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The 'Chimera' of Parenthood

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In 2015, The Independent *newspaper reported the case of a man who had 'failed' a paternity test in the United States because the genetic material in his saliva was shown to be different from that in his sperm. This was apparently the first reported instance of a paternity test being 'fooled' by a 'human chimera'. Such a chimera has extra genes, here absorbed from a twin lost in early pregnancy. The result was that the 'true' genetic father of the man's son was the man's deceased twin, who had never been born. Cases of chimeras potentially present a challenge to legal systems, given their frequent emphasis on genetics in determining parenthood. This paper considers what the phenomenon of the chimera might tell us about our understanding of parenthood and the differences between biological motherhood and fatherhood respectively. It advocates the recognition of the chimeric person as the 'true' legal father and suggests two methods through which this might be accomplished, pointing out the potentially significant and even damaging implications of one of them for English law's general approach to parenthood. The paper also explores the likely practical response of English law to the situation of a potential chimera.*

INTRODUCTION

In 2015, *The Independent* newspaper reported[1] the case of a man who had 'failed' a paternity test in the United States because (it eventually transpired) the genetic material in his saliva was shown to be different from that in his sperm.[2] This was said to be the first reported

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[1] S. Khan, '"Human chimera": Man fails paternity test because genes in his saliva are different to those in sperm', *The Independent*, 24 October 2015, at https://www.independent.co.uk/news/science/human-chimera-man-fails-paternity-test-because-genes-in-his-saliva-are-different-to-those-in-sperm-a6707466.html (visited 28 August 2020).

[2] See further K.M. Sheets et al, 'A case of chimerism-induced paternity confusion: what ART practitioners can do to prevent future calamity for families' (2018) 35 *Journal of Assisted Reproduction and Genetics* 345.

instance of a paternity test being 'fooled' by what is known as a 'human chimera'. Such a chimera has extra genes, in this instance apparently absorbed from a twin lost in early pregnancy. The result was that, according to the tests, the 'true' genetic father of the child in question was the man's twin, who had never been born. The man and the child's mother were not in dispute as to paternity and parenthood on the facts of the case. Instances of chimerism nevertheless potentially present a challenge to legal systems where there is such a dispute (whether motivated by child support, inheritance rights or involvement in upbringing), given their frequent emphasis on genetics in determining parenthood.

Having explored the phenomenon of chimerism with reference to relevant scientific literature, this paper analyses the likely response of the law of England and Wales to the situation of a potential chimera. The focus will be on situations where the putative father[3] is a possible chimeric person in the context of a paternity dispute.[4] After discussing the general approach of English law to determining legal parenthood, the paper analyses the specific implications of chimerism for determining legal fatherhood. In doing so, the paper considers what the phenomenon of the chimera might tell us about our understanding of parenthood and the similarities and differences between biological motherhood and fatherhood respectively, situating chimerism within more wide-ranging discussions about the nature of parenthood. The paper will acknowledge the potentially significant implications of chimerism for debates about the appropriate basis of legal parenthood (given the potentially multifaceted and fragmented nature of parenthood as a concept) and the opportunity it provides to test English law's coherence on parenthood more generally. It will nevertheless advocate the recognition of the chimeric person as the 'true' legal father in cases of 'natural' reproduction. It will recognise that this may require even 'natural' fatherhood to be understood as more of a 'process' than is often realised, but also point out the possible dangers of that argument and the potential advantages of an alternative approach based on the chimera's 'ownership' of all the relevant genetic material. Lastly, the paper will highlight the need for open-mindedness in genetic testing in order to identify suspected chimerism in the first place.

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[3] Where a parent who has not given birth, including a second female parent who is not a 'father', acquires their status by virtue of adoption, surrogacy or compliance with the assisted reproduction provisions in the Human Fertilisation and Embryology Act 2008, chimerism will be less relevant because that person need not have provided the sperm in any event. See further n **41** below.

[4] See, eg, K. Sheets and R. Wenk, 'Relationship Testing and Forensics' in N.L. Draper (ed), *Chimerism: A Clinical Guide* (Cham: Springer, 2018), 58ff on potential difficulties where the *child* is a suspected chimera.

THE PHENOMENON OF THE 'CHIMERA'

The first recorded literary reference to a 'chimera' (sometimes spelled 'chimaera') is in Homer's *Iliad*, where the term is used to describe a mythical creature that is part lion, part serpent and part goat.[5] In medical science, chimerism describes a phenomenon 'where an individual carries more than one complete genome'.[6] A 'congenital' chimera is 'an individual who carries the cell populations of dizygotic twins',[7] a term usually used to describe fraternal or non-identical twins who come from separate ova and are fertilised by separate sperm.[8] Chimerism is believed to occur through the fusion of twins at the earliest stage of embryo development, or from maternal-fetal exchanges during pregnancy, although *acquired* chimerism can occur as a result of blood transfusion or organ transplants.[9]

It has been said that chimerism 'is becoming well known among the general population due to its increased media presence',[10] but its presence in humans is also thought to be under-estimated, with most instances remaining undiagnosed because of the absence of physical symptoms and limitations of ordinary testing methods.[11] Boklage claims that '[t]he fraction of the population who are chimeric might be as high as 10% or more' and that, '[c]onservatively estimated, at least one live birth in eight is a product of a twin conception, the majority of which bring with them to delivery neither a co-twin nor any other overt evidence of their twin history'.[12] It is also expected to become more prevalent in light of the increased use of assisted reproduction.[13]

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[5] E. Bazopoulou-Kyrkanidou, 'Chimeric creatures in Greek mythology and reflections in science' (2001) 100 *American Journal of Medical Genetics* 66.

[6] Sheets et al n **2** above, 346.

[7] Sheets and Wenk n **4** above, 51.

[8] J.M Quinn, 'Dizygotic twin' in *Encyclopaedia Britannica* (2013), at https://www.britannica.com/science/dizygotic-twin (visited 28 August 2020).

[9] Sheets and Wenk n **4** above, 51-52.

[10] N.L. Draper, 'Preface' in N.L. Draper (ed), *Chimerism: A Clinical Guide* (Cham: Springer, 2018), v.

[11] Sheets and Wenk n **4** above, 52.

[12] C.E. Boklage, 'Embryogenesis of chimeras, twins and anterior midline asymmetries' (2006) 21 *Human Reproduction* 579, 588.

[13] Sheets and Wenk n **4** above, 53.

Significantly for present purposes, '[a]ny tissue sample from a chimeric individual may contain one or both cell populations'.[14] Some commentators have attempted to distinguish 'tetragametic' chimerism (where two ova are fertilised by two spermatozoa and the two zygotes produced then fuse, with up to 50% of the resulting cells containing the 'minor' DNA)[15] from *inter alia* 'microchimerism' (where only less than 1% of the cell population is made up of the 'minor' DNA[16]), arguing that only the former present a challenge to legal systems.[17] Sheets and Wenk, however, emphasise that 'mixed cells of all chimera[s], including transplant chimera[s], carry DNA of four gametes'.[18] Difficulties will arise in the context of forensic or paternity testing if only one population of cells is identified from a test and it is not the pertinent one: 'the tissues sampled from the chimera may not contain both genomes, or the minor population may be too small to observe in current routine parentage tests'.[19] This is true even if the difficulty is a rare one.[20] As Sheets and Wenk put it, 'relationship testing relies on the assumption that tested individuals carry one DNA profile in all tissues that are sampled',[21] and there can be situations where tests 'exclude…[the] alleged father from paternity of the child and g[i]ve no indication of a biological relationship between them'.[22] It has been said that '[c]urrent tests used…by relationship testing and forensic labs have several inherent limitations that prohibit the routine identification of chimeric individuals'.[23] With this in mind, the next section of the paper considers English law relating to parenthood, before the following one considers the implications of chimerism specifically for that concept.

THE GENERAL APPROACH TO DETERMINING LEGAL PARENTHOOD IN ENGLISH LAW

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[14] *ibid*, 51.

[15] *ibid*.

[16] *ibid*.

[17] See, eg, D.H. Kaye, 'Chimeric Criminals' (2013) 14 *Minnesota Journal of Law, Science & Technology* 1.

[18] Sheets and Wenk n **4** above, 51 n 1.

[19] *ibid*, 61.

[20] Kaye n **17** above.

[21] Sheets and Wenk n **4** above, 55.

[22] *ibid*, 57.

[23] *ibid*, 61.

The possibility of 'chimerism' presents a challenge to a legal system, and raises questions about what is being, or should be, asserted in a paternity case. It is first necessary to summarise the general approach of English law to determining a child's legal parenthood, before analysing the implications of chimerism for parenthood, and particularly fatherhood, in the next section. At this stage, it should be noted that while many substantive aspects of raising a child can be determined *inter alia* through the exercise of *parental responsibility*[24] (which can be held by non-parents and thus encompasses the more social aspect of 'parenting'),[25] parenthood per se is still both legally[26] and symbolically significant. For example, legal parenthood remains important, albeit not conclusive, in the allocation of parental responsibility[27] and liability for child support,[28] and it determines basic entitlement in cases of intestacy.[29] It will become clear that English law presumptively attaches significance to biology in cases of 'natural' conception in determining both legal fatherhood and legal motherhood, but that chimerism creates complexity for the notion of 'biological' parenthood.

Motherhood

In England and Wales, a child is currently limited to two legal parents.[30] As Lord Simon put it in the *Ampthill Peerage* case, '[m]otherhood, although a legal relationship, is based on a fact, being proved demonstrably by parturition',[31] ie the act of giving birth to a child. A child's legal mother is defined in the Human Fertilisation and Embryology Act 2008 as '[t]he woman who is carrying or has carried a child as a result of the placing in her of an embryo or

[24] See, eg, R. George, *Ideas and Debates in Family Law* (Oxford: Hart Publishing, 2012), 131 on the matters included within the scope of parental responsibility.

[25] See, eg, B. Sloan, 'Parental Responsibility of Non-Parents for Minors in England and Wales' in A. Dutta et al (eds), *Vormundschaftsrecht in Europa* (Bielefeld: Gieseking, 2015).

[26] See, eg, N. Lowe and G. Douglas, *Bromley's Family Law* (Oxford: Oxford University Press, 11th edn, 2015), 274.

[27] Children Act 1989, ss 2, 4.

[28] Child Support Act 1991. Cf, eg, Children Act 1989, Sch 1.

[29] Administration of Estates Act 1925, s 46. See, eg, *Re Birtles* [2018] EWHC 299 (Ch); [2019] Ch 85.

[30] See, eg, Lowe and Douglas n **26** above, 259.

[31] [1977] AC 547, 577.

of sperm and eggs'.[32] The basic position that the birth giver is the mother thus applies even where the child was conceived using an egg that was donated or did not otherwise belong to the mother (such that the mother is not *genetically* related to the child),[33] and initially even if later varied by a parental order giving effect to a surrogacy arrangement,[34] or adoption.[35] In *R (on the application of TT) v Registrar General for England and Wales*, a new common law definition of the 'mother' as 'a person whose egg is inseminated in their womb and who then becomes pregnant and gives birth to a child' was applied even to someone who gave birth after changing his legal gender to male.[36] Motherhood is thus conferred by the biological process of parturition, whether at common law or by statute, or alternatively the legal process of adoption or a parental order. Outside adoption or a parental order, each of which recognise the 'social' parenthood of presumptive involvement in nurturing and upbringing, it is 'the status afforded to a person who undergoes the physical and biological process of carrying a pregnancy and giving birth'.[37] This is a fact to which this paper will return in the next full section. It is, however, worth emphasising at this stage that it does not rely on a genetic link per se, such that chimerism potentially causes fewer problems in the context of motherhood.

As Sheets and Wenk put it, 'non-maternity is rarely suspected' in any event.[38] Paternity or non-paternity is perhaps rather easier to hide or dispute unless and until a genetic test is performed. DNA testing of mothers is nevertheless used in England and Wales in the context of establishing both motherhood and fatherhood, however.[39] Moreover, the US case of *Fairchild* demonstrates that a chimeric mother could face allegations of unsavouriness where she is shown not to be genetically related to the child and cannot provide a satisfactory

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[32] Human Fertilisation and Embryology Act 2008, s 33(1).

[33] Human Fertilisation and Embryology Act 2008, s 47. In fact it was held in *R (on the application of TT) v Registrar General for England and Wales* [2019] EWHC 2384 (Fam); [2019] 3 WLR 1195 that section 33 does not itself apply to the artificial insemination of a person's *own* eggs.

[34] Human Fertilisation and Embryology Act 2008, ss 54-54A.

[35] Human Fertilisation and Embryology Act 2008, s 33(2); Adoption and Children Act 2002.

[36] *TT* n **33** above at [149(a)]. The decision was upheld *sub nom R (Alfred McConnell) v The Registrar General for England and Wales and others* [2020] EWCA Civ 559 but with a narrower focus on statutory interpretation of the Gender Recognition Act 2004.

[37] *TT* n **33** above at [279].

[38] Sheets and Wenk n **4** above, 56.

[39] See, eg, *Re P (Identity of Mother)* [2011] EWCA Civ 795; [2012] 1 FLR 351. Testing the mother is apparently normal in paternity disputes: infolaw, 'Home vs legal paternity testing', at https://www.infolaw.co.uk/partners/home-vs-legal-paternity-testing/ (visited 28 August 2020).

explanation (such as egg donation or adoption) for her claim to legal motherhood.[40] In that case, DNA testing concerning *paternity* indicated that Ms Fairchild was not biologically related to her children. She was therefore denied public assistance and accused of fraud, with the children placed in foster care, despite her obstetrician's evidence that she had indeed given birth to them. During the investigation, she gave birth to a fourth child in front of a court-appointed witness, but DNA evidence suggested she was not related to that child either. Eventually, her lawyer (having heard of a chimerism case) requested further DNA testing of Ms Fairchild and her extended family. The children's DNA was consistent with that of their putative maternal grandmother, and a cervical smear ultimately showed the genetic link between the children and Ms Fairchild that skin, hair and saliva samples did not. This extraordinary case shows that great practical weight can be placed upon genetics notwithstanding the fact that motherhood is not per se determined in that manner.

English law's general approach to legal fatherhood must now be outlined.

Fatherhood in 'Natural' Conception Cases

The question of a child's legal fatherhood[41] is more complex and depends on whether assisted reproduction has been used. As with motherhood, the initial determination of legal fatherhood can be varied by an adoption or parental order. Unlike motherhood, however, outside those exceptions and the context of the Human Fertilisation and Embryology Act 2008, legal 'fatherhood concerns genetics and the provision of sperm which results in the birth of a child',[42] the assumption being that the child has been produced by an egg fertilised by sperm containing the father's genetic material. It is this assumption that is potentially

[40] See further C. Arcabascio, 'Chimeras: Double the DNA-Double the Fun for Crime Scene Investigators, Prosecutors, and Defense Attorneys' (2007) 40 *Akron Law Review* 435, 450ff.

[41] Where, for example, a mother's female partner who has not provided sperm is nevertheless regarded as the second legal parent, this will have occurred by virtue of a marriage or civil partnership with the relevant consent (Human Fertilisation and Embryology Act, s 42), the 'agreed female parenthood conditions' being satisfied (Human Fertilisation and Embryology Act, s 43-44), a parental order giving effect to a surrogacy arrangement (Human Fertilisation and Embryology Act, s 54) or adoption (Adoption and Children Act 2002). Such 'female parenthood' does not therefore rely on a genetic link between parent and child, such that chimerism will be less of a problem in the context of determining parenthood.

[42] *Re B (Parentage)* [1996] 2 FLR 15, 21. Cf, eg, C. Barton and G. Douglas, *Law and Parenthood* (London: Butterworths, 1995), 50ff on intentional parenthood.

challenged by the phenomenon of the chimera. That said, matters are not quite so straightforward as they may first appear even where no chimerism is involved. There remains a *pater est* or 'legitimacy' presumption at common law[43] that 'a child born to [or conceived by[44]] a woman during her marriage to a man is also the natural child of her spouse', extended by statute to 'a child born to a woman during her civil partnership with a man'.[45] Absent adoption, surrogacy or assisted reproduction to which the 2008 Act applies, that presumption of natural parenthood will also presumptively determine *legal* parenthood, albeit that the presumption may be rebutted by evidence on the balance of probabilities[46] and its value has been questioned in the modern era.[47] Where the mother is unmarried, no *pater est* presumption exists, but registration of the father on the birth certificate is considered good prima facie evidence of paternity[48] albeit that the mother is not even prima facie obliged so to register him.[49]

The fact that these presumptions can be readily rebutted by DNA evidence in the context of paternity proceedings is particularly significant in the context of chimerism. The paper will return to this issue once the specific question of who the legal father should be in a chimerism scenario is addressed in the next full section. First, however, the determination of fatherhood in the context of assisted reproduction must be considered.

Fatherhood and Assisted Reproduction

In the context of assisted reproduction, fatherhood can be determined according to the provisions of the Human Fertilisation and Embryology Act 2008. These can confer legal fatherhood from the outset on a person *known* not to be the genetic father of the child produced, such as where the child was conceived using donor sperm. By virtue of the Act, if 'at the time of the placing in her of the embryo or of the sperm and eggs or of her artificial insemination' a woman was in a marriage or civil partnership with a man and 'the creation of

[43] See, eg, *In re R (A Child) (IVF: Paternity of Child)* [2005] UKHL 33; [2005] 2 AC 621 at [17].

[44] J. Miles, R. George and S. Harris-Short, *Family Law: Text, Cases and Material* (Oxford: Oxford University Press, 4th edn, 2019), 620.

[45] Legitimacy Act 1976, s A1(2).

[46] Family Law Reform Act 1969, s 26.

[47] *Re H and A (Children) (Paternity: Blood Tests)* [2002] EWCA Civ 383; [2002] 1 FLR 1145.

[48] *Brierley v Brierly* [1918] P 257.

[49] Cf the unimplemented provisions of the Welfare Reform Act 2009, Sch 6.

the embryo carried by her was not brought about with the sperm of the other party to the marriage or civil partnership',[50] essentially[51] the mother's husband or civil partner will be the father of the child (rather than the sperm donor) 'unless it is shown that [the husband or civil partner] did not consent to the placing in her of the embryo or the sperm and eggs or to her artificial insemination'.[52] If the mother is not in a marriage or a civil partnership with the intended father, fatherhood can be conferred by virtue of the 'agreed fatherhood conditions' being met in broadly equivalent circumstances,[53] except that the artificial insemination or placement of sperm and eggs or embryo must occur 'in the course of treatment services provided in the United Kingdom' by a licenced person.[54] The agreed fatherhood conditions require the father to give a notice that he 'consents to being treated' as the father of 'any child resulting from treatment provided to [the mother] under the licence'.[55] The woman who is to give birth must 'a notice stating that she consents' to the intended father 'being so treated'.[56] The conditions require that neither party has given a further notice withdrawing consent,[57] and that the person who gives birth has not given a subsequent notice that someone else is to be treated as the father.[58]

Where these sections apply, it may be irrelevant in the context of a paternity dispute to assert that the currently recognised father is not the 'true' genetic parent of the child. This means that chimerism will cause less of a problem in some situations where the Act applies. That said, there will be some situations where sperm from the intended father *was* to be used to make him the biological father, and chimerism may well wrongly suggest that an error has been made by the fertility clinic.

Unfortunately, the potential for the assisted reproduction provisions to assist chimeras (perhaps by coincidence) will not be much consolation to chimeric persons who become involved in paternity disputes after conceiving a child naturally. The 'agreed fatherhood

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[50] Human Fertilisation and Embryology Act 2008, s 35(1)(a)-(b).

[51] Cf Human Fertilisation and Embryology Act 2008, s 38(2)-(4).

[52] Human Fertilisation and Embryology Act, s 35(1)(b).

[53] Human Fertilisation and Embryology Act 2008, s 36.

[54] Human Fertilisation and Embryology Act 2008, s 36(a).

[55] Human Fertilisation and Embryology Act 2008, s 37(1)(a).

[56] Human Fertilisation and Embryology Act 2008, s 37(1)(b). See ss 37(2)-(3) on the formal requirement for such notices, and 37(1)(e) excluding intended mothers and fathers within the prohibited degrees of relationship.

[57] Human Fertilisation and Embryology Act 2008, s 37(1)(c).

[58] Human Fertilisation and Embryology Act 2008, s 37(1)(d).

conditions' are bureaucratic and apply only where treatment is provided in a licensed clinic, such that they will not realistically be invoked except as part of a prospective plan. It is also highly significant that both the Act's marriage/civil partnership provision and the agreed fatherhood conditions apply *only* where the conception was *not* brought about by the intended father's sperm. Those provisions could potentially be useful if it is thought that the sperm truly belongs to the man's deceased sibling, but not otherwise. That said, if the sperm is to be treated as relevantly 'his' (a matter that is considered further in the next section of this paper), he will be in no worse a position than the putative fathers considered in the previous sub-section, and the issue would come to light only if the parents decided to undergo paternity testing notwithstanding their use of assisted reproduction.

In addition, while the Act confers fatherhood on spouses and civil partners outside the setting of a licenced clinic, conception via sexual intercourse will not be included within the definition of 'placing in [the mother]…[an] embryo or of the sperm…eggs or…her artificial insemination', particularly following *TT*,[59] even if the sperm inseminating the mother is not regarded as relevantly 'belonging' to the spouse or civil partner. This means that even a spouse or civil partner who is chimeric may face difficulties with paternity testing (but will at least have the benefit of the *pater est* presumption) unless he and the child's mother used assisted reproduction because either they knew he was a chimeric person or for another reason.

The next section considers the specific implications of chimerism for legal fatherhood.

THE PARTICULAR IMPLICATIONS OF CHIMERISM FOR LEGAL PARENTHOOD

Chimerism gives rise to some philosophical questions such as the 'true' nature of biological parenthood and identity, as well as policy questions such as who ought to be presumptively recognised as a *legal* parent and why. Chimerism has potentially significant implications for understandings of fatherhood and parenthood more generally, and the aim of the present section is to explore these issues.

[59] See also *M v F (Legal Paternity)* [2013] EWHC 1901 (Fam); [2014] 1 FLR 352.

The phenomenon highlights the differences between the understandings of different types of parenthood in English law: motherhood is determined via the *process* of giving birth, irrespective of any genetic link. That is currently[60] true at the outset even if the position is later varied by a parental order (giving effect to a surrogacy agreement)[61] or adoption.[62] Outside the (admittedly significant) context of assisted reproduction,[63] and again subject to a parental order or adoption, by contrast, the orthodox position appears to be that fatherhood is determined not primarily through a process but through a genetic link.[64] Even in the current law of surrogacy, genetics remain key: one of the applicants for a parental order must for the time being[65] be the genetic parent of the child,[66] such that only the longer and more arduous route of adoption is available to those who are not, albeit that in this particular instance the relevant genetic link can be provided by the mother as an alternative to the father. Much of this section is devoted to the question of who should be the legal father in a case where a putative father is a chimera, in light of the complexities that the phenomenon causes for notions of 'genetic' and 'biological' fatherhood. The difficult practical problem of whether and how a chimeric father might even be identified under present legal and scientific practice is then addressed.

The Fundamental Question: Who Should be the Legal Father?

The challenge issued by chimerism, specifically 'tetragametic' chimerism, is that arguably the 'true' father of the child can be the sibling of the person who ejaculated to produce the sperm with which the mother was inseminated. If that is the 'truth' being asserted, the normative importance of DNA testing and knowledge of origins is arguably in principle the same as if the twin had lived and died before the child was born, albeit with the added

[60] Cf Law Commission and Scottish Law Commission, *Building families through surrogacy: a new law* (Consultation Paper 244/Discussion Paper 167, 2019), ch 8.

[61] Human Fertilisation and Embryology Act 2008, ss 54-54A.

[62] Adoption and Children Act 2002.

[63] See, eg, Human Fertilisation and Embryology Act 2008, s 35-36.

[64] Cf, eg, R. D'Alton Harrison, 'Mater Semper Incertus Est: Who's your Mummy?' (2014) 22 *Medical Law Review* 357, 358-9.

[65] Cf Law Commission and Scottish Law Commission n **60** above, Consultation Question 59, suggesting that a genetic link should not be required in cases of medical necessity.

[66] Human Fertilisation and Embryology Act 2008, s 54(1)(b), 54A(1)(b).

practical difficulty that here the putative parent cannot be tested etc independently of the chimeric person. Testing is considered later in this section. But the importance of such *information* for medical and identity-related purposes need not lead to a conclusion that the deceased sibling ought to be the legal father. Chimerism thus further highlights the potentially multifaceted nature of parenthood, and it is vital to determine who should be the legal father from a normative perspective.

It is already legally possible for a child only ever to have had one parent in English law,[67] and many children will know only one parent as a matter of reality. If the two-legal-parent limit is to be maintained,[68] however, there is arguably little to be gained by asserting that a child's father was someone who never became a legal person simply because we have decided to attach significance to a particular aspect of biology. This is notwithstanding the strong case that can generally be made for regarding genetics as a core part of identity for human rights and other purposes, which some scholars question to varying extents in any event.[69] Quite apart from the potential emotional implications of being unexpectedly rendered 'fatherless' because of a quirk of biology, significant practical disadvantages for the child concerned would flow from a conclusion that the true genetic and therefore legal parent of a child is someone who never themselves became a legal person. These would include a presumptive deprivation of inheritance rights in cases of intestacy[70] and of child support,[71] and the chimeric person's ability to care for the child may be rendered precarious, in contrast to the *parent's* presumptive right of involvement in the child's upbringing now enshrined in statute.[72] There is the possibility that some such difficulties could be resolved through

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[67] This occurs, for example, in the context of assisted reproduction when the mother's spouse/civil partner does not consent to becoming the other parent or the agreed fatherhood/female parenthood conditions are not satisfied and the sperm donor is not treated as the father either (Human Fertilisation and Embryology Act 2008, s 41).

[68] Cf, eg, J. McCandless, and S. Sheldon, 'The Human Fertilisation and Embryology Act (2008) and the Tenacity of the Sexual Family Form' (2010) 73 *Modern Law Review* 175.

[69] See, eg, J. Marshall, 'Secrecy in births, identity rights, care and belonging' (2018) 30 *Child and Family Law Quarterly* 167; J. Herring and C. Foster, 'Please Don't Tell Me" The Right Not to Know' (2012) 21 *Cambridge Quarterly of Healthcare Ethics* 20, 26; R. Leckey, 'Identity, law, and the right to a dream' (2015) 38 *Dalhousie Law Journal* 525.

[70] Administration of Estates Act 1925, s 46.

[71] Child Support Act 1991.

[72] Children Act 1989, s 1(2A).

mechanisms such as adoption,[73] the granting of parental responsibility or related orders to the non-parent,[74] the making of a will, or the recognition of the child in question as a 'child of the family' who has some potential claim to financial support.[75] But adoption, for example, is an onerous process and an adoption order cannot be sought after a child reaches adulthood,[76] such that it is not a particularly viable alternative to the recognition of the chimeric person as the legal father in the first instance. More broadly, Bainham has argued that, for significant numbers of people, 'the claim that being a parent is about doing the job of a parent is explicitly rejected'.[77] The assisted reproduction provisions of the Human Fertilisation and Embryology Act could be used to ensure the legal fatherhood of the chimeric person in relation to *future* children, since they can confer fatherhood on someone who has *not* provided the genetic material. As is often the case, however, by the time the issue comes to light it may be too late to provide a solution, at least one that does not generate disputes that are costly in both financial and emotional terms.

Again, many children deal with similar issues in practice without being fathered by a chimeric person, and the absence of inheritance rights for one child (for example) could increase the entitlements of those 'fortunate' enough to have been conceived in circumstances such that they are recognised as legal children. Such conception could in fact happen naturally even in the context of a chimeric father: in the very US case with which this paper opened, more standard buccal testing '*did not exclude*' the chimeric father as the genetic parent of one child even though it did exclude him as the genetic parent of another.[78] But it is not obviously desirable for English law to deny fatherhood where there is (to put it mildly) one highly plausible candidate, ie the chimeric father, and one candidate who was never themselves born. This distinguishes the unborn twin from (for example) a sperm donor. In a chimerism context, it is thus possible and normatively appropriate to separate the value of knowledge of genetic origins for (*inter alia)* medical purposes and the question of legal parenthood per se.

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[73] Adoption and Children Act 2002.

[74] Children Act 1989, ss 4A, 8, 10.

[75] Children Act 1989, Sch 1; Inheritance (Provision for Family and Dependants) Act 1975, s 1(1)(d).

[76] Adoption and Children Act 2002, s 49(4).

[77] A. Bainham, 'Arguments About Parentage' [2008] *Cambridge Law Journal* 322, 331.

[78] Sheets et al n **2** above, 349 (emphasis in the original).

Admittedly, there is precedent in England and Wales for a person whose life did not overlap with the child's conception being symbolically recognised as the father. Specific provision is made for posthumously conceived or implanted children to have a now-deceased person recognised as their father if he validly and formally consented to such recognition, whether the sperm used came from him or a donor.[79] But in such circumstances the predeceasing father *did* become a legal person, and the symbolic recognition of his status does not (unlike in a chimerism scenario) presumptively deprive the child of another parent in the same way. Another distinction is that in the posthumous conception/transfer scenario the apparent policy reason for the failure to confer substantive rights is the disruption that would be caused in estate administration and related manners.[80] In our chimerism situation, there would be no substantive rights to confer in any event because the twin who was never born never possessed any himself. But it seems that any 'disruption' is most likely to stem from a *refusal* to recognise the chimeric person as the true legal father. There may also be an argument that the European Convention on Human Rights would prohibit discrimination by virtue of Article 14 (in conjunction with the right to respect for private and family life under Article 8) in relation to inheritance rights being made between those ostensibly conceived by a chimeric person but not treated as a legal child of that person, and those similarly conceived who *are* treated as such a child. These two types of children have been brought into being by the same two people via a process that is ostensibly the same from an external perspective. Any differential treatment as regards inheritance would arguably have some analogies to discrimination on the basis of the marital status of the parents, considered impermissible in *Marckx v Belgium*.[81]

Moreover, while the termination of parenthood via adoption is permissible under Article 8, this will be true only 'in very exceptional circumstances' consistently with the paramountcy of the child's best interests.[82] It would be difficult to argue that deprivation of a father 'only' (since the 'true' father never became a legal person) would be consistent with the child's best interests, particularly given that de facto ties between the chimeric person and

[79] Human Fertilisation and Embryology Act 2008, ss 39-40.

[80] See further N. Maddox, 'Inheritance and the posthumously conceived child' [2017] *Conveyancer and Property Lawyer* 408.

[81] (1979-80) 2 EHRR 330.

[82] *YC v United Kingdom* [2012] 2 FLR 332 at [134].

the child would also probably be recognised under Article 8.[83] In *Fröhlich v Germany*, for example, the European Court of Human Rights expressly recognised that 'the existing family ties between' the mother, her husband 'and the children they actually care for warrant protection under the Convention', even though the husband was unlikely to be the biological father.[84]

Admittedly, the European Court has found a breach of Article 8 in cases such as *Anayo v Germany*, where a legal system has failed properly to recognise the natural father (in that instance through a denial of contact) and preferred the mother's partner.[85] Such a situation is arguably more analogous to chimerism rather than adoption, since there would be no real *transfer* of parenthood but merely a recognition of what has been 'true' all along if the unborn twin were to be regarded as the legal father. But again, the chimerism situation can be distinguished because there a legal person is not being denied fatherhood, and the relevant child is merely losing entitlements without a corresponding gain.

Fundamentally, if a non-chimeric 'natural' father is to be treated as a legal father, there is no compelling policy reason to treat a *chimeric* would-be father differently, particularly in light of the ostensible deprivation of a parent otherwise involved. The following sub-sections consider principled routes through which the conclusion that the chimeric person is the legal father might be reached. They are advanced within the broad framework of current English law, generally leaving aside the possibility that 'purely' social parenthood might be substantively recognised after birth. Two possible approaches, and their implications for understanding parenthood in general, are considered: the 'ownership' approach and the 'process'-oriented approach. The former is ultimately preferred for its relative simplicity and its less significant implications for legal parenthood in other contexts.

The 'Ownership' Approach

One solution would be simply to assert that the chimera *does* 'own' all of 'his' genetic material, notwithstanding the fact that some of it derived from his unborn sibling. The notion of 'ownership' here would be non-technical. The possibility of 'ownership' in the strict sense

[83] See, eg, *VD v Russia* (2019) 69 EHRR 29.

[84] (2019) 68 EHRR 20 at [60].

[85] [2011] 1 FLR 1883.

of both bodily products and genetic information is much debated,[86] and while potential ownership of stored sperm samples was recognised in *Yearworth v North Bristol NHS* Trust,[87] here 'ownership' could be used in a looser sense in any event. On this analysis, the chimeric person genuinely has two sets of genetic material, being himself genetically 'tetra-parental' as Johnson puts it,[88] reflected in different proportions throughout his cells. One of those sets of DNA would be validly recognised as having produced the relevant child.

This broader understanding of 'ownership' of genetic material would reflect the argument that the genetic fatherhood status of the unborn twin is not a fundamental 'truth'. Rather, it is simply a conclusion drawn on the balance of the best available scientific evidence. The 'ownership' thesis would also assist the claim that the chimeric father is a genetic as well as a 'natural' father of the child in a looser sense, even if the situation is more complex by virtue of his chimerism. This, in turn, raises interesting questions about the relative importance of a genetic relationship's abilities to link a child to a specific (at some point living, human) parent, or to form a more fundamental aspect of identity. Bainham, for example, emphasises that legal parenthood 'makes the child a member of a family, generating for that child a legal relationship with wider kin going well beyond the parental relationship'.[89] But of course, given that the unborn twin would have been a sibling of the (ultimately) chimeric father, the twin would have been a biological relative of the child rather than a 'stranger' in any event.[90] This reduces the difficulty of issues of wider kinship that might be raised with the 'ownership' approach.

A possible objection to this 'ownership' approach, however, would be that it undermines the dignity of the unborn sibling as a potential human being, who did have a complete and unique set of DNA that happened to be absorbed by their sibling before being

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[86] See, eg, J. Herring, *Medical Law and Ethics* (Oxford: Oxford University Press, 8th edn, 2020), ch 8.

[87] [2009] EWCA Civ 37; [2010] QB 1.

[88] M. Johnson, 'A Biomedical Perspective on Parenthood' in A. Bainham, S. Day Sclater and M. Richards (eds), *What is a Parent: A Socio-Legal Analysis* (Oxford: Hart Publishing, 1999), 48.

[89] A. Bainham, 'Parentage, Parenthood and Parental Responsibility: Subtle, Elusive Yet Important Distinctions' in A. Bainham, S. Day Sclater and M. Richards (eds), *What is a Parent: A Socio-Legal Analysis* (Oxford: Hart Publishing, 1999), 33.

[90] Cf, eg, T.C. de Campos and C. Milo, 'Mitochondrial Donations and the Right to Know and Trace One's Genetic Origins: An Ethical and Legal Challenge' (2018) 32 *International Journal of Law, Policy and the Family* 170.

used to produce the eventual child.[91] By virtue of the 'ownership' approach, the unborn sibling suffers the arguable indignity of 'erasure' notwithstanding their apparent status as a genetic parent. Many would no doubt counter that any such question of dignity is resolved (subject to limited protection within abortion, human tissue and other legislation)[92] by the denial of more general legal personhood to the sibling because they had never been born. But it is arguable that this view adopts a particular, and potentially artificial, understanding of biology's implications that is not necessarily inevitable, albeit that it is convenient. A related argument against the 'ownership' approach could be that it gives insufficient recognition to the specific genetic *relationship* between the unborn twin and the eventual child, although that may not be far away from the suggestion that the unborn twin should simply be the legal father instead, which has already been rejected for policy reasons. Ultimately, no critique of the 'ownership' thesis is likely to outweigh the normative importance of regarding the chimeric person as the 'true' father.

The 'Process'-Oriented Approach

Another way of resolving legal parenthood in favour of the chimeric person being the 'true' legal father would be to suggest that English law's understanding of fatherhood is, or at least should be, subtly different from what has tended to be thought. This would apply outside the context of assisted reproduction within the scope of the Human Fertilisation and Embryology Act, where the person who is to be treated as the father from the moment of birth need not have provided the relevant semen in the first place. It would also be subject to later variation through adoption or a parental order in the usual way. The principle would be that fatherhood is based on a process after all, that of semen derived from one's body being used to impregnate the mother, a potential instance of what Johnson has described as the 'coital' aspect of parenthood,[93] or alternatively a 'causation'-based approach to fatherhood.

An Application of 'Intentional' Parenthood?

[91] See, eg, R.P. George, 'Embryo Ethics' (2008) 137 *Daedalus* 23.

[92] See, eg, Herring n **86** above, 367-371.

[93] Johnson n **88** above

The 'process'-oriented approach could also potentially be characterised as an application of 'intentional' parenthood, a school of thought that has been influential in justifying the conferral of legal parenthood in the context of assisted reproduction and surrogacy on those who are not necessarily biologically related to the child but manifested a recognised intention to become the child's parent.[94] *If* the 'process'-oriented approach can accurately be described as a manifestation of 'intentional' parenthood, it could help to rationalise English law's general approach to parenthood by emphasising that even natural parenthood can be described as intentional, such that *all* forms of parenthood could potentially be described as such and the perceived distinction between the different methods of acquiring legal parenthood would be reduced. In this context, it is significant that Barton and Douglas argued decades ago that a person's intention or desire to become a parent was 'the *primary* test of legal parentage'.[95]

It must be emphasised, however, that a naturally inseminating person cannot benefit from the requirement of consent to legal parenthood present in the Human Fertilisation and Embryology Act 2008. He may become a legal father even in the absence of consent or intention on his part, and might not have consented to *fatherhood* even if he did consent to the sexual intercourse resulting in the child's conception. For example, he may have been under the false impression that the mother was using contraception. In this respect, some naturally inseminating fathers may not be true 'intentional' parents, similarly to the way in which someone who feels compelled to give birth having fallen pregnant accidentally may not be a true 'intentional' parent.[96] The use of 'intentional' parenthood as a concept to characterise chimeric parenthood thus suffers from at least the same limitations as in other forms of natural parenthood, including the conclusion that 'unintentionally' conceived children would logically be parentless under this approach (which they are not in English law) unless and until a mechanism such as adoption took place.[97] This, in turn, demonstrates the need for a default rule. Horsey, moreover, prefers a model of intentional parenthood that encompasses both intention to conceive *and* a commitment to nurture, which again may be

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[94] See, eg, K. Horsey, Challenging presumptions: legal parenthood and surrogacy arrangements' (2010) 22 *Child and Family Law Quarterly* 449.

[95] Barton and Douglas n **42** above, 51.

[96] See also Marshall's (n **69** above) argument that a person who gives birth should not always be characterised as a 'mother'.

[97] See, eg, Horsey n **94** above, 455.

absent whether the father is chimeric or not.[98] An additional complication with 'intentional' parenthood in the context of unwitting chimerism is that, even if a chimeric person did intend to conceive a child via sexual intercourse with the mother, he presumably thought he would be doing so with his own genetic material. Assuming for present purposes that the 'ownership' thesis is rejected, conception with the father's own genetic material may not of course be what occurs, such that the notion of 'intention' would have to be qualified to an extent even here. Conversely, a further respect in which the chimerism situation differs from so-called 'intentional' parenthood under the 2008 Act is that the unborn twin self-evidently did not and could not consent to the *absence* of his legal parenthood of the child ultimately produced.[99]

A Comparison with Non-Chimeric Situations

However it is precisely characterised, the 'process'-oriented understanding of 'natural' and legal fatherhood would apply irrespective of the genetic content of the semen producing the child. This means that the difficulties raised by chimerism would be at least very considerably reduced, even if it were argued that the outcomes of scientific tests did not represent a fundamental 'truth' as discussed above. In fact, it may be that this 'new' understanding reflects the historical law and practice when '[b]efore the advent of blood tests, paternity could normally be inferred only from the fact that the alleged father had sexual intercourse with the mother about the time when the child must have been conceived'.[100] It also reflects the *pater est* presumption, which is tantamount to a presumption that the child was conceived through the insemination of the mother by her husband (or now civil partner), creating 'a legal truth regarding physical events, whether or not it corresponded with the actual physical truth'.[101] It can even reflect the position where a child is conceived after a father has died using his semen. In addition, while it has been shown that this specific 'process'-oriented approach in the context of natural reproduction need not *apply* to assisted reproduction regulated by the Human Fertilisation and Embryology Act, it could be argued

[98] *ibid*.

[99] Cf Human Fertilisation and Embryology Act 2008, s 41, albeit that this comes into effect only when no other person is to be treated as the father (or other second parent) of the child.

[100] Lowe and Douglas n **26** above, 260.

[101] J. Eekelaar, *Family Law and Personal Life* (Oxford: Oxford University Press, 2nd ed, 2017), 147.

that it is consistent with that Act because in both cases a process determines fatherhood irrespective of genetic content. It is significant, however, that the process of acquiring fatherhood by insemination is a biological one legally recognised, while the process of acquiring fatherhood under the Act (as distinct from the actual creation of the child) is a constructed and legal one per se, involving third-party intervention designed precisely to facilitate the acquisition of fatherhood where the intended father's sperm is not used.

Similarly, adoption and surrogacy could be brought within a 'process'-oriented analysis of parenthood, potentially adding to the coherence of English law's understanding of parenthood. That said, they too have to be understood as largely legally constructed rather than biological processes, albeit that use of the intended father's sperm may provide part of the justification for a parental order, and there are rare circumstances where an existing legal father might use adoption.[102]

Implications of the 'Process'-Oriented Approach

Developing the second, 'process'-oriented solution to the conundrum of the 'chimera', could it be argued that the genetic link usually determined by DNA testing serves, or at least should serve, as a proxy for insemination by the putative father rather than the other way around? It might reduce the perceived value of genetic testing. As illustrated by the US *Fairchild* case, however, regarding such testing as inconclusive is important in some factual scenarios involving *mothers*. As demonstrated later in this section, moreover, testing may still cause difficulties for chimeric fathers.

An advantage of this 'process'-oriented approach could in fact be that it reduces the distinction between the bases on which legal motherhood and fatherhood respectively are conferred. Very significant differences would inevitably remain between ejaculation and insemination on the one hand and pregnancy and parturition on the other, and Lady Hale attached particular significance to the gestational bond between mother and child in the House of Lords in *Re G (Children) (Residence: Same-Sex Partner)*.[103] But both motherhood and fatherhood would in the first instance flow from *processes* surrounding the child's conception and birth rather than genetics per se, in a context where the wisdom of the differences between the statuses of motherhood and fatherhood is increasingly being

[102] See, eg, *B v P (Adoption by Unmarried Father)* [2001] UKHL 70; [2002] 1 W.L.R. 258.

[103] [2006] UKHL 43; [2006] 1 WLR 2305.

questioned in any event.[104] It would also advance the possible argument that, just as there are two forms of 'biological' motherhood, genetic and gestational, there are also two (potentially separate) forms of 'biological' fatherhood, genetic and coital. This, in turn, shows that the label 'biological' is potentially ambiguous in relation to both types of parenthood rather than merely motherhood,[105] and that fatherhood is perhaps even more 'fragmented' than Sheldon thought.[106] Following the 'process'-oriented approach, in the contest for legal fatherhood, the 'genetic' parent can lose out to the 'coital' parent even in the context of 'natural' reproduction and before 'social' parenthood is considered. It may even be arguable that a chimeric father is not a 'true' biological father because of complications surrounding the relevant genetic material. This argument, however, is not convincing because he has still participated in a biological process resulting in the conception of the child (very broadly analogous to the gestational mother's role in the child's development), even if the 'ownership' thesis outlined above is considered unconvincing.

In any event, fatherhood would thus potentially be subjected to debates somewhat equivalent to those about whether gestation or genetics (or both or neither) is the most appropriate basis for presumptive legal motherhood.[107] The unsuccessful claim in *TT*, *sub nom R (Alfred McConnell) v The Registrar General for England and Wales*, for example, amounted to an assertion that gestation should not necessarily produce legal motherhood per se,[108] albeit that the claimant still sought legal *parenthood*.

Admittedly, however, the implications of this extension of a version of the genetics/gestation debate to fatherhood are clearly limited by the significant physical differences in the nature of insemination versus gestation and the clearer ability to control the divergence between genetics and parturition (in the case of motherhood, through egg donation) than between genetics and insemination (in the case of fatherhood). The 'process'-oriented approach, moreover, need not necessarily provide clear normative answers to the questions raised by these debates. It is nevertheless worth emphasising that, on this analysis,

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[104] See, eg, C. Fenton-Glynn, 'Deconstructing Parenthood: What Makes A "Mother"?' [2020] *Cambridge Law Journal* 34.

[105] See, eg, D'Alton Harrison, n **64** above.

[106] S. Sheldon, 'Fragmenting Fatherhood: The Regulation of Reproductive Technologies' (2005) 68 *Modern Law Review* 523.

[107] See, eg, D'Alton Harrison, n **64** above; Law Commission and Scottish Law Commission n **60** above.

[108] *McConnell* n **36** above.

the 'natural' processes of insemination via sexual intercourse followed by parturition (giving birth) presumptively determine parenthood in preference to genetics (where they occur and where there is a divergence between the two) in relation to both motherhood and fatherhood, which adds coherence to the law. On the other hand, parturition currently retains its presumptive dominance even when 'intention'-based processes regulated by the 2008 Act occur, while insemination does not necessarily do so. There may be good reasons for this, rooted in the particular long-lasting and onerous nature of gestation and parturition as compared to the provision of sperm, and consistency is not always desirable where scenarios can be relevantly distinguished from each other. It is nevertheless significant that the Law Commissions of England and Wales and Scotland are considering whether parturition should retain its presumptive dominance in the context of a surrogacy arrangement, having proposed a 'pathway' whereby a commissioning parent can be the child's legal parent instead of the gestational surrogate from birth in certain circumstances.[109]

Advantages over the 'Ownership' Approach

Does the second, 'process'-based, approach for the justification of chimeric legal fatherhood address any relevant criticisms of the 'ownership'-based analysis considered above? Arguably, it does not seek to *deny* the genetic contribution of the unborn twin in the same way (and thus any attack on 'dignity' or on the proven genetic relationship is reduced), since it purports to avoid genetics per se as the true basis of parenthood, and it cannot realistically be argued that the unborn twin participated actively in the process of insemination in any event. In this respect, it negates the risk that the unborn twin will be regarded as the legal father by holding that genetics per se ought *never* to determine fatherhood. In doing so, however, it arguably underplays the significance of genetics as an aspect of identity.

Identity, Medical Information and Biological versus Social Concepts of Parenthood

Debates about the relative importance of aspects of 'identity' have tended to invoke the UN Convention on the Rights of the Child. The CRC protects a qualified right to know and be cared for by one's parents in Article 7, and the right to establish one's identity and family

[109] Law Commission and Scottish Law Commission n **60** above, ch 8.

relations in Article 8. While the CRC has not been fully incorporated into English law per se, it is becoming increasingly influential.[110] Marshall highlights there is 'no explicit reference in these provisions…to the biological family',[111] but Bainham forcefully argues that, because of the history and context of the CRC, '"parents" in the Convention was intended to mean genetic parents and…the onus is very firmly on those who would argue for an unconventional interpretation'.[112] Genetic origins, in any event, must surely form at least *part* of identity for the purposes of Article 8 even if they need not represent its entire scope.[113]

Moreover, even if it is possible to debate the appropriate characterisation of identity for the purposes of the CRC, genetics per se will clearly be of direct relevance in the context of individualised medicine,[114] potentially creating a tension between the relevant aspects of parenthood. It is significant, however, that there is no absolute right to be told either the circumstances of one's conception (whether 'natural' or assisted)[115] or (as we will see) that one may have inherited a genetic condition, whether under Article 8 or domestic law.

From the child's perspective, the European Court of Human Rights has recognised that those seeking to establish the identity of their biological fathers have 'a vital interest, protected by the Convention', 'in receiving the information necessary to uncover the truth about an important aspect of their personal identity'.[116] Specifically, '[b]irth, and in particular the circumstances in which a child is born, forms part of a child's, and subsequently the adult's, private life guaranteed by Art.8 of the Convention',[117] and 'rigorous scrutiny is called for when weighing up the competing interests'.[118] Perhaps mysteriously (albeit in the context of case of a person subject to 'anonymous birth' and adoption), however, it has been held that

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[110] See, eg, *R (on the application of SG and others (previously JS and others)) v Secretary of State for Work and Pensions* [2015] UKSC 16; [2015] 1 WLR 1449.

[111] Marshall n **69** above, 176.

[112] Bainham n **89** above, 38.

[113] See, eg, B. Sloan, 'Article 5 of the Convention on the Rights of the Child and the Involvement of Fathers in Adoption Proceedings: A Comparative Analysis' (2020) 28(3) *International Journal of Children's Rights* (forthcoming).

[114] See, eg, *R (on the application of TT) v Registrar General for England and Wales* (n **33** above) at [193].

[115] See, eg, A. Bainham, 'What is the Point of Birth Registration?' (2008) 20 *Child and Family Law Quarterly* 449.

[116] *Mikulic v Croatia* [2002] 1 FCR 720 at [54].

[117] *Odièvre v France* (2004) 38 EHRR 43 at [29].

[118] *Jaggi v Switzerland* (2008) 47 EHRR 30 at [37].

'[t]he issue of access to information about one's origins and the identity of one's natural parents is not of the same nature as that of access to a case record concerning a child in care or to evidence of alleged paternity'.[119]

The result is that informational 'rights' of the child, albeit included within the scope of 'private life' for the purposes of Article 8 ECHR, would be of limited utility whether one treated the unborn twin as having its DNA subsumed within the chimeric person or as analogous to a sperm or even mitochondria[120] donor. In a case involving chimeras, moreover, the European Court would have to grapple with the question of what was truly meant by a 'biological' father. The relevance of international conventions to the question of genetic testing is considered further at the end of this section.

Many might consider the second, 'process'-oriented approach to be unnecessary. The argument would proceed that by far the simplest solution is to regard all the genetic material contained within the chimeric person as relevantly 'his', notwithstanding the fact that some of it ultimately derived from his twin who never had the privilege of being born. The chimeric person is thus still a genetic parent and chimerism does not truly disrupt the primacy generally accorded to genetics in the context of natural fatherhood, nor require fatherhood to be any further 'fragmented'. Those who emphasise the importance of natural parenthood may prefer the first, 'ownership'-based solution and argue that chimerism merely demonstrates the need for a more nuanced understanding of biology and genetics. Those who prefer a more social model of parenthood may nevertheless prefer the second approach (at least as compared to the first), emphasising its reliance on a (qualified) form of 'intentional' parenthood irrespective of genetic content. They may even use the potential absence of a genetic link further to advance the primacy of 'lived experience' or 'lived existence' as a normative basis both for determining legal parenthood and for determining the scope of identity rights.[121] They could highlight the fact that even 'natural' fathers may have neither a 'true' genetic link nor a gestational bond, and seek to minimise the relevance of a brief (necessarily, as compared to gestation and presumptive post-natal care) act of insemination

[119] *Odièvre* at **117** above at [43].

[120] De Campos and Milo n **90** above.

[121] See, eg, Marshall n **69** above.

per se to the resulting child.[122] While it *might* better reflect the 'lived experience' of those who give birth as compared to those who do not, this line of argument risks discriminating against 'natural' fathers in particular cases where mothers seek to excise them from a child's life to suit their own preferences,[123] and ignoring the many situations where a genetic link *will* exist in addition to the process-based one. It may also give inadequate weight to the fact that an individual person cannot generally[124] *choose between* insemination and parturition, such that which contribution is made to the creation of a child is not a matter of individual decision. Moreover, the chimeric father and the child may have been shown to share *a* genetic link (because of the close relationship between that father and the unborn twin), even if it is not the usual relationship expected between biological father and child. This arguably illustrates the extent to which the 'process'-oriented approach goes too far in apparently jettisoning genetics per se in favour of 'coital' parenthood.

Conversely, the 'process'-based argument may even be *criticised* by those who adopt a more social view of parenthood, because it could be interpreted as purporting to impose a formal equality between biological motherhood and fatherhood that does not exist due to the fundamental differences at least between gestation/parturition and insemination. Fineman, for example, argues that a 'reluctance to recognize and accommodate the uniqueness of Mother's role in child rearing conforms to the popular gender-neutral fetish at the expense of considerations for Mother's material and psychological circumstances'.[125] Whatever its possible advantages in terms of coherence, the far-reaching, complex and potentially damaging implications of the 'process'-based argument in these respects may well outweigh its potential normative benefits in protecting the 'dignity' of the unborn sibling. It is particularly significant that the argument could be critiqued by scholars with very different emphases on the relative importance of the various aspects of parenthood.

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[122] See, by analogy J. Wallbank, '"Bodies in the Shadows": joint birth registration, parental responsibility and social class' (2009) 21 *Child and Family Law Quarterly* 267; see R. Collier and S. Sheldon, *Fragmenting Fatherhood: A Socio-Legal Study* (Oxford: Hart Publishing, 2008), ch 2 for a critique of this viewpoint.

[123] See, eg, Sloan n **113** above.

[124] Cf, eg, B.P. Jones et al, 'Uterine transplantation in transgender women' (2019) 126 *British Journal of Journal of Obstetrics & Gynaecology* 152.

[125] M. Fineman, *The Neutered Mother, The Sexual Family and Other Twentieth Century Tragedies* (New York: Routledge, 1995), 88-89.

Conclusion on the Relative Merits

Within the broad framework of current English law, the basic conclusion on fatherhood would be the same whichever method of resolution is chosen. On either the 'ownership' or the 'process'-based analysis, the chimeric 'natural' father is the 'true' legal father (subject to the availability of adoption or conferral of PR on someone who is not a legal parent). It has been seen, however, that they may have differing implications for the more general understanding of parenthood, and that an 'ownership' approach has significant advantages in that respect.

Paternity Disputes, Scientific Tests and Practical Problems Caused by Chimerism

This section has drawn the normative conclusion that a chimeric father should be the legal father in a case of 'natural' reproduction, and put forward two theses facilitating that conclusion. It remains necessary to consider how an English court might respond to a situation of possible chimerism, and the likelihood that a chimeric father will be identified. Accurate genetic information will be particularly important if the 'ownership' thesis is preferred, as this paper has advocated. While it may be less significant for the 'process'-oriented approach, it remains useful as a proxy for coital parenthood. Whichever the precise justification for legal fatherhood, moreover, it may obviously be vital to determine that a chimera, and not a third party legal person, is the father. As will become clear, such information can also assume significance in the context of medical conditions. This sub-section will outline the general law and practice relating to paternity disputes, integrating a discussion of how possible chimerism might or should influence those involved in a practical sense.

Scientific Tests in Court Proceedings

The court may make a declaration of parentage under the Family Law Act 1986.[126] Under the Family Law Reform Act 1969, it has the power, '[i]n any civil proceedings in which the parentage of any person falls to be determined', 'either of its own motion or on an application

[126] Family Law Act 1986, s 55A.

by any party to the proceedings' to give a direction 'for the use of scientific tests to ascertain whether such tests show that a party to the proceedings is or is not the father or mother of that person', and 'for the taking…of bodily samples from all or any of…that person, any party who is alleged to be the father or mother of that person and any other party to the proceedings'.[127]

Under section 20, the person who carries out the tests must then make a report to the court stating 'the results of the tests', 'whether any party to whom the report relates is or is not excluded by the results from being the father or mother of the person whose parentage is to be determined', and 'in relation to any party who is not so excluded, the value, if any, of the results in determining whether that party is the father or mother of that person'.[128] It is specifically possible to 'obtain from the tester a written statement explaining or amplifying any statement made in the report'.[129]

Section 20 originally 'permitted a direction for "blood tests" to be made', but the wording was 'updated…to "scientific testing"; taking into account the development of DNA testing'.[130] The Lord Chancellor can make regulations concerning 'the manner of giving effect' to a section 20 direction, and the regulations may *inter alia* 'prescribe the bodily samples to be taken' and 'regulate the taking…of bodily samples', prescribe 'the scientific tests' to be carried out and the manner in which they are to be carried out' and 'make different provision for different cases or for different descriptions of case'.[131] The Lord Chancellor, however, does not appear to have taken the opportunity to make detailed provision about either bodily samples or permitted tests in the regulations currently in force.[132] For present purposes (specifically testing where there is the possibility of chimerism) this inaction potentially has both positive and negative consequences. On the one hand, the absence of prescription could allow a greater range of tests to be carried out when

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[127] Family Law Reform Act 1969, s 20(1). See Family Law Reform Act 1969, s 20(1A) and Gov.uk, 'Get a DNA test', at https://www.gov.uk/get-dna-test (visited 28 August 2020) on accreditation of testers. See also, eg, *Spencer v Spencer* [2018] EWCA Civ 100; [2019] Fam 66 on testing under the inherent jurisdiction where section 20 is inapplicable.

[128] Family Law Reform Act 1969, s 20(2).

[129] Family Law Reform Act 1969, s 20(4).

[130] *Spencer* n **127** above at [24]. See the Family Law Act 1987.

[131] Family Law Reform Act 1969, s 22. There is now a review obligation in relation to the exercise of the power: Blood Tests (Evidence of Paternity) (Amendment) (Review) Regulations 2015/2048.

[132] Blood Tests (Evidence of Paternity) Regulations 1971/1861.

appropriate, and allow for future advances in technology. On the other, it allows practice to focus on a narrower range of more straightforward tests, which might prejudice the ability to recognise chimerism and risk a conclusion that a legal person other than the one being tested is the 'true' father. While Lowe and Douglas assert that DNA tests 'can be carried out on a variety of bodily tissue',[133] practice seems to be limited in terms of the variety of samples taken. In one case, the samples collected were 'mouth swabs and the collection of saliva accordingly',[134] apparently preferred for their convenience.[135]

The difficulty is likely to be that DNA evidence seemingly showing that the chimeric person is *not* the genetic father of the child might be seen as all too conclusive [136] (even if it is not the only admissible evidence),[137] with chimerism per se left undetected. The experience of chimerism, however, suggests that even a *negative* finding from a DNA test cannot necessarily be 'trusted', notwithstanding the Court of Appeal's assertion that a DNA test provides 'effectively incontrovertible' evidence in this context.[138]

It is important to consider the consequences of these approaches and attitudes to DNA testing for the purposes of identifying chimeric persons. Writing from a US perspective, Sheets and Wenk assert that '[r]elationship testing labs routinely collect buccal samples, a sample choice…made for safety and convenience'.[139] This seems to accord with experience in England and Wales. By contrast, they note that '[t]he best way to identify a suspected chimeric individual is to sample and test germ cells',[140] ie sex cells or gametes,[141] with '[a]

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[133] Lowe and Douglas n **26** above, 264. See, eg, Blood Tests (Evidence of Paternity) (Amendment) Regulations 2001, SI 2001/773.

[134] *Re L (A Child) Paternity Testing* [2009] EWCA Civ 1239; [2010] 2 FLR 188 at [4]; see also Gov.uk n **127** above.

[135] DNA Diagnostics Centre, 'What Type of Samples Can I Use for DNA Testing?' at https://dnacentre.co.uk/what-type-of-samples-can-i-use-for-dna-testing/ (visited 28 August 2020).

[136] See, eg, Lowe and Douglas n **26** above, 264, using the language of 'virtual certainty'. Cf Bainham n **77** above 324, preferring the terminology of 'near certainty'.

[137] See, eg, *C v C and C (Legitimacy: Photographic Evidence)* [1972] 1 WLR 1335, but cf J. Mitchell, *Children Act Private Law Proceedings: A Handbook* (Bristol: Family Law, 3rd ed, 2012) at [6.82].

[138] *Re P* n **39** above at [13]. See also the Government's claim (Gov.uk n **127** above) that (standard) tests can 'prove that 2 people definitely are not related'.

[139] Sheets and Wenk n **4** above, 55

[140] *ibid*, 56.

[141] R.C. King, P.K. Mulligan and W.D. Stansfield, *A Dictionary of Genetics* (Oxford: Oxford University Press, 8th ed, 2013), 191.

semen sample provided by a chimeric father' being 'ideal'.[142] Again consistently with England and Wales,[143] Sheets and Wenk note that 'relationship testing labs currently employ [Short Tandem Repeats]-based DNA tests, which are not always sufficiently sensitive to detect STR alleles of minor cell populations' and can fail to recognise the second-degree relationship that more analysis could reveal to be a chimeric situation.[144] Even routine testing for second-degree relationships might help, but Sheets and Wenk note that this does not tend to occur. They conclude that '[d]iagnosing a possible chimera might include the use of more robust molecular tests', and that '[a] variety of tissues may require sampling to reveal the excluded parent's chimerism', including '[c]ells…obtained noninvasively from the hair follicles, nail clippings, skin, leukocytes, bladder, uterine cervix in women, and semen in men'.[145]

It is not clear that a judge faced with a negative result following routine DNA testing in England would be willing to order more onerous testing, or to consider alternative evidence of paternity despite the high probative value usually attached to DNA evidence, and of course the representatives of a suspected chimeric person (or on the other side of the case, depending on the parties' motivations) would have to be sufficiently aware of the existence of the phenomenon in the first place. It is significant, moreover, that the court may seek a high degree of control over any process of re-testing or further testing, such that it is reluctant to allow a tester free reign where she suspects chimerism without bringing the matter to the court's attention.[146]

It is, however, reassuring that there is some appreciation of the general limitations of DNA evidence. In one case, it was recognised that a DNA test 'cannot answer the [relevant] question…"definitively"', even if 'it can do so to a very high degree of probability'[147] and 'is likely to produce a robust conclusion one way or the other'.[148] Moreover, in *Re F (Children) (DNA Evidence)*, 'the need for greater clarity in relation to the terms of instruction to DNA experts, particularly where inter-sibling relationships are being analysed, as opposed to

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[142] Sheets and Wenk n **4** above, 56.

[143] *Re F (Children) (DNA Evidence)* [2007] EWHC 3235 (Fam); [2008] 1 FLR 348 at [27]-[28].

[144] Sheets and Wenk n **4** above, 56.

[145] *ibid*, 58. See also *ibid*, 62 on future developments in this respect.

[146] *Re F* n **143** above at [11].

[147] *Re Birtles* n **29** above at [13].

[148] *ibid* at [36]; see also *Re F* n **143** above at [27]-[28].

relatively straightforward paternity testing' was noted,[149] and 'the inherent forensic difficulties in challenging DNA evidence in the absence of a similarly qualified expert, led [the judge] to allow an application by the relevant parties for what was in effect a second expert opinion'.[150] Similar rigour and open-mindedness would be welcome in the context of a suspected chimeric person.

Where there is a suggestion of chimerism, even if it may be unlikely that such a suggestion will often be made in practice, it is to be hoped that a judge will take a pragmatic approach even in the face of a negative paternity test and permit further investigation. It might be thought that matters would be straightforward if no other candidates for paternity have been alleged, in that the putative 'father' could more readily be confirmed as such even in the absence of a DNA match, but of course the likelihood of other candidates is what will often generate the dispute in the first place. The possibility of chimerism makes it important that a negative finding in relation to one candidate should not per se cause the court to deduce that the other candidate is the father, at least where it is possible to test the other candidate(s). In a case where multiple putative fathers emanate from the same family, it is particularly important that the finding of a second-degree relationship between one candidate and the child should not per se lead to a conclusion that (for example) the candidate's brother must be the father. On the other hand, where it is for other reasons unlikely that a particular candidate is the father, there is arguably a risk that the somewhat unlikely possibility of chimerism could be used as a 'fishing' expedition if the phenomenon becomes well known.[151]

Article 8 ECHR and the Ordering of Enhanced Testing

There may be Article 8 implications of a refusal to admit further or more advanced scientific evidence where chimerism is suspected. An English court might be influenced by the need for efficiency in paternity proceedings emphasised in *Mikulic v Croatia*,[152] and certainty as well as accuracy is an important value in this context.

In *Jaggi v Switzerland*, however, the European Court found a breach of the right to respect for private life where the Government had refused to allow the taking of a DNA

[149] *ibid* at [4].

[150] *ibid* at [25].

[151] See, eg, *S v S* [1972] AC 24, 48

[152] *Mikulic* n **208** above.

sample from the deceased putative father's remains as part of a review of declaration of non-paternity made in 1948, when only blood analyses that could merely *rule out* paternity were available.[153] The Court implicitly rejected the Government's argument based on legal certainty. In *Tavli v Turkey*, moreover, it was emphasised in similar circumstances that domestic courts should interpret domestic law in the light of scientific progress and its social consequences.[154] On this basis, it seems likely that the Strasbourg court would support the ordering of enhanced tests in cases of suspected chimerism. It is to be hoped that a similar approach would be taken in England where chimerism was suspected, in the context of the flexible approach in family proceedings to the reconsideration of factual findings in the face of newly available evidence.[155]

Consent and Adverse Inferences

A further crucial set of considerations in the context of paternity testing is the issue of consent, the ordering of tests on children lacking the legal capacity to consent, and the drawing of adverse inferences where consent is refused by someone who *does* have that capacity. Under the Family Law Reform Act 1969, the basic position for a person over 16[156] is that a sample taken pursuant to a section 20 direction 'shall not be taken…except with his consent'.[157] For a person under 16, a sample may be taken where the person 'who has the care and control of him consents' or alternatively 'if the court considers that it would be in his best interests for the sample to be taken',[158] albeit that the child's 'best interests' are not 'paramount' but merely relevant for this purpose.[159]

Where a court gives a section 20 direction under and 'any person fails to take any step required of him for the purpose of giving effect to the direction, the court may draw such inferences, if any, from that fact as appear proper in the circumstances'.[160] The court is thus

[153] *Jaggi* n **210** above.

[154] (2009) 48 EHRR 11. See also, eg, *Paulík v Slovakia* [2007] 1 FLR 1090.

[155] See, eg, *Re E (Children) (Reopening Findings of Fact)* [2019] EWCA Civ 1447; [2019] 1 WLR 6765.

[156] Family Law Reform Act 1969, s 22(2).

[157] Family Law Reform Act 1969, s 22(1).

[158] S 21(3)(b).

[159] *Re T (Paternity: Ordering Blood Tests)* [2001] 2 FLR 1190, 1194. Cf Children Act 1989, s 1.

[160] Family Law Reform Act 1969, s 23(1).

not left 'powerless' in cases of refusal.[161] In *Re A (A Minor) (Paternity: Refusal of Blood Tests)*, the Court of Appeal held that the inference that candidate who refuses to be tested is the biological father 'should be virtually inescapable',[162] which might cause particular difficulties in a case of suspected chimerism.

A pertinent question is whether it would be inappropriate (readily) to draw adverse inferences against a putative father who refuses to undergo the more onerous processes potentially necessary to indicate chimerism. While he may have every reason to comply with such testing where he seeks to have his status positively recognised, there may be cases where he is content to have paternity negated to avoid financial liability for the child. The Court of Appeal in *Re A* suggested that a putative father 'would certainly have to advance very clear and cogent reasons for this refusal to be tested…which it would be just and fair and reasonable for him to be allowed to maintain'.[163] Waite LJ also hinted that previous reduced accuracy relating to blood testing as compared to modern DNA tests might have increased the justification for a refusal. While it could be argued that chimerism highlights such potential inaccuracy even amongst DNA tests, more testing is specifically designed to *increase* accuracy. Would the onerousness of the test itself be a sufficiently 'clear and cogent', just, fair and reasonable reason?

Sheets and Wenk note that it would be invasive to take an ovum to test a *mother* for chimerism, though even then this could be overcome if 'ova were previously collected' for other reasons.[164] For a putative father, in any case, Sheets and Wenk's described tests still seem non-invasive, though some may have, for example, religious objection to producing a sperm sample through masturbation. In any event, a father *motivated* to establish his paternity is likely to agree to further testing.

There is some evidence that courts consider the level of onerousness when ordering tests and/or drawing adverse inferences.[165] Given that the European Court in *X v Austria* was willing to permit the taking of the sample by force, however,[166] it may be difficult to argue

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[161] *Re P* n **39** above at [13].

[162] [1994] 2 FLR 463, 473.

[163] *ibid*.

[164] Sheets and Wenks n **4** above, 62.

[165] See, eg, *Re Birtles* n **29** above at [30]; *Caruana v Malta* Application no 41079/16 at [41].

[166] (1979) 18 DR 154.

that the mere drawing of adverse inferences from a refusal to participate in more detailed but still non-invasive testing is problematic.

Chimerism and the Ordering of Tests on Children

A body of domestic case law has developed on when a court ought to order tests on a child in the absence of the consent of person with care and control of the child.[167] In *Re H (A Minor) (Blood Tests: Parental Rights)* Ward LJ held that 'every child has the right to know the truth unless his welfare clearly justifies the cover up',[168] and the sooner the child is told it the better given that he can adjust to the fact of having two 'fathers' (one genetic and one social) if that is indeed the case. This reflects the general approach of the courts, also influenced by the public interest in the accuracy of records.[169] In some instances, however, judges have been prepared to decline to order tests to preserve the stability of the existing family unit (involving a man who may not have been the biological father)[170] or at least[171] to suspend the order in the face of strong opposition from a child able to express a view.[172]

An important matter to consider is whether the possibility of chimerism raises distinct issues from fairly typical cases of 'disputed' paternity, involving a child living in a family unit with the child's mother and her partner, with the issue being whether the partner is the 'true' father. In other words, does the possibility of chimerism militate more, less or the same amount in favour of finding out the 'truth' as compared to where a child may have been fathered by (for example) one of two living people? It is to be hoped that no stigma would attach to being (in some sense) the genetic child of someone never born, even if a child may struggle (at least initially) with the identity of her 'true' father. Any such stigma might militate against testing, but we have seen that the law is willing to recognise symbolic

[167] Judges do not always distinguish clearly between the directing of tests in the first place and taking samples from a child without relevant consent: Miles, George and Harris-Short n **44** above, 634. See the critique in *Re L* n **134** above at [9].

[168] [1997] Fam 89, 106.

[169] Cf J. Fortin, 'Children's Right to Know Their Origins: Too Far, Too Fast?' (2009) 21 *Child and Family Law Quarterly* 336 for criticism.

[170] *Re F (A Minor) (Blood Tests: Paternity Rights)* [1993] Fam 314; see also *Re D (A Child) (Paternity)* [2006] EWHC 3545 (Fam); [2007] 2 FLR 26 at [22].

[171] Cf *L v P (Paternity Test: Child's Objection)* [2011] EWHC 3399 (Fam); [2013] 1 FLR 578.

[172] *Re D* n **170** above.

fatherhood of a person whose sperm was used after death to conceive a child.[173] If anything, the possible existence of chimerism is likely to be *less* 'disruptive' for an established family unit than if another legal person has any likelihood of being the biological father, provided (as advocated in the earlier in this section) chimerism does not jeopardise legal parenthood. But we have seen that the issue of DNA testing in the context of chimerism, as well as depending on the motivations of the various parties involved, does raise questions about the precise nature of the 'truth' emphasised in testing cases.

The ECHR and CRC: Identity, Medical Information and Testing

As already intimated, paternity proceedings, and knowledge of origins more generally,[174] have been considered by the European Court of Human Rights in a number of cases. Both a parent's attempt to establish a legal relationship with a child[175] and a putative father's attempt to disavow paternity[176] also fall within the scope of 'private life' for the purposes of Article 8 of the ECHR.[177] Article 8 is not unqualified, such that a 'fair balance [needs to be] struck between the competing interests'[178] (which would include the private and family life of those resistant to testing). In *Fröhlich v Germany*, moreover, the Court upheld a decision that 'for the time being it was not in the best interest of the six-year-old child to be confronted with' the fact that her biological father was probably not her mother's husband.[179] In *Tsvetelin Petkov v Bulgaria*, however, the applicant successfully complained that the state had not 'ensure[d] adequate measures, in the context of a paternity dispute, to resolve with certainty the question of his relationship with the child'.[180]

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[173] Human Fertilisation and Embryology Act 2008, ss 39-40.

[174] See generally, eg, A. Diver, *A Law of Blood-ties – The 'Right' to Access Genetic Ancestry* (Cham: Springer, 2014).

[175] *Rasmussen v Denmark* (1985) 7 EHRR 371.

[176] *Shofman v Russia* (2007) 44 EHRR 35

[177] For a general discussion of fatherhood and the European Convention on Human Rights, see A. Margaria, *The Construction of Fatherhood: The Jurisprudence of the European Court of Human Rights* (Cambridge: Cambridge University Press, 2019).

[178] *Jaggi* n **118** above at [38].

[179] *Fröhlich* n **84** above at [64].

[180] Application no. 2641/06 at [50].

The English approach to scientific testing was considered with reference to the Convention in the domestic case of *Re T*.[181] Bodey J held that 'any such interference as would occur to the right to respect for the family/private life of the mother and her husband [would] be proportionate to the legitimate aim of providing [the relevant child] with the possibility of certainty as to his real paternity, a knowledge which would accompany him throughout his life'.[182]

Other aspects of Article 8, however, include the fact that the consequence of ordering tests might be the revelation of a medical condition (chimerism itself) from which a putative father suffers, but also that it may be important for medical reasons for the child of a chimeric father to know her 'true' genetic ancestry. This latter point is a possible response to the argument that if no other legal person is realistically likely to be the biological father, there is no need to prove the existence of the chimerism per se. That said, the relevant child will presumably have some genetic similarities with the chimeric father's 'own' material as well as that of the father's deceased twin, such that genetic predisposition may still be identified from the original sample, and chimerism itself may not be serious enough as a medical condition to justify disclosure.

There has been a large amount of scholarship about if and when family members should be told about a person's genetic profile.[183] While it is clear that the disclosure of the chimeric person's medical information would *prima facie* interfere with his right to respect for private life,[184] a common law duty to balance the relevant interests was recognised in *ABC v St George's Healthcare NHS Trust* in the context of Huntingdon's disease (albeit with Article 8 not thought to add anything to the analysis).[185] The motivation for paternity testing in *Spencer v Spencer*, for example, was to ascertain whether the applicant had inherited a genetic predisposition to bowel cancer,[186] although again chimerism itself is unlikely to be sufficiently serious to justify disclosure on that basis alone. Complexity might be added by the fact that, rather than being a serious genetically inherited condition itself, the existence of

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[181] [2001] 2 FLR 1190.

[182] *ibid* 1198.

[183] See, eg, Herring, n **86** above, 302ff; C. Mitchell et al., 'A Duty to Warn Relatives in Clinical Genetics: Arguably "Fair just and reasonable" in English Law?' (2016) 32 *Journal of Professional Negligence* 120.

[184] *Z v Finland* (1998) 25 EHRR 371.

[185] [2020] EWHC 455 (QB).

[186] *Spencer* n **127** above.

chimerism potentially provides information about other conditions that do match that description. Moreover, a child may have *avoided* inheriting a condition from a putative father because of chimerism.

A related point is that investigations attempting to establish the existence of chimerism may involve testing of the wider family. If such relatives are not parties to the proceedings, section 20 will be inapplicable, but the court may be willing to direct tests etc where appropriate. Caution will have to be exercised, however, in relation to family members under 16. [187]

In addition to the ECHR, Article 7 of the CRC has been invoked in England to bolster the emphasis on 'truth' prevalent in the English approach to testing.[188] The *Implementation Handbook* approved by the Committee on the Rights of the Child asserts that 'children's right to know their parentage could only be refused on the grounds of best interests in the most extreme and unambiguous circumstances'[189] and that 'for medical reasons alone this knowledge [of genetic paternity] is of increasing importance to the child'.[190] This may add weight to the need to uncover the full truth about paternity, albeit that it has been necessary to acknowledge some particular complexities surrounding medical information in the context of chimerism.

CONCLUSIONS

This paper has shown that English law's likely response to suspected chimerism is not necessarily clear. The paper has highlighted some issues of principle raised by chimerism, including the differences between motherhood and fatherhood as they are currently understood and constructed by English law. Outside the (admittedly significant) contexts of assisted reproduction, surrogacy and adoption, the orthodox understanding appears to be that motherhood is conferred by the process of giving birth, while fatherhood is ultimately based largely on genetics. Chimerism potentially challenges the latter assumption, since the genetic material ostensibly contributed by the chimeric father may have derived from the chimera's

[187] See, eg, *Re L* n **134** above; *Re L (Adoption: Identification of Possible Father)* [2020] EWCA Civ 577.

[188] See, eg, *Re H and A* n **47** above at [14].

[189] R. Hodgkin and P. Newell, *Implementation Handbook for the Convention on the Rights of the Child* (Geneva: Unicef, 3rd ed, 2007), 107.

[190] *ibid*, 105.

sibling, albeit that the sibling never became a legal person. It may be that the conceptual difficulty can be straightforwardly and satisfactorily resolved through the simple assertion that the genetic material 'belongs' to the chimeric person whether it derives from him in the expected way or ultimately from his unborn sibling, such that he is a genetic parent, and thus the legal father, irrespective of his chimerism. This approach has the advantages of avoiding both disruption of the usual focus on genetics in determining fatherhood and the complexity of a further 'fragmentation' of fatherhood. The alternative might be that chimerism means that the notion of paternity (even outside the assisted reproduction context) ought to be regarded as more of a process after all, based around the insemination of the mother. This thesis has potentially significant implications for the appropriate understanding of legal parenthood more generally, which might increase the law's overall coherence by characterising both biological motherhood and biological fatherhood as processes. The 'process'-oriented approach may advance the notion of 'intention' as a justification for conferring legal parenthood, albeit only in such a qualified manner as arguably to add little value. It also, however, *inter alia* risks undermining the status of biological fathers whether or not they are chimeras. To an extent conversely, it could provoke criticism from those who emphasise the fundamental difference between insemination on the one hand and gestation and parturition on the other and would reject any formal 'equality' in respect of them. This criticism will exist even if moving towards formal equality might help to remove discrimination against both fathers and children in the allocation of parental responsibility, which is automatically conferred on all legal mothers but not all legal fathers.[191] The 'ownership' thesis thus appears preferable.

More practically, it is to be hoped that the possibility that the putative father is a chimeric person will be appropriately recognised and investigated where a DNA test is 'failed', particularly as an alternative to attaching undue significance to a negative finding alone. It seems likely that an alerted judge in England and Wales would respond pragmatically and order, or accept evidence from, a more thorough range of tests than those usually undertaken. The issues are complicated, however, by the fact that putative fathers' motivations may vary in the context of paternity disputes. Some may wish to establish

[191] See, eg, B. Sloan, 'Illegitimate Consequences of "Illegitimacy"?: Article 2 UNCRC and Non-Marital Children in the British Isles' in M. Skivenes and K.H. Søvig (eds), *Child Rights and International Discrimination Law: Implementing Article 2 of the United Nations Convention on the Rights of the Child* (London: Routledge, 2019).

paternity as a prerequisite to gaining parental responsibility, presumptive involvement in the child's life or (rarely) inheritance rights. Others will be seeking to *negate* paternity, and thus potentially legal fatherhood, so that they can in turn avoid financial liability for the child. The drawing of adverse inferences from a refusal to undergo more onerous testing in a case of suspected chimerism, for example, raises difficult issues, even if the tests are still non-invasive.

In any event, chimerism highlights the potential ambiguity of the label 'biological' in the context of fatherhood alongside the more obvious case of motherhood, as well as the 'chimeric' nature of parenthood itself.