

## The true ramifications of genetic criminality research for free will in the criminal justice system

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### Abstract

There is an explicit belief – evident in jurisprudential literature – that developments in behavioural genetics in the very near future will necessitate a dramatic revolution in common law criminal justice systems. This paper considers what is truly shown by behavioural genetics in relation to free will, and the effect of such conclusions on criminal justice systems which rely upon the concept of free will as a foundation element.

This paper ultimately concludes that it is unlikely that criminal justice systems will be shaken – or indeed substantially influenced – by past or future discoveries in genetics. Three major arguments are employed: (1) that theses connecting genetic traits with criminal free will exhibit a naïve conception of partial genetic determinism; (2) that theses connecting genetic traits with criminal free will have been unduly motivated by discoveries in behavioural genetics which are disreputable or misleading; and (3) that even should an unexpected discovery be made exhibiting a strong causal connection between genetics and criminal behaviour, this will not prove to be an intolerable novelty for any criminal justice system which otherwise assumes free will to exist.

### Introduction

The reception of genetic discoveries in jurisprudence has been such that the foundation of criminal justice – the assumption of the existence of free will for regular defendants – is popularly predicted to crumble.<sup>1</sup> Indeed, most common law criminal justice systems<sup>2</sup> centre on an assumption of free will. Superficial inspection of current genetic research may inspire an opinion that such research will reveal causal links between genes and criminal behaviour which contradicts this assumption. A general acceptance of genetic determinism among some circles of jurists<sup>3</sup> has led to the view that fundamental changes must be made to the current system.<sup>4</sup> As noticed by Jones<sup>5</sup>, The Honourable Richard Lowell Nygaard, Judge of the United States Court of Appeals, has even suggested the need to create a new set of criminal laws.<sup>6</sup>

I contend, however, that these reactions are melodramatic and misinformed. Firstly, the idea of partial genetic determinism that fuels these concerns is notoriously tenuous, as will be illustrated in part I. In this regard, I will argue that the comments of most jurists suggest a certain naiveté in respect to the ability to establish genetic causality. Secondly, the ‘discoveries’ specifically linking criminal violence to genes, which excite the public and inspire jurisprudential commentary, have historically been failures. These will be explored in part II. Thirdly, when it is realised that there is nothing intrinsically novel about genetic explanations of behaviour, in the context of this paper, the system’s self defence mechanisms appear stronger than many jurists suggest. So in part III it will be shown, firstly, that the criminal justice system’s approach to psychological influences and insanity *already* encompasses genetically

based impairments. Also, when the distinction between genetic and non-genetic biological causes is seen to be contrived, it will be shown that genetically deterministic explanations of criminality will simply extend further a recognised legal fiction, which I have called the Second Noble Lie.

### Part I – The difficulty of establishing genetic causality

Fears regarding the impact of genetic research on our criminal justice system are founded on the possibility of identifying a genetic pattern ‘for’ criminality or violence.<sup>7</sup> Often, through the popular media, we are told that researchers have ‘found the gene for’ a particular physical or social attribute.<sup>8</sup> However, this seemingly straightforward proposition – that *g* is the gene *for* *t* – could have one of many meanings, of varying degrees and directions of causation<sup>9</sup>:

1. That everybody possessing gene *g* will *definitely* have trait *t*.
2. That *only* those possessing gene *g* could *possibly* have trait *t*.
3. A combination of (1) and (2) such that *t* will be apparent *if and only if* the person has *g*.
4. That there seems to be *some sort of statistical correlation* between having *g* and showing *t*.

Those afraid of the impact of genetic research on the nature of the criminal justice system should be no more propelled by statements in the form (4) than they are by observations that the majority of criminals are male.<sup>10</sup> Certainly, there is no genuine distinction to be made between the merely statistical criminal propensity of those who possess hypothetical gene *g*, and the increased criminal tendency of those who possess a Y chromosome.<sup>11</sup> Or, similarly, the disproportionate number of Indigenous Australians in custody.<sup>12</sup> Propositions of the form of (4) thus fail to be novel ones, as far as the criminal justice system is concerned.

The question of whether partial propensities based on genetic factors are any different to existing sociological ones will be addressed later. Consider, however, that to cast *new* doubts upon ‘the unquestioned hypothesis of free will in the face of scientific knowledge’<sup>13</sup>, propositions about genetic causation would have to tend towards (1), (2) or (3). Such contentions would be akin, for instance, to former *Science* editor Daniel Koshland saying:

*the brain is an organ like other organs... it can go wrong not only as the result of abuse, but also because of hereditary defects utterly unrelated to environmental influences.*<sup>14</sup>

So the interesting situations, as far as sceptics of free will in the criminal legal system are concerned, arise when claims of causality are based entirely on genetic ‘defects’ and not on the effects of environment.

Consider, now, that we can further specify the types of claims which may be interesting, by ignoring propositions of the form (2). This follows from the straightforward observation that there exist certain laws, already, which apply to only a specific class of possible defendants. For instance, only those in control of a dog could possibly commit the offence of ‘maliciously causing dog to inflict grievous

bodily harm'.<sup>15</sup> Only a woman could commit the offence of 'child murder by mother'.<sup>16</sup> So, if it were found, for example, that only those with the 'rape de-inhibitor gene' could *possibly* commit rape, this should not necessarily illicit a reaction from the criminal justice system – so long as only *some* possessors of this gene actually *did* commit the crime. If some 'rape de-inhibited gene' possessors still abstained from committing rape, this would suggest an element of non-determinism that would allow the system to retain its current approach.

We can thus finally concentrate our attention on propositions of the form (1), since we have seen that those in the form (2) and (4) already have analogues in our system, which are handled without too much concern. Additionally, this has meant that (3) is no more interesting than (1), and so we should focus on what Kaplan has called 'the 'intervention is useless' strand [of biological determinism]'.<sup>17</sup>

Certainly, if a 'hereditary defect' is found such that every possessor exhibits criminally violent behaviour, regardless of the environmental conditioning which preventative legal structures attempt to give<sup>18</sup>, then the criminal justice system would undeniably have to consider its position in regard to cases involving such persons. However, there has been much opposition to the possible existence of such a 'strong' genetic determinism, in general<sup>19</sup> and specifically for criminality<sup>20</sup>. Additionally, there is a common case study that has become an essential consideration in this debate, namely the story of phenylketonuria (PKU).

The first use of PKU as an example in this argument came in the introduction of Plomin et al:

*A genetically determined behavioral problem may be bypassed, ameliorated, or remediated by environmental interventions. The best example is PKU, a single-gene defect that formerly resulted in severe retardation... PKU individuals do not suffer retardation if a diet low in phenylalanine is provided during the developing years. Thus, an environmental intervention was successful in bypassing a genetic problem.*<sup>21</sup>

The argument continues with Kitcher:

*Before the discovery of special diets that enable children to develop normally, it was natural to think of a disease most prominently revealed in severe mental retardation as genetically determined. Armed with the understanding that the immediate causes of the cognitive disability lie in overloads of phenylalanine and under-supply of tyrosine, we can separate the manifested disease from the underlying genes.*<sup>22</sup>

So, we are given this example as a warning, to prevent us from prematurely labelling a behavioural condition 'genetically determined'. It is an instance where a supposedly true proposition in the form (1), namely that everybody possessing the PKU gene will inevitably suffer mental retardation, has in actuality been shown to be incorrect. Complaints have been raised that this account of PKU actually demonstrates an inherent belief by scientists of a less-radical kind of genetic determinism.<sup>23</sup> However for our purposes the PKU story serves as a reassurance that the type of discovery that

could really shake the criminal justice system is a historically difficult one to make, even for clear-cut single-gene defects.

Of course, this is not so much a conclusive thesis as it is a provider of perspective. It is beyond commentators to show that the ‘intervention is useless’ strand of genetic determinism is an eternally impossible one, however examples such as the PKU story serve to illustrate the high degree of improbability, at least in the near future.

Another perspective-granting argument – a general theme in many commentaries – is that the number and nature of influences on human development make it particularly difficult to locate discrete genetic causes of behaviour. Additionally, the interaction of biological and social factors makes the thus-far reductionist approach a naïve one. Lewontin et al provide a useful analogy:

*Think, for example, of the baking of a cake: the taste of the product is the result of a complex interaction of components – such as butter, sugar, and flour – exposed for various periods to elevated temperatures; it is not dissociable into such-or-such a percent of flour, such-or-such of butter, etc., although each and every component (and their development over time at a raised temperature) has its contribution to make to the final product.<sup>24</sup>*

So the manifestation of a trait is seen to be the product of a complex matrix of interactive relationships. Even if we hypothesised a direct connection between a genetic mutation and an exhibited trait, the highly interactive nature of influential factors would make such a reductionist hypothesis impossible to test, meaning that to proceed with the ‘intervention is useless’ approach in that instance would be fallacious<sup>25</sup>.

We are beginning to see, then, that establishing the sort of genetic causality which could threaten notions of free will in the criminal justice system is particularly difficult to do. This has been historically true, even in seemingly straightforward observations of genetic influence such as PKU, let alone for highly complicated behaviour such as criminal violence or aggression. It may be interesting, then, to examine some of the failed attempts at showing the biological causes for criminal behaviour.

## **Part II – The historical difficulty of biologically explaining criminality**

### ***Lombroso’s atavisms***

The attempt to find biological causes for criminality has not been limited to modern genetic endeavours. Lombroso, in attempting to find physiological signs of a person’s criminal propensity, constructed a theory ‘based on the idea that criminals were ‘atavisms,’ throwbacks to an earlier, less ‘civilized’ sort of person’<sup>26</sup>. The connection of Lombroso’s ideas to the modern debate about genetic criminality was inspired by Lewontin et al:

*Lombroso and his followers attempted to establish a system whereby a predisposition to engage in antisocial behavior could be predicted on the basis of physical characteristics... A rational criminology*

*thus became possible, a theory of criminal faces that was the obvious forerunner to today's belief in criminal chromosomes.*<sup>27</sup>

Physiological indicia of criminal likelihood included 'a heavy and developed jaw, projecting [eye] ridges, an abnormal and asymmetrical cranium... projecting ears, frequently a crooked or flat nose'<sup>28</sup>. The idea was, as Kevles described it, that 'since the crime-producing features of the physical organism must be hereditary, so must be the criminality'<sup>29</sup>. Of course, the entire adventure is all too reminiscent of phrenology, and has aptly received the same sort of criticism<sup>30</sup>. The scientific basis is obviously contrived, Lombroso's writing lacking even 'the usual obeisances to cold objectivity'<sup>31</sup>. Ignorance of the complexity of human criminal behaviour thus resulted in a misconceived attribution of criminality to pre-determined biological causes.

Despite the blatantly misinformed nature of Lombroso's *atavisms* idea, it nonetheless raised the same sort of fears about free will in criminal justice that we face with *genetic* causation theory. The similarity is astounding:

*The Lombrosian criminal anthropologists... tended toward liberal, even socialist, politics and saw themselves as scientifically enlightened modernists. They hoped to use modern science as a cleansing broom to sweep away from jurisprudence the outdated philosophical baggage of free will and unmitigated moral responsibility.*<sup>32</sup>

So we can see that this early analogue to genetically determined criminality was an utterly naïve one. But have modern attempts been any more accurate?

### **MAOA deficiency**

In 1993, Han Brunner and co-workers published an article in *Science* connecting 'impulsive aggression, arson, attempted rape, and exhibitionism' with 'a complete and selective deficiency of enzymatic activity of monoamine oxidase A'<sup>33</sup>.

Reaction to the report was immense, as described by Charles Mann:

*After the article was published, [group member Xandra Breakfield] was 'stunned' to receive phone calls from lawyers who wanted to test their clients on death row for MAOA deficiency, hoping that it might exculpate them; equally bad were the talk-radio hosts who suggested sterilizing people who carry what one journalist called 'the mean gene'.*<sup>34</sup>

Discoveries such as MAOA deficiency are what motivate and 'inform' public ideas of genetic criminal causality, to the extent that these ideas become manifest in common concerns about criminal justice, yet the findings are tenuous at best. Far from being convincing, the findings regarding the effect of MAOA deficiency on behaviour are connected with problems with any such finding in behavioural genetics, such as the 'misuse of statistical methods, failure to define the trait under study, bias in the selection of cases and controls, and inadequate sample size'<sup>35</sup>. For this reason, even if the findings of Brunner and co-workers are replicated, 'they are unlikely to mollify the critics of previous efforts to link specific genes to human behaviors'<sup>36</sup>.

Others have also shown specific concern, in this instance, to the cake-baking problem of Lewontin et al, pointing at non-genetic origins of the reported violent behaviour:

*These individuals are mildly retarded... There they are in the middle of families of unaffected people – is it any wonder that they are full of frustration and anger?*<sup>37</sup>

The story of MAOA serves to show that even with complicated technology and adherence to scientific standards – obviously lacking in Lombroso's theories – the biological descriptions of criminality which illicit public reaction are still naïve ones, once again making such reactions misplaced.

### XYY

The story of the XYY scare is an even more explicit illustration of the public embracing faulty biological explanations of criminal violence. Like Lombroso's atavisms and MAOA deficiency, this is another false start, which nonetheless gave people the impression that some are born to crime. Kitcher gives one account:

*...investigation of the chromosomes of men in prison and in mental hospitals revealed an unexpectedly large percentage of men with an extra Y chromosome. So was born the idea of the criminal chromosome. Mothers who discovered through amniocentesis that the fetus they were carrying was an XYY male came to believe, on the basis of apparently rigorous science, that they would be likely to give birth to a future jailbird or maniac.*<sup>38</sup>

Not too surprisingly, the claims – that XYY is an indicator of pre-determined criminal violence – have been conclusively disproved.<sup>39</sup> Once again, alternative causes were pointed at, for instance by Kaplan:

*XYY males' higher incarceration rate proved to be correlated with their reduced mental ability, but XYY males proved to be no more violent than the population at large – their higher incarceration rate was the result of mostly petty property crimes.*<sup>40</sup>

Like MAOA deficiency, the story of XYY shows that the additional knowledge we have gained since Lombroso's time has not necessarily prevented incorrect statements about inheritable criminality being made. It additionally illustrates the apparent willingness with which we the public accept such claims. Undeniably, such a tendency would simultaneously over-inflate any worries we have regarding the possibility of genetic discoveries causing legal revolutions.

Aside from the unlikelihood of finding a connection, it is also the case that, if a connection *were* to be found, it might not present any real difficulty for the criminal law. It *could* simply be another flavour of an already pervasive phenomenon, which the legal system is equipped to deal with. Similarly, it could fall within the range of the system's self-preservation mechanisms. The next part deals with the scope of the insanity plea, the idea of generalisation in law, and the system's method for handling philosophical issues of free will and determinism.

### Part III – The adaptability and resilience of the criminal justice system

#### *Genotypic mutation as just any other cause of mental disturbance*

Consider that, with the XYY theory, it certainly wasn't posited that an extra Y-chromosome directly influenced a possessor's activity. Rather, it was theorised that this genetic mutation had an effect on *brain activity* which, in turn, resulted in criminally violent behaviour. Similarly, the genes for MOAO don't directly affect behaviour – MAOA deficiency creates a metabolic disturbance, which, it was argued, affects brain states to the point where criminally violent acts are more readily committed.<sup>41</sup> It would be hard to imagine a genetic explanation of violent tendency that did not involve a corruption of mental faculties. This seems to suggest, then, a possible connection between psychological defences and hypothetical genetic ones.

Indeed, this link has been articulated by some commentators, particularly Joseph Alper, who has used it to argue against the seriousness of the ramifications of behavioural genetics research.<sup>42</sup> In his words, 'the essential feature of the insanity defence is that none of the definitions of insanity makes reference to the underlying cause of the impairment'<sup>43</sup>. He goes on to point out that 'the requirements for an insanity defense are couched in intention rather than physical terms'<sup>44</sup>. So, since any genotypic mutation that may affect behaviour will inevitably do so via some sort of macro-level psychobiological disturbance, the court will handle genetic defences in the same way that it handles all other psychological deficiency defences.

The court has neither reason nor impulsion to discriminate between the causes of mental illness, whether genetic or environmental. Indeed, since it is generally accepted that most recognised mental illnesses involve a complex interaction between genes and environment<sup>45</sup>, any sort of distinction made by the court between genetic and non-genetic causes would be entirely contrived, and so impossible to regulate.

Thus there is no reason to suggest that cases involving genes are, *ipso facto*, different – nor that the predictive power of genes is any greater than other factors, as illustrated in Part I – contrary to the excitement of many jurisprudential commentators. Of course, the practical administration of justice in genetic defence cases is not the main concern of this paper. Rather, we are more concerned with the more philosophical question of whether the *fundamentals* of criminal justice would still be valid if genetic causal discoveries were made. In this regard there is little reason, *prima facie*, to consider the scope of the M'Naughten rules, the insanity defence at large or analogous defences in some criminal jurisdictions such as non-insane automatism. However, it does show us that features of legal structure (such as generality) exist to self-perpetuate its applicability over time – ambiguity leaves room for interpretation, so creating dynamism. I argue that there exists an even stronger self-protective structure, the Second Noble Lie, which will guard the criminal justice system against any concerns regarding genetic determinism, just as it currently guards against philosophical questions of free will in general.

### ***The First Noble Lie***

The First Noble Lie is introduced here mostly for the purpose of drawing an analogy. It concerns the fact that judges inevitably impart their own subjective beliefs into their judgements, but that they must appear to objectively apply laws, for the sake of public confidence in the judiciary. Justice Kirby of the High Court of Australia describes the charade:

*Whenever tempted to depart from the words of the past, [pre-Mason judges] would usually pull themselves back to the ‘noble lie’. They did not ‘make’ law, they ‘applied’ it... judges pretended to a mechanical function whilst knowing, when they stopped to think about it, that it is inevitable that they play a creative role in making law.<sup>46</sup>*

There is very strong criticism, in jurisprudential literature, of the ‘judges don’t make law’ approach.<sup>47</sup> Katherine Biber provides a simple yet compelling argument:

*The ‘law’ is rarely clear, and applying it to unique scenarios requires acts of interpretation... opposing views are drawn from the same facts and, usually, the same body of legal authority.<sup>48</sup>*

And yet, the judiciary feels it necessary to deny its own law-making function, for instance the current Chief Justice of the High Court of Australia, Murray Gleeson claims that:

*The capacity of an individual to make an impartial determination of the facts, and to understand and conscientiously apply the law, is the primary requirement of fitness for judicial office.<sup>49</sup>*

This necessity is borne out of the struggle for public confidence in judicial democracy and impartiality<sup>50</sup> and thus intellectual honesty makes way for desired socio-legal policy. This ‘Noble’ lie illustrates that the legal system has no preoccupation with truth when it comes to conserving those policies that are believed to be essential for maintaining public order. Of course, the more interesting Noble Lie, insofar as it relates to this paper, is that which concerns free will.

### ***The Second Noble Lie***

This paper is in response to arguments that discoveries about genetically determined criminality will force the criminal justice system to reconsider its position on free will. Ironically, the system makes little effort to consider its approach to free will at all. As Matthew Jones points out:

*Courts have shown little indication that they are willing to undertake the difficult philosophical, biological and psychological inquiry necessary to truly formulate an understanding regarding the causes of human behavior.<sup>51</sup>*

Indeed, the law has little regard for whether free will exists or not – free will is an assumption in the criminal justice system, for the sake of policy, rather than a recognition of philosophical truth.<sup>52</sup> Herbert Packer comments on the system’s apathetic approach to truth about determinism:



*The idea of free will in relation to conduct is not, in the legal system, a statement of fact, but rather a value preference having very little to do with the metaphysics of determinism of free will... Very simply, the law treats man's conduct as autonomous and willed, not because it is, but because it is desirable to proceed as if it were.*<sup>53</sup>

So here we have a Second Noble Lie – intellectual honesty about free will and determinism makes way for pragmatic policy, according to the desires of lawmakers. Even when judges recognise that the assumption of free will may be contrived in most cases<sup>54</sup> they nonetheless perpetuate it, fearing the consequences of being candid.

This approach is certainly consequentialist – the system has no qualms with lying about a person's free will if this is found necessary for socio-legal stability. Additionally, it is distinctly utilitarian in that assuming free will for a person who has none will result in that person being punished, not out of desert, but for the purpose of maximising good governance. As Cragg describes it,

*an essential element of retributivist accounts of punishment is the view that punishment for wrongdoing is justified only where the person acted voluntarily.*<sup>55</sup>

Thus, by being apathetic towards whether actions are truly voluntary, the punishment in the criminal justice system must be serving a purpose not of *retribution*, but of *deterrence*.<sup>56</sup> It is far beyond the scope of this paper to determine whether this is the best approach. Suffice it to say that supporters of a Kantian legal system will no doubt be disappointed, and advocates of judicial democracy will be shocked by the self-righteous oligarchy which 'Noble' lying amongst lawyers has created.

Whether right or wrong, whether practical or inefficient, this feature of the legal structure exists. Evidently, it has survived the last century's dramatic advances in cognitive science, fending off the challenges of behaviourism and evolutionary psychology. Despite this, many jurists, such as Maureen Coffey<sup>57</sup> and Matthew Jones, suggest that *genetic* research *will* be sufficient to change the criminal justice system to one which 'relies more on utilitarian rationales to justify criminal behavior than it has in the past'<sup>58</sup>.

However, for this to occur in light of the Second Noble Lie, critics such as these must argue that the deterministic nature of genes is so great that the lie surpasses its threshold of believability. Even if we ignore the first half of this paper and take for granted the existence of a correlation between crime C and genotype G, it remains to be shown that genetic explanations of criminal behaviour are more powerful and enlightening than mere psychological and environmental ones, since these have failed to shake the system. Such an argument must imply that there is something intrinsically different about genotypic explanations of criminality as far as the court is concerned.

Of course, we realise by now that these statements are false – that there is no reason to consider genetic explanations as *ipso facto* different, and that the potency of genotypic explanations of behaviour has been greatly exaggerated by misinterpreting the results of research. Jones for instance, in coming to his above conclusion, refers to *YYY* and

MAOA as ‘promising research’<sup>59</sup>. Aside from what jurisprudential commentators have said in ignorance of the true nature of genetic criminal explanations, there is nothing left but an *argumentum ad novitatem* – jurists have simply become excited due to the novelty value of this new research, which they have evidently failed to place in perspective. In failing to present an original problem to the criminal justice system, any genetic defences will be encapsulated by the Noble Lie of the assumption of free will. Even with the assumption, as stated above, that some correlation can be shown to exist between genotype G and propensity to commit crime C, the very nature of genetic research would make such a correlation no more potent than other types of causal explanations which the court has ignored previously.

## Conclusion

Jurisprudential reactions to research into genetic criminality have been based on misinformation and consequently have exaggerated the ramifications of this research for the criminal justice system.

For one, it is particularly difficult to establish genetic causality in general, and many conclusions about direct genetic causality have been prematurely drawn or entirely naïve. The discoveries about criminal genetics which have informed jurisprudential writing, such as *XY* and MAOA, have actually been embarrassing failures, yet have stirred the imaginations of jurists. Future discoveries conclusively linking criminal violence with any sort of genotypic mutation seem highly unlikely, upon any honest consideration of what is required to establish convincing causality.

Even if such a discovery were made, the criminal justice system would handle it as just any other type of cause, and so cases of genetic defence would be treated as cases of psychological- or environmental-based defences of insanity or automatism are treated now. This also places concerns about genetic determinism within the scope of the system’s natural defence mechanism, the Noble Lie of free will. Any hypothetical discovery – however unlikely – of genetically influenced criminal tendency, will simply perpetuate this utilitarian legal fiction, and so be absorbed into the system without a problem.

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<sup>1</sup> For a summary of legal scholarship on the topic see M. Jones. 2003. Overcoming the myth of free will in criminal law: the true impact of the Genetic Revolution. 52 *Duke Law Journal* 1031: 1042-1050. For dissenting opinion, see M. Jones or J.S. Alper. 1998. Genes, free will, and criminal responsibility. *Social Sciences & Medicine* Vol 46, Issue 12: 1599-1611.

<sup>2</sup> This paper deals most specifically with the United States and Australian legal systems, as these have been the main sources of concern regarding the impact of genetic research specifically on questions of free will in criminal justice.

<sup>3</sup> See for instance C. Price-Huish. 1997. Born to Kill? Aggression Genes and Their Potential Impact on Sentencing and the Criminal Justice System. 50 *SMU L Rev*: 603; M. Johnson. 1998. Genetic Technology and Its Impact on Culpability for Criminal Actions. 46 *CLEV. ST. L. REV.*: 443 at p455; P.A. Brennan et al. 1996. Assessing the Role of Genetics in Crime Using Adoption Cohorts. In *Genetics of Criminal and Antisocial Behavior*. G.A. Boch and J.A. Goode eds. New York. John Wiley & Sons: 115.

<sup>4</sup> For instance Johnson, op. cit. note 3, pp462-70; R.L. Nygaard. 1996. Free Will, Determinism, Penology and The Human Genome: Where’s a New Leibnitz When We Really Need Him? 3 *U. Chi. L. Sch. Roundtable*: 417-62, at p437; S.I. Friedland. 1998. The Criminal Law Implications of the Human Genome Project: Reimagining a Genetically Oriented Criminal Justice System 86 *KY. L.J.*: 303-41; A. Evensberg. 2001. ‘But Your Honour, It’s In His Genes’: The Case for Genetic Impairments as Grounds

for a Downward Departure Under the Federal Sentencing Guidelines 38 Am. Crim. L. Rev.: 1565-72.

<sup>5</sup> Jones, op. cit. note 1, p1031.

<sup>6</sup> Nygaard, op. cit. note 4, p430.

<sup>7</sup> Jones, op. cit. note 1, p1040.

<sup>8</sup> See, for instance, M. Lerner. 2001. 'U' researchers find gene for a type of muscular dystrophy. Star Tribune 03/08/01; N. Wade. Researchers Find Gene for Type 2 Diabetes. New York Times. 27/09/00; J.B. Verrengia Researchers find gene for dwarfism in Amish babies. Laredo Morning Times. 02/03/00; K.A. Fackelmann. Scientists find gene for clotting disorder - action of activated protein C blocked in people with family history of venous thrombosis. Science News 07/05/94; 'Hate gene' breakthrough - Filipino researchers claim to find gene for homophobia. New Internationalist October 2000; U-M scientists find gene for low-frequency hearing loss. University of Michigan Health Service news release 20/11/01; Family and research team work together to find gene for hereditary pancreatitis. University of Pittsburgh Medical Center press release 19/05/96; UT Southwestern researchers find gene for inherited form of high cholesterol. University of Texas Southwestern Medical Center press release. 27/04/01; Hair loss: Scientists find gene for rare condition. Star Tribune. 30/01/98.

<sup>9</sup> This particularisation is of course not unique to this paper, and has been identified in analogous forms by other authors. For instance, S. Pattinson. 2002. *Influencing Traits Before Birth*. Ashgate. Aldershot: 45-46, which notes that insofar as causation is concerned, genotypes may be viewed as a necessary, sufficient, or contributory condition for traits. The particularisation I have provided is thus a clear analogue of Pattinson's, with the addition of a 'necessary and sufficient' formulation, being my form 3.

<sup>10</sup> T.H. Murray. 1994. Genetic Legacy and Culpability. In *The Human Genome Project: Human Aspects Vol II*. Madrid. Fundacion BBV.

<sup>11</sup> M. Kirby. 1999. The future of criminal law – some big issues. Address to the 28/07/99 conference of the Criminal Lawyers' Association Northern Territory.

<sup>12</sup> Royal Commission into Aboriginal Deaths in Custody. 1991. Final Report of the Royal Commission Into Aboriginal Deaths In Custody. Canberra. AGPS: §5-7.

<sup>13</sup> M. Kirby. 2000. Through the world's eye. Annandale NSW. The Federation Press: 43.

<sup>14</sup> D.E. Koshland Jr. 1990. The Rational Approach to the Irrational. *Science, New Series*, Vol. 250, No. 4978: 189.

<sup>15</sup> *CRIMES ACT (NSW) 1900 s35A*.

<sup>16</sup> *CRIMES ACT (NSW) 1900 s21*.

<sup>17</sup> J.M. Kaplan. 2000. The limits and lies of human genetic research: dangers for social policy. New York. Routledge: 11.

<sup>18</sup> H. Wechsler and M. Jerome. 1940. *Criminal Law and Its Administration*. New York. The Foundation Press: 4-17.

<sup>19</sup> Kaplan, op. cit. note 17, pp 9-56; P. Kitcher. 1997. *The Lives to Come: The Genetic Revolution and Human Possibilities*. New York. Simon and Schuster: 239-269; R.C. Lewontin et al. 1984. Not in our genes: biology, ideology, and human nature. New York. Pantheon Books.

<sup>20</sup> Alper, op. cit. note 1; K. Morley and W. Hall. 2003. Is There a Genetic Susceptibility to Engage in Criminal Acts? *Trends & Issues in Crime and Criminal Justice* No. 263, Australian Institute of Criminology: 4.

<sup>21</sup> R. Plomin et al. 1990. *Behavioral Genetics: A Primer*. New York. W.H. Freeman and Co: 9.

<sup>22</sup> Kitcher, op. cit. note 19, p244.

<sup>23</sup> Kaplan, op. cit. note 17, pp13-21.

<sup>24</sup> Lewontin et al., op. cit. note 19, p11.

<sup>25</sup> R.C. Bailey. 1997. Hereditarian scientific fallacies *Genetica* 99: 125-33 at p126.

<sup>26</sup> Kaplan, op.cit. note 17, p94

<sup>27</sup> Lewontin et al., op. cit. note 19, p54.

<sup>28</sup> Lombroso quoted in S. Chorover. 1979. *From Genesis to Genocide*. Cambridge Mass. MIT Press: 179.

<sup>29</sup> Kevles. 1985. *In the name of eugenics: Genetics and the uses of human heredity*. New York. Alfred A. Knopf: 71.

<sup>30</sup> See, for instance, S.J. Gould. 1981. *The Mismeasure of Man*. New York. W.W. Norton: 142-173, or Lewontin et al, op. cit. note 19, pp53-54, or Kaplan, op. cit. note 17, pp92-95.

<sup>31</sup> Gould, op. cit. note 30, p162.

<sup>32</sup> Gould, op. cit. note 30, p170.

<sup>33</sup> H.G. Brunner et al. 1993. Abnormal Behavior Associated with a Point Mutation in the Structural Gene for Monoamine Oxidase A. *Science* 262: 578-80, at p578.

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- <sup>34</sup> C.C. Mann. 1994. Behavioral Genetics in Transition. *Science* 264: pp1686-89, at p1689.
- <sup>35</sup> Mann, op. cit. note 34, p1688.
- <sup>36</sup> Mann, op. cit. note 34, p1688.
- <sup>37</sup> P. Breggin, quoted in Mann, op. cit. note 34, p1689.
- <sup>38</sup> Kitcher, op. cit. note 19, p69.
- <sup>39</sup> Pyeritz et al. 1997. The XYY male: the making of a myth. In *Biology as a social weapon*. Minneapolis. Burgess Publishing: 86-100; D. Borgaonkar and S. Shah. 1974. The XYY chromosome, male – or syndrome. *Progress in Medical Genetics* 10: 135-222.
- <sup>40</sup> Kaplan, op. cit. note 17, p97.
- <sup>41</sup> Brunner et al., op. cit. note 33.
- <sup>42</sup> Alper, op. cit. note 1.
- <sup>43</sup> Alper, op. cit. note 1, p1608, referencing M.P. Coffey. 1993. The genetic defence: excuse or explanation? 35 *William and Mary L. Rev.*: 353-99.
- <sup>44</sup> Alper, op. cit. note 1, p1608.
- <sup>45</sup> Alper, op. cit. note 1, p1608; N. Risch. 1990. Genetic linkage and complex diseases, with special reference to psychiatric disorders 7 *Genetic Epidemiology*: 3-16.
- <sup>46</sup> M. Kirby. The First Hamlyn Lecture: 'Judicial Activism: authority, principle and policy in the judicial method'. Delivered 19/11/03 University of Exeter, UK.
- <sup>47</sup> For instance, A. Mason. 1987. Future Directions in Australian Law 13 *Monash University Law Review*: 155-163; A. Altman. 1996. *Arguing About Law: An Introduction to Legal Philosophy*. Boston. Wadsworth: 226-30; P. Williams. 1993. *The Alchemy of Race and Rights*. London. Virago: 139-41.
- <sup>48</sup> K. Biber. Many shades of grey in white arguments on black deaths SMH 23/12/02.
- <sup>49</sup> M. Gleeson. 2000. Judicial Legitimacy 12(6) *Judicial Officer's Bulletin*: 41-44, 48.
- <sup>50</sup> Kirby, op. cit. note 46.
- <sup>51</sup> Jones, op. cit. note 1, p1034.
- <sup>52</sup> S. J. Morse. 1994. Culpability and Control 142 *U. PA. L. REV.* pp1587-89; R. C .Boldt. 1992. The Construction of Responsibility in the Criminal Law 140 *U. PA. L. Rev.* pp2245-47; H. Packer. 1968. *The Limits of the Criminal Sanction*. Stanford CA. Stanford University Press: 74-75; Jones, op. cit. note 1, pp1034-36.
- <sup>53</sup> Packer, op. cit. note 52, pp74-75, quoted in Jones, op. cit. note 1, p1035.
- <sup>54</sup> Justice Nygaard does provide at least one admission from the judiciary that the criminal justice system's approach to free will is contrived, or at least flawed, at Nygaard, op. cit. note 4, p422, where he notes that '[o]ur criminal law's philosophy must presume that individuals have a totally free will because our penology is motivated by revenge and the desire to punish offenders. Indeed, Americans are so preoccupied with punishment that we pay almost no attention to, and consequently receive little guidance from, either the social or physical sciences. We seem to shun any evidence that might help us explore the genesis of crime for fear that the evidence will indicate that our philosophical bases for criminal sentencing and our penal modes themselves have fundamental shortcomings. Even worse, we fear being perceived as 'soft' on crime. As a result, we rely upon an unscientific, underdeveloped theory of responsibility and blameworthiness.' While Justice Nygaard's explanation of the motivation for this Noble Lie is, with respect, arguable, the above passage nonetheless illustrates that judicial application of principles regarding free will is performed with knowledge of how contrived those principles are. See also Jones, op. cit. note 1, *his* endnote 21.
- <sup>55</sup> W. Cragg. 1992. *The Practice of Punishment: Towards a theory of restorative justice*. New York. Routledge: 24.
- <sup>56</sup> Cragg, op. cit. note 55, pp44-48.
- <sup>57</sup> Coffey, op. cit. note 43, pp394-98.
- <sup>58</sup> Jones, op. cit. note 1, pp1031-1032.
- <sup>59</sup> Jones, op. cit. note 1, p1040.