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## The Woolly-Mammoth in the Room: The Patentability of Animals Brought Back from Extinction Through Cloning and Genetic Engineering

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THE WOOLLY-MAMMOTH IN THE ROOM: THE  
PATENTABILITY OF ANIMALS BROUGHT BACK FROM  
EXTINCTION THROUGH CLONING AND GENETIC  
ENGINEERING

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ABSTRACT

*Advances and success in cloning and genetic engineering may mean passenger pigeons, dodos, gastric-brooding frogs, thylacines, woolly mammoths, and other extinct species will once again grace this planet. As de-extinction becomes a reality, it is uncertain whether these animals are patent eligible. Diamond v. Chakrabarty opened the door to cloning multicellular organisms. Since then, the U.S. Patent Office's Board of Patent Appeals and Interferences has found "non-naturally occurring, man-made organisms including animals" to be patentable subject matter under 35 U.S.C. § 101. Because the initial case challenging this decision failed on procedural grounds, the underlying legal issue has not been addressed in a federal court. Congress forbids patents directed at, or encompassing, human organisms, but has been silent with respect to animals. The Supreme Court holds that sections of naturally occurring DNA are not patent eligible, while non-naturally occurring synthetic strands are. But the*

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\* Miriam Ricanne Swedlow, University of Washington School of Law Class of 2016. Thank you to Professor Gomulkiewicz for your advice and direction, S. Nowak and E. Peyser for your expertise and insight, N. Hodjat for fearlessly steering the ship, R. Hammond for your enthusiastic encouragement, and my husband and five children for your support, love, inspiration, and much needed amusement.

*Court has not considered organisms created from both naturally occurring and synthetic DNA, as would be the case in de-extinction. The Federal Circuit upheld a decision denying a patent for Dolly the cloned sheep, yet left room for successful patents of other cloned animals. The Federal Circuit's distinction may lie between patenting the clone of an animal that already exists and patenting an animal that does not or no longer exists. In light of ever-changing science and technology, there are few clear boundaries of what organisms can or cannot be patented. Practitioners need to be aware of the boundaries and the gray areas in the existing law to navigate a path towards patentability of de-extinct species.*

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## INTRODUCTION

The ability to successfully reintroduce a previously extinct animal is no longer confined to the pages of Jurassic Park.<sup>1</sup> The de-extinction movement is beginning to bring species back from extinction, through cloning and genetic engineering. In 1996, scientists successfully cloned a complex mammal, Dolly the sheep.<sup>2</sup> Seven years later, Spanish and French scientists harvested DNA from the recently extinct Pyrenean ibex (the Spanish burcardo) and became the first scientists to clone an extinct animal.<sup>3</sup> Earlier this year, geneticists inserted the DNA of a woolly mammoth into lab-grown elephant cells.<sup>4</sup>

The motivation behind de-extinction is both pragmatic and fanciful. Supporters of de-extinction argue that species reintroduction carries the potential of medical and pharmaceutical discoveries.<sup>5</sup> De-extinction allows for preservation and re-establishment of ecosystems in danger of or already lost to extinction.<sup>6</sup> Humanity is remorseful over the species that have been lost. There is a powerful and compelling desire to see animals that only exist in museums and the pages of books, alive and returned to the wild.

Skeptics point to the instability of reintroducing an animal species into an environment no longer hospitable to its survival.<sup>7</sup> They caution that bringing back species may decrease the urgency

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<sup>1</sup> MICHAEL CRICHTON, *JURASSIC PARK* (1990).

<sup>2</sup> ROSLIN INST., U. EDINBURGH, *Dolly the Sheep: A Life of Dolly*, <http://www.roslin.ed.ac.uk/public-interest/dolly-the-sheep/a-life-of-dolly/> (last updated Apr. 7, 2015).

<sup>3</sup> Carl Zimmer, *Bringing Them Back to Life*, NAT'L GEO. (Apr. 2013), available at <http://ngm.nationalgeographic.com/2013/04/125-species-revival/zimmer-text>.

<sup>4</sup> Tanya Lewis, *Woolly Mammoth DNA Inserted into Elephant Cells*, LIVE SCI. (Mar. 26, 2015, 5:42 PM), <http://www.livescience.com/50275-bringing-back-woolly-mammoth-dna.html>.

<sup>5</sup> Zimmer, *supra* note 3.

<sup>6</sup> *Id.*

<sup>7</sup> Stuart Pimm, *Opinion: The Case Against Species Revival*, NAT'L GEOGRAPHIC NEWS (Mar. 12, 2013), <http://news.nationalgeographic.com/news/2013/03/130312--deextinction-conservation-animals-science-extinction-biodiversity-habitat-environment>.

of protecting fragile ecosystems, and warn about unintended consequences of interfering with established ecosystems.

The methods used for de-extinction are patent eligible, but patent eligibility for the re-created animals themselves is uncertain. This Article examines the potential for obtaining patents on extinct animals that have been re-created through cloning and genetic engineering. First, it explores the evolution of patent protection for living organisms. Next, it explores the scientific techniques currently being used to bring extinct species back into existence. Finally, it discusses the probability and potential hurdles to obtaining a patent on a re-created animal. Ultimately, successful applications for patents on these animals must first demonstrate that the resulting animal has characteristics (structural, functional, or otherwise) that are different from its extinct predecessor.

## I. LIVING ORGANISMS AND 35 U.S.C. § 101

### *A. Non-Naturally Occurring Plants Are Patent Eligible Material*

Title 35, Section 101 of the U.S. Code defines patentable inventions as “any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof . . . .”<sup>8</sup> The Plant Patent Act of 1930 establishes that living organisms are not precluded from patent eligibility.<sup>9</sup> The Act specifies that “[w]hoever invents or discovers and asexually reproduces any distinct and new variety of plant” can obtain a patent on it.<sup>10</sup> In passing the legislation, Congress explained that the work of “the plant breeder ‘in aid of nature’ was patentable invention.”<sup>11</sup> But in 1948, the United States Supreme Court held that naturally occurring, living organisms are not patentable, regardless of whether they are selected or mixed in a way not found in nature.<sup>12</sup> In *Funk Bros.*, a manufacturer sought a patent

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<sup>8</sup> 35 U.S.C. § 101 (2006).

<sup>9</sup> 35 U.S.C. § 161 (2006).

<sup>10</sup> *Id.*

<sup>11</sup> *Id.* at 312 (quoting S. REP. NO. 315, at 6–8 (1930) (Conf. Rep.); H.R. REP. NO. 1129, at 7–9 (1930) (Conf. Rep.)).

<sup>12</sup> *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948).

for a mixture of strains of bacteria that helped certain plants extract nitrogen from the air and fix it into the soil.<sup>13</sup> The Court held that the mixture was not eligible for a patent because the bacteria used in it was scientifically unaltered and found in nature.<sup>14</sup> Congress later sanctioned patent protection for certain sexually reproduced plants with the 1970 Plant Variety Protection Act.<sup>15</sup>

### *B. The Supreme Court Expands the Scope of Patent Eligible Organisms*

*Diamond v. Chakrabarty* challenged the United States Patent and Trademark Office's ("USPTO") denial of certain bacteria patent claims. The USPTO reasoned that bacteria were precluded from patent eligible material under § 101 because (1) microorganisms are "products of nature" and (2) living things are not patent eligible.<sup>16</sup> The Supreme Court rejected this reasoning, concluding that the statutory category of "composition of matter" includes living organisms and is not limited by the Plant Protection and Plant Variety Protection Acts.<sup>17</sup> Furthermore, the Court held that science and technology are not precluded patent protection simply because such methods were not conceptualized when §101 was enacted.<sup>18</sup>

Shortly after the *Chakrabarty* ruling, the USPTO issued two rulings through its Board of Patent Appeals and Interferences ("B.P.A.I."), expanding the definition of patentable subject material. In the first, *Ex parte Hibberd*, the B.P.A.I. held that entire plants and tissue cultures are patentable subject material.<sup>19</sup> A few years later in *Ex parte Allen*, the B.P.A.I. established that non-naturally occurring animals are patent eligible.<sup>20</sup>

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<sup>13</sup> *Id.*

<sup>14</sup> *Id.* ("[P]atents cannot issue for the discovery of the phenomena of nature.").

<sup>15</sup> *Diamond v. Chakrabarty*, 447 U.S. 303, 313 (1980).

<sup>16</sup> *Id.* at 306.

<sup>17</sup> *Id.* at 311.

<sup>18</sup> *Id.* at 318.

<sup>19</sup> *Ex Parte Hibberd*, 227 U.S.P.Q 443, 1985 WL 71986 (B.P.A.I. Sept. 24, 1985).

<sup>20</sup> *Ex Parte Allen*, No. 86-1790, 1987 WL 123816 (B.P.A.I. Apr. 3, 1987),

The USPTO followed these rulings with a notice reiterating that “[t]he Patent and Trademark Office now considers non-naturally occurring, nonhuman, multicellular, living organisms, including animals, to be patentable subject matter.”<sup>21</sup> The USPTO placed a moratorium on granting subsequent patents on animals to give Congress time to debate the issues involved, weigh concerns from the public, and prescribe changes to the laws.<sup>22</sup> No such hearings occurred.

Eight months later, the USPTO lifted the moratorium and issued the first patent for a genetically modified animal: “the Harvard mouse.”<sup>23</sup> The Harvard mouse triggered public concern and outrage.<sup>24</sup> The controversy over this patent led animal rights organizations and concerned farmers to challenge the USPTO’s interpretation of the patent statute.<sup>25</sup> Legal action was initiated, but the case was dismissed on standing grounds.<sup>26</sup> To date, the Supreme Court has not addressed the substantive question of whether transgenic animals should be patentable.

### C. *The Boundaries of Obtaining Patents on Living Organisms*

#### 1. Products of Nature Are Not Patent Eligible Subject Matter

The scope of patentable subject matter in the United States is not without limits. Laws of nature, principles, physical phenomena, abstract ideas, and products of nature are not patent eligible.<sup>27</sup> In particular, the Product of Nature doctrine prevents things already existing in nature from being patentable subject matter. However, it is not clear what falls within the scope of being a “product of

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*aff’d*, 846 F.2d 77 (Fed. Cir. 1988).

<sup>21</sup> Animals – Patentability, 1077 Off. Gaz. Pat. & Trademark Office 24 (Apr. 21, 1987).

<sup>22</sup> 36 PAT. TRADEMARK & COPYRIGHT J. (BNA) No. 888, at 271–72 (1988).

<sup>23</sup> U.S. Patent No. 4,736,866 (filed June 22, 1984) (issued Apr. 12, 1988).

<sup>24</sup> Elizabeth Hecht, Note, *Beyond Animal Legal Defense Fund v. Quigg: The Controversy Over Transgenic Animal Patents Continues*, 41 AM. U. L. REV. 1023, 1041–44 (1992).

<sup>25</sup> *Animal Legal Def. Fund v. Quigg*, 932 F.2d 920 (Fed. Cir. 1990).

<sup>26</sup> *Id.*

<sup>27</sup> *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980).

nature.” In the wake of *Chakrabarty*, courts apply the doctrine as an inquiry into whether a naturally occurring product has been changed or altered to the extent that the claimed form does not exist in nature.<sup>28</sup> This effectively limits what is a non-patent eligible, “product of nature.” The Supreme Court emphasizes that “the relevant distinction [is] not between living and inanimate things, but between products of nature, whether living or not, and human-made inventions.”<sup>29</sup> A composition of matter that occurs in nature will be considered patentable if given a new form, quality, properties, or combination not present in the original article.<sup>30</sup> Anything can be deemed “made by man” so long as it does not occur naturally without the interference of man. In *Funk Bros. and Chakrabarty*, the Supreme Court offers examples of what is and what is not a product of nature, but the distinction is murky and not easily defined.<sup>31</sup>

After *Chakrabarty*, the Product of Nature doctrine does not present a significant hurdle to patent eligibility in the USPTO or the courts. The USPTO began granting patents on naturally occurring DNA sequences that were “isolated” or “purified,” arguing that excised genes do “not occur in that isolated form in nature” and the “purified state is different from the naturally occurring compound.”<sup>32</sup> In 2013, the USPTO’s stance was challenged in *Ass’n for Molecular Pathology v. Myriad Genetics, Inc.* Relying on the Product of Nature doctrine, the Supreme Court held that naturally occurring, isolated DNA segments are not

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<sup>28</sup> Jerzy Koopman, *The Patentability of Transgenic Animals in the United States of America and the European Union: A Proposal for Harmonization*, 13 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 103, 123 n.79 (2002) (quoting E.S. VAN DE GRAAF, PATENT LAW AND MODERN BIOTECHNOLOGY: A COMPARATIVE STUDY ABOUT THE REQUIREMENTS AND THE SCOPE OF PROTECTION 28 (1997)).

<sup>29</sup> *J.E.M. Ag Supply, Inc. v. Pioneer HI-Bred Int’l, Inc.*, 534 U.S. 124, 134 (2001) (quoting *Diamond v. Chakrabarty*, 447 U.S. 303, 311–12 (1980)).

<sup>30</sup> *Chakrabarty*, 447 U.S. at 308.

<sup>31</sup> See, e.g., *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127 (1948) (finding that mixing together pre-existing bacteria in a manner that is not found in nature is still a product of nature); *Diamond v. Chakrabarty*, 447 U.S. 303 (1980) (finding that inserting DNA into bacteria to produce an organism that is not found in nature is not product of nature).

<sup>32</sup> Utility Examination Guidelines, 66 Fed. Reg. 1092, 1093, I(2) (Jan. 5, 2001).

patent eligible although, non-naturally occurring synthetic segments of DNA are.<sup>33</sup>

## 2. Cloned Organisms Are Generally Not Patentable Subject Matter

In general, cloned animals are not patent eligible. The Federal Circuit Court of Appeals upheld the USPTO's denial of a patent application for the first cloned mammal, Dolly the sheep.<sup>34</sup> The court based its ruling on the fact that Dolly is an exact genetic replica of an existing animal; therefore, her "genetic identity to her donor parent renders her unpatentable."<sup>35</sup> Despite the ruling, the decision leaves potential for obtaining patents on cloned animals. The court specifies that "having the same nuclear DNA as the donor mammal may not necessarily result in patent ineligibility in every case," emphasizing that at a minimum the clone must have "markedly different characteristics from the donor" of which it is a copy.<sup>36</sup>

Success in genetic engineering and advances in cloning have opened the possibility of bringing species of animals back from extinction, raising questions about whether these animals will be patent eligible under existing patent law. These re-created animals previously existed in nature but as a result of human behavior, or other events, are now extinct and no longer exist in nature. Their re-creation is entirely dependent upon the intervention of man with the ultimate goal of creating a genetic match to the original species. The process fails to fall neatly within the Product of Nature doctrine, pushing at its already tenuous boundaries.

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<sup>33</sup> Ass'n for Molecular Pathology v. Myriad Genetics, Inc., 133 S. Ct. 2107, 2115–20 (2013).

<sup>34</sup> *In re Roslin Inst.*, 750 F.3d 1333 (Fed. Cir. 2014).

<sup>35</sup> *Id.* at 1337.

<sup>36</sup> *Id.* at 1339.

## II. THE SCIENCE OF DE-EXTINCTION

### A. Cloning As a Tool For De-Extinction

De-extinction through cloning begins with the removal of DNA from the preserved tissue specimen of an animal. The original DNA must be intact and without any deterioration.<sup>37</sup> The DNA is placed into the nucleus of a reproductive egg from another animal that has been cleared of its own genetic material.<sup>38</sup> The cell is manipulated to begin dividing and eventually the embryo is placed into a surrogate mother of a compatible species.<sup>39</sup> The resulting animal is the genetic twin of the donor animal.

Part of the difficulty of cloning extinct animals is the fact that DNA typically undergoes some level of decay, depending on how long the species has been extinct. Animals recently extinct or at-risk of extinction are the best candidates for cloning. The DNA used with the Pyrenean ibex clone in Spain was obtained from the last living ibex, Celia, shortly after she died.<sup>40</sup> Nonetheless, the fragility of DNA limits the broad application of cloning as a means for de-extinction.

### B. Genetic Engineering of Extinct Species

Genetic engineering techniques address the problems of DNA decay in extinct animals. Scientists compare the mapped DNA obtained from extinct animals with the DNA of similar, non-extinct animals to identify key mutations that differentiate the two species.<sup>41</sup> Germ cells are stimulated from the similar or compatible species.<sup>42</sup> Strands of DNA matching the extinct animal are

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<sup>37</sup> Brian Switek, *How to Resurrect Lost Species*, *NAT'L GEOGRAPHIC NEWS* (Mar. 11, 2013), <http://news.nationalgeographic.com/news/2013/13/130310-extinct-species-cloning-deextinction-genetics-science>.

<sup>38</sup> *Id.*

<sup>39</sup> *Id.*

<sup>40</sup> Zimmer, *supra* note 3.

<sup>41</sup> *Id.*

<sup>42</sup> Nathaniel Rich, *The Mammoth Cometh*, *N.Y. TIMES MAG.* (Feb. 27, 2014), [http://www.nytimes.com/2014/03/02/magazine/the-mammoth-cometh.html?\\_r=1](http://www.nytimes.com/2014/03/02/magazine/the-mammoth-cometh.html?_r=1).

synthetically created and then “cut and pasted” into the DNA in the germ cells of the similar species in order to make it function like the extinct animal’s DNA.<sup>43</sup> These germ cells are placed into an embryo of the compatible species integrating into that animal’s reproductive organs.<sup>44</sup> The embryo will grow normally, but it now carries eggs or sperm of the reconstructed extinct animal.<sup>45</sup> Breeding two of these “chimeras” will result in the birth of the once extinct animal.<sup>46</sup>

Genetically restored extinct animals could be a reality by 2020 and clones of recently extinct animals could exist sooner.<sup>47</sup> Although patent eligibility of de-extinct animals is uncertain, patent eligibility for the processes of de-extinction is not in question. Dolly is not patent eligible, but the Roslin Institute holds a patent on the method used to clone her.<sup>48</sup> The question remains: can the genetic re-creation of an animal that previously existed in nature be patent eligible?

### III. THE PROBABILITY OF PATENT ELIGIBILITY

An animal generated through the de-extinction process could be deemed patent eligible. The re-created animal will not be an exact genetic copy of an animal that already exists and will have different structural characteristics than the original species. Therefore, no precedent forbids it and the trend of patent law is permissive in this area.

#### *A. The Arguments in Favor of Patent Eligibility*

Re-created extinct animals will have markedly different characteristics than the original animal, rendering them an exception to the Product of Nature doctrine and therefore, patent eligible. Patents are currently granted for transgenic animals

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<sup>43</sup> *Id.*

<sup>44</sup> *Id.*

<sup>45</sup> *Id.*

<sup>46</sup> *Id.*

<sup>47</sup> Zimmer, *supra* note 3.

<sup>48</sup> *In re Roslin Inst.*, 750 F.3d 1333 (Fed. Cir. 2014).

created for medical and scientific research.<sup>49</sup> Furthermore, the Federal Circuit's Dolly ruling left potential for obtaining a patent on a cloned animal.<sup>50</sup> Minor differences of the extinct animal's DNA or cellular structure are likely to be enough to demonstrate that the new animal is distinct from the parent organism. The fragile nature of extinct animal DNA allows for multiple avenues of differentiation from the original animal.

*Myriad's* ruling that non-naturally occurring synthetically produced strands of DNA are patentable supports the patent eligibility of extinct animals.<sup>51</sup> Transgenic de-extinction processes depend on creating synthetic strands of DNA and splicing them together with naturally occurring DNA to replicate the DNA structure of the extinct animal. Although the goal is to replicate the extinct animal's DNA, it will not create a naturally occurring genome. Indeed, the degradation of the original species' DNA makes it impossible to determine how close or different the two genomes are.

The fact that the resultant animal is a re-creation of an animal that *no longer exists naturally* further lends support to its patent eligibility. The state of being extinct may place the animal outside the category of a "product of nature." An extinct animal's species by definition does not exist in nature. As such, it is no longer naturally occurring. The re-created animal is fundamentally distinct because it cannot be compared to a current composition in nature.

The hurdle for obtaining patents on an animal brought back through de-extinction is whether it will fall outside the Product of Nature doctrine. Re-created extinct animals will likely fall outside the Products of Nature doctrine because they are distinctly

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<sup>49</sup> See, e.g., U.S. Patent No. 4,736,866 (filed June 22, 1984) (transgenic non-human eukaryotic animal whose germ cells and somatic cells contain active oncogene sequence); U.S. Patent No. 5,574,206 (filed Aug. 24, 1994) (transgenic mouse used for HIV research); U.S. Patent No. 5,602,301 (filed Nov. 16, 1994) (animal with successful graft specific to myocardial tissue); U.S. Patent No. 7,550,649 (filed Oct. 28, 2004) (transgenic mouse used in Parkinson's Disease research).

<sup>50</sup> *In re Roslin Inst.*, 750 F.3d 1333 (Fed. Cir. 2014)

<sup>51</sup> *Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 133 S. Ct. 2107, 2115–2120 (2013).

different than a naturally occurring animal. For the above reasons, initial animals produced as a result of de-extinction processes will likely be deemed patent eligible subject matter under current U.S. patent law.

### *B. The Arguments Against Patent Eligibility*

Granting patents for animals has not been without controversy. Many groups are concerned about the potential ramifications of allowing animals to be patented as evidenced in the Animal Legal Defense Fund suit. Growing discontent in corporate ownership of plant patents has increased public skepticism of “owning” living organisms.<sup>52</sup> Obtaining patents on animals intended for release into nature is likely to be met with more resistance and challenge.

Despite the likelihood that de-extinct animals will be deemed patent eligible subject matter under existing law, the scope of such patent protection is unclear. Patents for the first generation of organisms may survive the Products of Nature doctrine, but what about their offspring? The patent eligibility for the offspring of two transgenic re-created animals could be ripe for controversy under the Products of Nature doctrine. Can a wild animal, born of natural sexual reproduction fall outside the definition of a “product of nature” simply because its progenitor was the result of genetic engineering?

### *C. The Novelty of Re-Creation*

Although transgenic animals may meet the criteria for patentable subject matter, there may be other barriers to obtaining

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<sup>52</sup> See, e.g., *Campaigns – Animal Patents*, AMERICAN ANTI-VIVISECTION SOCIETY, <http://aavs.org/our-work/campaigns/animal-patents> (last visited Dec. 20, 2015); *About no patents on seeds*, NO PATENTS ON SEEDS, <https://no-patents-on-seeds.org/en/about-us/about-no-patents-seeds> (last visited Dec. 3, 2015); and Andrew B. Perzigian, *Detailed Discussion of Genetic Engineering and Animal Rights: The Legal Terrain and Ethical Underpinnings*, ANIMAL LEGAL AND HISTORICAL CENTER, MICH. ST. UNIV. COLLEGE OF LAW (2003), available at <https://www.animallaw.info/article/detailed-discussion-genetic-engineering-and-animal-rights-legal-terrain-and-ethical> (last visited Dec. 3, 2015).

patent protection. Patent eligibility requires the invention be new, non-obvious, and useful in addition to being patentable subject matter.<sup>53</sup> A patent cannot be obtained if “the claimed invention was . . . otherwise available to the public before the filing date of the claimed invention.”<sup>54</sup> Additionally, a patent will be denied “if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains.”<sup>55</sup> The core purpose of de-extinction is to bring back an animal that previously existed in nature. Many of the arguments justifying transgenic animals as patent eligible subject matter extend to defending that they are new and non-obvious, but a full discussion of this issue exceeds the scope of this Article.

In many ways the movement to re-create previously extinct animals underscores the purpose of the patent system “[t]o promote the Progress of Science and useful Arts . . . .”<sup>56</sup> Scientists and visionaries are actively collaborating to push the boundaries of science for the benefit of humanity. Patent protection creates further incentive to engage and invest in biotechnology. In exchange for the limited monopoly granted by a patent, the public is rewarded by the re-introduction of unique and beneficial species and the disclosure of how they were created.<sup>57</sup> Despite these benefits, successful recreation of a previously extinct animal is likely to generate public debate and scrutiny. In the face of public pressure, Congress has the ability to draft legislation to explicitly allow or limit patent eligibility for animals. For example, in the 2011 America Invents Act, Congress put limitations on patentability for human organisms.<sup>58</sup> With enough pressure and

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<sup>53</sup> See, e.g., 1-3 CHISUM ON PATENTS § 3.01 (2015); 1-4 CHISUM ON PATENTS § 4.01(2015); 1-5 CHISUM ON PATENTS § 5.01 (2015).

<sup>54</sup> 35 U.S.C. § 102 (a)(1) (2000).

<sup>55</sup> 35 U.S.C. § 103.

<sup>56</sup> U.S. CONST. art. I, § 8, cl. 8.

<sup>57</sup> JOHN G. SPRANKLING & RAYMOND R. COLETTA, PROPERTY: A CONTEMPORARY APPROACH (2nd ed. 2012).

<sup>58</sup> Leahy-Smith America Invents Act (AIA), Pub. L. 112-29, § 33(a), 125 Stat. 284, 340 (2011) (“Notwithstanding any other provision of law, no patent may issue on a claim directed to or encompassing a human organism.”).

media attention it is possible that the ability to patent a pigeon or woolly mammoth will ultimately be decided on Capitol Hill.

#### CONCLUSION

De-extinction offers the possibility of returning previously extinct animals to the planet, but the ability of scientist-creators to own the patent rights to these animals is uncertain. At this time, these organisms seem to fall within the scope of patent eligible subject material. With success brings publicity, and an application for a patent on the dodo, passenger pigeon, or woolly mammoth may result in controversy and possibly congressional limits. But absent congressional action, a carefully drafted application, mindful of the margins of the law, may result in a patent that can sustain subject matter challenge in the courts.

#### PRACTICE POINTERS

- To fall outside the Product of Nature doctrine, a patent application for a clone of a previously extinct animal needs to specify how the resulting animal is fundamentally different from the parent.
- In the absence of congressional intervention, a transgenic animal that was previously extinct will likely be patent eligible so long as it remains genetically distinct from the original animal.