1.　Introduction

1.1　THE CASE OF CHILD A AND CHILD B

A seven-year-old boy, Andy Scott, has been found murdered. He has been stabbed approximately 20 times with a sharp object, and also exhibits bruising consistent with trauma from a blunt instrument, likely a baseball bat or stick. His body is found in a small park near the school he attends. He appears to have fought his attacker, and police find hair, skin and blood samples under his fingernails. DNA analysis suggests there were at least two attackers.

The DNA is run through the National DNA Database, but no matches are found. The police decide to conduct a DNA dragnet in the area (asking that everyone who lives or works within a 1 km radius of the crime scene provide DNA samples to the police). Mr A, a 40-year-old teacher, refuses. He tells the police he has done nothing wrong, was out of town on the day in question, and therefore wishes to retain his privacy. The police advise him that if he does not comply, they will seek a court order for a sample, and the newspapers will find out. Scared that he will be branded a child murderer by the media, he unhappily complies.

At the same time, the police run a second search of the DNA database, this time looking for a familial match (searching the database for someone whose DNA is close enough to the samples to be a close relative of one of the attackers). This produces a result. Mr B is not the source of the DNA, but is a close familial match to the person who is. Mr B's DNA is in the database because he was arrested several years before, for being present at a sports event when a major fight broke out. Mr B was released without charge, but his DNA was taken and retained in the database. The DNA tells the police to look for a close family member of Mr B, who is likely to have blonde hair and blue eyes.

When the dragnet results are processed, it is revealed that Mr A is also a familial match.

The police begin to investigate the close relatives of Mr A and Mr B, and the community is stunned when it is revealed that the DNA at the crime scene belongs to Mr A's 10-year-old son, and Mr B's 10-year-old nephew. The police had identified the nephew through surveillance,

which included collection of DNA from a Coke can he had drunk from and then abandoned. When questioned, the boys admit that they had attacked the victim, explaining that he had been teasing them and they had just lost their tempers and attacked him.

At trial, Child A argues that he has the MAOA gene, also known as the criminal gene. He claims that the presence of the gene meant that he was not able to form the requisite mens rea for murder. To phrase it another way, he did not intend to kill, he simply had no choice in the situation but to act as he had. His genes had made him do it. For this reason, he claims that he cannot be guilty of murder. His lawyer presents scientific evidence in defence that the presence of the MAOA gene, coupled with childhood maltreatment, would make a person more likely to react aggressively than a person without these factors. While the judge accepted the scientific evidence, there was not sufficient evidence that Child A had suffered childhood maltreatment, and so this argument was rejected.

Hearing this argument, the police seek a court order that Child B submit to testing for the MAOA gene. Child B's family is known to be violent, and the police are aware of several hospital admissions for Child B as a result of maltreatment. Child B's lawyer protests, but the DNA test is ordered. Child B also has the MAOA gene. The police argue that Child B is a 'remorseless violent killer, genetically predisposed to murder' and that for the safety of the community, he should receive a longer sentence.

Despite evidence that the two boys had been involved in the murder to roughly the same extent, the sentences given following conviction are very different. Child B receives a substantially longer sentence than Child A. Child B is also told that even when he has served his sentence, he will be required to take specified medication for the rest of his life, or be returned to jail. The medication is intended to compensate for the low MAOA, but its long term side effects are not known. The judge comments at sentencing that he has given the strongest sentence he can to Child B because 'he's genetically programmed to be a killer, and there's no doubt he will kill again when released'.

The lawyers for Child B have announced their intentions to appeal the conviction and sentence. One of the grounds for appeal is that it was not appropriate for Child A and Child B to be treated equally for the purpose of determining criminal responsibility for their actions. They claim that Child B's MAOA status affected his ability to be morally responsible for his actions and that this should have been taken into account during the trial phase. In a media interview they commented:

> If B is found to be legally responsible for the killing he should of course be sentenced. We are not denying this. But first he must be found to be legally responsible. B's genetic makeup must be a major factor in determining this legal responsibility in the same way that scientists tell us that it is a major factor in determining how he responds to situations. Think of it this way: the criminal justice system does not treat adults and children the same way, because scientists tell us that their brains don't reason in the same way. The system doesn't treat mentally competent and mentally incompetent people in the same way, because again scientists tell us that their brains don't process information in the same way. If scientists also tell us that the brains of High MAOA and Low MAOA don't respond in the same way in given situations, why are we treating them the same? It is inconsistent to ignore what scientists are clearly telling us, and it is unfair to B.

Things have not been easy for Child B's family since the trial. Newspapers began asking the question of whether Child B's parents should also be considered legally responsible, whether criminally or in tort, for the killing. They argue that if the parents had not mistreated Child B, he would not have acted in the way that he had, and therefore they ought to bear some responsibility for the events.

His younger brother was excluded from school as a result of being in a fight. The other child, whom some witnesses claimed provoked the fight by teasing the brother about Child B, received only a one hour detention. The school has demanded that the brother supply them with the results of an MAOA test before permitting him to return, and claims that this is 'in the interests of the safety of the other students'.

Child B's older brother, who had previously been a model student and athlete has now joined a gang. He has been arrested and charged with property damage and assault and reportedly told the police 'its genetic, right? I'm going to be a criminal, so why not just get on with it.'

Child B's uncle was recently convicted of assault. He was given the maximum penalty available, and the judge commented that 'there's just too much of this [violent behavior] in the family. That's three, the child, his parents [maltreating B] and now his uncle. That's enough.' The Uncle has appealed the sentence for being disproportionate and unfair.

Child B's mother is reportedly pregnant with her fourth child, thought to be a boy. One newspaper has published an editorial, which has gained significant public support, arguing that she should not be allowed to have any more children.

The above story is not true. It is not unrealistic, in fact it is a combination of several true stories, but it has been written to demonstrate some of the issues that will be discussed throughout this book.

1.2 THE CASE OF ANTHONY YEPEZ

This story is true:

Anthony Yepez has been charged with murder. The facts are unpleasant. The victim was George Ortiz, the 75-year-old step-Grandfather of Yepez's girlfriend, Jeannie Sandoval. Yepez attacked Ortiz, choking and beating him, then soaking his body in cooking oil and setting fire to him. It is unclear whether Ortiz was still alive at the time. Sandoval, who took a plea deal and pleaded guilty to second degree murder for helping pour the cooking oil, has told the police that Ortiz had attacked her, striking her in the throat. Yepez had then 'attempted to intervene on her behalf' and shoved Ortiz. Ten minutes later, Yepez attacked Ortiz again, and this attack resulted in his death. Sandoval must testify at Yepez's trial as part of her plea deal.

Yepez's lawyer plans to argue that Yepez has Low MAOA, and suffered childhood maltreatment. His lawyer has explained that this argument might help convince the jury that 'this wasn't premeditated, and open up the possibility of conviction on a lesser offence, such as second degree murder'. On 29 January 2015 a hearing took place to determine whether this information could be introduced through three expert witnesses. The Prosecutors argued that the science was 'too young'. It had only been used 'in one or two cases' and 'would only confuse the jury'. The judge agreed and excluded the information, commenting that she felt 'iffy' as to whether 'the science was reliable enough to prove what it proposes to prove'.

At the time of writing (February 2015), Yepez's lawyer plans to appeal. He feels that the exclusion of this evidence prevents Yepez's 'main defence if not his only defence'. The ground of appeal, should it go ahead, will be that the judge 'held the defendant to a burden of proof not required by any law or statute'. One of the planned expert witnesses commented 'We're as certain that MAOA is related to violence as we are that cholesterol is related to heart disease … this is good science, done the way science is supposed to be done. I don't know any serious behavioral scientist that disputes it.'[1]

The case has not, as of yet, attracted much media attention, apart from the attention grabbing headlines like '*Judge Rejects "Warrior Gene" Testimony In Murder Trial*'. My prediction is that if the appeal is filed, by

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[1] This summary was taken from newspaper reports. See, for example, Phaedra Haywood, 'Judge Rejects "Warrior Gene" Testimony In Murder Trial' *The New Mexican*, 29 January 2015.

the time you read this book this will have changed and newspaper headlines surrounding this case will be easy to find. They may read something like:

Murdering: it's not my fault, it's genetic

From murder bumps to brain scans: new ways to excuse crime

Violence genes may be responsible for one-in-10 serious crimes

Pity the poor murderer, his genes made him do it

Lighter sentence for murderer with 'bad genes'

Scientists find that Nazis were correct about heredity and criminality

1.3 AIM OF THIS BOOK

Since the mid-1990s there has been an increasing amount of scientific research investigating the link between genes, the environment and crime. Much of this research has focussed on the MAOA gene, although more recently genes related to serotonin and dopamine are also being studied for their effects on behavior. Within months of the publication of the first scientific study on MAOA and its possible link to 'abnormal behavior', the study and its findings were introduced into court as part of a capital murder trial in the United States. While the genetic argument did not succeed in this case, the scientific research continued and several recent cases have accepted genetic arguments as relevant in determining liability or appropriate sentence.

This book aims to provide the basis for a much-needed discussion on the increasing use of genetic information during police investigations and criminal proceedings. It will achieve this through a consideration of the relevant science and law, focussing on relevant cases in order to consider how judges and juries have responded to legal arguments based on this emerging scientific understanding. It will also take a broader-picture approach, considering the potential impact these genetic arguments might have on the criminal justice system as a whole, including its theoretical concepts of punishment theory and sentencing and how genetics arguments might affect these. Finally, it will look to the future, and identify some potentially problematic or challenging consequences of accepting genetics arguments. Throughout this book reference will be made back to the hypothetical case of Child A and Child B, and consideration given as to how the issues raised in each chapter might impact on the scenario.

A more detailed description of chapter content follows.

1.4   STRUCTURE OF THIS BOOK

Chapter 2

Chapter 2 will attempt to place the current genetics arguments into a historical context. This is not society's first use of genetics in relation to criminal justice, and an understanding of why such an argument can be found throughout history is useful in understanding the role it can play with today's increasing scientific knowledge.

Chapter 3

Chapter 3 introduces some of the uses for genetic evidence during a criminal investigation. It discusses the increasing use of DNA databases and dragnets to link DNA samples found at a crime scene to potential suspects. It comments on the ever increasing phenomenon of 'function creep', and discusses two examples of this, familial testing and pheno-type testing. Finally, the chapter considers calls for a universal database.

Chapter 4

This chapter provides an introduction to the science. Using XYY Syndrome, an earlier potential 'crime gene' as an example and a lesson, the chapter then considers the genes currently thought to have a link to criminal or antisocial behavior. This chapter explains the science, and the various studies that have been carried out on these genes, in an attempt to go beyond the label of 'crime gene' to consider what in fact the science is telling us about these genes.

Chapter 5

Chapter 5 considers how genetic evidence may be used in a trial or in a sentencing hearing. It discusses rules relating to admissibility of evidence, before considering relevant cases and the particular issues they raise.

Chapter 6

Chapter 6 asks some important theoretical questions. What gives society the right to punish people? How do we determine appropriate punishment? And most importantly, can these established justifications survive the genetics cases discussed in Chapter Five? Are these cases leading

society away from the concept of 'free will', which is arguably the basis for criminal responsibility, and (again) towards an idea of genetic determinism? Do we need to reconsider the operation of the criminal justice system as a result of the emerging scientific understanding of behavioral genetics, and in light of the way in which genetic arguments have been applied in court to date?

Chapter 7

Chapter 7 looks to the future. If the scientific studies convince us that particular genes, coupled with particular childhood maltreatment, result in a greater chance of antisocial behavior, how should society respond to this? Should it proactively test people to identify those with the particular gene? If so, then what? This chapter raises ethical issues that might be considered unrealistic, futuristic, or even science fiction. With the speed that science can move, however, it is best that some of these potential issues are considered now, rather than reacted to later.

1.5 CONCLUDING REMARKS

While this book discusses the issue of a so-called 'crime gene' from a range of perspectives: criminal law, behavioral genetics, neuroscience, philosophy, sociology and history, it is far from a complete debate on the area. The human rights and privacy implications of the material discussed in this book, (to name just two areas of study) are formidable, and deserve much fuller analysis than it will be possible to provide here. A MAOA-type argument in a courtroom has implications far beyond the particular defendant and his (genetically, it is almost always a male defendant) specific case and requires a much larger discussion as to what acceptance of the argument might mean for society in terms of paths taken and paths better left alone. This book aims simply to contribute to that debate.