

Defeating the Virtual Defense in Child Pornography Prosecutions

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I. INTRODUCTION

The recent Supreme Court decision of *Ashcroft v. Free Speech Coalition*² has led prosecutors and investigators of child pornography to re-examine and anticipate how they will prove the elements of their case in child pornography prosecutions. Specifically, *Ashcroft* and its progeny now require the government prove that (1) the image is that of a real child, as opposed to one that is entirely computer generated or virtual,³ and (2) the defendant possessed the requisite scienter to commit the crime, that is, that the defendant knew that the image was real.⁴ This article will examine how these cases can continue to be vigorously and successfully prosecuted in light of the virtual defense.

II. ASHCROFT AND ITS AFTERMATH

In the 1990s, as technology took great strides in achieving lifelike images, some came to believe that child pornographers might soon be able to use commercially available software to create images that appeared to be children engaging in sexual conduct without using any real children in the production. These virtual images, created completely through computer generation and without any part of a human being child used in their creation,⁵ might be used to try to

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2. 535 U.S. 234 (2002) [hereinafter "Ashcroft"].

3. See discussion *infra* Part III.

4. See discussion *infra* Part IV.

5. Wholly computer generated images are not to be confused with morphed images, where an image of one real person is manipulated to change into another

evade the ban on child pornography created using real children set out in *Ferber v. New York*.⁶ Many feared these virtual images could create a potentially insurmountable defense to criminal prosecution of those who created, distributed or possessed child pornography. These images might also be used with impunity to groom the next generation of victims, by using these images to lower the resistance of real children to being sexually exploited.⁷ Many looked for a way to prevent the harm to real children by the sexualization and eroticization of minors in child pornography, whether created by exploiting real children or through the use of virtual images.

With this as a backdrop, in 1996 the Child Pornography Prevention Act⁸ (CPPA) expanded the definition of child pornography to include images that “appear to be”⁹ or “convey the impression”¹⁰ of being minors.¹¹ Congressional intent in expanding the scope of existing legislation was threefold. First, to prevent the use of virtual images whetting the appetite and feeding the fantasies of pedophiles/child abusers.¹² Second, to destroy the network and market for child pornography.¹³ Third, to prevent pornographic depictions of children being used in the seduction or coercion of other children into sexual victimization.¹⁴ It was also posited that this would close the loophole of defendants claiming, in every case where the government could not call a witness who was personally acquainted with the child, that the image was of a virtual child.¹⁵

image, or “cut and paste” images where part(s) of one real person’s image are superimposed on another real person’s image, such as putting one person’s head on another person’s body. *See Padgett v. United States*, 302 F.Supp.2d 593, 596-97 (D.S.C. 2004). Both these types of images were covered under the Child Pornography Prevention Act (CPPA) and were not challenged as unconstitutional. *Id.* As all but the sections of the CPPA that were challenged were deemed constitutional, both of these types of images continue to be proscribed. *Id.*

6. 458 U.S. 747 (1982).

7. For a brief summation of grooming and how it applies to Internet crimes against children, *see* Duncan T. Brown, *Developing Strategies for Collecting and Presenting Grooming Evidence in a High Tech World, Update*, vol. 14 no. 11 (2001), available at http://ndaa-apri.org/publications/newsletters/update_volume_14_number_11_2001.html (last accessed June 26, 2004).

8. 18 U.S.C. §§ 2251 to 2260 (2000).

9. 18 U.S.C. § 2256 (8)(B) amended by Pub.L. 108-21, Title V., § 502 (a)(1), April 30, 2003, 117 Stat. 678.

10. 18 U.S.C. § 2256 (8)(D) repealed by Pub.L. 108-21, Title V., § 502 (a)(3), April 30, 2003, 117 Stat. 678.

11. A minor is defined as a person under 18 years of age. 18 U.S.C. § 2256 (1) (Supp. 2003).

12. Sen. Rpt. 104-358, at 16 (Aug. 27, 1996).

13. *Id.* at 20.

14. *Id.* at 2.

15. *Id.* at 20.

The new language employed in the CPPA was successfully challenged as being overbroad and violative of the First Amendment in *Ashcroft v. Speech Coalition*.¹⁶ In *Ashcroft*, the Supreme Court held that the precedent set in *New York v. Ferber*,¹⁷ that the First Amendment afforded no refuge to child pornography,¹⁸ applied only to images of real children. *Ashcroft* further stated that even if virtual images were used to groom a new generation of victims, that was not a compelling state interest sufficient to overcome the respondent's right to the images.¹⁹ The Court was concerned only with the circumstances surrounding the creation of the image, not the consequences of its creation.²⁰ The Court also rejected all of the underlying Congressional intent behind the Act and dismissed any link between virtual child pornography and harm to real children.²¹ Finally, in what can only be described as a theory notably lacking in references to either academic or empirical research, the Court went on to state that the existence of virtual child pornography might even lessen the exploitation of real children.²²

The backlash against this decision was immediate and vociferous. Within months, the PROTECT Act²³ was created. Under the act:

16. *Ashcroft*, 535 U.S. at 1406.

17. *New York v. Ferber*, 458 U.S. 747; 102 S. Ct. 3348; 73 L. Ed. 2d 1113 (1982).

18. *Id.* at 774.

19. *Id.* at 1402.

20. *Id.*

21. *Id.* But see Wolak, J., Finkelhor, D. & Mitchell, K. (In press) *Arrested Child Pornography Possessors in Internet-related Crimes: Findings from the National Juvenile Online Victimization Study* (copy on file with the author). Citing 40% of those arrested for child pornography as "dual offenders," defined as those who commit both child pornography offenses and "hands on" sexual offenses against children. *Id.*

22. *Id.* at 1404. The Court stated that "[i]f virtual images were identical to illegal child pornography, the illegal images would be driven from the market by indistinguishable substitutes" because "[f]ew pornographers would risk prosecution by abusing real children if fictional, computerized images would suffice." *Id.* Unfortunately, there is no research to support this claim. Telephone Interview with Peter Collins, Forensic Psychiatrist, Ontario Provincial Police (June 26, 2004). To the contrary, pedophiles are "risk takers" who never believe they'll be caught, so availability of virtual images will be irrelevant to them. *Id.* Their behavior is also fantasy driven, and their fantasies involve real children, not virtual ones. *Id.* Therefore, to regress to virtual images would be a poor substitute. *Id.* The availability of virtual images will not eradicate child sexual victimization. *Id.* See also KENNETH V. LANNING, CHILD MOLESTERS: A BEHAVIORAL ANALYSIS FOR LAW ENFORCEMENT OFFICERS INVESTIGATING THE SEXUAL EXPLOITATION OF CHILDREN BY ACQUAINTANCE MOLESTERS 38 (4th ed. 2001) (regarding fantasy driven behavior).

23. Prosecutorial Remedies and Other Tools to End the Exploitation of Children

[C]hild pornography means any visual depiction, including any photograph, film, video, picture, or computer or computer-generated image or picture, whether made or produced by electronic, mechanical, or other means, of sexually explicit conduct, where—

(A) the production of such visual depiction involves the use of a minor engaging in sexually explicit conduct;

(B) such visual depiction is a digital image, computer image, or computer-generated image that is, or is indistinguishable from, that of a minor engaging in sexually explicit conduct; or

(C) such visual depiction has been created, adapted, or modified to appear that an identifiable minor is engaging in sexually explicit conduct.²⁴

Indistinguishable is defined as:

indistinguishable used with respect to a depiction, means virtually indistinguishable, in that the depiction is such that an ordinary person viewing the depiction would conclude that the depiction is of an actual minor engaged in sexually explicit conduct. This definition does not apply to depictions that are drawings, cartoons, sculptures, or paintings depicting minors or adults.²⁵

Against this backdrop, the ability of prosecutors to continue to accept and successfully prosecute child pornography cases will now be analyzed.

III. PROVING THE CHILD IS REAL

The ability to prove each element of the crime beyond a reasonable doubt is the hallmark of criminal prosecution. While one potential strategy would be for prosecutors to proceed against child pornography cases as obscenity cases,²⁶ this article will deal only with those prosecutions that go forward under child pornography statutes. In child pornography cases, it is the burden of the

Today Act of 2003 ("PROTECT Act"), Pub. L. No. 108-21, § 401(d), 117 Stat. 650, 670 (2003) (codified as amended in scattered sections of 18, 28, & 42 U.S.C.).

24. 18 U.S.C. § 2256 (8) (emphasis added) (Supp. 2003).

25. 18 U.S.C. § 2256 (11) (Supp. 2003).

26. See Duncan T. Brown, *Pornography After the Fall of the CPPA: Strategies for Prosecutors*, Update, vol. 15 no. 4 (2002), available at http://ndaa-apri.org/publications/newsletters/update_volume_15_number_4_2002.html (last accessed June 26, 2004); Debra A. Burke, *Thinking Outside the Box: Child Pornography, Obscenity and the Constitution*, 8 VA. J.L. & TECH. 11 (2003), available at http://www.vjolt.net/vol8/issue3/v8i3_a11-Burke.pdf. See also Wolak, J., Finkelhor, D. & Mitchell, K. (In press) Arrested Child Pornography Possessors in Internet-related Crimes: Findings from the National Juvenile Online Victimization Study (copy on file with the author). Citing 25% of state and local prosecutors interviewed for this study are now pursuing some child pornography cases under obscenity statutes post-*Ashcroft*. *Id.*

government to prove that the image charged is that of a real child.²⁷ How the government will meet that burden will depend on whether and how the defendant chooses to raise the defense of the images being virtual. It must be remembered that the defense in these cases is not that the images could have been slightly digitally altered, or that some small part of the image could have been computer generated, but rather that the image was entirely created without a real child.

(A) When the Defendant Offers No Evidence Regarding Computer Generated Images

Fortunately for prosecutors, there were a small number of cases that pre-dated Ashcroft dealing with claims of the government failing to prove the images were of real children. In the early case of *United States v. Nolan*,²⁸ the defendant claimed error as the government did not call an expert in photography to prove the images were of real children. The government relied on the testimony of a pediatrician and the images themselves to prove its case.²⁹ In *Nolan*, the court found that a non-expert fact finder could use “reasonable inferences derived from experience and common sense” to determine that real children were used to make the image and that the prosecution was not required to call a photography expert to counter mere speculation that the photos were faked.³⁰ Twelve years later in *United States v.*

27. See *Commonwealth v. Simone*, 2003 WL 22994238, at *20 (Va.Cir.Ct. 2003); *United States v. May*, 829 A.2d 1106, 1115-1116 (Super.N.J. 2003) (citing *United States v. Sims*, 220 F.Supp.2d 1222, 1226 (D.N.M. 2002) (unpublished opinion)) (holding, in light of *Free Speech Coalition*, that court had “previously erred by ruling that the government did not have the burden of proving beyond a reasonable doubt that the visual depictions at issue involved real children”); *United States v. Oakes*, 224 F.Supp.2d 296, 301-02 (D.Me. 2002) (observing, in light of *Free Speech Coalition*, prosecution bears burden of proving defendant possessed images of “real children”); see also *United States v. Reilly*, 2002 U.S. Dist. LEXIS 19564, at *18, 2002 WL 31307170, at *6 (S.D.N.Y. October 15, 2002) (holding, in light of *United States v. X-Citement Video*, 513 U.S. 64, 115 S. Ct. 464, 130 L. Ed. 2d 372 (1994), and *Free Speech Coalition*, “a defendant in possession of materials containing visual depictions of real minors engaging in sexually explicit conduct must know that real minors were the subject of the visual depictions”) to support criminal conviction; *United States v. Marcus*, 239 F.Supp.2d 277, 283 (E.D.N.Y. 2003) (same); accord *United States v. Pabon-Cruz*, 255 F.Supp.2d 200, 204-08 (S.D.N.Y. 2003); *People v. Alexander*, 791 N.E.2d 506, 515 (Ill. 2003); but see *United States v. Kimler*, 335 F.3d 1132, 1142 (10th Cir. 2003) (holding proof need not be based on expert opinion).

28. 818 F.2d 1015 (1st Cir. 1987).

29. *Id.* at 1018.

30. *Id.* at 1018-20.

Vig,³¹ the defendant claimed that the government had presented insufficient evidence to prove that real children were in the images.³² In Vig, the court similarly stated the “images were viewed by the jury which was in a position to draw its own independent conclusion as to whether real children were depicted.”³³ The government was not required to produce an expert witness to counter “unsupported speculation” that images could have been made without using real minors.³⁴

In the wake of Ashcroft, the government must first be prepared for the scenario where the defendant simply throws out the possibility that the images were computer generated without offering evidence to that effect. Under the “speculation” fact pattern, case law continues to support the proposition that mere or unsupported speculation regarding the images does not require the government to call a graphics expert to address this issue.³⁵ Rather, the government must simply build a sufficient evidentiary foundation to support the trier of fact’s finding that the images were of real children. Obviously, the easiest way to defeat this defense is to call a witness who is personally familiar with the victimized child. While some progress is being made in identifying sexually exploited children³⁶ and calling or offering to call law enforcement personnel who worked on their cases,³⁷ the majority of the children in the visual depictions are currently unknown and unidentified.³⁸ Were the only

31. 167 F.3d 443 (8th Cir. 1999).

32. *Id.* at 445.

33. *Id.* at 450-51.

34. *Id.* at 449-50.

35. *See, e.g., Vig*, 167 F.3d at 449-50.

36. *See United States v. Marchand*, 308 F. Supp. 2d 498, 504 (D.N.J. 2004) (discussing Federal Bureau of Investigation’s Child Exploitation and Obscenity Reference File).

37. A redacted copy of one such law enforcement witness statement offer is found in Appendix A. *See also Marchand*, 308 F. Supp. 2d 498, 504-5-5 (D.N.J. 2004) (where detective from Brazil and detective referenced above, plus two other detectives all testified at trial).

38. *See Enhancing Child Protection Laws After the April 16, 2002 Supreme Court Decision, Ashcroft v. Free Speech Coalition: Hearing Before the Subcomm. On Crime, Terrorism, and Homeland Security of the Comm. on the Judiciary House of Representatives*, 107th Cong. 28 (2002) (statement of Earnest E. Allen, President and Chief Executive Officer of the National Center for Missing and Exploited Children, that “this decision effectively requiring that we identify the child in order to sustain a child pornography prosecution effectively eradicates 95 percent of child pornography prosecutions,” as identity verification is rare.) INTERPOL estimates that of the victims depicted in the 200,000 child pornography images INTERPOL has on its database, only 254 have been identified. Correspondence with Anders Persson, Criminal Intelligence Officer, INTERPOL General Secretariat, June 24, 2004, underlying documentation on file

cases to be prosecuted those with identified victims, the number of perpetrators of child sexual victimization to escape justice would escalate exponentially.³⁹ In sum, it would be a surrender to child pornographers. As such, other ways must be found to defeat the digital defense of the virtual image.

Of paramount importance in preparing for the digital defense is the choice of images charged by the prosecutor. Just as a prosecutor may choose pre-pubertal images to avoid any question of the victim's underage status, so should the prosecutor choose only the images that leave the jury with no obvious questions as to whether the pictures or video are of real children. Not only should the content of the images be considered, but their form must be weighed. For example, if given the choice between charging thumbnail⁴⁰ images and full images, full images would be preferred as the jury will be better able to examine them.

The quantity of images should also be considered, as it is far more difficult to claim that hundreds of images are virtual rather than only two or three. If the defendant has multiple images of the same child, multiple charges based on multiple images of that same child would increase the level of expertise necessary to maintain the absolute consistency of such variables as lighting, body proportions, background and other details. In line with this logic, the expertise would have to increase exponentially to ensure absolute consistency in videos, mpegs and other movie formats. Finally, if the same child is shown both clothed and unclothed, the question can be asked who would waste the time and money to create virtual, yet legal, images of clothed children?

Other ways to defeat the claim of virtual images may include the prosecution calling any of the following types of witnesses:⁴¹ a child

with author.

39. See, e.g., 148 CONG. REC. H376-01, 2002 WL 1368903, at *H3884 (2002) (statement of Rep. Bob Goodlatte that "prov[ing] a child is real will require identifying the actual child," which will be an "impossible task" that allows perpetrators to evade prosecution).

40. A thumb nail is a miniature display of a page or image that enables a viewer to see the layout of many pages or images on the screen at once. Philip E. Margolis, RANDOM HOUSE PERSONAL COMPUTER DICTIONARY 481 (2d ed. 1996).

41. See generally Wolak, J., Finkelhor, D. & Mitchell, K. (In press) *Arrested Child Pornography Possessors in Internet-related Crimes: Findings from the National Juvenile Online Victimization Study* (copy on file with author). Citing the various strategies that have been used by state and local prosecutors to deal with the virtual defense, which was being raised in 40% of child pornography possession cases being prosecuted post-*Ashcroft*. Id. Those strategies included: using investigating officers to testify that they had determined the identities of

pornography historian;⁴² a pediatrician;⁴³ or a law enforcement expert.⁴⁴ It may also be proved by internal evidence of the photograph,⁴⁵ through reviewing other Websites the defendant has visited,⁴⁶ by whether the defendant was secretive and surreptitious in his trading or sale of the images,⁴⁷ by statements or e-mails the defendant may have made or composed,⁴⁸ and, finally, through the introduction of other acts evidence,⁴⁹ if present and allowed by jurisdiction. Case law has been developing post-Ashcroft to support these theories of prosecution.

As a starting point in the evolution of these cases, in *United States v. Deaton*⁵⁰ the Eighth Circuit held that the government did not have to prove the images were not computer generated, but rather simply that the image is of a real child.⁵¹ Where the defendant chooses not to put on any evidence that the images are virtual, courts both will and

victims, including images belonging to known series; using investigating officers to testify that images dated back to before virtual images were possible; using experts in computer graphics software to testify that CP images were not virtual; bringing charges based on videos because it is easier to show that videos are not computer generated; training investigators to elicit statements from CP possessors that they were looking at images of real children; using assistance offered about known images; giving preference to cases with known victims; pursuing CP possession as an aggravating factor in child sexual abuse cases; treating labels with the names and ages of children written on pictures by a CP possessor as admissions that the children were real. *Id.*

42. A child pornography historian is an individual who has worked with child pornography in his/her work, usually in a law enforcement capacity, (e.g., United States Customs, Postal or Federal Bureau of Investigation agent) and can testify as to the age and origin of particular pornographic images of children. *See United States v. Guagliardo*, 278 F.3d 868, 871 (9th Cir. 2002), *cert. denied*, 537 U.S. 1004 (2002); *United States v. Marchand*, 308 F. Supp. 2d. 498, 504 (D.N.J. 2004).

43. *United States v. Marchand*, 308 F. Supp. 2d 498, 505 (D.N.J. 2004) (court noting that testimony of doctor regarding progression of sexual development in images consistent with images of real children).

44. *E.g.*, *United States v. Hall*, 312 F.3d 1250, 1260 (11th Cir. 2002).

45. *See, e.g.*, *Marchand*, 308 F. Supp. 2d at 508-510 (discussing difficulty in producing accurate virtual images capturing variables such as lighting, hair growth, etc.).

46. *See, e.g.*, *United States v. Morton*, 364 F. 3d 1300, 1303 (11th Cir. 2004) (Internet history of defendant introduced to establish pattern of sexual exploitation of children).

47. *See United States v. Crow*, 164 F.3d 229, 238 n.4 (5th Cir. 1999) (instructions regarding file encryption reflected defendant's knowledge that intended receiver was minor).

48. *E.g.*, *United States v. Sims*, 220 F.Supp.2d 1222, 1227 (D.N.M. 2002) (unpublished opinion).

49. *E.g.*, *United States v. Riccardi*, 259 F.Supp.2d 1212, 1234-35 (D.Kan. 2003) (child erotica intermingled with child pornography proper "other acts" evidence as probative of knowledge, identity of depicted children, and lack of mistake).

50. 328 F.3d 454 (8th Cir. 2003).

51. *Id.* at 455.

should dismiss such mere speculation as grounds for reversing convictions. In *People v. Normand*,⁵² a similar view was expressed:

Like the federal courts that have confronted the issue, we conclude that *Free Speech Coalition* imposes no heightened burden upon the government to disprove that an image was not generated by computer. The trier of fact may make a determination as to how an image was produced from the image itself. It is not incumbent upon the State to prove that the image is not something other than it plainly appears to be through some means other than an examination of the image itself. A defendant is, of course, free to introduce evidence to controvert this proposition; however, defendant points to no such evidence in the instant case. We do not mean to suggest that a defendant bears some burden of proving an affirmative defense that an image was generated by computer or some other means without the use of actual children. In certain cases, the image may be such that it leaves the trier of fact with a doubt as to whether it depicts an actual child. We simply reiterate the unremarkable proposition that a defendant may introduce evidence to controvert this point, as is the case with any issue in a trial.⁵³

In *State v. Gann*,⁵⁴ the court refused to reverse the defendant's convictions, stating:

Gann asserts that under today's technology, it "is almost impossible to determine from looking, if an image in a photograph is true and unaltered, computer generated in whole or in part, or morphed." However, Gann never presented any evidence to show that the persons depicted in the evidentiary exhibits used to prove Counts 2, 8 and 10 were not actual persons but, instead, were computer generated or morphed, nor did Gann present any evidence showing that these persons were 18 years old or older. As in *Young*, the photograph and videos that form the basis for the charges in Counts 2, 8 and 10 "speak for themselves." Consequently, the trial court did not commit error by finding Gann guilty of Counts 2, 8 and 10.⁵⁵

In *United States v. Guagliardo*,⁵⁶ the Ninth Circuit stated that child pornography historian testimony that the images charged were first seen in magazines that pre-dated the computer revolution was sufficient to prove that the images were real.⁵⁷ There the court noted:

To prove that Guagliardo's images were of actual children, rather

52. *People v. Normand*, 803 N.E.2d 1099 (Ill.App. 2 Dist. 2004).

53. *Id.* at 1103.

54. 796 N.E.2d 942 (Ohio App. 12 Dist. 2003).

55. *Id.* at 950.

56. 278 F.3d 868 (9th Cir. 2002), *cert. denied*, 537 U.S. 1004 (2002).

57. *Id.* at 871.

than computer-edited images of adults. . .the government introduced evidence that Guagliardo's images had been published in magazines dating from the 1970s and 1980s, before computer "morphing" technology was available. A government witness, William Siebert, testified that he had worked as a mail inspector for the Customs Service during the mid-1980s and that he had personally encountered magazines that contained copies of Guagliardo's images.⁵⁸

The court also noted that the magazines themselves had copyright dates that proved the images had been in circulation prior to any technological advances the defendant might raise as allowing for the computer generation of images.⁵⁹ In *United States v. Marchand*,⁶⁰ the government's witness referenced the FBI's Child Exploitation and Obscenity File, which contains approximately 10,000 images of children that were taken "when computer technology was so primitive that a sound inference could be drawn that an image found in the Reference File depicts a real child."⁶¹

In *United States v. Bender*,⁶² defendant-appellant attacked the sufficiency of the evidence offered by the government to establish the computer images in question portrayed actual children. In *Bender*, the Eleventh Circuit affirmed the district court's holding that expert medical testimony of a pediatrician that the photographs appeared to portray real children, coupled with other evidence, was sufficient to prove the images were of real children.⁶³ Earlier case law had also accepted pediatrician testimony rejecting allegations of possible "special effects" being used with child pornography videos.⁶⁴

In *United States v. Richardson*,⁶⁵ the same circuit found that law enforcement testimony could also provide sufficient support for the images being those of real children.⁶⁶ The court summarized the issue before it as "whether it can be said that the jury could not reasonably have found that the children were virtual children, as if created by computer imaging technology."⁶⁷ Here, the court noted that an FBI agent testified that, based on his years of training and experience, the images appeared to be of real children.⁶⁸ The court

58. *Id.*

59. *Id.*

60. 308 F. Supp 2d. 498 (D.N.J. 2004).

61. *Id.* at 504.

62. 290 F.3d 1279 (11th Cir. 2002), *cert. denied*, 123 S.Ct. 571 (2002).

63. *Id.* at 1284.

64. *See* *United States v. Pollard*, 128 F.Supp.2d 1104, 1113 (E.D. Tenn. 2001).

65. 304 F.3d 1061 (11th Cir. 2002).

66. *Id.* at 1064.

67. *Id.*

68. *Id.*

stated:

[T]he evidence clearly established that the children depicted in the images or pictures were actual children. Special Agent Sheehan of the Innocent Images Task Force, a federal task force investigating child exploitation on the Internet, testified that, based on his training and extensive experience as a member of the task force, the images depicted actual children, not what simply appeared to be children. We have examined the images shown to the jury. The children depicted in those images were real. Of that we have no doubt whatsoever.⁶⁹

Similarly, in *United States v. Hall*,⁷⁰ the court held that:

[N]o one ever claimed, or even hinted, that the images were of virtual children. For example, Detective Dubord works with the Innocent Images Task Force, a federal task force investigating child exploitation on the Internet. Dubord testified that based on his training and experience, the images depicted minors.⁷¹

Courts have also addressed issues such as internal evidence of reality contained with the photograph. In *United States v. Pabon-Cruz*,⁷² the court looked at this “internal evidence,” stating:

[I]nternal evidence in many of the photographs suggests that they depict actual incidents of abuse. Some of them mask identifying features of the children or adults depicted, permitting the inference that the events depicted were actual abusers concerned lest they be identified and prosecuted for their criminal acts. Others can be inferred from objects depicted in them to have been created some time ago, before the development of digital technology. The same internal evidence from which the jury could conclude beyond a reasonable doubt, even absent stipulation, that actual children were depicted in the images at issue was unquestionably available to Pabon, and the jury thus could easily have concluded that what they knew beyond a reasonable doubt, he knew to the same degree of certainty.⁷³

Case-specific factual matters may also be sufficient to prove the image is of a real child. As part of a forensic examination of the defendant’s computer, the examiner may review other Websites the defendant has visited, as the content of the sites may assist the government in proving that the images charged were of real children.⁷⁴ If the defendant was secretive and surreptitious in his trading or sale of the images, this may be introduced to show the defendant’s guilty knowledge or state of mind. This, in turn, will

69. *Id.*

70. 312 F.3d 1250 (11th Cir. 2002).

71. *Id.* at 1260.

72. 255 F.Supp.2d 200 (S.D.N.Y. 2003).

73. *Id.* at 207.

74. *E.g., Morton*, 364 F. 3d 1300, 1303 (11th Cir. 2004).

reinforce the idea that if the images were virtual, why would the defendant behave in such a furtive manner. Incriminating statements,⁷⁵ Internet chats,⁷⁶ or e-mails⁷⁷ the defendant may have made or sent should also be assessed for potential evidence of real children being present in the photographs or videos. The introduction of other acts evidence, if present and allowed by law in the particular jurisdiction, is also a fertile source of evidence of pattern, plan, practice, state of mind, lack of mistake and intent.⁷⁸

(B) Proving the Case when the Defendant Does Offer Evidence Regarding Computer Generated Images: Do the Math.

In cases where the defendant does choose to mount his defense by offering evidence regarding computer generation of images, it is time to engage in some basic calculations regarding the possibility of virtual images being present. The calculations may be divided into those that deal with movies or videos and those that deal with pictures or jpegs.

Movies or video.

In *Ashcroft*, the Court singled out the film “Final Fantasy” as an example of computer generated film at its best.⁷⁹ First, the point must be made that the images in “Final Fantasy” are far from virtually indistinguishable from real people.⁸⁰ While it is unquestionably a state-of-the-art animated film, no reasonable juror would confuse it for a film with real actors. Putting that aside, it then becomes an issue of calculating the time, money and expertise that went into making that film.⁸¹ “Final Fantasy” was approximately 90 minutes in length.⁸²

75. See *Marchand*, 308 F. Supp. 2d at 508-509 (discussing defendant’s incriminating statements to law enforcement).

76. See *Padgett*, 302 F.Supp.2d at 600 (discussing transcripts of Internet chats revealing neither interest in nor dealings with virtual images).

77. See *Sims*, 220 F.Supp.2d at 1227 (noting defendant’s e-mail admitting one of images was of defendant sexually violating an 11-year-old girl); See also *United States v. Davis*, 41 Fed.Appx. 566, 572 (3rd Cir. July 26, 2002) (discussing incriminating nature of letters exchanged by defendant and undercover Special Agent and Postal Inspector).

78. E.g., *Riccardi*, 259 F.Supp.2d at 1234-35.

79. *Ashcroft*, 535 U.S. at 1409 (O’Connor, J., concurring in part and dissenting in part).

80. See *Virtual Child Pornography: Fact or Fiction?*, CYBERCRIME NEWSLETTER, NAAG (Nat’l Assoc. of Att’ys Gen., Washington, D.C.) April/May 2004, at 4 [hereinafter *Virtual Child Pornography*], available at <http://naag.org/issues/pdf/cybercrime-2004-aprmay.pdf> (last visited August 31, 2004).

81. *Virtual You*, Discover Magazine, Vol. 22, No. 7, July 2001 (copy on file

It was comprised of over 130,000 frames at 25 frames per second, and it cost \$115,000,000.⁸³ It took 4 years to produce, using 200 animators, 200 Graphix Octane Workstations and 1,100 custom designed CPUs.⁸⁴ The average cost of each second of the film was over \$20,000.00 and the average output of each worker was under 8 seconds of film per year.⁸⁵

It should be further noted that the human skin depicted in “Final Fantasy” is restricted primarily to the face, neck, arms, and hands, and that sequences in which one has a close-up view of these areas constitutes only a small percentage of the film.⁸⁶ This indicates that the time and expense needed to create the frames depicting human skin were even greater than the values estimated above.

Individual pictures or jpegs.

When it comes to still images, the numbers are just as compelling. To understand how virtual images could theoretically be made on computers, some background information on digital images is necessary.⁸⁷ A digital image is essentially a grid of numbers, where each number represents the brightness of each picture element, or pixel, in the image. An 8-bit image can have 256 brightness values, with any color being made by combining different amounts of red, green, and blue light. Since a digital image is simply a grid of numbers, it is conceivable that an artist could create a computer-generated image by “painting” a grid of numbers to represent anything that could be captured with a digital camera. However, each color image has 17 million possible colors for each pixel. A 4x6 image at 300 dots per inch (dpi) will have over 2 million pixels. Current digital cameras are over 4 megapixels (4 million pixels per image). Thus, there are over 67 thousand billion numbers for a color 4 megapixel image. While not all the possible numbers (colors) would realistically have to be considered, nevertheless, serious thought would have to be put into each of the values to be used,

with author).

82. *Id.*

83. *Id.*

84. *Id.*

85. *Id.*

86. See *Virtual Child Pornography*, *supra* note 80, at 3.

87. Robert D. Fiete, Ph.D., Senior Research Fellow, Eastman Kodak Company, *Living with Fake Images-How Do We Know When We're Being Fooled?*, presented at “Examination of Digital Child Pornography,” New York Prosecutors Training Institute (NYPTI) Seminar, Chappaqua, New York, December 2, 2003 (copy on file with author).

especially when illumination and edges are considered.⁸⁸ If the creator spent 10 seconds thinking about each pixel value and worked a 40-hour week, it would take over 5 years to complete a single 4x6 still color image.⁸⁹

The time consuming nature of this endeavor is what gave rise to computer graphics, which were developed to generate images of 3D objects with realistic illumination conditions. Creating realistic images of people, nevertheless, continues to be very difficult, with the difference between a real picture and one created by a computer, even using today's best technology, being discernable to the human eye.⁹⁰ The problems of creating a virtually indistinguishable human image include: (1) rendering correct portions and form of the body; (2) expressions on the face; (3) the color and texture of human skin, made particularly difficult as skin is a sub-surface scattering material that both absorbs and reflects light, and; (4) the interaction with light with all these features.⁹¹ Finally, and most tellingly, a computer cannot be programmed to perfectly reflect the discrete randomness, asymmetries and slight imperfections of physical appearance that are the cornerstone of real people and their images.⁹²

The time, expertise, and resources needed to even attempt to create a virtual image are overwhelming and completely unwarranted when similar images that are real are readily available and infinitely less expensive, or free. Unfortunately, in the area of child pornography, those images and the children who are sacrificed to make them, are present in abundance.

(C) The Majority View: Either Way, It's a Question for the Trier of Fact

Regardless of whether or not the defense offers evidence concerning computer generated images, the majority of jurisdictions believe that the final determination lies with the judge or jury as trier of fact. Most recently, the Fifth Circuit so held in *United States v. Slanina*.⁹³ In *Slanina* the court stated:

Free Speech Coalition did not establish a broad requirement that the Government must present expert testimony to establish that the unlawful image depicts a real child.

88. *Id.*

89. *Virtual Child Pornography*, *supra* note 80, at 3.

90. *Id.*; Fiete, *supra*, note 87.

91. Robert Morgester, Assistant Attorney General, California Department of Justice, Address at National Association of Attorneys General Cybercrime Conference, Oxford, Mississippi (Feb. 3, 2003) [hereinafter Morgester]. *See also* Fiete, *supra* note 87.

92. Morgester, *supra* note 91.

93. *United States v. Slanina*, 359 F. 3d 356 (5th Cir. 2004).

Three circuits that have considered this issue take the same position. See *United States v. Kimler*, 335 F.3d 1132, 1142 (10th Cir.), cert. denied, 157 L. Ed. 2d 759, 124 S. Ct. 945, 2003 U.S. LEXIS 9142, 72 U.S.L.W. 3392 (U.S. Dec. 8, 2003)(No. 03-7285); *United States v. Deaton*, 328 F.3d 454, 455 (8th Cir. 2003) (per curiam) (citing *United States v. Vig*, 167 F.3d 443, 449-50 (8th Cir. 1999)); *United States v. Hall*, 312 F.3d 1250, 1260 (11th Cir. 2002), cert. denied, 155 L. Ed. 2d 502, 123 S. Ct. 1646 (2003). “Juries are still capable of distinguishing between real and virtual images; and admissibility remains within the province of the sound discretion of the trial judge.” *Kimler*, 335 F.3d at 1142. Therefore, the Government was not required to present any additional evidence or expert testimony to meet its burden of proof to show that the images downloaded by Slanina depicted real children, and not virtual children. The district court, as the trier of fact in this case, was capable of reviewing the evidence to determine whether the Government met its burden to show that the images depicted real children.⁹⁴

Prior to *Slanina*, this issue was dealt with extensively in *United States v. Kimler*.⁹⁵ Defendant-appellant Kimler argued that *Ashcroft*, at least implicitly, laid down a rule of evidence that there was an absolute requirement that, absent direct evidence of identity, expert testimony was required to prove that the prohibited images are of real, not virtual, children.⁹⁶ He cited no authority for that proposition, and there is no such pronouncement in *Ashcroft* to that effect.⁹⁷ Rather, defendant Kimler pointed to Congressional Findings cited by the Court in its discussion that technological advances have made it “possible to create realistic images of children who do not exist.”⁹⁸ What defendant Kimler did not note, however, was direct language by the Court that imaging technology might be good and getting better, but it is implausible to conclude that it has actually arrived at the point of indistinguishability.⁹⁹

Kimler held that *Ashcroft* did not establish a broad, categorical requirement that, in every case on the subject, absent direct evidence of identity, an expert must testify that the unlawful image is of a real child.¹⁰⁰ It further held that:

94. *Id.* at 357.

95. 335 F.3d 1132 (10th Cir. 2003), cert. denied, 124 S. Ct. 945 (2003).

96. *Id.* at 1142.

97. *Id.*

98. *Id.* (citing *Ashcroft*, 535 U.S. at 240).

99. *Id.* (citing *Ashcroft*, 535 U.S. at 254).

100. 335 F. 3d at 254.

Juries are still capable of distinguishing between real and virtual images; and admissibility remains within the province of the sound discretion of the trial judge. The only two circuits to have considered the issue take the same position. *United States v. Deaton*, 328 F.3d 454, 455 (8th Cir. 2003) (per curiam) (citing *United States v. Vig*, 167 F.3d 443, 449-50 (8th Cir. 1999)); *United States v. Hall*, 312 F.3d 1250, 1260 (11th Cir.), cert. denied, 538 U.S. 954, 155 L. Ed. 2d 502, 123 S. Ct. 1646 (2002).¹⁰¹

In *United States v. Deaton*,¹⁰² the Eighth Circuit held that the photos themselves were sufficient to prove that real children were in the images, stating:

[W]e have previously upheld a jury's conclusion that real children were depicted even where the images themselves were the only evidence the government presented on the subject. See *United States v. Vig*, 167 F.3d 443, 449-50 (8th Cir.) (government, as part of affirmative case, was not required to negate unsupported speculation that images may have been computer-generated or other than what they appeared to be), cert. denied, 528 U.S. 859, 145 L. Ed. 2d 125, 120 S. Ct. 146, (1999).¹⁰³

In *United States v. Hall*,¹⁰⁴ the Eleventh Circuit held:

[A]fter examining the pictures sent out to the jury during Hall's trial, we conclude that the evidence showed that the children depicted in those images were real and that no reasonable jury could have found that the images were virtual children created by computer technology as opposed to actual children.¹⁰⁵

In *United States v. Pabon-Cruz*,¹⁰⁶ the court held that

[t]he jury also viewed what it was entitled to conclude was a representative sample of that material (child pornography). Certainly nothing about these shocking images would suggest in any way to the reasonable observer that the images did not depict actual children. To the contrary, the images appear sickeningly real. . . While advances in digital imaging technology have arguably made it possible to "fake" human images by creating convincing digital simulations, jurors could draw on their own common sense and experience to recall that the most expensive digital special effects Hollywood can command only rarely generate images that can be confused with live human actors. No reasonable person could have believed that more than a handful of the thousands of photographs and videos that the evidence shows Pabon had collected and distributed could possibly have been produced using

101. *Id.*

102. 328 F.3d 454 (8th Cir. 2003).

103. *Id.* at 455.

104. 312 F.3d 1250 (11th Cir. 2002), cert. denied, 538 U.S. 954 (2002).

105. *Id.* at 1260.

106. 255 F.Supp.2d 200 (S.D.N.Y. 2003).

such techniques.¹⁰⁷

State courts have arrived at similar conclusions. In *People v. Normand*,¹⁰⁸ the court concluded its finding with the following:

The trial court's language indicates that it was assessing the age of actual persons who appeared in the images defendant possessed. *United States v. Martens*, 59 M.J. 501, 509 (2003) ("Normal usage and common sense suggest that describing a person as a 'minor' or a 'child' indicates the subject is a real person, unless there is some limiting language such as 'appears to be,' 'virtual,' or 'computer-generated' "). As explained above, the pictures themselves provide ample evidence to support this proposition. Moreover, virtual people do not have ages.¹⁰⁹

People v. Phillips,¹¹⁰ addressed the same issue and held:

The trial judge, as trier of fact, found that these were clearly images of real children "well under the age of 18" and not computer-generated images. We have fully reviewed the evidence. At least as to these images, we are satisfied that everyday observations and common experiences can be relied upon by the trier of fact in reaching this determination. Having viewed the images, we, too, have no doubt that these images depict real children. . . The courts that have dealt with this very question since *Ashcroft* have all found that juries and trial judges, as finders of fact, are still capable of distinguishing between real and virtual images. *United States v. Kimler*, 335 F.3d 1132, 1142 (10th Cir. 2003); *United States v. Deaton*, 328 F.3d 454, 455 (8th Cir. 2003) (per curiam) (citing *United States v. Vig*, 167 F.3d 443, 449-50 (8th Cir. 1999); *United States v. Hall*, 312 F.3d 1250, 1260 (11th Cir. 2003), cert. denied, 538 U.S. 954, 155 L. Ed. 2d 502, 123 S. Ct. 1646 (2003). While imaging technology might be good and getting better, it has not yet arrived at the point where it is impossible to tell the difference between depictions of real children and virtual images. See *Kimler*, 335 F.3d at 1142. Until technology advances to the stage, we hold, as has every other court dealing with this issue, that the question is still one left to the common experience of the trier of fact.¹¹¹

Most recently, the question of whether the jury had the ability to decide this matter was answered in *State v. Holze*,¹¹² where the court affirmed the lower court's holding that:

[T]he question of whether this picture might depict something other than an actual child remains within the realm of juror competence. While jurors are

107. *Id.* at 207.

108. 803 N.E.2d 1099 (Ill.App. 2 Dist. 2004).

109. *Id.* at 1103.

110. 805 N.E.2d 667 (Ill.App. 3 Dist. 2004).

111. *Id.* at 676.

112. 2004 Wisc. App. LEXIS 383.

free to decide that the ‘phony child’ possibility does raise a reasonable doubt, such doubt is not so tangible or apparent as to require expert evidence to remove it.¹¹³

Military courts of justice have also ruled that whether the images are of real children is properly a question for the trier of fact to decide. In the case of *United States v. Appledorn*,¹¹⁴ the court stated:

[T]he images he (the defendant) received and possessed, which were admitted into evidence along with his stipulation, are undeniably children under the age of 18. We are convinced beyond a reasonable doubt that these images were not “virtual child pornography” or visual depictions of adults that appear to be children.¹¹⁵

In the later case of *United States v. Lee*,¹¹⁶ the Air Force Court of Criminal Appeals affirmed the defendant’s conviction for possessing child pornography, though the prosecution had put forward no evidence that the children in the images were real. The court stated:

Finally, the AFOSI recovered some of photographs in question, and they were included in the record of trial. Certainly the photographs themselves are evidence a fact finder may consider to determine whether actual children were involved in the production of the images.¹¹⁷

Military court decisions have similarly reasoned that where no evidence was offered that the pictures were computer generated, guilty pleas would be allowed to stand. A review of the images by the court, and a determination that the images spoke for themselves were noted in all. In *United States v. Mason*,¹¹⁸ the court held that:

It is clear from the record that the appellant based his plea upon the fact that the images in question portrayed actual children under the age of 18. At no time did the appellant suggest that the images constituted child pornography only because they “appeared to be” children, or because they were “advertised” as being child pornography. The appellant’s admissions concerning the images in question are amply supported by the pictures themselves, which were included in the record. This provides an adequate basis in fact and law for this Court to find the appellant’s pleas provident.¹¹⁹

113. *Id.* at *15.

114. 57 M.J. 548 (A.F.Ct.Crim.App. 2002).

115. *Id.* at 550.

116. 57 M.J. 659 (A.F.Ct.Crim.App. 2002).

117. *Id.* at 663.

118. 2002 C.C.A. LEXIS 244 (A.F.Ct.Crim.App. Jun. 11, 2002).

119. *Id.* at *29-*30 (citations omitted). *See also* *United States v. Dees*, 2002 C.C.A. LEXIS 317 (A.F.Ct.Crim.App. Dec. 13, 2003) (unpublished opinion). In *Dees*, the court upheld another guilty plea to child pornography where no evidence had been offered by the defense that the images were virtual. *Id.* The court stated:

Other military courts have reviewed guilty pleas where no evidence has been offered and found the guilty pleas provident. In *United States v. Rejkowski*,¹²⁰ the court stated: We have examined the exhibits and have no doubt that they depict actual children.¹²¹ Similarly in *United States v. Sollmann*,¹²² the court stated:

Normal usage and common-sense suggest that describing a person as a minor or a child indicates the subject is a real person, unless there is some qualifying language such as “appears to be,” “virtual,” or “computer-generated. . . . The factual predicate includes the appellant’s responses to the military judge’s questions. In each response, the appellant described the images as being “children” or “minors,” defined as someone under 18 years of age, engaged in sexual activity. At no time did the appellant ever indicate that he thought the images in question were “computer generated” or “virtual” photographs.¹²³

(D) *The Minority View - The First Circuit Stands Alone.*

Recently a split in the federal circuits has occurred. In April of this year in *United States v. Hilton*,¹²⁴ the First Circuit confirmed a grant of relief vacating *Hilton*’s pre-Ashcroft conviction for possession of child pornography.¹²⁵ In dismissing the government’s claim that by producing the images themselves, sufficient evidence had been provided to prove the children in the images were real, the court held:

The government argues, and other circuits have agreed, that the pornographic

The parties agreed to the introduction of some of the images in question, and representative samples of the images were included in the record. . . . This also provides a basis for this Court to determine whether the appellant’s pleas are provident. *Id.* Reviewing these images, we note that one image in Prosecution Exhibit 10 is a cartoon drawing, which cannot meet the definition of child pornography set out in *Free Speech Coalition*. However, the remaining pictures support the appellant’s admissions that the images in question involve actual children engaged in sexually explicit conduct. *Id.* at *9-*10 (internal citations omitted).

120. 2003 C.C.A. LEXIS 49 (N.M.Ct.Crim.App. Feb. 27, 2003) (unpublished opinion).

121. *Id.* at *9. *See also* *United States v. James*, 55 M.J. 297 (2001) where the court reviewed the images underlying the guilty plea and found that: Appellant’s admissions concerning the age of the subjects of the pictures in his case were amply supported by the pictures themselves which are attached to this record as exhibits. *Id.* at 301.

122. *United States v. Sollmann*, 59 M.J. 831 (2004).

123. *Id.* at 836.

124. *United States v. Hilton*, 363 F.3d 58, (1st Cir. 2004).

125. *Id.* at 66.

images themselves should suffice to prove the use of actual children in production. See *United States v. Kimler*, 335 F.3d 1132, 1142 (10th Cir. 2003) (“Juries are still capable of distinguishing between real and virtual images”); *United States v. Deaton*, 328 F.3d 454, 455 (8th Cir. 2003) (reaffirming the reasonableness of “a jury’s conclusion that real children were depicted even where the images themselves were the only evidence the government presented on the subject”); *United States v. Hall*, 312 F.3d 1250, 1260 (11th Cir. 2002) (affirming pre-Free Speech Coalition conviction because “no reasonable jury could have found that the images were virtual children created by computer technology as opposed to actual children”). These courts’ holdings express a judgment that a jury can distinguish a depiction of an actual child from a depiction of a virtual child “even where the images themselves were the only evidence.” *Deaton*, 328 F.3d at 45. While the images form essential evidence without which a conviction could not be sustained, we hold that the government must introduce relevant evidence in addition to the images to prove the children are real.

In *United States v. Nolan*, 818 F.2d 1015 (1st Cir. 1987), this court reviewed a conviction under the CPPA before Congress amended the definition of child pornography to include images that “appear[] to be” of children. See Pub. L. No. 104-208, div. A, tit. I, § 121(2)(4), 110 Stat. 3009-26 (1996). Nolan argued on appeal that since the government had relied on the images to prove the crime, it had presented insufficient evidence. We held that “on this record the prosecution was not required, as part of its affirmative case, to rule out every conceivable way the pictures could have been made other than by ordinary photography.” *Id.* at 1020. Rather, we noted that Nolan “presented no expert evidence at trial that these pictures were or could have been produced by any such artificial means.” *Id.* at 1019. Today we recognize that the vast technological revolution underway since 1987—when we decided *Nolan*—has made undeniable the fact that sexually explicit images portraying children can be produced by artificial means; the burden of proving that the images “were or could have been produced by any such artificial means” can no longer rest on the defendant. To convict under § 2252A(a)(5)(B), the government must supplement the images with other relevant evidence proving that the children portrayed are real. The defendant is entitled to have this element proved affirmatively without entering any evidence to the contrary.¹²⁶

It must be noted that while no one disputes the fact that “sexually explicit images portraying young children” can be produced by artificial means, that is not the question. The question is, are there wholly computer generated child pornography images that are virtually indistinguishable from real images? The court further stated in a footnote that:

This appeal does not require us to delineate what kinds of evidence can prove that the children depicted are real, as the government

126. *Id.* at 64-65.

proffered no evidence relevant to this element apart from the images. We note, however, that evidence establishing the identity of a depicted child could demonstrate to a factfinder that real children were used to produce images. Other evidence, such as the testimony of a computer graphics expert, could also permit the factfinder to reasonably determine that this element of the crime was proved beyond a reasonable doubt. See, e.g., *United States v. Rearden*, 349 F.3d 608, 613-14 (9th Cir. 2003).¹²⁷

(E) Legal Precedent for Determining the State of Technology

Having seen that at least one circuit is now expecting more than the images themselves to sustain a child pornography conviction, a review of cases where expert testimony was offered and the substance of that testimony is now in order. In *United States v. Rearden*,¹²⁸ the Ninth Circuit summed up the testimony of the government's expert witness as follows:

The government offered the testimony of David Mark Verrier Jones, an employee of a visual effects studio, whom the court accepted as an expert in the creation of visual effects based on his training and experience in the film industry. Jones testified that in his opinion, the images transmitted by Rearden had not been manipulated in any manner. He indicated that they had not been composited (which involves the altering of images by, for example, transferring the head of one person to the body of another) or morphed (which in Jones's view involves the creation of an intermediate image from two other images). Jones stated that it was beyond the limits of modern computer graphics to create a completely artificial picture of a believable photo-realistic human being (except, perhaps, of people who are very small in the background). Rearden put on no evidence to the contrary.¹²⁹

In affirming the defendant's conviction for shipping child pornography over the Internet, the Ninth Circuit also addressed the defendant's argument that Congressional testimony established the existence of virtually indistinguishable child pornography.

Rearden also faults Jones's testimony for being at odds with Congressional findings, noted by the Court in *Free Speech II*, to the effect that "as imaging technology improves . . . it becomes more difficult to prove that a particular picture was produced using actual

127. *Id.* at 65.

128. 349 F.3d 608 (9th Cir. 2003).

129. *Id.* at 613.

children.” 122 S. Ct. at 1397. However, we see no conflict; that the technology to create images of photo-realistic human beings may develop in the future does not make Jones’s testimony based on his contemporary experience inapposite. Nor does the possibility that it will be tougher for the government to carry its burden of proof mean that it failed to do so in this case.¹³⁰

Other courts and experts have addressed the possibility of today’s technology creating wholly computer-generated images of human beings that are virtually indistinguishable from real images. In *Commonwealth v. Simone*,¹³¹ the Virginia court reviewed the following evidence in finding Mr. Simone guilty of possessing child pornography:

Agent Wells of the Virginia State Police High Technology Crime Unit testified to his specialized training in computer crime virtual pornography issues. The Court found that he is an expert in computer forensics. He went on to explain his training in identification of computer-generated images (hereafter “CGI”), which are images that are one hundred percent computer created, and was certified as an expert in CGI. He explained that CGI consists of polygons, which comprise pixels. He said that polygons are formed from straight lines, so that a creator of CGI cannot re-create an image with accurate curves because such attempted-curves are really a number of straight lines that are formed together to look like curves. He further testified to his use of colorization, texture, shadowing, reflective light and pixelization in determining whether an item is CGI versus an image of an actual person. Agent Wells testified that, at the request of Agent Jones, he reviewed Commonwealth’s Exhibit 6, and Exhibits 8—10. He then testified in detail as to why each of those exhibits show images of actual children, rather than CGI, and offered his expert opinion that each image was that of an actual person.

Agent Wells presented several CGI of child pornography for comparison and stated that based upon the best information he has obtained, it will be some years before CGI can be created that are indistinguishable from images of actual persons.¹³²

In *United States v. Marchand*,¹³³ the Court took note of the defendant’s attempt to show that the technology exists to create realistic virtual images of child pornography that are indistinguishable from real images of child pornography, and to create reasonable doubt as to whether Marchand knew that the images were real rather than virtual from information available to

130. *Id.* at 614.

131. 63 Va. Cir. 216; 2003 WL 22994245 (Va.Cir.Ct. Nov. 12, 2003).

132. *Id.* at 9-11; *Id.* at *3.

133. 308 F. Supp. 2d 498 (D.N.J. 2004).

him at the time he possessed the images.¹³⁴

The Court reviewed the defendant's demonstration and introduction of computer software such as POSER, a tool for artists to use in creating virtual images of people.¹³⁵ Although the defense did not submit any images that had been created using POSER, the government introduced a limited number of virtual images of clothed adults as examples of what POSER can do.¹³⁶ No nude adults or children were created using this software, nor were any virtual images of sexually aroused body parts.¹³⁷

The Court, acting as the trier of fact, then rendered its impression of whether or not such technology did, in fact, create a virtually indistinguishable image:

The degree to which the images created with POSER appear real and the accuracy of the details depend on the skill of the artist. For example, the software does not create details such as hair growth or vein visibility through skin, although POSER will adjust the size of each body part to be in proportion with the size of the overall human figure. Unlike images that are created by manipulating and "cutting and pasting" pre-existing images, images created with POSER will not contain internal inconsistencies in the background, known as artifacts, which indicate that the pictures are not real. However, when backgrounds other than those created by POSER are imported into the images, POSER will not automatically create proper lighting effects, leaving it to the artist to ensure that the lighting effects, such as shadows cast by one body upon an adjacent figure or upon the ground, appear realistic. The pictures that the Defendant's expert characterized as indicative of pictures created with POSER do not appear at all realistic to the viewer.¹³⁸

The Court also distinguished the case at bar from two other post-Ashcroft cases where government witnesses seemed to give contradictory testimony, i.e. that it might be possible to create an indistinguishable image that is completely computer generated.¹³⁹ First, in *United States v. Ellyson*,¹⁴⁰ an investigator simply stated that it was "possible to completely construct an image of a young

134. *Id.* at 502.

135. *Id.*

136. *Id.*

137. *Id.*

138. *Id.*

139. *Id.* at 506-507.

140. 326 F.3d 522 (4th Cir. 2003).

boy. . .not having utilized a young boy in the construction of that image.”¹⁴¹ This is not, however, the same as stating that the image so created would be virtually indistinguishable from an image of a real child. He also stated that he had no personal knowledge of how the images were created.¹⁴² This is not the same as stating that the witness has no opinion as to how they were created, nor is it the same as saying that a reasonable person cannot tell the difference between real and virtual images upon inspection.

In the second case, *State v. May*,¹⁴³ two witnesses were called by the state, one as an expert in computer forensics and the other as an expert in computer and interrelated Internet related crimes, investigations and forensics.¹⁴⁴ It must be noted immediately that an expert in computer forensics is not the same as an expert in computer graphics and generation. Forensics deals with extraction of computer evidence without alteration to the original material and the impartial examination and analysis thereof.¹⁴⁵ Nothing in that definition deals with the areas in question, the possibility of computer generation of virtually indistinguishable child pornography images.

The Internet related crimes witness merely testified that he had made no determination of whether the image files at issue were actual or computer-generated.¹⁴⁶ The forensic expert testified that he personally had no ability to “tell whether an image is. . .a photograph of an actual person or a computer-generated image.”¹⁴⁷ As he was not an expert in computer generation of images, his opinion is less than dispositive.

(F) A Call for Definitively Determining the State of the Art

To date, no wholly computer generated child pornography image has been produced that is virtually indistinguishable from a real image.¹⁴⁸ Experts in the relevant community have searched for such an image and come away empty handed. If such an image existed it

141. *Id.* at 531.

142. *Id.*

143. 829 A.2d 1106 (N.J.Super.A.D. 2003).

144. *Id.* at 1111-12.

145. Detective Richard Hardy, San Diego Regional Computer Forensics Laboratory, Address at National Association of Attorneys General Cybercrime Conference, Oxford, Mississippi (Feb. 3. 2003).

146. *May*, 829 A. 2d at 1112.

147. *Id.*

148. *Virtual Child Pornography*, *supra* note 80, at 4. *See also* United States v. Rearden, 349 F. 3d 608 (9th Cir. 2003); United States v. Marchand, 308 F. Supp. 2d 498 (D.N.J. 2004); Commonwealth v. Simone, 63 Va. Cir. 216 (Va.Cir.Ct. Nov. 12, 2003).

would be showcased by every pedophile in the country who was prosecuted for child pornography. As one commentator has noted, “Every computer generation has its own mythology,” and this generation’s is the existence of virtually indistinguishable images that are wholly computer generated.¹⁴⁹

What is needed at this time is a definitive statement by the relevant scientific/technical community that as of this date, truly virtually indistinguishable child pornography images simply do not exist. There is no question that computer software does exist to allow for morphing. One well known example of morphing would be age progression, where children who have been missing for a considerable amount of time have their last photo age enhanced to reflect how they might appear today. However, as this requires that the child’s original image be used as a base for enhancement, this is not a wholly computer generated image.

Computer software does exist to allow for the creation of human images. Forensic imaging specialists at the National Center for Missing and Exploited Children have used such software to show how wholly computer generated images of children can be created. However, the images thus far produced to show this state of the art fall short on two counts. First, they are only images of children from the shoulders up, or “head shots.” These are not images of children being sexually victimized, therefore no genuine comparison can exist. Secondly, and just as importantly, even these images, while very good, fail to be indistinguishable from real children. At a recent conference on examination of digital child pornography,¹⁵⁰ the following images were placed on the screen and the audience was asked to pick out which, if any, of the pictures were real and which, if any, of the images were either computer generated or morphed. The pictures are shown below.¹⁵¹

149. *Virtual Child Pornography*, *supra* note 80, at 4.

150. “Examination of Digital Child Pornography,” New York Prosecutors Training Institute (NYPTI) Seminar, Chappaqua, New York, December 2, 2003.

151. International Center for Missing and Exploited Children, *at* www.ICMEC.org (last accessed March 28, 2004).



The image in the lower right hand corner is the wholly computer generated image. The forensic imaging specialist stated that it had taken him 2.5 days to create this image.¹⁵² That translates to approximately 20 hours to create only this much of an image, which does not show the child being sexually victimized. The two images on the top tier are age progressions, which would still be illegal under Ashcroft, as they are not wholly computer generated. The picture on the bottom left is the real image. When looking at and comparing the two images on the bottom tier, the differences are evident. As another commentator states, “Our perception is very sensitive to subtle details in the composure and texture of objects, especially when viewing images of people.” Computer-generated images “have a cartoon look to them when scrutinized.”¹⁵³ While the image of the virtual boy is very good, it is not virtually indistinguishable.

If wholly computer generated virtually indistinguishable images of child pornography are claimed to exist, let the moving party produce

152. Joe Mullins, Forensic Imaging Specialist, National Center for Missing and Exploited Children, Address at New York Prosecutors Training Institute (NYPTI) Seminar, Chappaqua, New York (December 2, 2003).

153. Fiete, *supra*, note 87.

them, along with the calculations as to how much time, personnel, graphic expertise and expense were necessary to create such images, and all underlying data and other necessary components to allow others to recreate those same images under scientific conditions/laboratory environments. Until such time as a truly indistinguishable wholly computer generated image of child pornography can be produced under such circumstances, it cannot be said to exist.

A definitive statement that virtually indistinguishable wholly computer generated child pornography does not currently exist will have three important repercussions. First, it should lead to the exclusion of testimony where “experts” are prepared to take the stand and claim that wholly computer generated virtual child pornography that is virtually indistinguishable from child pornography produced with real children is currently in existence. Motions to exclude filed under *Daubert*/*Frye*/*Kumho*¹⁵⁴ rationales should then be uniformly granted until such time as virtual images truly exist. Under *Frye*, unless the testimony offered reflects either a principle or discovery that has gained general acceptance in the particular field, it should be excluded.¹⁵⁵ Under *Daubert*,¹⁵⁶ unless the testimony rests on a reliable foundation and is based on scientifically valid principles, the judge may deem such testimony inadmissible. Finally, under *Kumho*, “expertise that is *fausse* and science that is *junky*” may be excluded by the judge as part of his or her gatekeeping function.¹⁵⁷ Regardless of which rationale is applied, the fact that there has yet to be a single documented case of wholly computer generated child pornography should result in “expert” testimony to the contrary being excluded.

Second, the definitive statement should precipitate the cataloguing of child pornography images currently in existence, which, should the technology later become available to produce the virtual child pornography image, would then be able to be shown to pre-date this technological advancement, and thereby be proven to be real.

154. *Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579 (1993); *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923); *Kumho Tire Company*, 526 U.S. 137.

155. *Frye v. United States*, 293 F. at 1014.

156. *Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. at 597.

157. *Kumho Tire Company*, 526 U.S. at 159.

Finally, it should eradicate the falsely comforting idea that perhaps the child in the photo is simply virtual and no harm has been done to a real child. Both the child and the harm portrayed are real.¹⁵⁸ Such a definitive statement would begin to turn the tide of the public misconception that virtually indistinguishable images currently exist.

IV. PROVING THAT THE DEFENDANT KNEW THAT THE IMAGES WERE OF REAL CHILDREN

Having overcome the first hurdle of a successful prosecution, proving that the image is of a real child, now the prosecution must navigate the second hurdle: proving that the defendant had the requisite scienter to commit the crime; that is, proving that he knew the images were of real children.

This issue first came to the fore in a pair of cases out of the Southern District of New York, *United States v. Reilly*,¹⁵⁹ and *United States v. Pabon-Cruz*.¹⁶⁰ In *Reilly*, the defendant was allowed to withdraw his guilty plea to receiving child pornography, having successfully asserted that the state failed to offer any proof at the plea that he knew the images of the children were real.¹⁶¹ There the court addressed the scienter requirement, stating:

In *United States v. X-Citement Video*, 513 U.S. 64, 130 L. Ed. 2d 372, 115 S. Ct. 464 (1994), the Court laid out the scienter requirement in the Protection of Children Against Sexual Exploitation Act 18 U.S.C. § 2252. *Id.* at 78. In *X-citement*, the Court followed the reasoning of *Morissette v. United States*, 342 U.S. 246, 96 L. Ed. 288, 72 S. Ct. 240 (1952), *Staples v. United States*, 511 U.S. 600, 128 L. Ed. 2d 608, 114 S. Ct. 1793 (1994) and *Liparota v. United States*, 471 U.S. 419, 85 L. Ed. 2d 434, 105 S. Ct. 2084 (1985). *X-citement*, 513 U.S. at 70-73. The *X-citement* Court held that the term “knowingly” in § 2252 (a)(1) and (2) modifies the phrase “the use of a minor” and is properly read to include a scienter requirement for the age of minority.

... Chief Justice Rehnquist, who wrote for the Court in *X-citement* stated in his dissent in *Free Speech*, “in *X-citement Video*, *supra*, we faced a provision of the Protection of Children Against Sexual Exploitation Act of 1977, the precursor of the CPPA, which lent itself much less than the present statute to attributing a “knowingly” requirement to the contents of the possessed visual

158. To this end, European law enforcement has begun to refer to child pornography as child abuse images and/or crime scene photos. Letter from Anders Persson, Criminal Intelligence Officer, INTERPOL General Secretariat, to the author (June 24, 2004) (underlying documentation on file with author).

159. 2002 U.S. Dist. LEXIS 19564 (S.D.N.Y. Oct. 15, 2002).

160. 255 F.Supp.2d 200 (S.D.N.Y. 2003).

161. *Reilly*, 2002 U.S. Dist. LEXIS at *18.

depictions, we held that such a requirement nonetheless applied, so that the government would have to prove that a person charged with possessing child pornography actually knew that the materials contained depictions of real minors engaged in sexually explicit conduct.”

Thus, in light of *X-citement* and consistent with the narrow class of images which the *Free Speech Court* ruled are prohibited by the CPPA, a defendant in possession of materials containing visual depictions of real minors engaging in sexually explicit conduct must know that real minors were the subject of the visual depictions.¹⁶²

In *Pabon-Cruz*, the same district was faced with a similar claim but with different facts. Pabon-Cruz had not entered a defective guilty plea, he had been found guilty by a jury.¹⁶³ The court distinguished the cases with the following analysis:

Pabon relies on *Reilly* for the proposition that proving that the images depict actual children is insufficient to prove that the defendant knew that they did. . . That reliance is misplaced. In *Reilly*, the Court permitted a defendant to withdraw his guilty plea to violating § 2252A because the defendant had not been advised that knowledge that the depictions involved children was an element of the offense; the Court did not define “child pornography” during the plea proceeding; and the defendant’s allocution did not acknowledge that he knew that the images were of actual children. The government’s only proffer at the time of the plea had been that it could prove that some of the images depicted actual children. . . The Court thus did not address the type of proof that would permit a jury to find knowledge. Rather, the Court only held that *Reilly* had not knowingly and voluntarily pled guilty and was thus entitled to withdraw his plea. Pabon, in contrast, was tried before a properly-instructed jury that found that he did have the requisite knowledge.¹⁶⁴

The court further rejected the defendant’s claim that the state could not prove the requisite scienter, stating:

162. *Id.* at *14-*18 (internal citations omitted). See also *United States v. Dean*, 231 F. Supp. 2d 382, 386 (D. Me. 2002) (adopting the *Reilly* analysis, noting, “Free Speech Coalition impacts not only the definitional passages of the instructions; it adds another layer to the scienter analysis of 18 U.S.C. § 2252A(a) in view of *United States v. X-Citement Video*, 513 U.S. 64, 130 L. Ed. 2d 372, 115 S. Ct. 464 (1994)). See *United States v. Reilly*, 2002 U.S. Dist. LEXIS 19564, 2002 WL 31307170, *4-6 (S.D.N.Y. Oct. 15, 2002) (“In light of *X-citement* and consistent with the narrow class of images which the *Free Speech Court* ruled are prohibited by the [18 U.S.C. § 2252A(a)], a defendant in possession of materials containing visual depictions of real minors engaging in sexually explicit conduct must know that real minors were the subject of the visual depictions.”).

163. *Pabon-Cruz*, 255 F.Supp.2d at 206.

164. *Id.* at 208.

The argument that it is theoretically possible that every image Pabon received and distributed had been simulated, and that unless he had been present for their production (and there is no evidence he ever was involved in producing any pornography of any kind) Pabon could not have actually “known” that they were real, demands an epistemological certainty that the law has never required. Drug couriers are convicted every day of “knowingly” distributing illegal drugs that they had never field-tested or personally sampled, and which theoretically could have been counterfeit. In those cases, it is enough for the factfinder to conclude that the defendant believed that the package contained real narcotics, and that the circumstances were such that the defendant’s belief was well supported and turned out to be accurate.¹⁶⁵

The court also drew parallels between this scienter requirement and that of another criminal statute.¹⁶⁶ The court referred to Judge Learned Hand’s writing on the subject of the burden of proof in cases of receiving stolen property, citing:

The receivers of stolen goods almost never “know” that [the goods] have been stolen, in the sense that they could testify to it in a court room. The business could not be so conducted That the jury must find that the receiver did more than infer the theft from the circumstances has never been demanded, so far as we know; and to demand more would emasculate the statute. . . .¹⁶⁷

The more recent case of *United States v. Marchand*¹⁶⁸ synopsisized the total burden on the Government as follows:

To prosecute a defendant under this section, the Government first must prove beyond a reasonable doubt that the image depicts a real child. . . . The Government must also prove beyond a reasonable doubt that the Defendant knew that the images he possessed depicted real minors engaged in sexually explicit conduct. *United States v. X-Citement Video, Inc.*, 513 U.S. 64, 78, 115 S. Ct. 464, 472, 130 L. Ed. 2d 372 (1994). In *X-Citement Video*, the Court held that the term “knowingly” refers to the minority age of the persons depicted and the sexually explicit nature of the material. *Id.* Thus, *Free Speech Coalition* and *X-Citement Video*, read together, require the Government to prove that the defendant knew the images he possessed depicted real children engaged in sexually explicit conduct.¹⁶⁹

Marchand gives the most detailed instruction thus far in how the Government may prove its case of the requisite scienter in child

165. *Id.* at 207-208.

166. *Id.* at 208.

167. *Pabon-Cruz*, 255 F.Supp.2d at 208.

168. 308 F. Supp. 2d 498 (D.N.J. 2004).

169. *Id.* at 503-504.

pornography prosecutions. The Court listed seven areas of evidence that it reviewed in coming to its decision:

1) the appearance of the images; 2) the number of images; 3) the number and identity of web sites the Defendant accessed; 4) the language used in the web sites; 5) the mode and manner by which the Defendant viewed and stored the images; 6) the Defendant's state of mind; and 7) the available computer technology and manual skill required to create realistic virtual images, including a small sample of such images posted on the internet and created with the software most frequently discussed by the Defense.¹⁷⁰

The Court noted that knowledge may be proven through direct and/or circumstantial evidence of actual knowledge or a finding of willful blindness, or both.¹⁷¹ A defendant acts knowingly if he acts with deliberate disregard of the truth, as one cannot avoid responsibility for an offense by deliberately ignoring what is obvious.¹⁷² Having determined this, the Court went on to discuss the particular evidence it considered in rendering its decision. That evidence included:

[T]he details of each image, the staple that appeared in one of the images, a file name that includes the age of the child, the large number of images and the substantial number of separate web sites from which the pictures were downloaded, the fact that certain images showed the same child over and over again as part of a series, the very real facial expressions of the children (sometimes multiple children in the same image), the extremely detailed close-up of an erect male penis with veins engorged, one video of child sex abuse in progress, and the background in the photographs depicting highly detailed furniture, rumpled bedding, general household clutter, and extremely realistic lighting effects.¹⁷³

The Court reviewed the evidence before it, highlighting the appearance and number of images, the defendant's statements to the police and his state of mind, and the state of technology in coming to its conclusion that:

. . . It is the appearance of the pictures themselves, the Defendant's own words, the lack of evidence that it is feasible to create large numbers of life-like, virtual, nude, prepubescent children with correct levels of sexual development, and the lack of evidence that it is feasible to create virtual, anatomic, sub-dural sexual arousal, the number of web sites which the Defendant visited, and the evidence presented regarding the Defendant's state of mind, that are most

170. *Id.* at 505.

171. *Id.* at 506.

172. *Id.* (citations omitted).

173. *Marchand*, 308 F. Supp. 2d at 507.

probative to a fact finder when assessing the Defendant's knowledge.

In this case, the evidence proves beyond a reasonable doubt that the Defendant knew that at least one of the pictures contained an image of a real child engaged in sexually explicit activity. The level of accurate detail in every picture, such as lighting, hair growth, and visible vein engorgement, along with obvious indicators such as the visible staple in one of the pictures, inter alia, convinces this Court that the Defendant could not have believed that each and every picture was created without using a real child. The facts in this case also prove beyond a reasonable doubt that Dr. Marchand was aware of the high probability that the pictures depicted real minors and that he deliberately ignored the truth and was not merely foolish or negligent in failing to realize that the images portrayed real children. If the Defendant did not have actual knowledge that real children were portrayed, then he deliberately avoided knowing the truth.¹⁷⁴

By using the seven factors outlined in *Marchand*, coupled with the *Pabon-Cruz* rationale regarding the correct interpretation of "knowingly," triers of fact may continue to determine whether the requisite scienter is present in any given case.

V. CONCLUSION

Ashcroft has defined the prosecution's burden of proof in child pornography cases as proof beyond a reasonable doubt the image charged is that of a real child. While there is now a split in the federal circuits, the majority of federal circuits and their sister state courts that have addressed the issue, hold that this burden may be met simply through the government introducing the images into evidence and presenting them to the trier(s) of fact. Subsequent case law has grafted the X-citement Video's scienter rationale onto Ashcroft, requiring additionally that the State prove beyond a reasonable doubt that the defendant knew the images were of real children. Case law has identified seven factors that may be looked to in assessing scienter, and has rejected claims that this element must be proven to an absolute degree of epistemologic certainty. Case law has also denied any refuge to those who would turn a blind eye to the reality of the origin of the images, and to those who choose to be deliberately indifferent to that same issue.

While this two tier test of prosecutorial viability places additional strain on the already stretched resources of both law enforcement and prosecutors, these elements of proof do not pose insurmountable

174. *Id.* at 510.

barriers to aggressive, successful prosecutions. To paraphrase the court in *Marchand*, the prosecution can still prove, beyond a reasonable doubt, each element of the crime of child pornography. While Ashcroft now imposes an additional burden on the government in its proofs, that burden can, nevertheless, be satisfied.¹⁷⁵

175. *Id.*

Form MG 11

Witness Statement

(CJ Act 1967, s.9;MC Act 1980, ss.5A(3)(a) and 5B;MC Rules 1981, r.70)

Statement of Sharon G.

Age if under
18

Over 18

(if over 18 insert 'over 18')

Occupation

Police Officer

This statement (consisting of: 2 pages each signed by me) is true to the best of my knowledge and belief and I make it knowing that, if it is tendered in evidence, I shall be liable to prosecution if I have willfully stated anything which I know to be false or do not believe to be true.

Dated: 11th July 2002

Signature: Sharon G.

I am a Police Officer serving with the National Crime Squad of England and Wales based in the United Kingdom.

Since May 1998 I have been a case officer responsible for conducting investigations into a worldwide paedophile organisation. Part of these investigations is to identify and locate the children subject to abuse on the images and video clips seized throughout the world.

On the 29th March 2000 I removed from our exhibits store two compact disks named Hercules1. These disks were recovered from the computer of a male named Gary S. and formed part of a bestcrypt container. Bestcrypt is a program that creates a container or a strongbox to hold images and other sensitive material. Access can be gained only if the correct password or passphrase is known. The passphrase was supplied to Law Enforcement by Gary S.

I examined the disk marked 1 of 2 and made a copy of it which, I produce as my exhibit SAG/128. Upon the examination of the CD I found a file path directory which I copied and produce as my exhibit SAG/129.

I viewed that file path and found Six Hundred and Six paedophilic images all of which are exhibited and produced by me as exhibits SAG/130 to SAG/735.

All of the children from these images have been identified.

L.P., a Deputy County Attorney of the Technology and Electronic Crimes Bureau in the Maricopa County Attorneys Office in the

United States of America, has sent me sixteen images in an effort to identify the children in those images. Having viewed them I am able to identify as follows:-

Hel&g012 is identical to image hel&gav012.jpg which is produced by me as exhibit SAG/412.

Hel&g014 is identical to image hel&gav014.jpg which is produced by me as exhibit SAG/414.

Hel&g015 is identical to image hel&gav015.jpg which is produced by me as exhibit SAG/415.

Hel&g016 is identical to image hel&gav016.jpg which is produced by me as exhibit SAG/416.

Hel&g020 is identical to image hel&gav020.jpg which is produced by me as exhibit SAG/420.

Hel&g026 is identical to image hel&gav001.jpg which is produced by me as exhibit SAG/401.

Hel&g029 is identical to image hel&gav029.jpg which is produced by me as exhibit SAG/429.

Hel&g049 is identical to image hel&gav049.jpg which is produced by me as exhibit SAG/449.

Hel&g13 is identical to image hel&gav009.jpg which is produced by me as exhibit SAG/409.

Hel&ga11 is identical to image hel&gav011.jpg which is produced by me as exhibit SAG/411.

Hel&gav0is identical to image hel&gav040.jpg which is produced by me as exhibit SAG/440.

Hel_gav0 is identical to image hel&gav015.jpg which is produced by me as exhibit SAG/415.

The male child in these pictures are:-

Gavin I. M. born 22nd April 1988. I produce his birth certificate as exhibit SAG/96.

Hel_rob2 is identical to image hel_rob02.jpg which is produced by me as exhibit SAG/499.

Hel_rob03 is identical to image hel_rob03.jpg which is produced by me as exhibit SAG/500.

The male child in these pictures are:-

Robert D. M. born 22nd October 1986. I produce his birth certificate as exhibit SAG/95.

Hel-cum0 is identical to image hel-cum02.jpg which is produced by me as exhibit SAG/518.

Hel-lo04 is identical to image hel-lo04.jpg which is produced by me as exhibit SAG/534.

The female child in all of these sixteen pictures is:-

Helene E. M. born 9th May 1989. I produce her birth certificate as exhibit SAG/97.

I have seen and met Robert, Gavin and Helene on numerous occasions and can confirm that without doubt they are the three children subjected to sexual abuse in the images produced.

The adult male responsible for the abuse of the named children is Gary S. S has been convicted in England with the assault of these children and I produce the certificate of his conviction as exhibit SAG/126.

On Tuesday 4th April 2000 I took these sixteen images to Wandsworth Prison, London, and showed them to Gary S. He identified them as being a true and accurate copy of the photographs taken by him of Robert, Gavin and Helene. Both Gary S. and myself signed them to that effect.

All of the original exhibits have been retained by me and will be made available at any court appearance.

I am prepared to attend court and give any evidence if necessary.