

THE INSANITY DEFENCE: IS IT STILL FIT FOR PURPOSE?

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The M'Naghten Rules formulated in 1843 have provided the basis for the insanity defence in many Western countries, including New Zealand. Although many candidates for the insanity defence experience psychosis, the principal determining factor is whether they knew their criminal act was morally wrong, a difficult metaethical judgement. In New Zealand the advent of methamphetamine abuse has created a significant challenge for forensic assessors in differentiating between mental disease and chronic intoxication, raising the question of whether the insanity defence as currently formulated is fit for purpose in assessing criminal culpability in such cases. The article explores this problem through an examination of a number of leading cases, noting the variable character of expert testimony on insanity where methamphetamine is involved. The article then examines the question of whether evidence of mental states falling short of insanity may be utilised to support a palliative claim reducing murder to manslaughter. A tentative new approach invites consideration of allowing investigation of insanity in cases involving meth-induced paranoia, whether or not the threshold of disease of the mind is met. In the concluding sections the article examines the impact of developments in cognitive neuroscience and asks whether neuroscience can help in determining criminal responsibility and whether it supports a "control limb" in a reformulated insanity defence. The article concludes with a brief discussion of mental disorder and impulsive aggression.

I INTRODUCTION

The insanity defence has ancient origins in the common law of crimes. However, the modern version of the defence goes back to 1843 and the case of Daniel M'Naghten.¹ M'Naghten suffered from paranoid delusions – in particular, that Sir Robert Peel, the English Prime Minister, together with the Tories, was conspiring to kill him. M'Naghten was charged with murder after he shot and

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1 *M'Naghten's Case* (1843) 10 Cl & Fin 200, 8 ER 718 (HL). See also Warren Brookbanks "The M'Naghten Rules: Time for a decent burial?" [2002] NZLJ 315. The New Zealand Law Commission reviewed the insanity defence in 2010 but concluded that, despite some weaknesses, major reform of the statutory defence was not warranted. See Law Commission *Mental Impairment Decision-making and the Insanity Defence* (NZLC R120, 2010).

killed Edward Drummond, having mistaken him for Peel. Although acquitted of murder, the furore which then attended his acquittal resulted in the 15 common law Judges being summonsed by the House of Lords to state what the law was governing such cases. The answers given by the Judges, known as the M'Naghten Rules, have become the basis for the law on insanity in many Western countries. However, from the outset the Rules have been the subject of vigorous criticism on the grounds that they were too narrowly formulated and failed to reflect modern developments in psychiatric knowledge. In many instances this has resulted in some arbitrary decisions as to whether or not an offender was insane. Accordingly, some jurisdictions have recrafted their insanity rules to bring them more in line with contemporary psychiatric knowledge, while developments in cognitive neuroscience are also having an impact on the way insanity is formulated.

In this article I propose to explore these and other issues in an attempt to investigate what a modern, scientifically credible, insanity defence might look like. I will begin this survey by briefly describing the structure of the insanity defence in New Zealand, preparatory to a discussion of the problem of methamphetamine in relation to the insanity defence. The article will then look at some issues at the interface of the insanity defence and developments in cognitive neuroscience. This will include a discussion of the relevance of emerging data on impulse control disorders, as a basis for making the case for a "volitional" insanity, or "control" limb for the insanity defence. This will include consideration of the problem of schizophrenia, as a key element in the construction of "disease of the mind". I will briefly consider its relationship to impulsive aggression before offering some concluding observations.

II INSANITY IN NEW ZEALAND

The essence of the defence, defined in s 23 of the Crimes Act 1961, was most recently outlined by the Court of Appeal in *Cameron v R*.² The defence depends on a presumption of sanity, imposing a legal burden on the defendant to make out the defence on the civil standard of balance of probabilities.³ Framing the defence according to a "two limb" model of assessing responsibility, s 23(2)(a) applies where as a result of "disease of the mind" the defendant was "incapable" of "understanding the nature and quality of the act or omission". This is a focus on the physical act or omission, a requirement in effect that the defendant did "not know what he was doing".⁴ The limb applies where the defence is automatism attributable to a disease of the mind or a case where a delusion renders the accused unaware of the character of the act.⁵

2 *Cameron v R* [2021] NZCA 80, [2021] 3 NZLR 152.

3 See Crimes Act 1961, s 23(1); and *Cameron v R*, above n 2, at [47].

4 *Cameron v R*, above n 2, at [48].

5 At [48].

The second limb in s 23(2)(b) applies where, as result of disease of the mind, the defendant is incapable of "knowing that the act or omission was morally wrong, having regard to the commonly accepted standards of right and wrong". The Court of Appeal describes the "paradigm case" as where a delusional defendant acted intentionally while believing the act was justified.⁶ However, the Court of Appeal has held that the incapacity standard relative to both limbs is not an objective standard, but depends simply on whether the defendant understood the nature and quality of their acts or knew the acts were wrong.⁷

A recent New Zealand study seeking to identify the common characteristics among defendants found to be legally insane, compared to those psychiatrically examined but convicted of an offence, found that all assessments for both those found insane and those found sane were based on expert opinion regarding moral wrongfulness. In no cases were assessments based on the defendant's ability to understand the nature and quality of their acts.⁸ Furthermore, the study found that the most common diagnosis among those found insane was psychotic disorder, but that a high proportion of sane defendants were diagnosed with schizophrenia, had previous psychiatric hospitalisations and were found to be suffering psychosis at the time of the offence.⁹ The forensic examiner's opinion regarding the defendant's ability to understand the moral wrongfulness of the act was the sole factor differentiating the sane and the insane. As the authors note, if the sample of those found insane and sane is not significantly different in characteristics other than the examiner's opinion regarding moral wrongfulness, this represents a challenge to the idea that civilised societies do not punish mentally ill people who do not understand what they are doing or that their acts were wrong.¹⁰

This observation may also highlight why the Law Commission's conclusion that the insanity defence did not warrant major reform may have been misconceived. If, in reality, the differences in opinion between forensic assessors as to the moral understanding of criminal defendants can have such far-reaching, and potentially devastating, consequences, then it surely behoves us to ensure that such opinions, framed around specific legal tests, are well grounded in the most up-to-date scientific understanding, and reflect attested neurobiological as well as psychiatric knowledge. It is not enough that an assessor opines that he or she understood the offender to know his or her act was "morally wrong" without more. What is the ethical and/or metaphysical basis for such a claim? Furthermore, the test for insanity ought also to be capable of addressing why an offender lacked the capacity to control apparently impulsive actions. Although the legal history of such claims has been

6 At [48].

7 At [49]. See also Warren Brookbanks "Incapacity or knowledge? The test for insanity" [2020] NZLJ 315.

8 Sixiao Sunny Li and Susan Hatters Friedman "Moral wrongness and insanity: a New Zealand sample" (2015) 26 *Journal of Forensic Psychiatry & Psychology* 686 at 692.

9 At 694.

10 At 694.

unpromising,¹¹ a better understanding of the nature and neurological precursors of impulse control disorders may justify their reconsideration within insanity defence jurisprudence.

III THE METHAMPHETAMINE PROBLEM

New Zealand Police statistics are revealing as regards the consumption of methamphetamine. Data have revealed that a 31 per cent decline in meth consumption levels occurred in May, June and July 2020, with an average of 10.1 kg consumed each week.¹² This is compared to an average of 14.6 kg consumed weekly from April 2019 to March 2020. However, the National Wastewater Testing Programme revealed that in the third quarter of 2022 an average of 15.5 kg of meth was consumed across sample sites per week.¹³ This was shown to be below the average quantity detected over the previous four quarters (19 per cent or 3.1 kg). It is suggested that the reduction in consumption is related to a reduction in meth availability in New Zealand. However, it does not suggest any lessening in interest in the use of meth.

The social cost of this abuse is substantial. Police statistics estimate that the 13.5 kg of meth consumed equates to an estimated cost of \$14.9 million in social harm per week in the third quarter of 2022. Despite the reduction in use during the third quarter of 2022, probably attributable to COVID-19 restrictions disrupting international supply chains and the movement of drugs, meth has been shown to have had an increasing impact on the health of New Zealanders.¹⁴ Approximately \$7.8 million per week was generated from meth distribution across New Zealand sample sites in the first quarter of 2022.¹⁵

Although meth-induced psychosis is a rare phenomenon, on one view it is becoming more common, with an anecdotal upsurge in the use of the drug.¹⁶ A 2019 health survey estimated that one

11 See for example *R v True* (1922) 16 Cr App Rep 164 (Crim App), where the Court of Criminal Appeal held there was no need to extend the ambit of the M'Naghten Rules to include cases where the accused was "deprived of the power of controlling his actions", cited in Lisa Claydon and Paul Catley "Abolishing the Insanity Verdict in the United Kingdom: A Better Balance Between Legal Rules and Scientific Understanding?" in Sofia Moratti and Dennis Patterson (eds) *Legal Insanity and the Brain: Science, Law and European Courts* (Hart Publishing, Oxford, 2016) 207 at 216.

12 See Sophie Cornish "Nationwide meth use dropped by almost a third during and after lockdown" *Stuff* (online ed, New Zealand, 24 September 2020); and Paul Bellamy and Glenn Hardingham *Methamphetamine in New Zealand: A snapshot of recent trends* (Parliamentary Service, Parliamentary Library Research and Information research paper 2021/03, March 2021) at 4.

13 See New Zealand Police "National Wastewater Testing Programme – Quarter 1 2022" (July 2022) <www.police.govt.nz>.

14 See Bellamy and Hardingham, above n 12.

15 See New Zealand Police, above n 13.

16 Ian Goodwin "Methamphetamine induced psychosis" (speech to the Criminal Bar Association Annual Conference, Auckland, 6–7 August 2022).

per cent of all the New Zealand population had used meth.¹⁷ Between 2014–2015 and 2019–2020 the number of discharges from publicly funded hospitals with a primary diagnosis of mental or behavioural disorders indicating meth increased from 216 to 901.¹⁸ While psychosis is a rare but significant effect of regular meth use, it is considered that the numbers are an underestimate of the extent of the problem. But to the extent that meth-induced psychosis does exist, its typical expression is in delusional thought, hallucinations and thought disorder.¹⁹ However, a legal challenge that has emerged is that while offending under the influence of meth is often associated with a profoundly disturbed mental state, often accompanied by irritability, aggression, sleeplessness, mood swings and paranoia, not every such state of mental disturbance is capable of having an exculpatory effect for the alleged offence. Excuse depends on the particular constellation of impairments, their causal origins and the extent to which they endure after the criminal event.

Recent developments in other jurisdictions suggest that attempts to assign criminal responsibility as between the effects of substance-induced intoxication and mental impairment is as fraught as it currently is in New Zealand. Where the meth user suffers from a pre-existing psychosis there may be a reasonable chance of insanity being available. But where the offender experiences a first-time psychosis caused by meth, the position regarding insanity is less clear. Similarly, where there is a subsequent psychosis following reoccurring meth use, should the resulting mental state be characterised as a mental disease or is it simply a case of advanced intoxication? While meth-induced psychosis is generally transient, it is capable of impairing judgement and knowledge of the moral wrongfulness of behaviour. This causes significant challenges for the courts as they grapple with competing ethical, moral, social and legal values, suggesting an urgent need for novel solutions to the problem of meth and insanity. Ultimately, it may be seen as something of a lottery whether the accused is judged to be legally insane or suffering from drug intoxication.

Whether drug-induced psychosis constitutes a disease of the mind is a highly conflicted judgement. Meth is recognised as a potent psychostimulant that is capable of inducing psychosis amongst users.²⁰ Because meth use is associated with a high prevalence of psychotic symptoms, this may present as a major burden on the health system as a result of high demand for care and management of meth-related psychoses.²¹ As a result there may be resistance among psychiatric professionals in confirming diagnoses of meth-induced psychosis, preferring to regard it as an artefact

17 See Bellamy and Hardingham, above n 12.

18 Bellamy and Hardingham, above n 12, at 5.

19 Bellamy and Hardingham, above n 12.

20 Travis A Wearne and Jennifer L Cornish "A Comparison of Methamphetamine-Induced Psychosis and Schizophrenia: A Review of Positive, Negative, and Cognitive Symptomatology" (2018) 9 *Frontiers in Psychiatry* 491.

21 Wearne and Cornish, above n 20.

of intoxication rather than a bona fide mental illness. Complicating matters is the fact that some meth users may experience prolonged psychosis, persisting even after the drug has cleared from the body.

Furthermore, for some users meth psychosis may develop into an enduring form of psychosis.²² The difficulty is that, if the meth psychosis is characterised as acute, symptoms may resolve with abstinence from meth and withdrawal management. In those circumstances there may be resistance to characterising the condition as a disease of the mind because of the implications for the health care system. On the other hand, if it is a case of persistent meth psychosis with similar symptoms to schizophrenia, and warranting the use of antipsychotic medications, the association of meth use with specific lifestyle choices may similarly prejudice some assessors against a disease of the mind recommendation.

The legislation gives no guidance. Determination of what constitutes a relevant disease of the mind is entirely a matter for the courts. Interestingly, the claim of insanity verdicts becoming a lottery became an issue in the 1920s in murder trials involving ex-servicemen damaged by war who committed sudden acts of violence against members of their families. Sally Smith observes that uncertainty surrounding many judges' directions to juries, and a lack of transparency around Home Secretary reprieves, "injected an increasingly random quality into the outcome of murder trials in which insanity was the defence".²³

Of particular concern is the distinction between pathological conditions that may be characterised as a "disease of the mind" for the purposes of s 23 of the Crimes Act 1961 and those characterised as "drug-induced psychosis" and generally excluded from the insanity defence. Psychoses constitute a disease of the mind where they arise from an internal as opposed to an external cause. Mental conditions like schizophrenia or serious mood disorders constitute internal causes, whereas events like concussion, hypnotism or consumption of drugs or alcohol are usually characterised as external causes and excluded from the ambit of disease of the mind. Similarly, where a transient state of psychosis is caused by substance use, it is not accepted as a disease of the mind.²⁴ However, as has been noted by Mellsop and colleagues, the difficulty with this analysis is that some offenders may experience an underlying mental disorder "in which psychotic symptoms, with associated offending, are precipitated by drug use".²⁵ The authors continue:²⁶

22 Wearne and Cornish, above n 20.

23 Sally Smith "It's a shame!" in *Marshall Hall: A Law unto Himself* (Wildy, Simmonds & Hill Publishing, London, 2016) 168 at 175.

24 Graham Mellsop and others "Drug driven psychoses and legal responsibility or insanity in six Western Pacific nations" (2016) 47 *Intl JL & Psychiatry* 68 at 70.

25 At 70.

26 At 70.

To meet the unwritten but commonly accepted definition of [disease of the mind], one of the two prerequisites for the insanity defence, it has been thought necessary that this mental disorder would continue to exist independently from the drug use ... In such cases, the Court often focusses on whether it is substance use which is the primary cause of the psychosis or whether an underlying mental disorder is predominantly responsible. In practice, this may be an unanswerable question.

R v Lipsey-McCarthy is illustrative of the difficulty regarding methamphetamine use.²⁷ It involved an appeal against conviction for a vicious assault on an elderly woman in a public street. The Court acknowledged that:²⁸

... difficulties of evaluation of mental disorder, in terms of disease of the mind, arise where a mental state may be attributable both to an inherent psychiatric condition and external causes such as the influence of drugs.

The Court found that psychiatric evidence had provided a rational basis to conclude, on the balance of probabilities, that if the appellant did not know her conduct was morally wrong, then her disability in that respect was attributable to an underlying psychiatric condition which could be characterised as a disease of the mind, rather than the transient effects on the appellant's mental processes of the methamphetamine she had consumed.²⁹ The Court rejected the appellant's argument that the jury's verdict was unreasonable and could not be supported by the weight of the evidence, finding that the appellant's behaviour and the psychiatric evidence supported a possible conclusion of legal insanity, but were not determinative of it.³⁰ The Court concluded "this [was] because the term 'disease of the mind' ... is not a medical expression but a legal concept, which embraces more than medical science".³¹ The appeal against conviction was dismissed because the Court of Appeal was not satisfied that the trial Judge's direction on insanity was in any way flawed.

Furthermore, there was evidence that the appellant knew that her behaviour was wrong, despite forensic evidence that her consumption of methamphetamine had triggered schizophrenia, to which she was predisposed. On this basis insanity was excluded. However, it is interesting to note that the appellant had made an admission to one of the forensic experts that when she saw the elderly woman she "tried to restrain herself from lashing out *but in the end could not control herself*".³² She had then

27 *R v Lipsey-McCarthy* CA237/04, 28 October 2004.

28 At [16].

29 At [17].

30 At [18].

31 At [18].

32 At [10] (emphasis added).

run away from the scene because she felt "really bad" for what she had done.³³ This, of course, raises the question of whether lack of impulse control ought to be a relevant consideration in any evaluation of the scope of exculpatory insanity. The issue will be considered later in the article.

Other recent New Zealand cases illustrate the continuing challenges presented by meth-addicted defendants relating to both issues of criminal responsibility and to questions of culpability. The cases demonstrate the point already made that defendants found insane and those found sane often share many common characteristics, including previous hospitalisations and the presence of psychosis at the time of the offence.

The challenges associated with distinguishing mental disease from drug-induced psychosis are well illustrated in *R v Yad-Elohim*.³⁴ The accused, who was experiencing auditory hallucinations telling him to kill the victim, had been charged with the murder of an elderly victim following a brutal and sustained assault on the innocent victim. There was agreement that the appellant suffered from chronic schizophrenia, possibly exacerbated by his consumption of methamphetamine some time earlier. In addition, it was revealed that during treatment the defendant's psychotic symptoms persisted in a way that was consistent with chronic schizophrenia, rather than drug-induced psychosis. Both defence and Crown experts at trial agreed the accused was psychotic and suffering from a disease of the mind, namely enduring schizophrenia, at the time of the attack and continued to display active psychotic symptoms after arrest and subsequently. Where the experts failed to agree, however, was on whether the disease had rendered him "incapable of understanding the nature and morality of [his] actions".³⁵ In sentencing, the Judge noted that the defendant was found guilty of murder by the jury, who:³⁶

... must have concluded that you were not, by reason of your illness, rendered *incapable of understanding* the nature and quality of your actions or of knowing that your actions were morally wrong, having regard to the commonly accepted standards of right and wrong.

However, given the clear conflict of expert opinion on the question of moral wrong, it is also possible that the jury convicted simply because they were repulsed by the defendant's actions and impacted by an operating "vividness heuristic".³⁷ The verdict also raises the question whether, if the jury had been directed that the test for insanity was simply whether the defendant *knew* his acts were wrong at the

33 At [10].

34 *R v Yad-Elohim* [2018] NZHC 2494.

35 At [6].

36 At [7] (emphasis added).

37 Where "concrete and vivid information" about a specific case, eg a particularly brutal homicide, "overwhelms the abstract data on which rational choices are often made", eg evidence that the accused was suffering from a chronic and disabling mental impairment like schizophrenia: see Michael L Perlin *The Hidden Prejudice: Mental Disability on Trial* (American Psychological Association, Washington, 2000) at 4.

time of the assault, then evidence of his chronic, persisting illness, recognised as a disease of the mind, and the impact of methamphetamine may have left them in sufficient doubt as to whether he *actually possessed* the relevant knowledge at the relevant time.³⁸

In contrast to *Yad-Elohim* is *R v Rawson*, where the appellant was found not guilty by reason of insanity following assaults on his father and stepmother, resulting in charges of attempted murder and assault with a weapon.³⁹ All three forensic experts agreed that the defendant was probably insane at the time of the offending, providing the basis for the Crown and defence's concurrence that not guilty by reason of insanity was the only reasonable verdict, and thus triggering the procedure under s 20 of the Criminal Procedure (Mentally Impaired Persons) Act 2003. It was agreed that he experienced florid psychotic symptoms, including delusions of grandeur and religiosity that could have impacted on his actions at the time of the offending. Notably, methamphetamine was not involved in this offending.

In finding that the defendant was insane in terms of s 23 of the Crimes Act 1961, Toogood J found that while the defendant may have appreciated that what he was doing was assaulting both his father and stepmother, the schizophrenic psychosis from which he suffered meant he was:⁴⁰

... incapable of knowing the quality of the acts constituting the offences at the time the offences were committed. That is, he did not apprehend that they were voluntary acts for which he was responsible.

Given the parallel psychotic processes which characterised both cases, it is difficult to see what facts might have influenced the jury towards an insanity verdict in *Rawson* as compared to the judgement that *Yad-Elohim* was *not* incapable of knowing that what he did was morally wrong.⁴¹

What this discussion of the cases demonstrates is the highly variable character of expert testimony both in support of and opposed to the insanity defence where meth is in contention. In one sense this is an inevitable feature of an adversarial system which invites an independent tribunal of fact to determine which version of the evidence is more probative of the facts in issue than the other. It is never an equal contest. Unfortunately, elements of unconscious bias and incipient sanism⁴² may also

38 It is significant that in his sentencing notes the trial Judge emphasised the issue of whether the accused was "rendered *incapable* of understanding" twice in two succeeding paragraphs, presumably with a similarly worded direction to the jury on their approach to the insanity defence: see *R v Yad-Elohim*, above n 34, at [6]–[7]. See also Brookbanks, above n 7.

39 *R v Rawson* [2019] NZHC 1381.

40 At [40].

41 Two further cases demonstrate how schizophrenia, co-occurring with methamphetamine abuse, can be differentiated for the purposes of discerning legal insanity: see *Tarapata v R* [2016] NZCA 500, (2016) 28 CRNZ 126; and *R v Brackenridge* [2019] NZHC 1004, [2019] NZAR 932.

42 "Sanism" is an irrational form of prejudice or bigotry which, according to Michael Perlin, has distorted insanity defence policies: see for example Michael L. Perlin "Unpacking the Myths: The Symbolism Mythology of Insanity Defense Jurisprudence" (1990) 40 Case W Res L Rev 599. As with other "isms",

prejudice the tribunal of fact against finding a particular defendant legally insane, often regardless of powerful evidence of psychosis.

IV METHAMPHETAMINE AND INTENTION

Another issue raised by the *Yad-Elohim* judgment concerns the question of whether evidence falling short of insanity may support a verdict of manslaughter in creating a reasonable doubt with regard to the specific intent for murder. In *R v Lechasseur* the Québec Court of Appeal held that evidence that falls short of what is required to establish a defence of insanity may still be sufficiently strong to create a reasonable doubt regarding the capacity of the accused to establish the specific intent required by law.⁴³ In *R v Makoare* the New Zealand Court of Appeal held that, where the court has to decide if someone is mentally abnormal, an expert may be able to supply the court with scientific and medical opinion which is likely to go beyond the experience and knowledge of jurors.⁴⁴ Such evidence, the Court held, might be admissible in relation to the issue of murderous intent but only if the expert could point to admissible evidence which sufficiently connects the opinion expressed as to human behaviour generally with the behaviour of the individual whose conduct or thought process is in issue.⁴⁵ In *R v B (an accused)* the Court of Appeal affirmed that expert evidence may be admissible where it is directed at an accused's mental capacity when his state of mind is a feature of the offence, as opposed to simply "oath-helping".⁴⁶

According to this analysis, where, as in the case of *Yad-Elohim*, the evidence of mental impairment is insufficient to reach the legal insanity threshold, evidence of the offender's profoundly disturbed mental state should be made available to the jury to determine whether the prosecution has proved beyond reasonable doubt that the accused had the intention to commit murder. For this purpose expert evidence should be adduced as to the impact on the accused's cognitive processes of his or her paranoid and delusional ideation, leaving for the jury's consideration whether the accused formed the relevant intent to kill.

This is a vexed area of law and practice where bright lines of distinction are very absent. It is not common in New Zealand for evidence negating intent to be left to a jury where the insanity defence has failed. Yet there is clearly potential unfairness where a defendant is convicted of murder following a failed insanity defence, where there may have been a reasonable doubt as to the mens rea for murder.

sanism is often based on stereotype, myth, superstition and deindividualisation and may result in the discrimination or oppression of individuals considered to have a mental disorder or other cognitive impairment.

43 *R v Lechasseur* (1977) 38 CCC (2d) 319 (QCCA).

44 *R v Makoare* [2001] 1 NZLR 318 (CA).

45 At 324.

46 *R v B (an accused)* [1987] 1 NZLR 362 (CA) at 372.

A major problem with the insanity defence as presently formulated is that it represents a binary judgement of criminal responsibility: the defendant is either insane or is not insane. Yet, as this discussion has shown, an offender may experience serious mental impairment in the form of paranoia yet not be judged legally insane according to the narrow test enshrined in s 23 of the Crimes Act 1961. The idea of allowing evidence of paranoia to be presented as negating the mens rea for murder would go some way towards lessening the harshness of the binary test for insanity and allow scope for a jury to bring in a verdict of manslaughter on the basis of the absence of proof of full mens rea.

Other questions arise: is "disease of the mind" an appropriate descriptor for an acknowledged mental impairment that is closely tied to methamphetamine consumption but lacking an organic basis? It is useful to note that Hong Kong, which has followed the common law system in Commonwealth countries, in addition to "disease of the mind" also allows for "abnormality of mind induced by disease or injury" as an alternative descriptor for the essential ingredient in an insanity defence. Perhaps this might provide a gateway for "drug-induced psychosis", as a relevant "injury", to found an insanity defence. We might also question whether the focus of the test in s 23 on knowledge of moral wrong is appropriate, or even meaningful, in this context. Should the impact of paranoia be assessed independently of the insanity model?

In *R v Brackenridge* Jagose J ruled that a "drug-induced psychosis" could amount to a disease of the mind for the purposes of s 23(2).⁴⁷ In giving his reasons for the ruling his Honour said:⁴⁸

Significant use of high potency cannabis derivatives and/or methamphetamine can produce permanent changes in a person's brain which lead to schizophrenia. New Zealand Ministry of Health data suggest such use probably increases the rate of schizophrenia in those genetically predisposed to its onset. The rate of schizophrenia among such users of either cannabis or methamphetamine is five or six times the rate among non-users. The rate doubles again for significant users of both drugs. As such, schizophrenia can be drug-induced in the genetically predisposed.

His Honour characterised the consequences of "disease of the mind" as being whether the "state of the defendant's mind at the time of the offending is affected divergently from what is presumed 'normal' – 'the ability to understand, to reason *and to think rationally*'."⁴⁹

Jagose J rejected the proposition that the defendant was "undeserving of the defence" because his mental state resulted predominantly from the self-induced effects of the drug. The Court held that the "deserving" nature of the offender for the exercise of the discretion to allow evidence of insanity was

47 *R v Brackenridge*, above n 41.

48 At [3].

49 At [5] (emphasis added), citing *R v Dixon* [2007] NZCA 398, [2008] 2 NZLR 617 at [29] and [39].

not relevant in determining whether the accused had the capacity to be held responsible.⁵⁰ His Honour concluded with the observation that:⁵¹

Schizophrenia facilitates a state of mind that may affect an offender to the extent that s/he is incapable of the requisite knowledge or understanding. That schizophrenia may be drug-induced is immaterial, because the operative state of mind is schizophrenic, however induced. That is quite distinct from an exclusively drug-induced state of mind, which seems indistinguishable from intoxication (which may not provide excuse or justification). Such only may render the offender "unable", rather than the qualifying "incapable".

This is an important decision because of the clear endorsement of drug-induced schizophrenia as a "disease of the mind". If the underlying mental illness is schizophrenia then that should always trigger the insanity defence, whether ultimately successful or not.

However, it is clear that the cases considered here stretch the utility and applicability of the insanity defence as currently formulated. In each of the cases considered, the defendants were profoundly paranoid and delusional yet in the majority of cases did not meet the narrow insanity test. It is also evident that forensic experts are ill-equipped to say the defendants did, or did not, understand that their conduct was "morally wrong". Strictly, this is a question of fact for a jury to determine, and outside the expertise of forensic experts. Questions of moral understanding are difficult questions that few are competent to answer. It should be no surprise then that forensic professionals may, and often do, disagree as to whether the accused knew their actions were morally wrong. Sadly, this disagreement may have disastrous consequences for a defendant who, in all respects other than his or her appreciation of wrong, was severely mentally impaired. Furthermore, there is a risk that the impacts of a *vividness* heuristic, related to the often gruesome facts of an insanity case, could overwhelm the judgement of clinicians and jurors.⁵² In *Brackenridge* this was a judgement, at least on the part of the Crown, that the accused was undeserving of the defence. This has the potential to facilitate the application of a *character-based* assessment of responsibility, at the expense of subjective *capacity-based* criminal responsibility, which is still the preferred model of responsibility attribution in New Zealand criminal law. On this view the perception of the offender as a person of bad character, as reflected in his/her abhorrent behaviour, may prevail over more nuanced capacity/responsibility considerations, leading to a punitive criminal justice disposition.

50 *R v Brackenridge*, above n 41, at [9].

51 At [10] (footnotes omitted).

52 The idea that "concrete and vivid information" about a specific case "overwhelms the abstract data on which rational choices are often made": see Perlin, above n 37, at 4.

V A NEW APPROACH

A possible approach might be simply to avoid the distinction between internal and external causes in such cases. An enduring dilemma concerns the nature of the relationship between methamphetamine and the insanity defence. The principal point of contention is not which knowledge limb of the defence methamphetamine impairment might satisfy, but whether methamphetamine is capable of producing psychological outcomes constituting a disease of the mind. The question is complex. The rationale for excluding methamphetamine-induced psychosis from the ambit of disease of the mind is that its ostensible origin in an *external* cause (the voluntary consumption of a mind-altering substance) alienates it from the conventional wisdom that true diseases of the mind derive from exclusively *internal* causes.

Under previous analysis, where the mental impairment was transient, leading to a state of psychosis induced exclusively by the consumption of meth, without the addition of underlying mental illness, its characterisation as a disease of the mind necessarily failed, regardless of any other more primal causal factors that may have precipitated the meth use in the first place. Yet because meth abuse is so often associated with mental impairment, whether pre-existing, co-existing or derivative of meth consumption, determining causal tracks and causal priorities is often an extremely difficult, if not impossible, task. The upshot is that where insanity is advanced on the basis of a psychotic disorder originating in, or precipitated by, the use of meth, unless the meth effects meet the disease of the mind threshold, characterised as schizophrenia, the defence fails.

This is an unsatisfactory situation. There are two fundamental problems. First, the disease of the mind rubric is inadequate to accommodate the types of mental distress commonly associated with the use of illicit substances. Secondly, it is unreasonable to require forensic psychiatrists to fit difficult and often conflicting clinical analyses into legal language and concepts for which they are entirely ill-suited. This is simply because clinical diagnoses and assessments rarely fit neatly into legal models, which often require binary determinations that depend on value judgements based on unfamiliar psychological constructs. Identifying a primary cause when both drug use and psychosis was present is challenging for expert witnesses. Furthermore, "in such situations real world clinical complexity does not align well with the legal definitions, which often emphasise dualism over multiplicity".⁵³ Clinical judgements are invariably more nuanced and reflect categorisation of illnesses and impairments viewed on a spectrum rather than a particular moment in time.

For these reasons I am advocating a novel approach to the problem of meth and the addition of a control limb to the insanity test. This would avoid the need to make difficult distinctions between causes of mental impairment where meth is involved. The purpose of this addition would be to reflect the fact that much more is now known about impulse control disorders than was known when the M'Naghten Rules were formulated and that the simple binary between an impulse unresisted and one

53 Mellsoop and others, above n 24, at 70.

that was irresistible is inadequate to reflect the range of disorders that may result in an irretrievable loss of control.⁵⁴

The approach I am advocating proceeds on the basis that where an offence is committed under the effects of a highly disabling psychotic disorder, whatever the cause, which results in significantly impaired cognition or volition, the resulting incapacity should automatically engage exculpatory insanity. Disease of the mind would be a sufficient element but not a necessary requirement, together with other causal factors impacting on mental capacity. Provided evidence supporting the relevant cause was such as to prove that the person lacked the relevant knowledge of the circumstances of the act or the moral wrongfulness of the act, or that they were unable to control their behaviour, they would be found to be legally non-responsible for their acts and entitled to a qualified acquittal. Such a finding would then engage various health-based disposal options which would aim to address the specific condition experienced by the offender at the time of the offence, involving targeted therapeutic and rehabilitative interventions. Specific conditions could include methamphetamine addiction, foetal alcohol spectrum disorder, traumatic brain injury, autism spectrum disorder and other aberrant mental states causing loss of mental capacity.

VI DEVELOPMENTS IN COGNITIVE NEUROSCIENCE

How, if at all, might developments in neuroscience help in this debate? In *R v Dixon* the New Zealand Court of Appeal made the following observation in the context of considering the trial Judge's direction to the jury:⁵⁵

What is to be avoided is any suggestion that under this limb of the insanity defence, the jurors' task is to perform a neurological or psychiatric assessment of the accused's brain or its workings, with a view to establishing its *capacity*.

The thrust of the trial Judge's direction had been that the jury were to make an assessment of the capacity of the defendant's *brain* to rationalise what was morally right and wrong. This was held to be contrary to the correct interpretation of s 23(b) established in earlier cases, namely that the jury should have been simply asked whether the defence was established on the balance of probabilities that the defendant, because of his disease of the mind, did not know that what he was doing was morally wrong.⁵⁶

What this discourse clearly indicates is that, at least at the time of the decision in *Dixon*, insanity is not concerned with an investigation into the workings of the brain, but is exclusively concerned with the operation of the mind, conceived in terms of memory, reason and understanding. That is to

54 See Warren Brookbanks "Provocation: Psychological Precursors for Loss of Self-Control as a Mitigatory Claim" (2009) 16 *Psychiatry, Psychology and Law* 196.

55 *R v Dixon*, above n 49, at [32].

56 At [32].

say, insanity is (currently) concerned with *mental content* rather than *organic changes* in the brain.⁵⁷ Indeed, criminal jurisprudence since that time has reinforced the relatively narrow confines within which the insanity defence is constructed, to effectively exclude any investigation into the biological functioning of the human brain and the implications for human behaviour. On this view insanity is a largely mental construct, unconcerned with the realities of neurological impairment, but focused on the functional capacities of the mind.

However, more recently there has been a growing interest in both academic and practice domains in the potential role of neuroscience in the assessment of criminal responsibility. Four recent studies from Canada, England and Wales, the Netherlands and the United States illustrate how neuroscientific evidence, "introducing neurobiological explanations of criminal behaviour into courtrooms", is increasing in different legal systems.⁵⁸ Yet while neuroscience has been used in some legal systems to answer questions about a defendant's legal responsibility, the reliance of psychiatric assessors on a defendant's self-report raises serious questions both about the reliability of behavioural assessments concerning a defendant's sanity and the ability of neuroscience to detect relevant subjective mental states that might impact on the responsibility question.⁵⁹ As one commentator has observed, there is "an increased likelihood of error in reliance on the self-report of examinees in forensic cases, which often involve circumstances that could motivate examinees to exaggerate, minimize, or falsify the information they provide".⁶⁰ As Meynen rightly observes, forensic psychiatry does not have a "perfect solution" to the profound problem that information about mental states is based on what people themselves reveal about such states, and he asks whether neuroscience could be of help by adding more objective information related to diagnosis.⁶¹ The central question, in Meynen's view, is whether neuroscience can be helpful in answering the legal question, namely whether "mere neurobiological facts" are capable of deducing normative conclusions about the level of a person's criminal responsibility.⁶²

57 See Gerben Meynen "Neuroscience-based Psychiatric Assessments of Criminal Responsibility: Beyond Self-Report?" (2020) 29 Cambridge Quarterly of Healthcare Ethics 446 at 451.

58 Johannes Fuss "Legal responses to neuroscience" (2016) 41 JPN 363.

59 Meynen, above n 57, at 448.

60 Thomas Grisso "Guidance for improving forensic reports: A review of common errors" (2010) 2 OAJFP 102 at 104 as cited in Meynen, above 57, at 448.

61 Meynen, above n 57, at 449.

62 At 450.

Some commentators are sceptical of this possibility. Stephen Morse has argued that the contribution of neuroscience to normative disputes about how broad or narrow an insanity defence should be is "virtually nil".⁶³ Morse continues:⁶⁴

The biological understanding of mental disorder is simply too sketchy and so few findings are well replicated that neurodata cannot be a sensible guide to legal policy making regarding legal insanity or the legal response to people with mental disorders in general.

Morse notes that neuroscience cannot show that people suffering from particular severe mental disorders have less behavioural control than others who do not have such disorders. Furthermore, he dismisses claims that existing neuroscience has "considerably more to offer" on the basis that such studies tend to "cherry-pick the scientific studies and to draw broad and extensive inferences from them that the studies do not support".⁶⁵

Morse makes the further point that, because at present there are no reliable "biomarkers" for any mental disorder, the presence of which are essential in providing the basis for an insanity defence, none of the neural differences neuroscience has identified between people suffering from mental disorders and normal controls is large enough or sufficiently reliable to be diagnostic in an individual case.⁶⁶

This is likely to remain the position for the foreseeable future, given that in most jurisdictions criminal responsibility is based on behavioural assessment (ie describing what people should or should not do) and psychopathology as the central evidence in any claim for reduced culpability.⁶⁷ This is affirmed by Meynen, who notes that the law is often concerned with issues that neither neuroimaging nor other brain-based techniques are capable of answering.⁶⁸ He gives as an example the concept of *mens rea*, "a legal concept not readily covered by neuroscientific or neuroscientific concepts and approaches",⁶⁹ and warns that neuroscience data must be treated with caution on two counts.⁷⁰ First, they are often preliminary and are concerned with the group level. Secondly, they may not address the legal matter directly, which requires further interpretation and inferences. However,

63 Stephen J Morse "Legal Insanity in the Age of Neuroscience" in Sofia Moratti and Dennis Patterson (eds) *Legal Insanity and the Brain: Science, Law and European Courts* (Hart Publishing, Oxford, 2016) 239 at 265.

64 At 265.

65 At 265.

66 At 267.

67 Fuss, above n 58, at 363.

68 Gerben Meynen "Neurolaw: recognizing opportunities and challenges for psychiatry" (2016) 41 JPN 3.

69 At 4.

70 At 4.

on a more challenging note, Meynen notes that insofar as the "revision" domain of neurolaw concerns the compatibility of moral and legal responsibility, some argue that converging neuroscientific evidence points to the claim that certain notions of agency, foundational for criminal law, should simply be abandoned, a position strongly rejected by commentators like Stephen Morse.⁷¹

Perhaps we can put the question in another way. How can neuroscience support evaluations of legal insanity and the viability of current insanity definitions in the face of emerging insights into how neural circuit dysfunction can contribute to criminal behaviour?⁷² Korponay and Koenigs survey ways in which abnormalities in brain regions that mediate moral cognition and behavioural inhibition can give rise to psychosis or low IQ, which may result in impaired pro-social decision-making, impulsive behaviour or diminished understanding or reality. They conclude that at the present time a neuroscientist is unable to look at a neuroimaging scan and conclusively say whether an individual "qualifies as legally insane".⁷³ "[N]or can he definitively conclude that a particular abnormality contributed to a crime".⁷⁴ The default position is that neuroimaging data may function as "suggestive evidence" that complements and is secondary to traditional behavioural evidence used in insanity assessments.⁷⁵ It is certainly the case that new developments in the area of brain imaging may be capable of providing objective and reliable information relating to the structural and functional aspects of the brain, which could be helpful for judges endeavouring to understand an offender's mental state, in particular intention and insanity.⁷⁶ To this extent neuroscience could be useful to the law by having the capacity to confirm or invalidate behavioural evidence.⁷⁷

Furthermore, it may be necessary to be more specific about what we understand by the expression "neuroscience". It is suggested that the question "is neuroscience relevant to criminal responsibility?"

71 Stephen J Morse "Responsibility and Mental Capacity" in Nicole A Vincent (ed) *Neuroscience and legal responsibility* (Oxford University Press, New York, 2013) 27 as cited in Gerben Meynen "Neurolaw: Neuroscience, Ethics, and Law. Review Essay" (2014) 17 *Ethic Theory Moral Prac* 819 at 820.

72 Cole Korponay and Michael Koenigs "The Neurobiology of Antisocial and Amoral Behaviour: Insights from Brain Science and Implications for Law" in Sofia Moratti and Dennis Paterson (eds) *Legal Insanity and the Brain: Science, Law and European Courts* (Hart Publishing, Oxford, 2016) 9.

73 At 33.

74 At 33.

75 At 33.

76 Geert Philip Stevens "'My Brain Made Me Do It?' Reflections on the Role of Neuroscience in Assessing Criminal Responsibility – A South African Medico-legal Perspective" (2020) 27 *Psychiatry, Psychology and Law* 202 at 204.

77 Ariane Bigenwald and Valerian Chambon "Criminal Responsibility and Neuroscience: No Revolution Yet" (2019) 10 *Frontiers in Psychology* article 1406 at 6.

is problematic in at least three ways.⁷⁸ First, the question fails to distinguish between the relevance of current neuroscience as opposed to future neuroscience and its relationship to criminal responsibility. Secondly, the question is problematic because neither neuroscience nor criminal responsibility are sufficiently unified or homogenous concepts to justify finding an "intelligible one-to-one relationship".⁷⁹ Thirdly, relevance or irrelevance is not the issue. Vincent suggests that neuroscience might be *relevant* to the law because it challenges its fundamental assumptions, or seeks to provide an empirical justification for them, but irrelevant in the fact that the two areas lack a common language and a common set of concepts.⁸⁰ However, for present purposes it is enough to note that while neuroscience, broadly conceived, is unlikely to revolutionise the notion of criminal responsibility, or evoke the "neuroscientification of law",⁸¹ we might realistically think in terms of the "juridification of neuroscience" as neuroscientific discoveries are embraced by legal thinking and integrated and applied to criminal justice.⁸² For example, in the Netherlands, neuroscience is sometimes employed for the behavioural evaluation of defendants.⁸³ However, in an article published in 2015 examining the use of neuroscientific and behavioural genetic information in criminal cases, it was found that in a significant majority of cases the legal question with regard to which neuroscientific/genetic information was most commonly introduced was criminal responsibility.⁸⁴ While the role of neuroscience in the assessment of legal insanity does appear to be growing in the Netherlands, Meynen cautions that the role of neuroscience in psychiatric assessments generally is very limited.⁸⁵ This, no doubt, reflects the present reality in most jurisdictions.

VII DOES NEUROSCIENCE SUPPORT A "CONTROL" LIMB?

Granted the current limits of the ability of neuroscience to assist in determinations of legal responsibility, are there other domains of legal discourse where it might assist? For example, could it assist in determining the basis for a volitional or control limb for the insanity defence? This is a

78 Nicole A Vincent "On the Relevance of Neuroscience to Criminal Responsibility" (2010) 4 *Crim Law and Philos* 77 at 78.

79 At 79.

80 At 80.

81 Bigenwald and Chambon, above n 77, at 16.

82 At 16.

83 Gerben Meynen "Legal Insanity in the Netherlands: Regulations and Reflections" in Ronnie Mackay and Warren Brookbanks (eds) *The Insanity Defence: International and Comparative Perspectives* (Oxford University Press, Oxford, 2022) 274 at 290.

84 See CH de Kogel and EJMC Westgeest "Neuroscientific and behavioral genetic information in criminal cases in the Netherlands" (2015) 2 *JLB* 580 as cited in Meynen, above n 83, at 290.

85 Meynen, above n 83, at 294.

question that has "long vexed jurists".⁸⁶ The question is whether a mentally disordered person who understands that their actions are wrong, but lacks the capacity to resist the impulse to do them, should be excused.⁸⁷ In 1923 the Atkin Committee was established to look at what changes were desirable in criminal trials where the insanity defence was raised. After considering extensive medical evidence the Committee recommended, amongst other things, the need to recognise that a person charged with a criminal offence, but where a mental disease has deprived him of the power to resist, should not be held criminally responsible.⁸⁸ Smith notes that in 1923 Lord Darling introduced a Bill to implement the Atkin Committee recommendations, including adding an irresistible impulse clause to the M'Naghten Rules, but the Bill was defeated in the House of Lords. Opposition to the change was led by the Law Lords, who:⁸⁹

... objected strongly to any blurring of the standards by which mental state was to be assessed and even more strongly to what they perceived as the supremacy of medical opinion over legal principle. Some went so far as to express the view that the law was there to make people resist their impulses.

More recently in *R v Keal* the England and Wales Court of Appeal rejected a "broader" approach to legal insanity which was based on the notion of agency and included an element of "lack of choice".⁹⁰ The Court rejected the idea that knowledge (or being conscious) necessarily imports choice (agency) so that inability to choose otherwise would constitute insanity. The Court concluded that under the M'Naghten Rules the defence of insanity is not available to a defendant who, although he knew what he was doing was wrong, believed he had no choice but to commit the act in question.⁹¹ In so finding the Court of Appeal has re-affirmed the established position in English law that a claim asserted by a person charged with a criminal offence that he or she is irresponsible for his act when it is committed under an impulse which the person is by mental disease in substance deprived of the power to resist is not a defence recognised by law. This is despite the England and Wales Law Commission recommending the inclusion of a defence of irresistible impulse in its proposed reform of English law in a 2013 discussion paper.⁹²

There is substantial disagreement on how this question should be answered. As to whether neuroscience can assist in this debate, Maxwell Bennett notes, for example, how lesions in particular

86 Steven Penney "Impulse control and criminal responsibility: Lessons from neuroscience" (2012) 35 Intl JL & Psychiatry 99.

87 At 99.

88 Smith, above n 23, at 174.

89 At 174–175.

90 *R v Keal* [2022] EWCA Crim 341, [2022] 4 WLR 41.

91 At [48].

92 At [46].

regions of the brain, detected with magnetic resonance imaging (MRI), are capable of restricting the capacity to inhibit an ongoing act.⁹³ He also considers how lesions in other parts of the brain may lead to a failure of restraint, as in the case of impulsivity and delay aversion.⁹⁴ Bennett argues that neuroscience can establish the important principle that "abnormal behaviour is very likely due to failure of restraint as a consequence of an incapacity that arises from loss of synapses in a particular part of the brain", but concedes that:⁹⁵

... where the legislature and the courts draw the line as to when loss of synaptic connections is of such an extent as to excuse a defendant is a key issue for further deliberation.

Nevertheless, neuroscience does offer some useful insights into the nature, and possible treatment of, impulse control disorders like impulsive aggression and pyromania. Impulsive aggressive traits, for example, have been linked to dysfunctional serotonin neurotransmission. Other studies have noted that low levels of 5-hydroxyindoleacetic acid (5-HIAA), indicating low turnover of serotonin in the central nervous system, have been linked to violent and aggressive behaviour in prisoners.⁹⁶

However, the problematic nature of determining formal links between behavioural deficits like impaired impulse control and corresponding neural substrates is now well attested. The reality is that while it is clear that impulsivity "correlates with structural and functional differences in people's brains",⁹⁷ in the current state of scientific knowledge, it does not follow that neuroscience is capable of saying whether criminal defendants are morally or legally responsible for their behaviour,⁹⁸ or, more relevantly to the present discussion, whether an urge to act is genuinely irresistible, or merely unresisted. Nevertheless, there is evidence that in some situations some people "may find it impossible to control their behaviour, even if they know it is wrong".⁹⁹ The structural dynamic of this unenviable state has been described as an imbalance between the limbic system of the brain (essentially the amygdala which controls impulsivity) and the prefrontal cortex (vmPFC), the reflective system which regulates the long-term consequences of behavioural choices.¹⁰⁰

93 See Maxwell Bennett "Criminal law as it pertains to 'mentally incompetent defendants': A McNaughton rule in the light of cognitive neuroscience" (2009) 43 ANZJP 289.

94 At 291.

95 At 291.

96 See John M Schmitz "The Interface Between Impulse-Control Disorders and Addictions: Are Pleasure Pathway Responses Shared Neurobiological Substrates?" (2005) 12 Sexual Addiction and Compulsivity 149 at 160.

97 Penney, above n 86, at 100.

98 At 100.

99 At 100.

100 At 100.

Nonetheless, assessing criminal responsibility in cases where the accused suffered from an impulse control disorder at the time the offence was committed is by no means straightforward. "Few things are so complex and difficult to comprehend as the human mind, controlling human behaviour".¹⁰¹ While serious mental disorders like schizophrenia may pose fewer challenges to the legal system in terms of assessing for criminal responsibility, there is a "grey zone" which includes milder disorders and personality disorder which poses major challenges. It has been suggested that impulse control disorders may fall within this category.¹⁰² A compounding problem is that while an accused may experience a mental illness or impairment which meets certain clinical diagnostic criteria as, for example, DSM-5, the particular mental illness may not meet the threshold of a particular legal criterion, such as insanity or unfitness to stand trial. With reference to the South African legal criterion for insanity, Stevens expresses the problem in these terms:¹⁰³

Within the ambit of pathological criminal incapacity [the South African descriptor for legal insanity], the question to be assessed is whether an accused who commits an offence as a result of suffering from one or more of the impulse control disorders listed in the DSM-5 will be able to invoke the defence of pathological criminal incapacity.

While the DSM system identifies a range of impulse control disorders, including pathological gambling, kleptomania and pyromania, for the purposes of the present discussion our concern is with those impulse control disorders which manifest in aggressive violence. To have any relevance to legal insanity, however, the common feature will always be the existence of a pathological inability to resist internal impulses.¹⁰⁴ Relevant impairments might include conditions like intermittent explosive disorder, narcissistic rage, catathymic crisis and limbic psychotic trigger reaction, each of which may have neurological correlates.¹⁰⁵ However, whether they are capable of conferring exculpation on the basis of total absence of impulse control is another matter entirely. This is an area where much more work is required in order to establish more certain connections between aggressive behaviour and imperious psychological and/or neurological processes.

101 Geert Philip Stevens "The Role of Impulse Control Disorders in Assessing Criminal Responsibility: Medico-Legal Perspectives from South Africa" (2016) 23 *Psychiatry, Psychology and Law* 413 at 414.

102 At 414.

103 At 415.

104 Michael Stoll "Miles to go Before we Sleep: Arizona's Guilty Except Insane Approach to the Insanity Defense and its Unrealized Promise" (2009) 97 *Geo LJ* 1767 at 1791 as cited in Stevens, above n 101, at 416.

105 See Brookbanks, above n 54.

VIII MENTAL DISORDER AND IMPULSIVE AGGRESSION

Aggression, which is behaviour destructive to self, others or objects, can be premeditated, impulsive or the result of a medical disorder.¹⁰⁶ Prototypical cases of impulsive aggression, where associated with anger, involve the engagement of acute threat response neural system structures, including the amygdala, hypothalamus and the periaqueductal grey (PAG).¹⁰⁷ Where the acute threat response is implicated, impulsive aggression may involve unplanned and often enraged attacks on an object perceived to be the source of the threat.¹⁰⁸ There are some data which suggest that the ventromedial frontal cortex (vmPFC) inhibits the aggressive responses mediated by the amygdala, hypothalamus and PAG, in the sense of "putting the brakes on".¹⁰⁹ A suggested refinement of this analysis is that, rather than the vmPFC putting the brakes on the amygdala, it might be better to consider that it "provides information on potential rewards and costs of future actions, so that optimal response choice can occur".¹¹⁰

Patients with schizophrenia may be more disposed to impulsive aggression when overstimulated, agitated or while suffering psychosis. The courts have recognised that some schizophrenic sufferers can make sudden and unprovoked homicidal attacks.¹¹¹ Typically impulsive aggression in schizophrenia is linked to greater severity of illness generally¹¹² and may be the product of delusions or misinterpretation of a patient's surroundings due to psychosis.¹¹³ While there are data "supporting the argument that the acute threat response systems (amygdala, hypothalamus, and PAG) mediate impulsive aggression",¹¹⁴ it may be a significant further step to rely on impulsive aggression or other impulse control disorders to support a defence of insanity. Intermittent Explosive Disorder (IED) is a mental disorder characterised by frequent impulsive anger outbursts, usually out of proportion to the situations which triggered them. Such aggressive outbursts have a rapid onset which usually lasts about 30 minutes, often in reaction to some minor provocation.¹¹⁵ They may manifest as temper tantrums, verbal arguments or even minor assaults, but usually without property damage or injury to

¹⁰⁶ Alan C Swann "Neuroreceptor Mechanisms of Aggression and its Treatment" (2003) 64 J Clin Psychiatry (Suppl 4) 26.

¹⁰⁷ Robert JR Blair "The Neurobiology of Impulsive Aggression" (2016) 26 JCAP 4.

¹⁰⁸ At 4.

¹⁰⁹ At 6.

¹¹⁰ At 6.

¹¹¹ *R v Smith* [1989] 3 NZLR 405 (CA) at 408 per Casey J.

¹¹² Swann, above n 106, at 28.

¹¹³ At 29.

¹¹⁴ Blair, above n 107, at 5.

¹¹⁵ Stevens, above n 101, at 417.

animals.¹¹⁶ Occasionally, however, the aggressive outburst may result in damage, or injury to a person. What is significant about IED, for the purposes of the present discussion, is that it represents a failure to control impulsive aggressive behaviour in response to provocation and has been associated with criminal behaviour.¹¹⁷

Although IED is a recognised mental disorder within the DSM-5 classification system, its recognition as a foundation for legal insanity is more complex. As discussed above, to date impulse control disorders do not provide an evidential foundation for establishing the insanity defence in New Zealand. It is unlikely that IED alone would provide the basis for a defence of insanity, even if New Zealand did move to embrace lack of volitional control as a basis for an insanity plea. While the condition is associated with frequent episodes of impulsive anger, beyond the outbursts of anger, sufferers of IED have normal and appropriate behaviour.¹¹⁸ It is estimated that about 80 per cent of those with IED have another mental health condition. Most common amongst these are anxiety disorder, externalising disorder, intellectual disability, autism and bipolar disorder.¹¹⁹ However, there is little evidence that those who suffer from this condition completely lack the ability to control their behaviour in the circumstances.

It has been argued that if volitional control were ever to be subjected to a legal standard the standard should be *total inability* to exert control in the circumstances. Such a high standard, coupled with the accused bearing the burden of proof, and available scientific and other supporting information, "should be sufficient to enable decision-makers to distinguish between deserving and undeserving cases".¹²⁰ As Penney observes, for the foreseeable future, the vast majority of offenders with impulse control deficits will continue to be found responsible for their actions, even though impulsivity may be relevant to other aspects of criminal liability and punishment.¹²¹

IX CONCLUSION

The law around exculpatory insanity is in a state of flux. While suggestions for reform have been around for at least 100 years, few jurisdictions have embraced ground-breaking reforms incorporating modern scientific understanding – in particular, the new insights of neuroscience. Partly, this is the result of inertia, and a deep commitment to paradigms of the past. In New Zealand the insanity defence has not undergone any significant change since its first enactment in 1893. Nevertheless, in this

116 At 417.

117 At 418.

118 Cleveland Clinic "Intermittent Explosive Disorder" <my.clevelandclinic.org>.

119 Cleveland Clinic, above n 118.

120 Richard E Redding "The Brain-Disordered Defendant: Neuroscience and Legal Insanity in the Twenty-First Century" (2006) 56 Am UL Rev 51 as cited in Penney, above n 86, at 101.

121 Penney, above n 86, at 102.

jurisdiction as much as in any other comparable democracy, changing societal circumstances and a greater awareness of the challenges of neurodisability generally represent major challenges as to how insanity is formulated and the social goals it aims to achieve. This is especially the case as new and challenging forms of addiction come under the spotlight. Law change may be forced upon us if it is not forged voluntarily. The destructive effects worldwide of the abuse of methamphetamine are a good example. Clearly, tough policing, enhanced border control and harsh sanctions are insufficient in themselves to address this scourge and change behaviour. Presenting a novel approach to the problem of methamphetamine, I have argued that part of the process of change should include a rethinking of the role of the insanity defence where methamphetamine use has produced cognitive incapacity equivalent to a disease of the mind. The ensuing response should be the development of new disposal options and treatment of the problem as primarily a health, rather than a criminal justice, issue. In this context I have also argued for further consideration being given to proof of intention, especially in cases of homicide, where evidence is insufficient to support insanity.

Although New Zealand judges have emphasised that insanity is concerned with the mind as opposed to the brain, new understandings of neurobiology cannot be ignored. The article explored some developments in cognitive neuroscience to see if there is scope for neuroscience to impact on both our understanding and assessment of criminal responsibility. I asked whether "mere neurobiological facts" are capable of deducing normative conclusions about the level of a person's criminal responsibility and concluded that, in the present state of scientific knowledge, neuroscience technology is incapable of determining whether a person is legally insane, although neuroimaging may assist judges in understanding an offender's mental state resulting from neural damage or dysfunction. Nevertheless, developments in this domain are occurring rapidly, and it seems highly likely that in the future neuroscience will have a more determinative role in criminal science.

A critical question for the purposes of the current discussion is whether neuroscience itself supports claims that the insanity defence should include a control limb. This has always been a highly controversial aspect of insanity formulations, with significant division amongst different jurisdictions as to whether or not an "irresistible impulse" limb should be part of legal insanity. Recently, the decision of the England and Wales Court of Appeal in *R v Keal* has effectively doomed any prospect of a control element being added to the M'Naghten Rules for the foreseeable future, consolidating criticism of the narrowness of the purely cognitive focus of the defence. However, as I have suggested in the article, a better scientific understanding of the nature and causes of impulse control disorders may herald a fresh approach to uncontrollable and imperious psychological drives which defies the simple binary of irresistible versus unresisted. Although, as I argued in the final section, cases where there has been a total inability to exert control in the particular circumstances are likely to be rare, evidence seems increasingly to support the claim that for a small cohort of offenders the claim of irresistible impulse, based on discovery of neural correlates of impulsivity, is credible. However, it is clear that more work needs to be done in this domain to establish clear and convincing evidence that some impulse control disorders may have an exculpatory effect. Conditions like IED, while

evidencing clear loss of control, may lack the psychological force to render loss of control complete or total, thereby excluding them from the ambit of insanity. But granted the distress and risk posed by impulsive aggression, the law must be clear as to the distinction between forms of aggression that occur impulsively and genuinely without the actor's ability to control, and those which are intentional and culpable.

