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# The GFP (Green) Bunny: Reflections on the Intersection of Art, Science and the First Amendment

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# The GFP (Green) Bunny: Reflections on the Intersection of Art, Science, and the First Amendment*

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*"All men by nature desire to know."*[1]

## I. INTRODUCTION

In other countries and at other times, art and artists have been considered to have great power. Plato, for example, wished to ban artists from his Republic except insofar as they were controlled by the philosopher kings.[2] Similarly, in the heyday of the former Soviet Union, art and artists were supposed to serve the state through the method of Socialist Realism.[3] In contrast, art has all too often been marginalized in the United States and has usually been relegated to museums where it has had little impact upon the general public unless it was particularly controversial because it dealt with sex[4] or was blasphemous.[5]

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1. ARISTOTLE, METAPHYSICS (Joe Sachs trans. 1999).

2. PLATO, REPUBLIC 80-85 [Stephanus *392c-98b] (Cornford trans. 1941). Because of their power and corrupting influence, Plato outlawed artists in his Republic unless they served the state. *Id.*

3. The Statute of the Union of Soviet Writers declared: "Socialist Realism is the fundamental method of Soviet Literature and criticism: it demands of the artists a true, historically concrete representation of reality in its revolutionary development. Further, it ought to contribute to the ideological transformation and education of the workers in the spirit of socialism." MONROE C. BEARDSLEY, AESTHETICS FROM CLASSICAL GREECE TO THE PRESENT 360 (1st ed. 1966).

4. The Mapplethorpe controversy some years ago in Cincinnati is a good example.

5. Rudolph Guliani, former Mayor of New York, threatened the Brooklyn Museum of Art when, as part

Science, on the other hand, has become powerful, influential, and privileged around the world because of its obvious successes in explaining and controlling the natural world. If there were a vote as to whether art or science has had the greater influence on everyday life in modern times, it is fair to say that science, even if frequently viewed with ambivalence,[6] would win hands down.

For these reasons, it is worth paying serious attention to the GFP Bunny, a transgenic artwork by Eduardo Kac.[7] Kac explains:

> My transgenic artwork "GFP Bunny" comprises the creation of a green fluorescent rabbit, the public debate generated by the project, and the social integration of the rabbit. GFP stands for green fluorescent protein. "GFP Bunny" was realized in 2000 and first presented publicly in Avignon, France. Transgenic art . . . is a new art form based on the use of genetic engineering to transfer natural or synthetic genes to an organism, to create unique living beings. This must be done with great care, with acknowledgment of the complex issues thus raised and, above all, with a commitment to respect, nurture, and love the life thus created . . . .[8]

The GFP Bunny is intriguing in part because it is reminiscent of Magritte's "The Treachery of Images," a painting of a pipe with the words "This is not a pipe." Magritte wants us to understand that the painting is only an image of a pipe and to contemplate the relationship between the reality of a pipe and its image. Similarly, the GFP Bunny looks like a normal bunny but, because it has the green fluorescent protein gene, it glows green when exposed to blue light.

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of its "Sensation" Exhibit, the museum displayed a painting entitled "Holy Virgin Mary" by a young artist named Ofili. The work depicted the Virgin Mary and female genitalia and also contained elephant dung.

6. ROGER SHATTUCK, FORBIDDEN KNOWLEDGE: FROM PROMETHEUS TO PORNOGRAPHY 218 (1996) (listing fear of monsters, fear of creating uncontrollable chain reaction, and fear of self-knowledge as reflecting such ambivalence) [hereinafter SHATTUCK].

7. Eduardo Kac is an Assistant Professor of Art and technology at the School of the Art Institute of Chicago. School of the Art Institute of Chicago, *available at* http://www.artic.edu/saic/programs/faculty/facbios.html#k. (last visited Mar. 12, 2002). His work, which has been widely exhibited around the world, deals with the philosophical and political dimensions of communications processes and includes electronic and photonic media such as holography, computers, video, robotics and the Internet, and biological systems such as animals, plants, bacteria and organic tissue.

8. EDUARDO KAC: TELEPRESENCE, BIOTELEMATICS, AND TRANSGENIC ART (Peter Tomaz Dobrila & Aleksandra eds. 2000), *available at* http://www.ekac.org/gfpbunny.html (last visited Mar. 12, 2002) [hereinafter EDUARDO KAC]. The GFP Bunny was created with the green fluorescent gene of a jellyfish so that it glows green when exposed to blue light. Kac explains his purposes as follows:

> This is where art can also be of great social value. Since the domain of art is symbolic even when intervening directly in a given context, art can contribute to reveal the cultural implications of the revolution underway and offer different ways of thinking about and with biotechnology. Transgenic art is a mode of genetic inscription that is at once inside and outside of the operational realm of molecular biology, negotiating the terrain between science and culture. Transgenic art can help science to recognize the role of relational and communicational issues in the development of organisms. It can help culture by unmasking the popular belief that DNA is the "master molecule" through an emphasis on the whole organism and the environment (the context). At last, transgenic art can contribute to the field of aesthetics by opening up the new symbolic and pragmatic dimension of art as the literal creation of and responsibility for life.

*Id.*

What, then, is a normal bunny? By what characteristics is one defined? What is the relationship between a real normal bunny and the real GFP Bunny? Has not the artist, as a god-like creator, made a new kind of bunny?[9]

While such questions are certainly worth thinking about, I propose to address the First Amendment implications of the GFP Bunny for artistic and, especially, scientific expression and experimentation. I will then consider the anti-Enlightenment argument that some knowledge is so dangerous that it should be forbidden to humankind.[10] This argument finds some support in Greek mythology, 19th century British literature and the Bible, particularly in Genesis. I conclude with some general observations about where we go from here with regard to the rapidly developing field of biotechnology.

## II. THE FIRST AMENDMENT: SOME FUNDAMENTALS

What are the First Amendment implications of the GFP Bunny and transgenic art? Whether the GFP Bunny is characterized as art or science, to what extent, if any, should its creation be protected by the First Amendment? What can government do constitutionally by way of regulating transgenic art and transgenic processes, including related biotechnological experimentation?

First Amendment theories abound, but I want to mention briefly two of the mainstream theories and relate them to artistic and scientific expression.[11] First, the self-government theory was most exhaustively articulated by Alexander Meiklejohn[12] and is reflected in *New York Times v. Sullivan*.[13] Under this theory, free speech and a free press are necessary for self-government. Citizens must be able to educate themselves about issues of concern and thereby intelligently participate in governing themselves. This theory obviously fits very nicely into an overall theory of the United States form of representative government. However, with its emphasis on political speech, it is inevitably hierarchical and thus does not do a very good job of explaining why artistic and scientific expression deserve full First Amendment

9. The Steven Spielberg/Stanley Kubrick movie, *A.I.* (Artificial Intelligence), released in 2001, raises the even more interesting question of the definition of a human being. The movie tells the story of an artificially created boy, really a computer, who has been programmed with the cognitive and emotive characteristics of a real boy.

10. *See generally* SHATTUCK, *supra* note 6. Not surprisingly, Kac's GFP Bunny created an international controversy about the ethical as well as the artistic propriety of the work. I address the topic of forbidden or esoteric knowledge *infra*.

11. Each of these theories is instrumental in nature. It is also possible to argue that free speech is an end in itself and an aspect of personal identity. As Justice Brandeis pointed out in his classic concurrence in *Whitney v. California*, 274 U.S. 357, 375 (1927) (Brandeis, J., joined by Holmes, J., concurring): "Those who won our independence believed that the final end of the State was to make men free to develop their faculties .... They valued liberty both as an end and as a means. They believed liberty to be the secret of happiness and courage to be the secret of liberty." *Id.*

12. *See generally* ALEXANDER MEIKLEJOHN, FREE SPEECH AND ITS RELATION TO SELF-GOVERNMENT (1948).

13. 376 U.S. 254 (1964).

protection.[14] In addition, under this theory, whatever First Amendment protection is conferred on artistic and scientific expression is derivative and that result is questionable.[15]

The second theory, the marketplace of ideas, is probably the dominant and most relied on theory in Supreme Court case law. It is based on the approach of John Stuart Mill's *On Liberty*[16] and received its initial First Amendment exposure in dissenting opinions by Justices Holmes and Brandeis.[17] Under this theory, there is no such thing as a false idea. Rather, sellers and buyers of ideas participate in the marketplace of ideas, which ranks and values those ideas. This Darwinian "survival of the fittest ideas" process brings us closer to truth, although the theory does not depend on the existence of absolute truths. Ideally, this theory should provide as much First Amendment protection to artistic and scientific expression as it does to political expression because it is not inherently hierarchical.[18]

Under both of these First Amendment theories, the conventional wisdom[19] is that government is not allowed to regulate on the basis of content, although there are exceptions to this, including the accepted role of government in regulating so-called "low value" speech.[20] Somewhat more consistently, government is prohibited by the First Amendment from regulating based on the

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14. Harry Kalven, Jr., *The Metaphysics of the Law of Obscenity*, 1960 SUP. CT. REV. 1, 16. "Not all communications are relevant to the political process. The people do not need novels or dramas or paintings or poems because they will be called upon to vote." *Id.*

15. For extensive criticism of the treatment of artistic expression as derivative under the First Amendment, see Sheldon Nahmod, *Artistic Expression and Aesthetic Theory: The Beautiful, The Sublime and The First Amendment*, 1987 WIS. L. REV. 221 (1987).

16. JOHN STUART MILL, ON LIBERTY (1st ed. 1859).

17. Abrams v. United States, 250 U.S. 616, 630 (1919) (Holmes, J., joined by Brandeis, J., dissenting). Justice Holmes stated:

> "But when men have realized that time has upset many fighting faiths, they may come to believe even more than they believe the very foundations of their own conduct that the ultimate good desired is better reached by free trade in ideas–that the best test of truth is the power of the thought to get itself accepted in the competition of the market, and that truth is the only ground upon which their wishes can safely be carried out."

*Id.*

18. Nevertheless, I have elsewhere criticized the marketplace of ideas rationale for marginalizing emotive and non-cognitive artistic expression. Nahmod, *supra* note 15, at 241-42.

19. I want to make clear that I will not deal with conditions that may be imposed on government funding of art and science but rather with attempts by government to regulate directly through the criminal law. *See* Nat'l Endowment for the Arts v. Finley, 524 U.S. 569 (1998) (considering whether denial of artist grants amounted to constitutional violation); Rosenberger v. Rector and Visitors of Univ. of Va., 515 U.S. 819 (1995) (addressing denials of student funding); Rust v. Sullivan, 500 U.S. 173 (1991) (attempting to regulate abortion counseling). *See generally* Redish and Kessler, *Government Subsidies and Free Expression*, 80 MINN. L. REV. 543 (1996); Post, *Subsidized Speech*, 106 YALE L.J. 151 (1996).

20. The government, for example, can regulate commercial speech, obscene speech, and indecent speech because of its content. *E.g.*, Fla. Bar v. Went For It, 515 U.S. 618 (1995) (regulating lawyer's commercial speech); F.C.C. v. Pacifica Found., 438 U.S. 726 (1978) (regulating indecent speech); Miller v. California, 413 U.S. 15 (1973) (regulating obscene speech).

viewpoint of speech.[21] Such regulation places the power of government behind particular ideas and viewpoints and, because it obviously skews the marketplace of ideas and interferes with citizen education for self-government, it is fundamentally inconsistent with these First Amendment theories. Further, while the First Amendment protects speech and press, it also protects expressive conduct in certain circumstances, especially when the symbolic or expressive nature of the conduct is the particular target of the government. Anti-flag burning statutes are a good example.[22]

Matters become more complicated, however, when there is a generally applicable and facially constitutional statute regulating conduct, and the question is whether that statute can constitutionally be *applied* to conduct that is intended to be expressive. Could a political assassin successfully claim that his act was protected by the First Amendment, and thus he could not constitutionally be convicted for murder? Obviously the answer is no. Everyone understands that government can legitimately prohibit the *act* of murder, irrespective of the murderer's intent to convey a message. But what about a person who burns a draft card in protest of an unpopular war? Can *that* person successfully argue that a federal statute that generally prohibits the destruction and mutilation of draft cards on administrative grounds cannot constitutionally be applied to him or her?

The answer in the latter situation–the famous *United States v. O'Brien* case[23]–also turns out to be no. The Court has developed a kind of balancing test for such cases that consider other ways the legislature might have dealt with the problem before it, the effect on expression, and the reasons for the governmental regulation in the first place.[24] In *O'Brien*, the Court determined that the government's concern with the administrative efficiency of the draft was important, that its prohibition of draft-card destruction and mutilation was closely related to this goal, and, perhaps most importantly, that the government's concern was unrelated to the suppression of expression. In this last connection, the Court also emphasized that Mr. O'Brien was not punished for the communicative aspect of his conduct. After *O'Brien*, then, a content/viewpoint-neutral regulation of conduct is not likely to be struck down

21. R.A.V. v. St. Paul, 505 U.S. 377, 381-382 (1992).

22. Texas v. Johnson, 491 U.S. 397 (1989) (addressing constitutionality of flag burning). However, as discussed later, where such a government purpose cannot be shown, then the usual result is that the challenged statute is constitutional as applied, even if it has an adverse impact on speech.

23. 391 U.S. 367 (1968).

24. *Id.* The *O'Brien* Court stated:

> [W]e think it clear that a government regulation is sufficiently justified if it is within the constitutional power of the Government; if it furthers an important or substantial governmental interest; if the governmental interest is unrelated to the suppression of free expression; and if the incidental restriction on alleged First Amendment freedoms is no greater than is essential to the furtherance of that interest.

*Id.* at 377.

even if there is an adverse impact on expression, a result that has serious implications for the GFP Bunny in particular and for transgenic art and scientific experimentation in general.

## III. ART, SCIENCE, AND THE FIRST AMENDMENT

### *A. Art*

Since artistic expression is presumptively entitled to some level of First Amendment protection, it is appropriate to ask whether the GFP Bunny is art.[25] Kant would likely say that it is not art because Kac intended to make a statement that is primarily political, social, and ethical, and not one that is disinterestedly aesthetic.[26] Still, Kant's unduly narrow definition should not prevent us from considering the GFP Bunny and its social context to be art in these considerably more artistically adventurous times. There are surely aesthetic aspects to the GFP Bunny: its colors, its shape and the fact that it is a living, breathing creature that interacts with others. Also, Kac intended the very processes that he used to create the GFP Bunny to be art. Furthermore, the GFP Bunny may be art because it is displayed or advertised as art.[27]

Since the GFP Bunny is an artistic creation that is aesthetically, as well as politically and socially, expressive, the First Amendment protects Kac's right to display, talk, and write about it along with our right to see, discuss, and contemplate it, regardless of how unsettling or dangerous Kac's ideas are. This result follows from a straightforward application of the fundamental First Amendment principles described earlier. The First Amendment, however, does not necessarily protect every part of the artistic process of creating the GFP Bunny, particularly the actual procedures used to transfer genetic material.[28] To understand why, consider a statute that prohibits all painting or

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25. Kac himself believes that this is an improper question because it objectifies the GFP Bunny and deflects attention from the communicative and social aspects of his project.

26. IMMANUEL KANT, CRITIQUE OF JUDGMENT 37-81 (J.H. Bernard trans., Hafner Press-Macmillan 1951). See the discussion of Kant's aesthetic theory in Nahmod, *supra* note 15, at 229-31 and 233-35.

27. *Cf.* Marcel DuChamp's Fountain (Urinal).

28. EDUARDO KAC, *supra* note 8. Kac explains:

> In developing the "GFP Bunny" project I have paid close attention and given careful consideration to any potential harm that might be caused. I decided to proceed with the project because it became clear that it was safe. There were no surprises throughout the process: the genetic sequence responsible for the production of the green fluorescent protein was integrated into the genome through zygote microinjection. The pregnancy was carried to term successfully. "GFP Bunny" does not propose any new form of genetic experimentation, which is the same as saying: the technologies of microinjection and green fluorescent protein are established well-known tools in the field of molecular biology. Green fluorescent protein has already been successfully expressed in many host organisms, including mammals. There are no mutagenic effects resulting from transgene integration into the host genome. Put another way: green fluorescent protein is harmless to the rabbit. It is also important to point out that the "GFP Bunny" project breaks no social rule: humans have determined the evolution of rabbits for at least 1400 years.

sculpting. Painting and sculpting are certainly conduct and not pure speech, and therefore one might think that government can regulate such conduct without regard to the First Amendment. But that conclusion is unsound because the conduct in question is strictly expressive in nature. If government prohibits painting and sculpting primarily to prevent the resulting expression, namely a painting or sculpture, then government acts in a manner directly contrary to the First Amendment. Such a statute is facially unconstitutional.

Now suppose the government maintains that it has empirical support for the proposition that painting and sculpting are physically unhealthy and must therefore be restricted to promote public health. In such a case, because the statute is allegedly not directed at the resulting expression (suspend disbelief and assume that we believe the government) but rather at the harms associated with the conduct itself, the statute is not facially unconstitutional on that basis. Still, this statute is probably facially unconstitutional on a different ground: It is substantially overbroad because it covers a great deal of protected expressive conduct that is not physically harmful. Moreover, even if the facial overbreadth question is finessed and the *O'Brien* test is satisfied, it is likely that this statute is not constitutional as applied to most cases of painting and sculpting because the restriction of First Amendment rights is much greater than necessary to further the government's interest in public health.

Next consider a statute prohibiting all *artistic* use of transgenic processes. This statute is directed at the dangers that transgenic processes entail—the possible abuse of such processes by government[29] and by the private sector, and the potential harm caused if such processes go awry and, for example, create half-human, half-animal "monsters" or chimeras. The statute, however, is unconstitutionally underinclusive (and violative of both equal protection and the First Amendment for this reason) because it is limited to the artistic use of such processes and does not cover other uses, scientific and otherwise, of such processes. In a very real sense, this statute singles out artistic expression for disadvantageous treatment even though other uses of transgenic processes are permitted.

Suppose, on the other hand, a *generally applicable* statute that prohibits transgenic processes because of the dangers created by those processes. This statute is facially constitutional. Further, despite the ordinarily privileged First Amendment position of artistic expression as high value speech, the statute is constitutional as applied to artists like Kac under the *O'Brien* test because the prohibition is unrelated to the suppression of expression.[30]

If I am correct about this, there is no artistic First Amendment immunity

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*Id.*

29. Recall the Nazi eugenics movement to breed a master race.

30. In contrast, if the criminal prohibition were directed at transgenic processes used by artists only, then it would be struck down as content-based and perhaps viewpoint-based discrimination in the absence of a compelling government interest.

from generally applicable, content- and viewpoint-neutral criminal laws regulating conduct, so long as artistically expressive conduct is not singled out for criminal sanction. Government can regulate and even prohibit transgenic processes altogether, which means that the artistic use of transgenic processes is subject to political control.

### *B. Science*

Suppose now that the transgenic processes that brought the GFP Bunny about are characterized as scientific expression and/or experimentation. Just as was the case for discussions of art by artists and by society at large, the First Amendment presumptively protects discussion of the GFP Bunny by scientists and by society at large.[31] Indeed, the marketplace of ideas theory of the First Amendment may well be modeled on notions of scientific progress and development through such discussions.[32] What, though, of scientific experimentation that typically constitutes conduct? What is, or should be, its status under the First Amendment in light of the fact that scientific experiments are necessary for the testing of hypotheses and the formulation of theories?[33]

Some have suggested that scientific experimentation itself, even apart from scientific discussion, deserves strong First Amendment protection.[34] One such argument is that just as news-gathering is entitled to First Amendment protection because it is inextricably intertwined with the dissemination of news, scientific experimentation should also be entitled to such First Amendment protection because meaningful scientific discussion is typically difficult if not impossible without scientific experimentation of some kind.[35] A second such argument is that scientific experimentation essentially constitutes expressive conduct.[36]

Neither argument, however, is ultimately convincing. The news-gathering rationale is not persuasive because, despite a suggestion to that effect in *Branzburg v. Hayes*,[37] news-gathering has never been given independent First

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31. Such discussion, in fact, is one of Kac's artistic goals. I later discuss, from the perspective of Greek mythology, 19th century British literature and the Bible, the question of whether certain kinds of scientific knowledge should either be forbidden or esoteric, that is, limited to a select few.

32. Comment, *Considerations in the Regulation of Biological Research*, 126 U. PA. L. REV. 1420, 1428 (1978) [hereinafter *Regulation of Biological Research*] (quoting Thomas Emerson to effect that truth-seeking function of First Amendment rooted scientific method).

33. JAMES FEIBLEMAN, SCIENTIFIC METHOD 113-115 (1972).

34. Davidson, *First Amendment Protection for Biomedical Research*, 19 ARIZ. L. REV. 893, 894-895 (1977); *Regulation of Biological Research*, *supra* note 32, at 1428.

35. Davidson, *supra* note 34, at 905.

36. *Regulation of Biological Research*, *supra* note 32, at 1428.

37. 408 U.S. 665 (1972). The *Branzburg* Court said: "Nor is it suggested that news gathering does not qualify for First Amendment protection; without some protection for seeking out the news, freedom of the press could be eviscerated." *Id.* at 681. Nevertheless, in *Branzburg* itself, the Court held that reporters could be required to answer grand jury questions about their sources like other citizens. *Id.* It reasoned that requiring reporters to respond to grand jury subpoenas did not involve restrictions on what the press could publish. *Id.*

Amendment protection when the government has acted in a content/viewpoint-neutral manner and has not singled out news-gathering for disadvantageous treatment. The expressive conduct rationale is not persuasive either because, like the pure speech rationale, it indicates only that a content/viewpoint-based regulation of scientific experimentation is unconstitutional. But when government regulates scientific experimentation (admittedly conduct, albeit expressive, under this approach) in a content/viewpoint-neutral manner, that regulation is constitutional under *O'Brien*. This result holds, I think, despite the contention that scientific experimentation promotes the First Amendment values, as set out by Thomas Emerson, of self-fulfillment, attaining truth, promoting society's decision-making, and providing a balance between change and stability.[38]

Consequently, the First Amendment does not prevent government from regulating or prohibiting certain scientific experimentation altogether, insofar as those experiments constitute conduct that government legitimately fears is inherently dangerous or might lead to abuse or other harmful consequences, such as ecological disaster. Thus, the use of scientific transgenic processes could be prohibited across the board without violating the First Amendment. Just as there is no artistic First Amendment immunity from generally applicable criminal laws regulating conduct, there is no scientific First Amendment immunity either.

## IV. FORBIDDEN KNOWLEDGE

Here, then, is a possible irony. If Kac's GFP Bunny successfully calls attention of the public to the dangers of transgenic processes in particular and of biotechnology in general, the political result could be stringent government regulation that prohibits not only scientific experimentation in genetic engineering but transgenic artistic expression as well. Kac did not intend this when he created the GFP Bunny.[39]

My First Amendment conclusions, however, only beg the deeper question: *Should* the government stringently regulate the artistic and scientific use of transgenic processes? To put the same question somewhat differently and more broadly: Is there some knowledge that should be forbidden because it is

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In addition, there was no real showing of chilling effect on the media or on the willingness of informers to provide information. *Id.*

38. Davidson, *supra* note 34, at 901.

39. Kac argues that an absolute prohibition of the use of transgenic processes would be unwise because the "success of human genetic therapy suggests the benefits of altering the human genome to heal or to improve the living conditions of fellow humans." EDUARDO KAC, *supra* note 8. While acknowledging that the "specter of eugenics and biological warfare, and with it the fear of banalization and abuse of genetic engineering . . . [and] the possible loss of privacy" are legitimate concerns, he still concludes that "a complete ban on all forms of genetic research would prevent the development of much needed cures for the many devastating diseases that now ravage human and nonhumankind." *Id.* These fears must be dealt with by society in a productive manner, and this is why, in his view, transgenic art can have great social value. *Id.*

dangerous either per se or because of its potential use? Or, should certain kinds of knowledge be limited to a select few and thus rendered esoteric, like Kabbalah?[40] These questions have not only a First Amendment connection but also mythic, literary, and religious dimensions that I will briefly comment upon.

In the First Amendment world, the answer to the forbidden and esoteric knowledge questions is ordinarily no,[41] particularly where the speech is "high value." This answer reflects an Enlightenment view of the importance of virtually all knowledge, including, of course, scientific knowledge. This frequently holds true even where government attempts to prevent the release of information which may harm national security if obtained by enemies of the United States. In such cases, the doctrine of prior restraint typically plays a major protective role.[42] In passing, though, I should note the forceful argument that the prior restraint standard, if uniformly applied post-publication in criminal cases, may underprotect the government's interest in preserving the secrecy of information consisting of scientific data such as equations, charts and blueprints which do not have a significant bearing on public deliberation.[43]

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40. In Jewish tradition,

> "Kabbalah" is the traditional and most commonly used term for the esoteric teachings of Judaism and for Jewish mysticism, especially the forms which it assumed in the Middle Ages from the 12th century onward. In its wider sense, it signifies all the successive movements in Judaism that evolved from the end of the period of the Second Temple and became active factors in Jewish history.

GERSHOM SCHOLEM, KABBALAH 3 (1974). *see* LEO STRAUSS, PERSECUTION AND THE ART OF WRITING (1988) (dealing with esoteric knowledge in religious and philosophical writings).

41. This negative answer is not universally true. Obscene speech, for example, is considered to be per se dangerous, with the result that it is defined out of the First Amendment world altogether and consigned to a kind of hell. Less drastically, even though most political speech is protected by the First Amendment, certain inflammatory political speech that is both intended to incite imminent lawless conduct and likely to do so is not protected by the First Amendment. Brandenburg v. Ohio, 395 U.S. 444, 448 (1969). The same is true for political or other speech that provokes a hostile audience reaction, that is, fighting words. Chaplinsky v. New Hampshire, 315 U.S. 568, 572 (1942). The *Chaplinsky* Court explained: "[F]ighting" words–those which by their very utterance inflict injury or tend to incite an immediate breach of the peace. [S]uch utterances are no essential part of the exposition of ideas, and are of . . . slight social value as a step to truth." *Id.*

42. N.Y. Times v. United States, 403 U.S. 713, 714 (1971). This case stated that a system of prior restraints bears a heavy presumption of unconstitutionality and held that the United States did not carry its "heavy burden" of showing justification for enjoining the publication of the Pentagon Papers. *Id.*

43. Obvious examples include technical data about bomb manufacture, chemical warfare, and encryption. Under this view, then, there are some situations in which technical data are not entitled to the highest First Amendment protection. Symposium, *Government Control of Information*, 74 CAL. L. REV. 889 (1986). Although extensive discussion of this issue is beyond the scope of this Article, the argument is relevant as well to government attempts to punish publication of technical data about transgenic art and biotechnology.

Compare *Bartnicki v. Vopper*, 532 U.S. 514 (2001), where the Court held that the First Amendment protected the media disclosure of the contents of an illegally intercepted cellular telephone conversation about a public issue, where those disclosing did not participate in the interception but either knew, or had reason to know, that the interception was illegal. The Court balanced the interest in the free dissemination of information concerning public issues and the interest in privacy and in fostering private speech. On the current debate over encryption and the question of whether source codes are speech see, for example, *Bernstein v. United States Dept. of Justice*, 176 F.3d 1132 (9th Cir. 1999), which concluded that encryption software in source code form, and as employed by those in cryptography, is expressive for First Amendment purposes and entitled to the

In marked contrast, the well-known Greek myths of Prometheus and of Pandora's box speak of the dangers of knowledge and of excessive human curiosity. In Hesiod's version, Zeus hinders mankind by hiding fire because of his anger over a sacrificed ox. The demigod Prometheus, however, steals it and gives it back to mankind. As punishment, Zeus binds Prometheus to a rock where a vulture repeatedly eats out his liver. Thereafter, in order to punish mankind as well, Zeus sends Pandora, the first woman, who eventually removes the lid of the jar containing the "gifts" the gods sent with her. As a result of her curiosity, mankind is punished with troubles and evil.[44]

More recently, British literature also warns of the perils of certain kinds of scientific knowledge. Mary Shelley's *Frankenstein, or The Modern Prometheus*,[45] published in 1818, tells of the terrible consequences of the scientific, and therefore artificial, creation of a monster. In addition, Robert Louis Stevenson's *The Strange Case of Dr. Jekyll and Mr. Hyde*,[46] published in 1886, in which Dr. Jekyll releases an unknown part of his character, demonstrates the dangers of too much self-knowledge.

It is not only Greek myth and British literature that caution that the pursuit of knowledge should not be unconstrained and that some knowledge should be forbidden or esoteric. In my view, there is a religious dimension as well. Underlying at least some of the nervousness and controversy involving transgenic art and biotechnology is the fear of playing God (the quintessential creator in Western religion) by creating living beings artificially. From a Western religious perspective, the artificial creation of life may transgress the line between God, who possesses the sacred knowledge of creation, and humanity, which should not. This transgression, furthermore, may be tampering with forces that, once unleashed, could bring catastrophe to humanity.

Indeed, two of the stories in *Genesis* explicitly warn of the dangers of forbidden knowledge. The first warning appears in the Biblical narrative of Adam, Eve, and the serpent.[47] God warns Adam and Eve not to eat from the Tree of Knowledge of Good and Evil, even though they were created in God's image. Because they disobey, they lose their innocence, develop the faculties of reason and shame,[48] and are punished by expulsion from Eden, painful childbearing (for Eve), the necessity to work and, particularly, mortality.

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protection of prior restraint doctrine.

44. SHATTUCK, *supra* note 6, at 14-15. The author summarizes the Hesiod version of these myths and shows their connection. *Id.*

45. MARY SHELLEY, FRANKENSTEIN, OR THE MODERN PROMETHEUS (Bantam 1981) (1818).

46. ROBERT LOUIS STEVENSON, THE STRANGE CASE OF DR. JEKYLL AND MR. HYDE (Dover Publications 1991) (1886).

47. The narrative is contained in *Genesis* 1-3.

48. In *Genesis* 3:22, God explains that as a result of eating from the Tree of Knowledge of Good and Evil, Adam and Eve had become "as one of us" and now knew the difference between good and evil.

The second warning is in the Tower of Babel narrative.[49] Here, the citizens of Babylon, aided by living in one community and sharing one language, discover the technology of bricks and mortar and use it to build a tower to heaven in order to make themselves famous. When God sees this, he is concerned that if they are successful, they will be able in the future to accomplish anything that they can imagine, with tragic consequences for both mankind and God's law. So God disperses them and renders them unable to understand each other's language.

## V. CONCLUSION

What, then, do these reflections on Kac's GFP Bunny teach us about transgenic art and biotechnology? On the one hand, the First Amendment permits governmental regulation of biotechnological experimentation in areas such as transgenic research, stem cell research and, cloning. On the other hand, various narratives of Greek myth, British literature, and the Bible warn of the perils of certain kinds of knowledge. To the extent that these narratives arise out of human experience and are not based solely on fear of the unknown, they suggest that the First Amendment Enlightenment model of unlimited knowledge does not provide unqualified benefits to society. There are often significant costs and risks associated with the scientific development of knowledge.

This places the responsibility squarely on democratic processes, namely, on us and our political representatives, to make some very difficult regulatory decisions. We should not leave these matters solely to the private sector, which is motivated primarily by profit, or exclusively to scientists, in light of their self-interest. Yet, at the same time, we must also be concerned about government's possible misuse of important scientific knowledge. There is no easy solution, only continued vigilance in the face of rapid biotechnological development.

49. *Genesis* 11:1-9.