourable, though by modest margins. Thus, about 50% of EU respondents considered GM crops risky, 40% of US respondents felt likewise. The same ten percentage point difference applied to the question of whether GM crops were useful, morally acceptable or should be encouraged (Figure 5). Interestingly, over a four year period, while US attitudes remained the same, those in the EU became less favourable by about ten percentage points. The responses on attitudes to GM food were similar (Figure 6).

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