HUMAN CLONING RESEARCH IN JAPAN: A STUDY IN SCIENCE, CULTURE, MORALITY, AND PATENT LAW

But only God can make a tree.[1]

I. INTRODUCTION

Movies and science fiction novels for years have depicted ancient and exotic animals resurrected from extinction by mad scientists and out-of-this-world phenomena. While in actuality we have yet to see any such resurrections, the theoretical results once thought to be science fiction fantasy have come a step closer to reality as powerful technology has been developed which allows the production of genetically identical copies of living, breathing animals through the process of cloning. Cloning technology carries moral, cultural, scientific and legal implications. Today, researchers and scientists work diligently to develop groundbreaking technology that must be protected through worldwide patenting of the fruits of their labor. Recent advances in cloning and other scientific technology have reached the point that there is "virtually no life form which does not have the potential as the subject of a patent application,"[2] including human beings. Japan has been at the forefront of the development of cloning technology. In the summer of 1998, Japanese researchers announced that they had successfully cloned a cow. This success, combined with other recent cloning developments throughout the world, immediately raised the question of whether cloning could have human applications, and ultimately whether human cloning was possible. Thus begins a debate that transcends the realms of morality, culture, ethics, and the law.

Parts II and III of this note address scientific research in Japan in general, and the science of cloning specifically. Part IV provides an overview of the patent law system of Japan, and Part V discusses religious and cultural influences on Japanese morality. The note then turns specifically to human cloning, beginning with Part VI which presents arguments both for and against human cloning. Part VII describes why human cloning is contrary to morality in Japan and asserts that there is no need for governmental regulation of human cloning research in Japan because Japan's patent law system provides both adequate regulation of the technology and the flexibility to allow potentially useful technology to emerge and to allow societal views to change.

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1. 1 Joyce Kilmer, *Trees*, *in* 1 POEMS, ESSAYS & LETTERS 180 (Robert Cortes Holliday ed., 1918).

2. Sally I. Hirst, *Biopatents: A Sense of Order*, TRENDS IN BIOTECHNOLOGY, Aug. 1992, at 63.

II. SCIENTIFIC RESEARCH IN JAPAN

Since World War II, Japan has become a global leader in technological advancements and is typically regarded as a leader in technological innovation and utilization throughout the world.[3] The science and technology industry of Japan has seen fierce competition for many years, especially in the area of research and development.[4] Since 1981, when the Japanese Ministry of International Trade and Industry (MITI) officially designated biotechnology[5] as "a key to future industrial technology,"[6] the Japanese government has played "a central role in the development, growth, and regulation of . . . [scientific] industry."[7] While a great deal of money has been spent on scientific research, Japan's Science and Technology Agency suggests that improvement is needed in life science research.[8] This need for improvement and the overall importance of life science research has prompted action by the Japanese government.

The Prime Minister of Japan recently issued recommendations for research and development of the life sciences, which are consistent with the

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3. *See* Gerald J. Mossinghoff & Vivian S. Kuo, *World Patent System Circa 20XX, A.D.*, 80 J. PAT. & TRADEMARK OFF. SOC'Y 523, 550 (1998).

4. In 1991 alone, Japanese industry spent $97 billion on scientific research. *See* Andrew H. Thorson & John A. Fortkort, *Japan's Patent System: An Analysis of Patent Protection Under Japan's First-to-File System*, 77 J. PAT. & TRADEMARK OFF. SOC'Y 211, 221 (1995).

5. "Biotechnology" can be defined as "the scientific manipulation of organisms, particularly at the molecular genetic level, to produce useful products." THOMAS F. LEE, GENE FUTURE: THE PROMISE AND PERILS OF THE NEW BIOLOGY 17 (1993). Biotechnology, therefore, in a sense, has been around for centuries, through the use of yeasts to ferment wine and the cross-breeding of crops. *See id.* Biotechnology in the form of manipulation of life was even around in the year 100 A.D., when the Chinese used powdered chrysanthemum as an insecticide. *See Historical Events in Biotechnology* (visited Sept. 21, 1998) <http://www.ncbiotech.org/timeline.htm>.

6. Akim F. Czmus, *Biotechnology Protection in Japan, the European Community, and the United States*, 8 TEMP. INT'L & COMP. L.J. 435, 437 (1994).

7. *Id.*

8. *See generally Survey on the Present and Future of the Life Sciences* (visited Sept. 3, 1998) <http://www.sta.go.jp/life/life/e9801_5.html>. Life science research focuses on living organisms and their diversity, and employs various analytical methods in order to study the functions and structures of the basic elements of life such as DNA and proteins. *See* discussion *infra* notes 23, 122. Life science research covers everything from understanding life at the molecular level at one end of the spectrum, to studying development, illness, ecosystems, and other complex life phenomena of entire organisms at the other. *See* The Prime Minister of Japan, *Basic Plan for Research and Development on Life Science* (tentative trans., Aug. 13, 1997) (visited Sept. 3, 1998) <http://www.sta.go.jp/life/lifeplan.htm> [hereinafter Prime Minister's Report]. This research has a large number of goals in Japan, which include creating technological systems to conquer disease and understanding the interaction and meaning of life. *See id.*

government's position on the importance of biotechnology. The recommendations stress the need for research and development in the life sciences because the life sciences have "far greater potential to make a direct contribution to the improvement of the well being of people . . . than other fields of science and technology."[9] The Prime Minister also stated goals to be achieved through life science research, including caring for the people of Japan by creating "a society in which people can lead lives safe and healthy, by overcoming diseases . . . [a]nd creat[ing] a society in which people can age free from fear . . . [of] disease and isolation resulting from some age-related illnesses."[10] The Prime Minister's Plan goes on to emphasize that "[e]xpectations for basic research are very high; it is not only a basis for innovative development in science and technology, but such development in itself is valuable as intellectual property for all humans to share. Japan, especially, is highly expected to boldly challenge unknown fields in science and technology."[11]

Other factors reveal the need for improvement in life science research as well. For example, researchers in the United States, Germany, and France produce more research papers than researchers in Japan.[12] Also, less than one-third of scientific researchers in Japan are currently conducting life science research,[13] in spite of the importance of life science research in the view of the Japanese government.[14] Critics have argued that the initial cause of these shortfalls is a deficiency in college-level and graduate-level education.[15] In response, the Japanese government has attempted to

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9. Prime Minister's Report, *supra* note 8, ch. 1(1).

10. *Id.* Other goals stated by the Prime Minister for life science research included the preservation of the environment and the development of pharmaceutical and food industries through a better understanding of biology. *See id.*

11. William A. Blanpied, *Japan's Science and Technology Policy: Retooling for the Future*, NAT'L SCI. FOUND. (Mar. 1998) (last modified May 14, 1998) <http://www.nmjc.org/jiap/specrpts/reports/spl_1998.html> (quoting *Introduction* to the Science and Technology Basic Plan (1996)).

12. *See Survey on the Present and Future of the Life Sciences*, *supra* note 8. For example, the number of papers per researcher in the United States is 14.6 times higher than that of Japan, and the number of papers per unit of research expenditure is 5.4 times higher. *See id.*

13. *See id.*

14. *See supra* notes 8-9 and accompanying text.

15. For example, very high emphasis is placed on university entrance examinations through rigid preparation in elementary and secondary education in Japanese schools. Upon passing a university entrance examination, students are often assigned to a specific faculty or branch of the university, which eliminates the chance to "shop around while at the university for a field of specialization," which has already been determined. EDWIN O. REISCHAUER & MARIUS B. JANSEN, THE JAPANESE TODAY: CHANGE AND CONTINUITY 195 (enlarged ed. 1995). Also, graduate schools are often viewed as unimportant to the Japanese, in part due to the fact that the role of the university in research activities is diminishing compared to that of research in the private sector. *See id.*

restructure the research and development system of the country to place more emphasis on the life sciences and to bring life science research in line "with the Japanese economy and with Japanese society more broadly."[16]

In spite of some current shortfalls of life science research in Japan, the Japanese people are certainly aware of such research and seem very interested. In general, the Japanese have "a very high level of interest in science."[17] The Japanese Prime Minister's Office has promoted this interest even further, by calling for the "promotion of public understanding of science and the 'establishment of a national consensus on science and technology.'"[18] This high level of interest in science, however, is not accompanied by a high level of interest in the ethical side of scientific research however. Ethics in the life sciences, also known as bioethics, is a relatively new concept in Japan, and the concept has developed in a way unique to the rest of the world because of Japan's "unique cultural values and traditions."[19] "Public discussion of bioethics has only begun in the last few years."[20] Recent studies have also indicated that teachers in Japan feel

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16. Blanpied, *supra* note 11. Efforts to accomplish this task include measures to increase industry-university cooperation in research, the creation of more post-doctoral research positions, "systematic improvement in . . . [research and development] facilities at both national and private universities," and the promotion of public understanding of the life sciences. *Id.*

17. *See* Darryl R. J. Macer, *Japan: the Land of "Bio"*, ALTE ANGSTE NEUE WELT; GENTECHNOLOGIE, IM VISIER NIPPONS 46-47 (English original, Zeitthema (Aus.) 2d ed. 1993) (visited Sept. 21, 1998) <http://re-xs.ucsm.ac.uk/eubios/papers/austria.htm>. For example, surveys in Japan have revealed that 96% of the people surveyed had heard of the word "biotechnology." *See id.*

18. Blanpied, *supra* note 11 (quoting Science and Technology Basic Plan). In reality, however, the current state of affairs in Japan is that "[p]ublic opinion is seldom influential in determining public policy and there are no effective means used by the public to change policy." Darryl R. J. Macer, *Bioethics May Transform Public Policy in Japan*, 13 POL. & LIFE SCI. 89-90 (1994) (visited Sept. 21, 1998) <http://re-xs.ucsm.ac.uk/eubios/papers/plsppj.htm>. Therefore, while the public may have a high level of awareness of scientific research in general, it is unlikely that public opinions would change any policies regarding scientific research. "In Japan . . . [a] truly open national forum has yet to exist for any major policy, and the establishment of such a multi-disciplinary forum would probably represent in itself a transformation of society structure." *Id.*

19. *See Words in the News*, DAILY YOMIURI/YOMIURI SHIMBUN, Feb. 20, 1997, *available in* 1997 WL 9499757. For further information on bioethics, see TOM L. BEAUCHAMP & LEROY WALTERS, CONTEMPORARY ISSUES IN BIOETHICS (3d ed. 1989); ARTHUR CAPLAN, MORAL MATTERS: ETHICAL ISSUES IN MEDICINE AND THE LIFE SCIENCES (1995); REM B. EDWARDS & GLENN C. GRABER, BIO-ETHICS (1988).

20. Macer, *supra* note 18. While there has been past concern with issues such as environmental pollution and suspicion of the medical profession, public debate on life science issues has only recently begun. *See id.* Macer argues that this is due in part to the fact that the government of Japan is an Asian-style democracy where "[p]ublic opinion is seldom influential in determining public policy and there are no effective means used by the public to change policy." *Id.* Macer goes on to argue that the movement toward bioethics and

the need to teach bioethics in schools because of a disrespect for life that they see displayed by Japanese children.[21] Education is vital in terms of public awareness and responsibility, and is especially important in science and technology because education leads to understanding.

III. THE SCIENCE OF CLONING

Cloning is the process by which a cell, or a group of cells, are used to create an entirely new organism that is "genetically identical to the ancestral cell or organism from which it is derived."[22] Cloning has proven very useful at the molecular level for some time.[23] "Researchers have been cloning animal, plant and other organism cells and genes for over twenty years."[24] Since then, cloning research has led to tremendous breakthroughs in the development of medicines and the treatment of disease.[25]

While cellular cloning techniques have been used for over twenty

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bioethical reasoning may itself have a dramatic affect on Japanese culture. *See id.*

21. *See* Yukiko Asada et al., *High School Teaching of Bioethics in New Zealand, Australia and Japan,* J. MORAL EDUC., Dec. 1, 1996, at 92.

22. LEE M. SILVER, REMAKING EDEN: CLONING AND BEYOND IN A BRAVE NEW WORLD 94 (1997). While the term "cloning" definitely carries this connotation, geneticists also use the term to describe the production of identical copies of genes, which in laymen's terms are structures that carry all the information that is needed to direct every process in an organism. *See* discussion *infra* note 23. *See also* DAVID SUZUKI & PETER KNUDTSON, GENETHICS: THE ETHICS OF ENGINEERING LIFE 98 (rev. ed. 1990). The term "cloning" can also refer to molecular cloning (duplicating strings of DNA containing genes) and embryo twinning (splitting an embryo into two identical halves to produce twins). *See Introduction* to FLESH OF MY FLESH: THE ETHICS OF CLONING HUMANS IX (Gregory E. Pence ed., 1998) [hereinafter FLESH OF MY FLESH].

23. Cloning is a key process in the isolation of human genes for research. Genes are made up of Deoxyribonucleic Acid (DNA). Because the mechanism is beyond the scope of this paper, it suffices to say that DNA encodes all the hereditary information required to create and orchestrate every cell in the human body. If it were possible to unwind all the DNA in the human body, the DNA could "stretch to the moon and back roughly one million times." SUZUKI & KNUDTSON, *supra* note 22, at 31. For an in depth discussion of cloning at the molecular (not organism) level, see generally LEE, *supra* note 5. For a complete discussion of the workings of genes and DNA, see DAVID FREIFELDER, ESSENTIALS OF MOLECULAR BIOLOGY (George M. Malacinski ed., 2d ed. 1993); SUZUKI & KNUDTSON, *supra* note 22. For the structure and chemistry of DNA, see THEODORE L. BROWN ET AL., CHEMISTRY: THE CENTRAL SCIENCE 990-93 (5th ed. 1991).

24. William S. Feiler, *'Birth' of Dolly Raises Patent Issues on Clones*, N.Y.L.J., Mar. 9, 1998 (visited Aug. 27, 1998) <http://www.ljextra.com/patents/0309dolly.html>.

25. Such breakthroughs have included treatments for heart attack, hemophilia, anemia, cancer, hepatitis, and other diseases. It has also been suggested that cloning could be useful as a research tool in developing new therapies to treat human disease, such as growing human cells and tissues for grafts and transplantations that would not be rejected by their recipient which often occurs today. *See* ROBERT GILMORE MCKINNELL, CLONING: A BIOLOGIST REPORTS 67-71 (1979).

years, the prospect of cloning at the organism level began to gain notoriety in 1993, when a group of researchers in the United States[26] successfully took seventeen human embryos and cloned them, multiplying them into forty-eight embryos.[27] The experiment laid the groundwork for the fierce debate on human cloning which was to come, even though the research did not produce an entire organism.[28] The fire surrounding human cloning did not ignite until 1997, however, when cloning at the organism level came to the forefront of scientific research as a team of scientists in Scotland[29] announced that they had cloned a mammal and produced a viable sheep which came to be known as "Dolly."[30] Since then, the cloning of entire animals has become more and more feasible.

In the summer of 1998, scientists in New Zealand announced that they had successfully cloned the last "surviving member of a rare breed of cow."[31] Later that same summer, researchers at the University of Hawaii announced that they had cloned more than fifty female mice.[32] Researchers used a slightly different technique to clone the mice than was used to clone the sheep in Scotland, and they have indicated that "since all mammals develop in a roughly similar fashion, the new technique could be used to

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26. The research was led by Dr. Robert Stillman, George Washington University.

27. *See* Philip Elmer-DeWitt, *Cloning: Where Do We Draw The Line?*, TIME, Nov. 8, 1993, *available in* 1993 WL 2929305.

28. This research effort cloned an embryo's cells that were immature and undifferentiated. *See id.* As will be discussed, the complex cloning techniques later developed produced viable organisms from adult cells that had already undergone differentiation. *See infra* note 33.

29. The team of scientists was led by Dr. Ian Wilmut. For Dr. Wilmut's research paper unveiling his work, see Ian Wilmut et al., *Viable Offspring Derived from Fetal and Adult Mammalian Cells*, 385 NATURE 810 (1997).

30. *See* SILVER, *supra* note 22, at 91. In fact, the sheep had been born several months before the announcement, but the funding corporation that backed the research waited for approval of patents on its cloning techniques before announcing the birth of the lamb to the public. *See* FLESH OF MY FLESH, *supra* note 22, at IX. The patents on the techniques — patent numbers WO 97/070668 and WO 97/070669 — were granted by the World Intellectual Property Organization (WIPO).

31. Rick Weiss, *Last Cow of Rare Breed is Cloned in New Zealand*, WASH. POST, Aug. 20, 1998, at A02. The cow was the last female survivor of the Enderby Island breed, which lived on an island near New Zealand for over a century. *Cloning Comes to the Rescue of a Lady*, SCI. NEWS, Sept. 5, 1998, *available in* 1998 WL 14404402. Dr. David N. Wells, who led the cloning effort of the cow, stated: "With . . . [the cow's] birth, we have vastly improved the chances of saving this endangered breed." *Id.*

32. *See* Rachel K. Sobel, *Copying a Multitude of Mice*, U.S. NEWS & WORLD REP., Aug. 3, 1998 (visited Oct. 1, 1998) <http://www.usnews.com/usnews/issue/980803/3mous.htm>. More important than the fact that the mice were cloned, is the success rate that the researchers achieved. While it took researchers 277 tries to successfully clone the sheep in Scotland, researchers achieved success and produced viable mice between two and three percent of the time, indicating that cloning techniques are being improved and becoming more and more successful. *See id.*

clone larger animals and perhaps even humans."[33]

Japan has been one of the principal players in recent cloning developments. First, the technique used to clone the mice at the University of Hawaii was developed by Ryuzo Yanagimachi, a Japanese professor.[34] Also, Japanese researchers announced in July of 1997 that they had cloned twin calves using a process similar to the method used to create the sheep in Scotland.[35] Since then, Japan has received international attention for its cloning of cows and other farm animals.[36] Dr. Ian Wilmut, the researcher who led the cloning of the sheep in Scotland, acknowledged the importance of Japanese cloning efforts, stating: "If we take together our research with sheep, Japanese work with cattle and American work with mice, it clearly shows that this is a very powerful and effective technology."[37]

While appearing extremely complex, cloning is a relatively simple process. One cloning method that has met with success is called "Somatic Cell Nuclear Transplantation," which is the method that was used to clone the sheep in Scotland.[38] In this technique, the nucleus[39] of a somatic cell[40] is

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33. *Human Clones a Step Closer*, POPULAR MECHANICS, Oct. 1998, at 20. What is fascinating about this effort and other recent cloning efforts is the fact that researchers have taken cells that have already become very specialized in performing a certain task in an organism and wound the cells back, allowing them to give instructions for the complete organism. *See id.* This feat was once thought impossible in biology. *See* Sharon Begley, *Little Lamb, Who Made Thee?*, NEWSWEEK, Mar. 10, 1997, *available in* 1997 WL 9315470.

34. *See U.S., British Firms Plan to Clone Pigs*, JAPAN SCI. SCAN, July 27, 1998, *available in* 1998 WL 8029785.

35. *See infra* notes 38-50 for a discussion of the different cloning techniques.

36. *See Analysis: Cloning Reports, Reactions Ripple Back to Japan*, ASIA PULSE, Mar. 7, 1997, *available in* 1997 WL 10601695. In addition to research and development on cloning in the private sector, Japan has ongoing research in the public sector. Regional governments have programs, and both the Tokyo University of Agriculture and Kinki University have cloning programs. *See id.* One reason for the research on cows, in particular, was a nationwide goal of creating cows that would produce more milk or a higher quality of beef. *See Japan's First Cloned Calf Dies*, AP ONLINE, July 25, 1998, *available in* 1998 WL 6698471. Scientists in the United States have also succeeded in cloning a cow. *See id.*

37. *Cloning an 'Effective' Technology, Says Sheep Cloner*, JAPAN SCI. SCAN, July 27, 1998, *available in* 1998 WL 8029784. Dr. Wilmut went on to comment that while he was concerned with the possibility of human cloning, he did not oppose cloning efforts which use early human eggs for research because the eggs "cannot yet be considered to be fully human and possess awareness." *Id.*

38. *See* Feiler, *supra* note 24.

39. The nucleus is the part of a cell that contains all of the genetic material (the DNA), as well as all of the complex machinery that is required to reproduce cells and the genetic material contained in them, as well as many other vital components that are essential to life. *See* FREIFELDER, *supra* note 23, at 373-75.

40. A somatic cell is "any cell of the embryo, fetus, child or adult which contains a full complement of two sets of chromosomes." Feiler, *supra* note 24. Every cell of the human body contains 46 chromosomes. *See* SUZUKI & KNUDTSON, *supra* note 22, at 30. A chromosome is a structure that consists of a strand of DNA. *See* discussion *supra* note 23.

removed and implanted into an egg cell[41] which has had its nucleus removed.[42] This egg cell, which contains identical genetic material to the organism from which it was removed, is implanted in the womb of a surrogate mother where it divides and develops into an embryo.[43] One problem encountered with this technique, however, is that adult cell nuclei "cannot be readily reprogrammed back to an embryotic state."[44] The cells must be reprogrammed in order to make them capable of directing the development of the organism from the time that it is one cell, all the way through the life of the organism.

This problem was conquered by the researchers at the University of Hawaii.[45] As with the technique used to clone the sheep, DNA was extracted from adult cells and injected into an egg cell with the nucleus removed.[46] This time, however, the DNA was extracted from cumulus cells[47] instead of somatic cells.[48] After a few hours, the cell was placed into chemicals that prompt cell division and then was transferred to the womb of a surrogate mother, where it developed just as a normal fertilized egg cell would grow into an embryo and then into an entire organism.[49] While scientists conquered the problem of making adult cells revert back to stages where they are capable of directing development, they were unable to explain exactly why the process worked in this case.[50]

While these incredible advances in technology carry serious scientific implications, they are accompanied by legal ramifications as well. As with all areas of scientific research, cloning researchers seek patent protection for

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A chromosome carries genetic instructions for carrying on all cellular processes, and ultimately the developing and functioning of the human body. *See* SUZUKI & KNUDTSON, *supra* note 22, at 30-32.

41. Egg cells are the reproductive cells of females.

42. *See* Feiler, *supra* note 24. It must be noted that while the concept of cloning is relatively simple, the actual operation is exquisitely complex. For a further discussion of the physical operation and technique used in nuclear transfers, see MCKINNELL, *supra* note 25, at 40-47.

43. *See Tinkering with Mother Nature* (visited Sept. 21, 1998) <www.infoplease.com/ipa/A0198330.shtml>.

44. SILVER, *supra* note 22, at 96.

45. *See supra* notes 32-34 and accompanying text.

46. *See* Sobel, *supra* note 32, at 1.

47. Cumulus cells are cells that adjoin egg cells within an ovary in females. *See id.*

48. *See* Adam Rogers & Erika Check, *The Mice That Roar*, NEWSWEEK, Aug. 3, 1998, at 54. Somatic cells are "any cell of the embryo, fetus, child or adult which contains a full complement of two sets of chromosomes." Feiler, *supra* note 24.

49. *See* Sobel, *supra* note 32.

50. *See* Rogers & Check, *supra* note 48, at 54. Scientists speculate that the process works because cumulus cells rarely divide, making them good candidates for cloning. *See id.* Even though cumulus cells rarely divide, they still contain all the genetic material necessary to produce an entire organism. *See id.*

their work, and the importance of such protection is certainly recognized by the Japanese.[51]

IV. OVERVIEW OF PATENT LAW IN JAPAN

The protection of intellectual property in Japan derives from Japan's constitution.[52] Japan has protected intellectual property since the Patent Monopoly Act of April 8, 1885, was passed.[53] Since then, the explosion of technology has made the patent a valuable and controversial device. In Japan, in 1991, just over 100 years after the Patent Monopoly Act was passed, over 360,000 patent applications were published.[54] Today, patents are very important to companies in Japan, as Japanese companies "know well the values of intellectual property and technological innovation."[55] Japanese companies even provide their employees with rewards to encourage them to file patents. Patents have become very important both for the individual inventor and small business as well.[56] In order to analyze the role of the patent in Japanese scientific industry, a basic understanding of the Patent Law is necessary.

The purpose of Japan's Patent Law is to "encourage inventions by promoting the protection and utilization of inventions and thereby, to contribute to the development of industry."[57] One major area of "invention"

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51. *See* text accompanying *infra* notes 55-56.

52. While it is true that the constitution of a country will likely be the original source of patent protection, there are other sources of patent protection as well. Governments pass laws and sign international treaties which affect the scope of patent protection in their respective countries. For a discussion of many of the major international patent treaties, see generally Michael N. Meller, *Planning for a Global Patent System*, 80 J. PAT. & TRADEMARK OFF. SOC'Y 379 (1998); Mossinghoff & Kuo, *supra* note 3; Michael P. Ryan, *The Function-Specific and Linkage-Bargain Diplomacy of International Intellectual Property Lawmaking*, 19 U. PA. J. INT'L ECON. L. 535 (1998).

53. *See* Thorson & Fortkort, *supra* note 4, at 214.

54. *See id.*

55. *Id.* The importance of patents can be seen from the filing of patents internationally by Japanese companies. For example, in ranking the top ten companies that filed patent applications in the United States in 1993, Japanese companies held six of the ten spots. *See* Dan Rosen & Chikako Usui, *The Social Structure of Japanese Intellectual Property Law*, 13 UCLA PAC. BASIN L.J. 32, 33 (1994). In Germany, Japanese companies also filed over twice as many patent applications than American companies in 1992. *See id.*

56. For example, financial institutions in Japan have created a system of providing loans to venture businesses by holding patent rights as collateral for the loans. *See Jottings March*, YOMIURI SHIMBUN/DAILY YOMIURI, Mar. 3, 1998, *available in* 1998 WL 6591191. This opportunity is especially valuable for small businesses and individual inventors who may not have the collateral that large corporations have to obtain credit and loans.

57. Patent Law, Law No. 121 of 1959, art. 1 (amended 1998) [hereinafter Japan Patent Law].

in Japan is biotechnology.[58] The process of patenting an invention[59] in Japan begins with the filing of an application with the Japanese Patent Office (JPO). The application must include basic information on the inventor[60] and must disclose the invention. The disclosure in the application must include a claim over the subject matter to be patented and "a detailed explanation of the invention . . . describ[ing] the invention in a manner sufficiently clear and complete for the invention to be carried out by a person having ordinary skill in the art to which the invention pertains."[61]

In Japan, the first requirement to receive a patent is that the invention be useful or industrially applicable.[62] To be industrially applicable, an invention must have some usefulness, as the "industrially applicable" requirement deals with that usefulness and the level of innovation that is required for patentability.[63] In biotechnology, inventions are useful when they can be "repeatedly exploited."[64]

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58. Biotechnology is also a major area of invention in the United States. For a listing of the requirements for the patenting of biotechnological inventions in the United States and a discussion of those requirements, see MICHAEL A. EPSTEIN, MODERN INTELLECTUAL PROPERTY ch. 11(II)(A) (2d ed. 1992).

59. An invention is a highly advanced creation of technical ideas by which a law of nature is utilized. *See* Japan Patent Law, art. 2.

60. Examples of basic inventor information that is required include the name(s) and address(es) of the inventor and applicant and the name(s) of attorneys representing the applicant. *See id.* art. 36. *See also Japanese Patent Law* § IV(D)(1) (visited Sept. 5, 1998) <http://www.shinjyu.com/patent.html> (describing information which must appear in patent applications).

61. *See id.* § IV(D)(2). Note also that this requirement represents a change to the law instituted for applications filed after July, 1995. *See id.* For applications filed before that date, the applicant only had to disclose the purpose, constitution, and the effect of his invention, but did not have to disclose how to make the invention. *See id.*

62. *See* Japan Patent Law, art. 29. The term "industrially applicable," like the term "invention," is somewhat vague and highly subjective. In Japan, only inventions that are industrially applicable are patentable. *See id.* In the United States, a patent can be obtained for the invention or discovery of "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof." 35 U.S.C.A. § 101 (West 1984).

63. The industrial applicability requirement of Japan's Patent Law developed under the influence of the "nonobviousness" requirement of the United States. *See* Toshiko Takenaka, *The Substantial Identity Rule Under the Japanese Standard*, 9 UCLA PAC. BASIN L.J. 220, 224 (1991). The nonobvious standard for the United States is codified at 35 U.S.C.A. § 103 (West 1984 & Supp. 1999).

64. Alan J. Kasper, *Protection of Software Related Inventions in Japan*, 479 PLI/PAT 931, 940 (1997). While patent protection for biological products and processes is increasing in Japan, inventions in the field of therapeutic or diagnostic treatment of humans are still not "industrially applicable" because they are not considered part of "industry." *See* Miyako Okada-Tskagi, *Intellectual Property Law in Biotechnology*, 16 MED. & L. 9, 14 (1997). As far as biological inventions outside of Japan are concerned, the European Union has recently issued a directive which permits patent protection of new inventions

The second requirement for an invention to be patentable in Japan is novelty.[65] Under the novelty requirement, a person may not obtain a patent on any invention already existing in what is known as "prior art."[66] Prior art consists of any invention that was publicly known, publicly worked on, or publicly used in Japan prior to the filing of the patent application, or any invention that was described in a publication distributed in Japan or anywhere else in the world prior to the filing of the patent application.[67]

The third requirement for patentability in Japan is an inventive step. A person may not obtain a patent for inventions which could easily have been made by a person with ordinary skill in the art to which the invention pertains prior to the filing of the patent application.[68] The most important

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> which involve an inventive step and which are susceptible of industrial application . . . even if they concern a product consisting of or containing biological material or a process by means of which biological material is produced, processed or used. . . . Biological material may be the subject of an invention even if it has previously occurred in nature.

John R. Schmertz & Mike Meier, *EU Issues Directive to Member States to Coordinate Domestic Law on Scope of Patent Protection for Biotech Products*, 4 Int'l L. Update 96 (1998). Such action by the European Union has made the legal scene more "biotech-friendly." *See Gist-Brocades: Strasburg Approves Move on Biotech Patent Rules*, CHEMICAL BUS. NEWSBASE, Sept. 1, 1998, *available in* 1998 WL 14756548.

65. *See* Japan Patent Law, art. 29(1)-(3). For a further discussion of the novelty requirement in Japan, see ROBERT W. RUSSEL, PATENTS AND TRADEMARKS IN JAPAN (A HANDY BOOK) 279-80 (3d ed. 1974). Novelty is also a requirement for patents in the United States. *See* 35 U.S.C.A. § 101 (West 1984).

66. *See* Japan Patent Law, art. 29; *Japanese Patent Law*, *supra* note 60, § IV(D)(2), § V(C)(2).

67. *See* RUSSEL, *supra* note 65, at 314-15. Prior art determines novelty in the United States as well. For a discussion of the concept of "prior art" in the United States and the rest of the world, see generally Kate H. Murashige, *The Hilmer Doctrine, Self-Collision, Novelty and the Definition of Prior Art*, 26 J. MARSHALL L. REV. 549 (1993).

68. This inventive step requirement is similar to the standard of unobviousness in the United States. A certain level of innovation is required in order to make an invention patentable. *See* WILLIAM H. FRANCIS & ROBERT C. COLLINS, CASES AND MATERIALS ON PATENT LAW 315 (1995). This requirement is mandated in part by public policy considerations, and the "need to balance public interest considerations against the grant of a patent monopoly." Takenaka, *supra* note 63, at 225 (footnote omitted). The powerful and lucrative grant of a patent monopoly "is not justified [simply] by [a] trivial change or modification" on an existing invention. *Id.* Rather than stimulating inventiveness, granting patents for such trivial changes would obstruct inventiveness. *See id.* Since the purpose of Japan's Patent Law is to promote invention and the development of industry (*see* discussion, *supra* note 57 and accompanying text), "allowing a monopoly on existing technology would debilitate industry and forestall progress by preventing people from freely using technology." *Id.* at 223. To determine whether the inventive step in Japan has been met:

1. identify the claimed invention and review the teachings of the prior art;
2. select the most suitable prior art for comparison with the invention;
3. compare the claimed invention with the selected prior art;
4. recognize the common and different features between the two without

exception to the general rule of patentability of inventions in Japan for purposes of this note,[69] however, is the statutory requirement that inventions which contravene public order, morality, or public health cannot be patented.[70]

In Japan, the first inventor to file a patent application with the Japanese Patent Office owns the rights to the invention, assuming that the other requirements are met.[71] This first-to-file system has also been proposed as the international standard for the grant of patents.[72] When a patent application is filed, it is automatically published[73] "eighteen months from the earlier of the Japanese filing date or the foreign convention priority date,"[74]

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considering effects;

5. establish a logical argument as to whether or not a person of ordinary skill in the art could have made the claimed invention at the time of filing on the basis of the features previously identified in the cited prior art and the invention;

6. judge whether sufficient motivation exists in the cited prior art to arrive at the claimed invention; and

7. if sufficient motivation exists, the application lacks an inventive step.

David J. Abraham, *Shinpo-Sei: Japanese Inventive Step Meets U.S. Non-Obviousness*, 77 J. PAT. & TRADEMARK OFF. SOC'Y 528, 529-30 (1995). This inventive step requirement and inquiry is similar to the non-obviousness standard set forth in 35 U.S.C.A. § 102 (West 1984). For an excellent comparison of the two standards, see generally Abraham, *supra.*

69. Ultimately, for reasons set forth later in this note, human cloning is contrary to morality in Japan, and therefore, a human clone or a process to clone humans cannot be patented in Japan. *See infra* Part V.

70. *See* Japan Patent Law, art. 32(2).

71. *See id.* art. 39. This creates the possibility that the first person to actually invent may not receive a patent if they neglect to file for a patent and someone later creates the same invention but files for a patent first. The Japanese "first-to-file" system, which is the system used by the majority of the world, is in contrast to the United States' "first-to-invent" system, and it should be noted that the United States' system has been criticized in recent years. *See generally* Vito J. DeBari, *International Harmonization of Patent Law: A Proposed Solution to the United States' First-to-File Debate*, 16 FORDHAM INT'L L.J. 687 (1993) (discussing the United States' first-to-invent system). Currently, only the United States, Jordan, and the Philippines utilize the first-to-invent system. *See id.* at n.7. For an in-depth discussion of the differences between the two systems and the debate over whether to adopt the first-to-file system in the United States, see generally *id. See also* John C. Lindgren & Craig J. Yudell, *Protecting American Intellectual Property in Japan*, 10 SANTA CLARA COMPUTER & HIGH TECH. L.J. 1, 18 (1994) (describing the first-to-invent debate).

72. *See* DeBari, *supra* note 71, at 688. For a comparison of Japanese Patent Law to WIPO standards, see generally Mark S. Cohen, *Japanese Patent Law and the WIPO Patent Law Harmonization Treaty: A Comparative Analysis*, 4 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 847 (1994).

73. This publication is called a *Kokai*, which translated literally to English means "laid open to the public." RUSSEL, *supra* note 65, at 237.

74. Lindgren & Yudell, *supra* note 71, at 18-19.

so that the general public may inspect the application.[75] For the patent application to be examined by the Japanese Patent Office, a request for examination must be filed within seven years of filing the patent application.[76] If the subject matter of the patent application meets all of the requirements, a patent is issued that will protect the invention for the shorter of: (1) fifteen years from the date of publication for opposition, or (2) twenty years from the date the application was filed.[77]

The value of a Japanese patent in protecting an invention has met some criticism around the world, however. One objection is that Japanese patent protection has a very narrow scope,[78] which has caused inventors to flood the patent office with applications,[79] inevitably creating long delays for examination and the issuance of patents. Also, the Japanese Patent Office has long been criticized as being protective toward Japanese inventors and companies as compared to their foreign counterparts, even though

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75. *See id.* at 19. Prior to 1995, the pending patent application was inspected by examiners and then published in a *Kokoku*. *See id.* This publication basically provided competitors with the subject matter of the application the opportunity to try and undermine the validity of the patent, which forced foreign applicants to face opposition that they may not encounter in their home country. *See id.* At the time, this system was in stark contrast to that of the United States, where only patent examiners at the Patent & Trademark Office would examine the patent application in total secrecy. *See id.* This practice was ended under an accord between the United States and Japan in 1995, making it easier for inventors in the United States to obtain patents in Japan. *See generally* Stephen Lesavich, *The New Japan-U.S. Patent Agreements: Will They Really Protect U.S. Patent Interests in Japan?*, 14 WIS. INT'L L.J. 155 (1995). In Japan today, a patent is granted by an examiner, and then is published for opposition. *See Japanese Patent Law*, *supra* note 60, § VII. Anyone who opposes the patent then has six months from the publication date to file an opposition with the Japan Patent Office (JPO). *See id.* Any oppositions are judged by a three to five member group of patent examiners. *See id.*

76. *See* Lindgren & Yudell, *supra* note 71, at 19. If the request for examination is not filed within this time, the application is deemed withdrawn. *See id.* This is another example of contrast to the United States' system, where every patent application is automatically examined. Lindgren suggests that the "deferred examination" process in Japan may be better than the American system because of the pace of technological growth in the world today, because an applicant would have seven years to see if his invention is in use before going through the expensive process of prosecuting a patent on the invention. *See id.*

77. *See* Japan Patent Law, art. 67.

78. *See* Jeffrey A Wolfson, *Patent Flooding in the Japanese Patent Office: Methods for Reducing Patent Flooding and Obtaining Effective Patent Protection*, 27 GEO. WASH. J. INT'L L. & ECON. 531, 541 (1994).

79. *See id.* There are other reasons for the flood of patent applications in Japan. For example, the Japanese can obtain status by the number of patents that they hold. *See id.* Also, the number of applications may be reflective of a mentality in Japan that litigation is disfavored. Rather than risk litigation, it may be better to apply for patents and let the JPO determine whether to allow the patent or to reject it. *See* Lindgren & Yudell, *supra* note 71, at 25. Otherwise, by litigating matters which could not be settled amicably, both parties are shamed and dishonored. *See id.* Therefore, litigation is seen as an extreme measure. *See id.*

improvements have been made in recent years.[80]

V. RELIGIOUS AND CULTURAL INFLUENCES ON JAPANESE MORALITY

Determining what dictates morality in Japan is no easy task. Religion is one prominent influence on morality in Japan. While most Japanese tend to consider themselves non-religious, because Japan is home to virtually all of the world's major religions, religion has undoubtedly affected Japanese thought and culture.[81] This effect of religion on Japanese thought and culture is not the result of the differing individual religious traditions, but it is instead the product of the combinations of these traditions which has created certain persistent themes in Japanese society. These themes include "the closeness of man, 'gods' . . . , and nature;"[82] the significance of the family, both living and dead;[83] the intimate relationship between religious practice

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80. *See* Lindgren & Yudell, *supra* note 71, at 6. A prime example of protectionism is the Kilby patent. Jack St. Clair Kilby invented the integrated circuit in 1958, which was one of the more important technological innovations of this century. *See id.* at 7. Kilby applied for a patent in the United States in 1959, and received a patent in 1964. *See id.* Kilby also applied for a patent in Japan in 1960, but the patent was not granted until 1989, arguably because of the protectionist policies of the Japanese Patent Office. *See id.* The patent expires in 2001, which is 15 years from the date it was published in Japan for opposition. *See id.* at 7-9. Recent developments have suggested that Japan may be moving away from its protectionist policies of the past. In 1994, the United States and Japan signed "The New Patent Accord," which was intended to resolve some of the disputes between the United States and Japan concerning patent protection. *See* Lesavich, *supra* note 75, at 174-80. The agreement made accommodations to correct errors in translation from English to Japanese, because U.S. companies have in the past lost or received worthless patents because of translation errors for which the Japanese Patent Office would not allow the correction. *See id.* at 174. The JPO also agreed to allow accelerated examination of patent applications for applications that have also been filed in other countries, which likely will eliminate results such as the Kilby case. *See id.* at 175-76. Protectionism in the JPO has also been seen in the area of importation of patented inventions into Japan, but this protectionism was reduced to some extent in 1997, by the landmark decision in *BBS Kraftfahrzeugtechnik AG v. Racimex Japan Corp.*, H-7 (o) No. 1988 (Sup. Ct., July 1, 1997) (Japan). For an in-depth discussion of the case, see John A. Tessensohn & Shusaku Yamamoto, *The BBS Supreme Court Case*, 79 J. PAT. & TRADEMARK OFF. SOC'Y. 721 (1997).

81. *See* G. Cameron Hurst III, *The Enigmatic Japanese Spirit*, ORBIS, Mar. 22, 1998, *available in* 1998 WL 12909529. In the early 1980s, one survey reported that over 65% of Japanese people surveyed said that they had no personal religious faith, and yet visits and donations to temples and shrines are high and religious festivals flourish. *See id.*

82. *See* H. BYRON EARHART, THE NEW RELIGIONS OF JAPAN: A BIBLIOGRAPHY OF WESTERN-LANGUAGE MATERIALS 2 (1970).

83. *See id.* Reverence for and even the worship of ancestors in Japan is viewed as very important in Japanese society. As one commentator stated, "[t]he mere fact that they were predecessors is sufficient to command respect and attention from their descendants of the family." ROBERT J. SMITH, ANCESTOR WORSHIP IN CONTEMPORARY JAPAN 115 (1974). The dead are revered for the contribution that they have made to the family in the past, but some

and daily life; and "the natural bond between Japanese religion and the Japanese nation."[84]

Because of such pervasive themes in Japanese religion and the presence of a variety of religious traditions, the Japanese approach to religion has been described as "fundamentally tolerant and eclectic."[85] While Japan has historically tolerated various religions,[86] much of today's influence on morality comes from two religious schools of thought: Shinto and Buddhism.

Shinto,[87] the indigenous religion of Japan, stresses a belief that human beings are in communion with the living forces in the world, which forms a communal cult where "gods or spirits, animals and trees, even rocks and streams . . . [are] believed to be living in communion with men."[88] The Japanese believe all forces and objects of nature have a spiritual essence[89] and that these forces are to be given proper respect.[90] Persons and objects whose spiritual essences come to be revered are called *Kami*.[91] In each family, there are persons who are *Kami*, and Shinto makes it clear through the concept of *Kami* that there is no distinction between human beings and

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of this veneration is generated by a fear "that a slighted or neglected spirit of the dead might return to harm the living." *Id.*

84. *See* EARHART, *supra* note 82, at 2.

85. JACK SEWARD, THE JAPANESE 188 (1995).

86. The Constitution of Japan declares that "[f]reedom of religion is guaranteed to all." JAPAN CONST. art. 20, *reprinted in* 9 CONSTITUTIONS OF THE COUNTRIES OF THE WORLD (Albert P. Blaustein & Gisbert H. Flantz eds., Oceana Publications 1990). Seward refers to Japan as a "'museum of religions,' . . . [holding] its doors open to all religions that care to test their demotic appeal in the arena of their archipelago." SEWARD, *supra* note 85, at 188. For a discussion of religion and the law in Japan, see Kawawata Yuiken, *Religious Organizations in Japanese Law*, *in* RELIGION IN JAPANESE CULTURE 199 (Noriyoshi Tamaru & David Reid eds., 1996).

87. The word "Shinto," translated into English, means "way of the *kami* (gods)." JOSEPH M. KITAGAWA, ON UNDERSTANDING JAPANESE RELIGION 139 (1987).

88. MASAHARU ANESAKI, HISTORY OF JAPANESE RELIGION 22 (1963).

89. *See* SEWARD, *supra* note 85, at 192.

90. *See* ANESAKI, *supra* note 88, at 21.

91. *See* SEWARD, *supra* note 85, at 192. The meaning of the word "*Kami*" is difficult to translate and understand. Seward indicates that the term means "above" or "superior." *Id.* Anesaki suggests the term carries the meanings of "superior," "sacred," or "miraculous." ANESAKI, *supra* note 88, at 21. Another useful interpretation is:

> [*Kami*] signifies the deities of heaven and earth that appear in the ancient records and also the spirits of the shrines where they are worshipped. Needless to say it includes human beings, and such objects as birds, beasts, trees, plants, seas, mountains, and so forth. In ancient usage anything which was outside the ordinary, possessed superior power or was awe-inspiring was called *kami* . . . [including e]vil and mysterious things . . . . [In each] family there are human beings who are *kami* . . . .

William Theodore De Bary, *Japanese Religion*, *in* AN INTRODUCTION TO JAPANESE CIVILIZATION 309, 312 (Arthur E. Tiedemann ed., 1989).

divinity.[92]

The human being as an individual in Shinto is far less important than the community as a whole.[93] While vague, it is conceded that each human being possesses what has come to be conceptualized in the notion of the "soul."[94] All living things have such a spirit, and "when a living thing dies, its spirit leaves the body and exists in Heaven until its eventual return to this world."[95] In general, "[a] reverence for life and creativity . . . abhorrence of death and defilement[,] . . . [a]n appreciation of the beauty and awesomeness of nature or divine creativity, . . . [and] an acknowledgment of one's dependence on some . . . higher being"[96] have gained acceptance and expression in Shinto worship. This appreciation of nature, through ideas that not only is nature sacred, but also that human beings and nature are on equal levels, is discernable from an examination of Buddhism as well.[97]

Buddhism is the predominant religion in Japan today.[98] Buddhism stresses the unity of all beings through the goal of realization that there is a "spiritual communion pervading the whole universe" and a basic unity of existence in life and spirit.[99] The model for achieving spiritual enlightenment is the Buddha, who taught "all-oneness" and "all-embracing charity."[100] In contrast to Shinto, Buddhism stresses that pain, suffering and death are important and essential in life.[101] Suffering and death are accepted and not

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92. *See* SEWARD, *supra* note 85, at 193-94.

93. *See* ANESAKI, *supra* note 88, at 36.

94. *See id.* at 39. In Shinto, the soul is composed of two parts, one mild (*nigi-mitama*) and one rough (*ara-mitama*). *See id.* at 40. The mild part of the soul cares for the person's health and prosperity, while the rough part of the soul performs adventurous tasks or even bad deeds. *See id.*

95. Takeshi Umehara, *Shinto and Buddhism in Japanense Culture*, JAPAN FOUND. NEWSL., 1987, at 15.

96. De Bary, *supra* note 91, at 315.

97. *See* Lucille Craft, *Monkey Culture*, WASH. POST, Dec. 10, 1997, *available in* 1997 WL 16223097.

98. *See* THE INTERNATIONAL SOCIETY FOR EDUCATIONAL INFORMATION, THE JAPAN OF TODAY 113 (1996) [hereinafter INTERNATIONAL SOCIETY]. As of 1994, Buddhism in Japan had a total following of 90 million people. *See id.* The population of Japan was approximately 125 million in 1995. *See id.* at 77.

99. ANESAKI, *supra* note 88, at 53. Such realization results in spiritual enlightenment, or *Bodhi*. *See id.*

100. *Id.* at 53-54.

101. *See* De Bary, *supra* note 91, at 316. The importance of suffering can be seen from the essential teachings of Buddhism, the "Four Noble Truths," which state in part:

> 1. The truth of suffering — that suffering is inherent in life. Buddhism is deeply conscious of the finite character of human life. Joy and sorrow, pleasure and pain, health and sickness are inextricably bound up with one another. The more we seek of one, the more exposed we are to the other. . . .
>
> 2. That suffering is caused by desire or selfish craving. It is the desiring of things for oneself that brings pain. . . .

feared by Buddhists.

The human being in Buddhism is one component that makes up the "fundamental oneness of all beings."[102] The world is made up of innumerable beings who act as individuals, but in reality these things make up one family.[103] The life of a human being is the "moral causation of the continuity of existence through successive births and deaths," or *Karma*.[104] Ultimately, the quality of life that a person experiences is determined by the merit of his past and present deeds, and therefore, illness and disease are not resisted because they are an "irresistible consequence of one's own *Karma*."[105]

It must be noted that there is no clear line distinguishing followers of Shinto and followers of Buddhism in Japan. In fact, many Japanese consider themselves adherents to both religions.[106] Nevertheless, as a result of the influence of Shinto, Buddhism, and other religions,[107] the Japanese appear to be willing to accept sickness, disease, and ultimately death. In addition,

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3. Desire, and consequently suffering, can be eliminated.

Id.

102. ANESAKI, *supra* note 88, at 66.

103. *See id.*

104. *Id.* at 70.

105. *Id.* at 73.

106. For example, in 1986, 93% of Japan's population considered themselves to be adherents to Shinto, and 74% of the population considered themselves Buddhists as well. *See* Thomas P. Kasulis, *Intimacy: A General Orientation in Japanese Religious Values*, 40 PHIL. E. & W. 433, 440 (1990).

107. In addition to followers of Shinto and Buddhism in Japan, Christianity had a following of about 1.5 million in Japan as of 1994. *See* INTERNATIONAL SOCIETY, *supra* note 98, at 113. This includes about 1 million Protestants and about 440,000 Catholics. *See id.* at 115. Also Confucianism has influenced thought and behavior in Japan as more of a "code of moral precepts rather than a religion," even though its influence has declined since World War II. *Id.* Confucianism has three elements which have had a special influence on the Japanese. These elements are ethical humanism (emphasis on human loyalties to other humans and personal relationships), rationalism (emphasis on objective reason in human affairs), and historical mindedness (emphasis on the importance of history). *See* De Bary, *supra* note 91, at 322-24. The teaching of these elements stresses discipline and creates a method of instruction for morality and ethics by stressing an indebtedness to parents and teachers, which leads to the practice of "good-will in human relationships." ANESAKI, *supra* note 88, at 271. Confucianism also recognizes that a person owes "loyalty to the family and obedience to the state" at the same time, which often results in a difficult conflict in terms of values and morality. *See* Amartya Sen, *Human Rights and Asian Values: What Lee Kuan Yew and Le Peng Don't Understand About Asia*, NEW REPUBLIC, July 14, 1997, *available in* 1997 WL 9026115. Confucianism also recognizes the virtue of harmony in society, and virtues of "justice" and "humanity" at the individual level. *See* Yutaka Yamamoto, *A Morality Based on Trust: Some Reflections on Japanese Morality*, 4 PHIL. E. & W. 451, 453 (1990). Even though Confucianism has not played a central role in Japan's religious tradition, it has clearly been a central aspect of the Japanese philosophical tradition. *See* Kasulis, *supra* note 106, at 440.

the Japanese revere both the living and the dead. With regard to the role of human beings in the overall order of life, religious influences in Japan have created the idea that human beings are interdependent with nature, "without nature belonging to humankind or humankind belonging to nature."[108]

In Japan today, numerous "modern religions"[109] have emerged, which differ from the traditional religions of Japan in ways that range from the very subtle to the very broad.[110] In contrast to the acceptance of sickness and disease found in the traditional religions, the modern religions of Japan "recognize to some extent the legitimate role of medicine in the cure of certain illnesses."[111] Rather than focus on the end results of sickness and disease as the traditional religions do, the modern religions of Japan tend to focus on identifying the underlying causes of the sickness and disease.[112]

In addition to religion, there are many other cultural ideas that influence Japanese thought which play an important role in their perceptions of life and the role of the human being. For example, Japanese education encourages learning through "repetition and emulation."[113] Educational training both at home and in school encourages conformity both to one's own group and to Japanese society as a whole.[114] In general, there is a powerful societal emphasis on staying within the group.[115] At the same time, Japanese teaching emphasizes intangibles such as the spirit, mind, and emotions, which arguably have played a major role in the industrialization of Japan as well as playing a prominent role in science and technology.[116]

In terms of intangibles, such as the spirit, the Japanese view many

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108. Kasulis, *supra* note 106, at 445.

109. There are over 170 "New Religions" that have appeared in Japan's history. SEWARD, *supra* note 85, at 201. For an annotated bibliography of the New Religions of Japan, see generally EARHART, *supra* note 82.

110. *See supra* notes 87-108 and accompanying text.

111. CLARK B. OFFNER & HENRY VAN STRAELEN, MODERN JAPANESE RELIGIONS 183 (1963). Such an idea could have an impact in shifting Japanese thought and cultural norms because, even as of the mid-1960s, these modern religions had an estimated following of approximately 15% of the Japanese population. *See id.* at 27.

112. *See id.* at 183.

113. BERNICE Z. GOLDSTEIN & KYOKO TAMURA, JAPAN AND AMERICA: A COMPARATIVE STUDY IN LANGUAGE AND CULTURE 150 (1975).

114. *See id.* at 151. Therefore, the Japanese are unlikely "to single out exceptional individuals for praise" and "encourage display of excellence in front of others." *Id.* This system is in contrast to the educational system of the United States, where parents and teachers encourage students to stand out as individuals and to focus on their individual attributes and abilities. The Japanese encourage repetition, memorization, and habit formation. *See id.* at 150-52.

115. *See Japanese and American Crime and Culture Compared*, NAT'L. PUB. RADIO, Aug. 18, 1994, *available in* 1994 WL 8679379.

116. *See* ROSS MOUER &YOSHIO SUGIMOTO, IMAGES OF JAPANESE SOCIETY: A STUDY IN THE STRUCTURE OF SOCIAL REALITY 41-42 (1986).

areas of life as "regulated by a variety of dualistic principles."[117] Human beings are accorded special respect because they are "endowed with the capacity for sophisticated spiritual activities."[118] This special respect does not suggest that human life and its preservation is a top priority for the Japanese.[119] It has long been debated in Japan how much "cultural intervention, in the form of medical tinkering," is acceptable in the process of dying.[120] Further reasons for the resistance to medical intervention come from the importance of a bond with nature that the Japanese revere and the desire to let nature exist as it is and let things be themselves.[121]

VI. HUMAN CLONING

Research and development in biotechnology today is often conducted with applications to human beings in mind. For example, while researchers may be studying gene expression[122] in mice, it is likely that they hope to use

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117. S. N. EISENSTADT, JAPANESE CIVILIZATION: A COMPARATIVE VIEW 322 (1996). Examples of such dualistic principles include purity and pollution, good and evil, inner feeling and formal pretense, insider and outsider. *See id.* at 322-23.

118. Prime Minister's Report, *supra* note 8, ch. 1(3)(b).

119. An example demonstrating that the preservation of human life is not a top priority for the Japanese is the Japanese attitude toward suicide. There are several situations when suicide is accepted and not frowned upon. *See* EISENSTADT, *supra* note 117, at 325. Suicide in "service of the collectivity" (altruistic suicide) is fully accepted, and so are some types of non-altruistic suicide. *See id.* A person may commit suicide as a means of protest or as a means "of resolving . . . the dilemmas and contradictions [in which] one is caught." *See id.* Suicide is an honorable way out of these situations, and is also an honorable way out of contradictions between "intense internal feelings and social and group pressure." *Id.* In such cases, suicide is "a very legitimate culmination of one's life." *Id.* Further evidence of the unique view of human life held by the Japanese can be seen in medical treatments. In the United States, there were nearly 2,000 heart transplants in 1990. *See* Margaret Lock, *The Unnatural as Ideology: Contesting Brain Death in Japan*, *in* JAPANESE IMAGES OF NATURE: CULTURAL PERSPECTIVES 121, 123 (Pamela J. Asquith & Arne Kalland eds., 1997). In Japan that same year, there were none. *See id.* This difference is not the result of a lack of skill or technology on the part of the Japanese, but is the result of cultural differences toward human life. *See id.*

120. *Id.*

121. *See* Kasulis, *supra* note 106, at 449.

122. A gene is a piece of a chromosome "that codes for a functional product." JAMES D. WATSON, MOLECULAR BIOLOGY OF THE GENE 702 (3d ed. 1976) A chromosome is a structure that organizes Deoxyribonucleic Acid (DNA). *See id.* at 697. DNA is basic genetic material of human beings and all other organisms and is organized on chromosomes in genes. *See id.* at 699. The bottom line is that genes contain the genetic instructions to make everything that an organism needs to live and grow. *See id.* at 697, 699-700, 702-03. For a more detailed explanation of the role of genes and their structure and function, see CURT STERN, PRINCIPLES OF HUMAN GENETICS (3d ed. 1973); JOHN PHILIP TRINKAUS, CELLS INTO ORGANS: THE FORCES THAT SHAPE THE EMBRYO (2d ed. 1984); WILLIAM WU, METHODS IN GENE BIOTECHNOLOGY (1997).

their findings to better understand gene expression in human beings.[123] Therefore, it is not surprising that when cloning technology became available and exhibited success in other species, the possibility of cloning human beings became a topic of immediate debate.[124] While some companies do not see the potential for business in the human cloning arena,[125] there are inevitably going to be companies that do, and "the potent comb[ination] of strong demand and scientific progress means attempts to copy people are inevitable — and imminent."[126]

Initial response to the concept of human cloning was negative, and people did not take the possibility of human cloning very seriously.[127] Early perceptions emerged straight from the realm of science fiction, through phrases such as "the genetic resurrection of dead people, the mass-production of dangerous superhumans and the pursuit of immortality by transplanting our brains in specifically-bred replacement bodies."[128] Along similar lines, arguments arose about the possibility of creating "'scientific' categories of superior and inferior people"[129] through a new eugenics[130] movement.[131]

Several positive uses of human cloning have been advanced, however, which have intensified the debate over human cloning. The most frequently cited use for human cloning is that it may be offered as a solution to fertility problems. While this idea seems outlandish at first, it is important to note

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123. Another example of the importance of animal studies is cancer research. Researchers throughout the world are studying cancerous cells in various animals, with the hope of applying their discoveries to treating cancer in human beings.

124. As one commentator put it, the cloning of the sheep in Scotland raised the possibility of human cloning in the future, and called "the sacredness of human life . . . into question." *Moments '97: From Clones to Martians*, U.S. NEWS & WORLD REP., Dec. 29, 1997, at 112.

125. ProBio America is one company that does not see business potential in human cloning. ProBio America is the company that owns the rights to the mouse cloning method. *See* discussion *supra* notes 45-50. Laith Reynolds, chief executive officer of ProBio America, has stated publicly that his company has no current interest in applying cloning technology to human beings. *See* John Carey, *Human Clones: It's Decision Time*, BUS. WK., Aug. 10, 1998, at 32.

126. *See* Carey, *supra* note 125, at 32. As Princeton University biologist Lee M. Silver stated, "I don't see how we can stop it from happening." *Id.*

127. For example, in 1997, 87% of Americans surveyed said they were opposed to human cloning. *See U.S. News in Brief*, U.S. NEWS & WORLD REP., Mar. 17, 1997, *available in* 1997 WL 8331732.

128. *Asian Editorial Excerpts*, JAPAN ECON. NEWSWIRE, Jan. 16, 1998, *available in* WL JAPANNEWS Database.

129. Peter N. Spotts & Robert Marquand, *A Lamb Ignites Debate on the Ethics of Cloning*, CHRISTIAN SCI. MONITOR, Feb. 26, 1997, at 3.

130. "Eugenics" is defined as "the science that deals with the improvement of races and breeds, especially the human race, through the control of hereditary fators." WEBSTER'S NEW UNIVERSAL UNABRIDGED DICTIONARY 629 (deluxe 2d ed. 1983).

131. *See* Spotts & Marquand, *supra* note 129, at 3.

that the techniques of in vitro fertilization, surrogate embryo transfer, and sex preselection were once thought to be radical techniques, but are now commonplace in treating infertility.[132] A human embryo could be cloned into several embryos, one of which would be implanted into an infertile woman's uterus, allowing an otherwise infertile woman to give birth to a child.[133] This procedure has met with serious opposition, however, because of ethical issues surrounding the initial embryo which is to be cloned.

An ethical argument has been raised that the embryo will be conceived just to produce embryos for infertile couples, which may be unacceptable.[134] Proponents of cloning as a solution to infertility argue, however, that cloning is "essentially a way of creating a delayed identical twin,"[135] except the cloned twins would be different from each other because they would grow up at different times, in different environments, and with different generational experiences.[136]

Another potential use for human cloning has been offered in the area of behavioral research. Psychologists and behavioral scientists would be able to use cloned humans to study the effects of "genetic inheritance versus environment in determining personality and behavior."[137] Behavioral scientists would be able to study the classic behavioral debate of nature versus nurture and could benefit by understanding the relative influences of each.

Another use for human cloning, though somewhat more controversial, has been for research and treatment of the human body. For example, human cloning has been advanced as a way of creating organs for transplants.[138] In fact, in November, 1998, it was announced in the United

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132. *See* Jean Bethke Elshtain, *Our Bodies, Our Clones*, NEW REPUBLIC, Aug. 4, 1997, at 25. Dr. Mark Sauer, an infertility expert at Columbia Presbyterian Medical Center in New York, noted that he "dreams of offering his patients a type of cloning some day." *Id.*

133. *See id.*

134. *See* Herbert F. Krimmel, *The Case Against Surrogate Parenting, in* TAKING SIDES: CLASHING VIEWS ON CONTROVERSIAL BIO-ETHICAL ISSUES 51, 52 (Carol Levine ed., 1984). Much of the ethical concern over this process centers around the motives underlying conception of the initial embryo. *See id.* Krimmel argues that the problem lies with the fact that the "child is conceived not because he is wanted by his biological mother, but because he can be useful to someone else." *Id.* In fact, this raises an argument not only against cloning embryos to solve infertility problems, but also with surrogate motherhood in general. *See generally id.*

135. Allison M. Mays, *Cloning: Now That We've Got It, What Do We Do With It?*, 22 LAW & PSYCHOL. REV. 287, 299 (1998).

136. *See id.*

137. Katheryn D. Katz, *The Clonal Child: Procreative Liberty and Asexual Reproduction*, 8 ALB. L.J. SCI. & TECH. 1, 12 (1997).

138. *See* Krimmel, *supra* note 134, at 53. *See also* Alexander M. Peters, *The Brave New World: Can the Law Bring Order Within Traditional Concepts of Due Process?*, 4 SUFFOLK U. L. REV. 894 (1970); Roderic Gorney, *The New Biology and the Future of Man*, 15 UCLA

States that cloning technology had seen some success in developing human organs to be used in transplants.[139] It is still the case, however, that negative applications of human cloning seem to dominate discussion of the subject.

Proponents of human cloning note, among other things, that while clones have identical genetic material to their twin, they are physically different organisms.[140] The developmental process of the clone and the environment inside the uterus of the surrogate mother are different from that of the original mother, so the body of the clone will be different from its genetic twin.[141] This is precisely why some Japanese researchers have indicated that there is no need to fear human cloning technology.[142] While the technology to clone a human being may not be perfected today, because of potentially positive uses and applications, some fertility clinics in the United States have begun conducting experiments with human eggs which

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L. REV. 273 (1968); J.G.Castel, *Legal Implications of Biomedical Science and Technology in the Twenty-First Century*, 51 CAN. BAR REV. 119 (1973). In addition to solving infertility and providing behavioral research tools, one scientist has suggested that human embryos could be grown for organs in a manner that would bypass legal and ethical concerns. *See* Steve Connor & Deborah Cadbury, *Headless Frog Opens Way For Human Organ Factory*, LONDON SUNDAY TIMES, Oct. 19, 1997 (visited Sept. 21, 1998) <http://www.purefood.org/Patent/headless.html>. Dr. Jonathan Slack, a professor of developmental biology at Bath University, has developed a technique to suppress the development of the head of a tadpole, which could ultimately lead to a headless frog with fully developed organs. *See id.* Dr. Slack suggests that this technique could be used not to create and clone headless human embryos, but to "genetically reprogramme the embryo to suppress growth in all the parts of the body except the bits you want, plus a heart and blood circulation," which would produce the desired organs for transplant. *Id.* This theory has met some harsh criticism, however, concerning the exploitation of animals. *See id.*

139. "Researchers have isolated and cloned human . . . [stem] cells in a laboratory." *See* Paul Recer, *Human Stem Cells Grown in Laboratory*, INDIANAPOLIS STAR, Nov. 6, 1998, at A05. Stem cells produce the cells which ultimately differentiate to become the various organs of the body during embryonic development. *See id.* Stem cell research has been slowed in recent years by the controversy surrounding human embryonic research, but researchers are hopeful that this research could someday produce hearts, kidneys, and tissue to replace diseased parts of the body. *See id.*

140. *See* Masahiro Morioka, *Some Ethical Issues of Cloning*, 7 EUBIOS J. ASIAN & INT'L BIOETHICS 67, 68 (1997).

141. *See id.* In addition, should the technology be someday perfected to clone and produce a viable human being, that individual will also be different for several other reasons. For example, 1) the cloned individual will be born years later than its twin, and 2) the cloned individual will be exposed to completely different experiences and environments. This seems to suggest that while the clone had identical genetic material to another person, it is likely that the two people would be very different. One expert has suggested that "people are influenced by a range of relationships and environmental factors 'that help determine who and what we are, . . . [so m]aking a genetic copy of a person is not making the same person." Spotts & Marquand, *supra* note 129, at 3 (quoting Dr.Thomas Murray, Director of the Center for Biomedical Ethics at Case Western Reserve University).

142. *See* Morioka, *supra* note 140, at 67-68.

"lay the groundwork for cloning."[143]

Environmental and developmental differences do not change the fact that the genetic constitution of a cloned individual is the same as its twin. It has been argued that this genetic similarity can diminish genetic diversity, having very serious implications for the future of humanity.[144] The argument has also been raised that, while individual clones will be different in personality and behavior, they will have their physical traits preplanned, which "turns creation of children into something akin to manufacturing."[145] Opponents of cloning also argue that the long-term effects of cloning are unknown,[146] and there could be a high likelihood of death of cloned embryos because the technology is imperfect.[147]

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143. Gina Kolata, *Human Cloning: Yesterday's Never Is Today's Why Not?*, PEOPLE'S TRIB. (ONLINE EDITION), Apr. 1997 (visited Sept. 21, 1998) <http://www.purefood.org/Patent/humanClone.html>.

144. Critics argue that cloning simply produces copies of the same basic genetic constitution. Cloning has met with opposition because it not only contradicts the basic human instinct to breed sexually, but it also "subverts the evolutionary process." *World Is Not Yet Ready for Human Clones*, NATION, Jan. 15, 1998, *available in* 1998 WL 5445791. Evolution refers to the sequence of life forms that have emerged over time and the "causal mechanisms that produce such changes in forms." A. Terry Rambo, *The Study of Cultural Evolution*, *in* PROFILES IN CULTURAL EVOLUTION 26 (A. Terry Rambo & Kathleen Gillogy eds., 1991). Sexual reproduction is important not only for humans, but for all species because it recombines genetic material. The recombination of the genetic material of two individuals leads to new combinations, which produces variation and different characteristics in offspring. These new characteristics can include things such as resistance to disease, stronger physical features, and enhanced mental abilities. Cloning "sidesteps the reshuffling and screening inherent in the genetic process and strips evolution of the main source of the variation that drives it." *World Is Not Yet Ready for Human Clones*, *supra*. In fact, in perhaps the most famous work on the process of evolution, Charles Darwin partially based his theory of the development of different species on the recombination of genetic material, although the structure and function of such material had not been identified at the time of his work. *See generally* CHARLES DARWIN, ORIGIN OF SPECIES (1859). *See also* GERHARD WICHLER, CHARLES DARWIN: THE FOUNDER OF THE THEORY OF EVOLUTION AND NATURAL SELECTION (1961). For a comprehensive discussion of the role of genetic material in human diversity, see DANIEL C. DENNETT, DARWIN'S DANGEROUS IDEA (1995).

145. Carey, *supra* note 125, at 32.

146. Scientists are unsure whether cloned organisms will develop problems related to their cloning, and have no way of predicting whether this will occur because the technology is so new. In fact, the researchers in Scotland that cloned "Dolly" have expressed some concern that the cloned sheep may age prematurely or have a shorter lifespan than a sexually conceived sheep. Mays, *supra* note 135, at 294. Scientists have further indicated that cloning could damage DNA, potentially subjecting the animal to numerous diseases later in life. *See id.* Also, the cell used for cloning may contain mutations during cell divisions, which could "predispos[e] the cloned animal to cancer and age-linked diseases." *Id.*

147. Cloning technology, which is relatively new and unrefined, has generated concern which stems from the statistical probability of producing a viable clone. For example, researchers that cloned the sheep in Scotland had to use 277 sheep embryos to produce the one viable clone. *See* Rick Weiss, *Panel Backs Some Human Clone Work, Board Would Ban*

Opponents of human cloning raise other issues that are very difficult to deal with when one considers the value of human life and the unique identity of each human being which the Japanese revere. For example, the argument has been raised that it is not the place of human beings to tinker with life through any sort of genetic engineering, including human cloning. Opponents of human cloning also raise a deontological argument that cloning is inherently wrong because it threatens the value of human life and the integrity of the species.[148] This argument is based on evolutionary theory, and emphasizes that life "evolved on this planet into a delicately balanced, intricate, [and] self-sustaining network[, and] [m]aintaining this network involves many interactions and equilibria that we understand only dimly."[149] The argument stresses that the precise and delicate balance of nature must be more thoroughly understood before we should allow genetic engineering to alter the earth's ecosystems, or humans could "inadvertently collapse the ecological system in which we have found our niche."[150]

Opponents of human cloning are concerned with the issue of the actual emotional development of a cloned child as well. For example, a child that was cloned could eventually face the reality of having another child in the family with the same genetic makeup as herself. Commentators argue that, while the clone will be different because of differing environmental influences which affect the cloned child and her twin, when the child learns of the genetic sameness she will think, "or unconsciously sense," that she is being replaced by the new cloned child because she is inadequate.[151] The clone could also experience difficulties growing up through feelings that she is not truly a unique and separate individual, and may feel the need to simply behave as the older sibling to attain parental approval.[152] As University of Chicago professor Leon R. Kass stated, human cloning would be "a major step toward regarding our children as acceptable only if they conform to the

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Implanting Embryos, WASH. POST, June 4, 1997, at A01. In addition, there has been concern raised about danger to the surrogate mother of the cloned organism because the surrogate mother of the cloned calves in Japan died. *See* Jonathan Watts, *Japan Proposes Ban on Human Cloning*, LANCET, Aug. 8, 1998, at 465.

148. *See* Rebecca Dresser, *Ethical and Legal Issues in Patenting New Animal Life*, 29 JURIMETRICS J. 399, 410 (1988).

149. Robert L. Sinsheimer, *Genetic Engineering: Life as a Plaything*, *in* THE CULTURE OF SCIENCE 63, 65 (John Hatton & Paul B. Plouffe eds., 1993).

150. *Id.*

151. *See* Stephen A. Newman, *Human Cloning and the Family: Reflections on Cloning Existing Children*, 13 N.Y.L. SCH. J. HUM. RTS. 523, 526-27 (1997). Newman argues this possibility could be highly detrimental when combined with the fact that the newborn will get more attention, which inevitably happens when a new sibling is born. *See id.* at 526. This could create jealousy and resentment on the part of the older child. *See id.*

152. *See id.* at 527.

choices of our will."[153]

While the ethical side of creating a human clone is debated, the issue of whether there is a fundamental right to clone one's self requires some consideration. This issue has not yet been addressed by the Supreme Court of Japan. It could be argued by the proponents of human cloning that they have a fundamental right to their genetic identity and therefore have the right to copy it if they choose, while opponents of human cloning could counter-argue that the clone ultimately has the fundamental right to have her own unique identity and genetic makeup.[154]

While the debate over human cloning seemed very theoretical until the past few years, as cloning technology has improved, the possibility of human cloning has become less remote. As may have been expected, a plan to actually clone a human being became reality in early 1998. A scientist in the United States, Dr. Richard Seed, announced that he has assembled a team of doctors that are prepared to attempt to clone a human being.[155] Dr. Seed claims to have several people willing to be cloned, and while some commentators doubt that he would follow through with his plan to clone a human being, they believe that he has the technical and entrepreneurial expertise, as well as the "philosophical commitment to radical science," to accomplish his goal.[156] Dr. Seed theorizes that cloning clinics could be set up worldwide to produce some 200,000 babies a year.[157] It is debatable whether such a daunting task as cloning a human being could be successful today, but Dr. Seed's claims make it clear that there are some scientists that are willing (and possibly able) to push cloning technology to the ultimate level of the human being. However, as Mark Sauer, chief of reproductive endocrinology at Columbia-Presbyterian Medical Center in New York stated: "There's little question that [human cloning] can be done. The question is should it be done."[158]

The Japanese government has acted in response to human cloning issues. An advisory panel to Japan's Education Minister recently proposed "that Japan ban studies that may lead to human cloning, with a condition to revise the position within three years."[159] Some fear has emerged that a ban on human cloning will cause the technology to "simply be driven

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153. Carey, *supra* note 125, at 32.

154. *See* Spotts & Marquand, *supra* note 129, at 3.

155. *See* Rick Weiss, *Scientist Plans to Clone Humans*, WASH. POST, Jan. 7, 1998, at A03. Dr. Richard Seed is a scientist from Chicago, Illinois, who has been active in various kinds of fertility research. *See id.*

156. *Id.*

157. *See Ethics*, TIMARU HERALD, Sept. 14, 1998, *available in* 1998 WL 8248492.

158. Weiss, *supra* note 155, at A03.

159. *Ministry Panel Urges Ban on Cloning of Human Beings*, JAPAN SCI. SCAN, Aug. 3, 1998, *available in* 1998 WL 8029788. The current Education Minister of Japan is Nobutaka Machimura. *See id.*

underground, where the possibility of unsafe, unregulated, and exploitive misuse is far more likely."[160] Critics of the proposed ban postulate that "[t]he great falsehood here is that research will go away."[161] In addition, in an interim report released in June of 1998, Japan's Science and Technology Council called for the strict regulation of human cloning, but at the same time supported the advancement of cloning technology in general.[162] In spite of criticism and alternative proposals, in August of 1998, the Science Council of the Japanese Education Ministry "drafted the government's official guidelines that ban research into human cloning."[163]

VII. HUMAN CLONING WILL NOT BE ALLOWED IN JAPAN AS IT IS CONTRARY TO JAPANESE MORALITY

The official position of the Japanese government is that human cloning is unacceptable for moral and ethical reasons.[164] However, determining why human cloning is contrary to morality in Japan is no easy task.

Cloning is not contrary to morality in Japan because the thought of a human clone living in society is contrary to Japanese morality in and of itself. Genetically identical individuals already exist in society in the form of identical twins.[165] Identical twins ultimately end up somewhat different from each other,[166] and a human clone would develop differently than its "twin," ending up far more different from its twin than an identical twin

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160. Carey, *supra* note 125, at 32 (quoting Rabbi Barry Freundel).

161. *U.S. News in Brief*, *supra* note 127 (quoting David Adamson, the Society for Assisted Reproductive Technology).

162. *See* Asako Saegusa, *Japanese Fear That New Publicity Rules Could Hinder Their Research*, NATURE JAPAN, July 30, 1998 (visited Oct. 1, 1998) <http://www.naturejpn.com/newnature/news/news300798a.html>.

163. *See* Watts, *supra* note 147, at 465. The Japanese ban on human cloning goes beyond the strict regulation of cloning suggested by the Science and Technology Council by banning any transplantation of fertilized human embryos. *See id.*

164. *See id.*

165. Identical or monozygotic (one-egg) twins are genetically identical because they are initially created from one fertilized egg which splits, giving each twin the same genetic material.

166. While they may have the same genetic material, even monozygotic twins will ultimately have physical and emotional differences. Development of individual organs in each twin while in the womb of the mother will be slightly different as well. *See* George Johnson, *Don't Worry: A Brain Still Can't Be Cloned*, *in* FLESH OF MY FLESH: THE ETHICS OF CLONING HUMANS 9, 10 (Gregory E. Pence ed., 1998). Such differences are very subtle — subtle enough to make the organs interchangeable between the twins with no noticeable effect. *See id.* at 10. Personality and emotional differences stem from the fact that the brain of each twin will develop with incredibly slight differences. *See id.* at 10-11. These tremendously slight differences, such as the pattern in which brain cells are arranged, can make one twin ultimately interested in different stimuli than the other. *See id.*

born at the same time would from its twin.[167] Furthermore, the fact that identical twins have the same genetic constitution does not prevent the twins from developing their own individual identities, in spite of the fact that the twins grow up in very similar environments.[168] As one commentator noted: "To be human is not the simple summation of genetic, biochemical or physiological processes. Consciousness and knowledge do not exist in our genes; they emerge out of the interaction between individuals and human society."[169] It logically follows that a clone has the same chance to develop its own individual identity, and "its genetic constitution does not predestine it to the limited status of a 'copy.'"[170] Genetically identical twins are not discriminated against or viewed as un-human, suggesting that having genetically identical human beings is not per se unethical.[171]

The violation of morality stems from deeply-rooted tradition and cultural and religious factors. Perhaps human cloning is contrary to Japanese morality because of the concept of the "soul." Shinto provides at least a vague notion of the "soul" to its followers in Japan.[172] Buddhism recognizes an inner soul that is both unique to the individual and universal at the same time, where one can find "an ultimate reality which transcends all individual differences."[173] Within the realm of science, "[e]ven a hard-core materialist might agree that, in . . . [a] sense, everyone has a soul."[174] Apprehension toward human cloning may stem from the notion that a human being created by cloning either does not have a soul or has a soul that is less unique than a human being conceived sexually because of the genetic sameness. The concept of "soul" does not provide the answer however.

Once again drawing the comparison to identical twins born at the same time, commentators have argued that a human clone would have no less of a soul than a human who develops as a result of a sexual act because it would be absurd to argue that an identical twin has less soul than its

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167. A cloned individual could end up far different from its twin because of the potential for lapse of time between their births and the differences in environmental and parental influences. *See supra* note 141 and accompanying text. *See also* KURT BAYERTZ, GENETHICS: TECHNOLOGICAL INTERVENTION IN HUMAN REPRODUCTION AS A PHILOSOPHICAL PROBLEM 146 (Sarah L. Kirkby trans., 1994) (arguing additional differences between clones and their twins stem from differing embryotic development and environmental factors both inside and outside of the womb).

168. *See* Johnson, *supra* note 166, at 11.

169. Jonathan King, *Cloning Sheep: Converting Life Forms Into Corporate Property* (visited Sept. 21, 1998) <http://www.purefood.org/patprop.html>.

170. BAYERTZ, *supra* note 167, at 146.

171. *See Ethical Aspects of Cloning Techniques*, 23 J. MED. ETHICS 349 (1997).

172. *See supra* notes 94-95 and accompanying text.

173. ANESAKI, *supra* note 88, at 209.

174. Johnson, *supra* note 166, at 11.

sibling.[175] Also, Shinto and Buddhism both carry notions that human beings and the rest of nature are interwoven and that nature deserves a certain level of reverence and respect just like human beings.[176] This proposition raises the question of why human cloning and the patents involved are contrary to morality in Japan, while cloning of other animals and the related patents are not.

The answer could lie in the fundamental differences that the Japanese perceive as setting human beings apart from the rest of the animal world. Human beings have the capacity for self-consciousness. Self-consciousness "permits a being to reflect on itself from an external vantage point,"[177] which ultimately allows humans to think of themselves as part of a larger whole.[178] Recognizing one's self as part of this larger whole allows humans to view the interacting forces that exist in the world and to use these forces to their benefit.[179] The Japanese are also very cognizant of the fact that human beings have the intellectual capacity for religion, which plays an important role in determining the "'essence' of human nature."[180] While this explains why animal cloning patents are allowed in Japan but human cloning patents would not be, it does not completely address why human cloning is contrary to Japanese morality.

The most likely answer to why human cloning is contrary to morality in Japan comes from the deeply rooted reverence for human life that the Japanese exhibit. One historical source of this reverence is religion. Shinto stresses a reverence for life and an appreciation of the beauty and awesomeness of nature.[181] Buddhism teaches of a world made of unique individuals which ultimately make up one family.[182] Other religious influences[183] contribute to overall reverence for the human being in Japan as well.[184] The combination of these approaches creates the sense that a cloned human being crosses the line and steps outside of the beauty, individuality,

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175. *See* MCKINNEL, *supra* note 25, at 112-13.

176. *See* Kasulis, *supra* note 106 and accompanying text.

177. Matthew Hallinan, *Biological Evolution and the Emergence of a Cultural Being*, *in* CULTURAL PERSPECTIVES ON BIOLOGICAL KNOWLEDGE 63, 86 (Troy Duster & Karen Garrett eds., 1984).

178. *See id.*

179. *See id.*

180. WINSTON DAVIS, JAPANESE RELIGION AND SOCIETY 229-30 (1992).

181. *See supra* notes 87-90 and accompanying text.

182. *See supra* notes 99-100 and accompanying text.

183. *See supra* note 107 and accompanying text.

184. The Catholic Church, for example, contributes to this reverence. In fact, the Catholic Church, which has a following of about 500,000 in Japan, has issued a statement on human cloning, which takes the position that the creation of human beings belongs to God, and is not the right of human beings themselves. *See* Statement of the Standing Committee of the Catholic Bishops' Conference of Japan, *Concerning Research on Human Cloning* (visited Oct. 1, 1998) <http://www02.so-net.or.jp/~catholic/ EDOC/ CLONING.htm>.

and sense of worth and dignity that is unique to human beings, suggesting that human life should not be tampered with in such a way.

Another factor to be considered is the position of the government. The Japanese government plays a prominent role in determining moral norms in Japan. This premise stems in part from the fact that Japan is an Asian-style democracy, and thus, public opinion is rarely an influential determinant of public policy.[185] The Prime Minister of Japan has emphasized the need for respect of human life and dignity, especially in human scientific research.[186] In addition, Japan's Science and Technology Council has stated that human cloning is contrary to a common view of human life held by the Japanese because it uses human beings as tools to achieve research objectives.[187] Whatever the reason that human cloning is contrary to morality in Japan, this broad assertion carries very serious consequences in the scientific community.

The June 1998 report of Japan's Science and Technology Council requires "information about all mammalian cloning research to be made public before the animal is born."[188] Researchers in Japan are opposed to legal regulations on experimentation, fearing that this requirement could "jeopardize the international impact of their work."[189] Such disclosure may have an impact on the patentability of their work as well, which could drive private industry away from cloning research. Companies will not spend vast amounts of time and money on research which cannot provide the protection and financial benefits of a patent.

A better solution to requiring disclosure of mammalian cloning or an outright ban on human cloning would be to use the patent law to regulate the research. The Japanese patent law system already provides an effective mechanism to regulate human cloning research. Because of the value of patents in Japan, research efforts into human cloning or any other type of cloning for that matter will likely be abandoned if they cannot produce patentable inventions.[190] Patents are extremely valuable in both the private and corporate structures of Japan.[191] Patents will not be issued in Japan for inventions that are contrary to morality.[192] Since religious, cultural, and governmental influences have made human cloning contrary to morality in Japan, the patent law can effectively regulate human cloning by itself. If the

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185. *See* Macer, *supra* note 18, at 89.

186. *See* Prime Minister's Report, *supra* note 8, ch. 1(3)(b).

187. *See Government Panel Urges Controls on Cloning of Human Beings*, JAPAN SCI. SCAN, June 22, 1998, *available in* 1998 WL 8029773.

188. Saegusa, *supra* note 162.

189. *Id.*

190. *See supra* notes 55-57 and accompanying text.

191. *See supra* notes 54-56 and accompanying text.

192. *See* Japan Patent Law, art. 32(2). *See also supra* note 70 and accompanying text.

Japanese view on the morality of human cloning should change, the use of the patent law system to regulate cloning research will mean that no governmental action or reform will be necessary, which would not be the case if governmental bans or restrictions are imposed today.

An outright ban on human cloning research will preclude any technological advances in the field that may someday prove to have serious significance to the human race. One criticism of cloning at the organism level is that it has not yet been proven safe, but there is no way to prove a technology safe or unsafe if it is banned outright. Also, some individuals have argued that to clone one's self is a fundamental right.[193] While outside the scope of the morality argument of this note, the fundamental right argument certainly deserves attention and could become central as cloning technology improves. At a minimum, from a legal standpoint it seems clear that "human cloning should be governed by the same laws that now protect human rights[, because a] world not safe for cloned humans would be a world not safe for the rest of us."[194] For now, the best alternative is to allow the patent law system to regulate and control this technology because of the importance of the patent to researchers in Japan.

VIII. CONCLUSION

For millions of years, species have been coming and going from the Earth. There is an evolutionary reason why human beings inhabit the planet today, but we there is also an evolutionary reason why the vast majority of the species that have ever inhabited the earth are no longer here. While cloning technology may be viewed by some as a way of achieving species immortality in a sense, nature still has and always will have the ultimate say in what species survive. Human destiny is ultimately in the hands of a power which is far beyond the reach of human control.

It is no longer the case that only God can make a tree. Human beings can now make just about anything using modern scientific techniques and may soon be able to even make a human being who is the identical genetic copy of another. As the bounds of science are nearly limitless, we can assume that someday this technology may be perfected. For now, we must seriously consider the ramifications of such technology and address the difficult issue of whether human beings should pursue human cloning technology. Perhaps there is no explanation as to why human cloning should

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193. *See supra* note 154 and accompanying text. *See also* Elshtain, *supra* note 132, at 25.

194. Ruth Macklin, *Human Cloning? Don't Just Say No. Sure, It's a New Technology. But There's No Evidence Yet That It's Harmful*, U.S. NEWS & WORLD REP., Mar. 10, 1997, *available in* 1997 WL 8331694.

not be allowed. Perhaps human cloning just crosses a line which will never be crossed. Such lines were crossed when atomic bombs were dropped and when man walked on the moon. It is entirely possible that the barriers preventing human cloning may soon be crossed. While we may have the relatively easy task of debating human cloning issues at the theoretical level today, human cloning will become more of an issue as cloning technology evolves, and it may be a reality in many of our lifetimes.

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* J.D. Candidate, 2000, Indiana University School of Law — Indianapolis; B.S., 1995, Indiana University — Bloomington. The author wishes to dedicate this note to his parents, David and Karen Borowski, in gratitude for their constant love, support, and encouragement. The author would also like to thank his wife, Angie, for her unconditional love, support, and patience.