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ACTUS REUS AND THE BRAIN: ANOTHER FALSE DAWN

FINBARR MCAULEY*

ABSTRACT. *This article examines the claim that experimental neuroscience is key to an improved understanding of actus reus. It focuses on the assumptions made by neuroscientists about the nature of actus reus and their principal conclusion that the voluntary act component thereof is essentially an endogenous process originating in the brain. The article contends that neuroscientists have misconstrued what lawyers and judges mean by actus reus such that their experimental findings on the subject are irremediably flawed.*

KEYWORDS: *actus reus*, *bodily movement*, *human behaviour*, *voluntary conduct*, *mental and brain states*, *readiness potential*, *experimental neuroscience*.

I. PRELIMINARY

Although it has been aired extensively in the scientific and legal literature, the claim that the heads of mens rea have identifiable neural correlates in the form of changing blood oxygenation levels in the brain is logically incoherent.[1] Its incoherence stems from the fact that it is based on a fundamental misunderstanding of the vocabulary of mens rea and its role in the ascription of criminal responsibility. The psychological predicates associated with criminal responsibility are not mental states; intention, knowledge and subjective recklessness all lack the attributes that would so qualify them.[2] Nor does it make sense to locate them in the mind, as the mind is not a place and thus cannot play host to entities of any kind.[3] Consequently, intention, knowledge and subjective recklessness cannot have neural correlates in the manner imagined by neuroscientists and their criminal law collaborators. As they are not mental states and are not located in the mind, it makes no sense to look for their mirror images in the brain.[4]

*Professor Emeritus of Law. Address for Correspondence: Sutherland School of Law, University College Dublin, Belfield, Dublin 4, D04 VIW8, IE. Email: Finbarr.mcauley@ucd.ie. I am grateful to the journal's reviewers for their insightful comments.

[1] See F. McAuley, "Mens Rea in the Brain: New Frontier or Dead End?" (2025) 141 L.Q.R. 437.
[2] Ibid., at 447–52.
[3] Ibid., at 452–55.
[4] Ibid., at 456–61.

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On the contrary, like their ordinary language counterparts, the technical legal concepts of intention, knowledge and subjective recklessness are bound up with the intellectual powers and abilities of human beings; their distinguishing mark is that they pertain to the things people do in those aspects of life of concern to the criminal law. In the case of intention, the relevant power typically encompasses being able to do nefarious things on purpose (such as shoot or punch a victim), aim at a particular outcome (such as defrauding the revenue) or do something as a means of achieving some further objective (such as attacking a police officer in order to resist arrest). In the case of knowledge, the appropriate power usually, though not invariably,[5] consists in the ability to acquire and retain incriminating information (e.g. that one is in possession of contraband); and subjective recklessness routinely goes to the ability to take legally relevant matters into account in the course of one's criminal activities.[6]

This distinction is crucial both inside and outside the criminal law. As it makes no sense to assess intellectual powers and abilities independently of the things they equip one to do, it follows that we are limited to evidence of performance when making such assessments.[7] Thus, if it is alleged that a defendant deliberately punched someone, witness evidence that he was seen aiming a blow at his victim will normally be enough to convict him of assault in the absence of countervailing evidence that the punch might have been thrown accidentally. Similarly, an allegation that a defendant knew something – for example, that he had proscribed drugs on his person or property – will usually succeed on foot of evidence he was seen taking custody of the prohibited items.[8] Finally, direct evidence that a defendant took or detained a demonstrably unwilling hostage will normally be enough to convict him of false imprisonment; absent a lawful justification or excuse, his actions appear to disclose at least subjective recklessness on the issue of victim consent.

Nor is this a trite illustration of the criminal law in action. The point is rather that proving mens rea typically turns on what defendants can be shown to have done and said in the stream of life, not on imagined happenings in their minds or patterns of neuronal activity in their brains. Notwithstanding the universal distinction between the objective and subjective aspects of criminal liability, we do not have two sets of criteria for determining the presence or absence of the elements of criminal offences, a behavioural one for objective elements going to actus reus and a non-behavioural one for subjective elements going to mens rea. As the foregoing examples illustrate, the only standard

[5] Like intention, the concept of knowledge is not univocal: ibid., at 457–58.
[6] Ibid., at 440–44.
[7] Ibid., at 452–55.
[8] Ibid., at 449.

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available for this purpose is the behavioural one routinely relied on by criminal courts and this applies to actus reus and mens rea alike.[9]

Given the essentially performative character of the psychological predicates associated with criminal responsibility, it is therefore a category error to treat these phenomena as disembodied occult happenings standing behind a defendant's overt actions or to regard the latter as merely evidence from which a defendant's guilt may be inferred.[10] Although criminal lawyers often make the latter mistake,[11] testimony that the defendant aimed a blow at his victim is evidence *of* intention,[12] not evidence from which intention may be inferred, just as evidence he was told goods were stolen is evidence he knowingly received stolen goods[13] or evidence he extinguished the lights in a theatre and placed an iron bar across the exit and shouted "fire" is evidence that he maliciously inflicted grievous bodily harm on fleeing patrons injured in the scramble to escape.[14]

It goes without saying that prosecution evidence is not necessarily conclusive. As every law student learns, evidence is always defeasible.[15] As suggested, the blow in the assault example may have been accidental. There may be countervailing evidence the blow was struck unintentionally in the course of a clumsy attempt by the defendant to put on his own overcoat. Similarly, there might be contradictory evidence that the defendant in the receiving example was not told the goods were stolen and had no grounds for believing that they were. Notice, however, that evidence introduced pursuant to the principle of defeasibility must itself be behavioural, not least because there is no such thing as non-behavioural evidence of the intellectual powers of human beings. In the nature of things, these powers can only be judged by reference to the things people do and say when exercising them, as they do not exist in any other dimension, the protestations to the contrary by neuroscientists and cognitive psychologists notwithstanding.[16]

Nor does it make sense to posit the need for a separate, non-behavioural account of the psychological predicates associated with criminal responsibility as leading neuroscientists have done or to suggest that

[9] Ibid., at 440–44.
[10] See Sections VI and VII.
[11] The error may be a lingering effect of the once pervasive presumption that an agent intends the natural and probable consequences of her actions. For an illuminating discussion of the history and reach of the presumption, see P. Handler, "Criminal Intent in Nineteenth-Century England" [2024] C.L.J. 334. The error itself is discussed in McAuley, "Mens Rea", 442–44.
[12] *Director of Public Prosecutions v Brown* [2018] IESC 67, [2019] I.R. 1.
[13] "A man may be said to know that goods are stolen when he is told by someone with first-hand knowledge [. . .] that such is the case": *R. v Hall (Edward Leonard)* (1985) Cr. App. R. 260, 264 (C.A.) (Boreham J.).
[14] *R. v Martin* (1881) 8 Q.B.D. 54.
[15] Borrowed from the law of property, the term was coined by H.L.A. Hart to refer to "the distinctive ways in which legal utterances can be challenged": H.L.A. Hart, "The Ascription of Responsibility and Rights" (1948) 49 Proceedings of the Aristotelian Society 171, 173, 186–90.
[16] See Sections II, V and McAuley, "Mens Rea", 440.

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neuroscience will eventually be able to provide one. Advocates of this project sometimes justify it on the basis that the vernacular approach to personal responsibility for wrongdoing is essentially a body of naïve knowledge, occasionally dismissively characterised as "folk psychology" to highlight the contrast between it and the more sophisticated assessments of neuroscientists and cognitive psychologists.[17]

But this is another category mistake. The ability to do or refrain from doing things at will, do things on purpose, acquire and use information, understand complexity and take account of risks in the course of one's activities are not things that can be subtracted from behaviour in order to make way for deeper truths about its inner nature. Rather they are the stuff of behaviour. They are part of the behavioural repertoire of human beings such that what is left when they are stripped out no longer consists of behaviour. Denuded of them, what remains is not behaviour at all but mere physical movement, the motion of human bodies and limbs in space as they come in contact with other bodies both human and non-human.[18]

II. Key Issues

This policy of subtraction and emasculation is also a prominent feature of the debate about the potential relevance of neuroscience to the analysis of actus reus. Indeed, it features on both sides of that debate, in contributions supporting the claim that neuroscience holds the key to understanding human volition and in some of the more sceptical assessments of its potential in that regard. Thus, one prominent writer on the affirmative side of this divide recently defined actus reus as follows:

> For legal purposes, an "act" has a fairly clear definition; it is the physical aspect of the crime; a person's bodily movements. These movements might involve a gross motor act such as a kick, a punch, or a tilt of a steering wheel, or there might be a movement of the vocal apparatus or the typing fingers, in the case of offences of language. In any case, an overt change of the person's bodily state must lead to the harm, even when the harm is separated in time or directness from the act.[19]

In similar vein, two of the leading legal commentators on the limitations of the experimental findings of neuroscience when applied to the voluntary component of actus reus have defined the latter, respectively, as "a bodily movement that is appropriately guided by the mental state of volition [. . .] [W]hat must be shown is that the defendant engaged in

[17] See Section X.
[18] See McAuley, "Mens Rea", 461–62.
[19] N.J. Davis, "Efficient Causation and Neuroscientific Explanations of Criminal Action" in B. Donnelly-Lazarov (ed.), *Neurolaw and Responsibility for Action: Concepts, Crimes and Courts* (Cambridge 2018), 125.

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some relevant bodily motion that was guided by volition";[20] and as a "willed bodily movement" or "consciously willed bodily movement",[21] in order to accommodate the possibility that there might be such things as "unconscious willings".

In what follows, it will be contended that treating bodily movement as the substratum of voluntary action has deleterious consequences for understanding actus reus and, consequently, for a proper assessment of the relevance of neuroscience when attempting to do so. First, it suggests actus reus invariably involves physical movements on the defendant's part, whereas, in point of fact, several criminal offences can be committed without the defendant as much as raising an eyebrow. Nor is this objection confined to the obvious fact that criminal liability for omissions is a well-established feature of modern legal systems. In fairness, neuroscientists working in the area generally acknowledge the problem posed by criminal omissions, even if they tend to regard them as the exception that proves the rule by treating them as suppressed or inhibited bodily movements.[22] However, as will be seen in due course, quite apart from criminal omissions, several offences of commission involve no bodily movement whatsoever, nor yet an attempt to suppress or inhibit one.[23]

Second, the argument from bodily movements is incompatible with the logic of actus reus. It will be seen that the latter turns on the inherent properties of action verbs, especially their generic character and inarticulate premises, such that the stuff of actus reus cannot be equated with bodily movements, muscular contractions or neuronal events.[24]

Third, as already suggested, the argument from bodily movement ignores the fact that doing things at will, like doing them intentionally, knowingly or recklessly, is also an expression of intellectual power – in this case, the power of choice – and, consequently, can only be meaningfully assessed in terms of performances that demonstrate the defendant could have helped what he did in the circumstances – for example, by showing he was in control of whatever he was doing, acting for a reason, responding to an insult or settling a score. In other words, by introducing the only kind of evidence that counts as a measure of acting voluntarily in the law: viz., behavioural evidence that shows a defendant could have done otherwise but chose not to. Precisely because it goes to the intellectual

[20] See G. Yaffe, "Libet and the Criminal Law's Voluntary Act Requirement" in W. Sinnott-Armstrong and L. Nadel (eds.), *Conscious Will and Responsibility* (Oxford 2010), 190.
[21] See L. Alexander, "Criminal and Moral Responsibility and the Libet Experiments" in Sinnott-Armstrong and Nadel (eds.), *Conscious Will*, 204.
[22] See e.g. Davis, "Efficient Causation", 125.
[23] See Section III.
[24] See Section IV.

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power of choice, it will be seen that evidence of this kind must go beyond an account of the defendant's bare bodily movements.[25]

Fourth, undue emphasis on bare bodily movements tends to invite the conclusion that understanding the springs of human behaviour is to a significant degree a matter of being able to identify its antecedent causes, whether in the form of occult occurrences in the mind[26] or neuronal events in the brain.[27] As we shall see, the experimental neuroscience of voluntary action tends to proceed on this basis, as do some of the attempts to apply its findings to the question of the voluntary component of actus reus.[28] It will be contended that these attempts are doomed insofar as they treat volition as a mental state or analyse it in causal terms. Essentially, the argument will be that "volitions" are not mental states and do not operate causally in the sense in which neuroscientists and cognitive psychologists believe.

Finally, it will be contended that it is a serious mistake to treat legal doctrine as a body of theoretical knowledge about human behaviour, especially when it comes to psychological predicates, such as volition, that play a leading role in the ascription of criminal liability.[29] The burden of the argument will be that the aforementioned predicates do not function as hypotheses about human behaviour in the manner assumed by neuroscientists and, accordingly, as provisional explanations that can be superseded by better explanations as and when they arise. On the contrary, the arcane idioms in which they are often couched notwithstanding, lawyers treat these phenomena as part of the essential, a priori data of human behaviour and, consequently, as things to be explained rather than explained away. In short, as things that must be accommodated and cannot be decommissioned when discussing actus reus without collapsing into incoherence.

III. Motionless Actus Rei

The error of treating bodily movement as the infrastructure of actus reus can be seen clearly from the range of activities punishable at criminal law that do not involve bodily movements of any kind. These include purely perceptual acts of assistance, such as acting as a lookout, that ground accessorial liability for many serious crimes including burglary, rape and murder. Indeed, since 1976, defendants found guilty of assisting the perpetrator of a serious crime can be convicted of the complete offence.[30] In the result, there is no reason in principle why someone who acted as a

[25] See Section V.
[26] See Section VI.
[27] See Section VII.
[28] See Section VIII.
[29] See Section X.
[30] Accessories and Abettors Act 1861, s. 8, as amended by Criminal Law Act 1977.

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lookout while a confederate committed burglary, rape or murder should not be found guilty of the crime in question, the fact he stood stock-still while it was being committed notwithstanding. As assistance in these circumstances consists of helping in the commission of the offence, the lookout's contribution is surely no less significant in that regard than helping a burglar bag up his ill-gotten gains or a rapist to subdue his victim.

Naturally, this does not mean that evidence of monitoring and listening by a defendant at or near the scene of a crime must be taken as conclusive evidence of assistance or encouragement. As the jurisprudence shows, evidence of presence at the scene goes to actus reus if and only if it can be shown to have assisted or encouraged the perpetrator. The point being made here is that such evidence is not defeasible simply because it consists of purely perceptual acts of scanning the scene and listening for approaching footsteps or police sirens – in short, because it doesn't involve any bodily movements. On the contrary, evidence of looking and listening in these circumstances will be treated like any other bit of behavioural evidence (including behavioural evidence involving bodily movements) and evaluated accordingly: viz., by interpreting the defendant's actions in the context in which they occurred with a view to determining the extent to which, if at all, they can properly be counted as evidence of assistance or encouragement.

Two of the leading cases in point nicely illustrate how this process of behavioural interpretation works in practice. Thus, in *R. v Coney*, Mathew J. said that spectating at an illegal prize fight might be good evidence of abetting battery, as "the presence of spectators watching with keen interest" at such events was the "chief incentive to the wretched combatants to fight on until dreadful injuries have been inflicted and life endangered".[31] In contrast, in *R. v Clarkson (David George)*,[32] the Court of Appeal quashed convictions for aiding and abetting in the case of two soldiers who silently watched another soldier rape a young woman. In the opinion of the Court, it was not enough to prove the accused had watched the rape. Leaving aside the issue of mens rea, it also had to be shown that their presence at the scene emboldened the perpetrator. As the court of trial had not been so directed and no such evidence had been adduced, the convictions could not stand.[33] Notice, however, that there is nothing in the decision to suggest the convictions would not have been upheld had contextual evidence of encouragement been introduced – for example, to the effect the accused had been messaged by the perpetrator just before the assault began or had otherwise received notice of what was planned or underway.

[31] (1882) 8 Q.B.D. 534, 544.
[32] [1971] 3 All E.R. 344 (C.M.A.).
[33] Ibid., at 348 (Edmund Davies J.).

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Nor is liability for purely perceptual acts confined to the sphere of assisting or encouraging crime. It is also a distinguishing mark of several offences including voyeurism and interception in iterations where actus reus is defined in terms of the purely perceptual acts of looking (or observing) and listening, respectively. Thus, "a person commits [voyeurism] if [. . .] for the purpose of obtaining sexual gratification he observes another person doing a private act" knowing the other person does not consent to being so observed.[34] Similarly, unauthorised and non-consensual listening to another's telephone conversations amounts to the criminal offence of interception.[35] Indeed, the latter is especially interesting in this connection as it has deep roots in English law going back as far as the manorial courts where, in Blackstone's telling, unauthorised listening to other people's conversations was punishable as eavesdropping, then an offence of ulterior intent:

> Eaves-droppers or such as listen under walls or windows, or the eaves of a house, to hearken after discourse, and thereupon to frame slanderous and mischievous tales, are a common nuisance and presentable at the court-leet: or are indictable at the sessions, and punishable by fine and finding sureties for good behaviour.[36]

Likewise, liability for perceptual acts is a feature of the offences of harassment and coercion where the act of watching (respectively, another person or their home or workplace) is an expressly acknowledged form of actus reus. Nor has the legislature shied away from candidly and unambiguously describing the perceptual acts involved in offences of this kind as *acts*.[37] Thus, interception has been defined, inter alia, as the unauthorised and non-consensual "act [. . .] of [. . .] listening or attempted listening to [. . .] a telecommunications message", thereby directly contradicting the assumption commonly made by neuroscientists and their criminal law collaborators that "[f]or legal purposes, an 'act' has a fairly clear definition; it is the physical aspect of the crime; a person's bodily movements",[38] "some relevant bodily motion that was guided by volition".[39]

IV. Bodily Movements and the Logic of Actus Reus

It has already been suggested that undue emphasis on bare bodily movements misconstrues the logic of actus reus.[40] Strikingly, actus rei

[34] Sexual Offences Act 2003, s. 67(a).
[35] Regulation of Investigatory Powers Act 2000, s. 1.
[36] W. Blackstone, *Commentaries on the Laws of England: Book IV Of Public Wrongs*, edited by R. Paley (Oxford 2016), 169.
[37] Thus, the offence of interception has been defined as involving, inter alia, "(b) an act [. . .] (i) that consists of [. . .] the listening or attempted listening to [. . .] a telecommunications message": Postal Packages and Telecommunications Messages (Regulation) Act 1993, s. 1 [Irl.].
[38] See Davis, "Efficient Causation", 125.
[39] See Yaffe, "Libet", 190.
[40] See Section II.

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typically make no reference to bodily movements. This is because offence definitions are heterogenous with respect to the range and type of bodily movements that can be subsumed under them. Otherwise, they would be endlessly repetitive and impossibly unwieldy. Accordingly, as a matter of trite law, actus reus typically goes to specifically proscribed circumstantial features and/or results of the defendant's actions rather than the bodily movements involved in them, still less to their constituent muscular contractions.

Thus, iterations of actus reus normally employ action verbs such as unlawful *killing* (murder and manslaughter), *creating* a substantial risk of death or serious injury (endangerment), *forcibly stealing* another's property (robbery), *taking* or *detaining* someone against their will (false imprisonment), persistently *following*, *pestering* or *communicating with* another (coercion and harassment[41]) and so on. Unsurprisingly, action verbs of this sort are multi-, rather than mono-, referential. Just as they do not refer to particular bodily movements or muscular contractions, neither are they tied to itemised actions or modes of commission.[42] Mutatis mutandis, as long as a specified act of shooting, stabbing or strangling causes the victim's death, it counts as a species of the larger genus of unlawful killing, just as punching, kicking, battering, gouging or otherwise interfering with bodily integrity count as instances of the actus reus of assault and its cognates.

Nor is this arrangement simply a matter of grammatical form. It also has important logical and procedural implications. The logical implications are straightforward.[43] The action verbs associated with actus reus take the human being as their subject. Thus, while storms and floods can cause death and destruction, they cannot do so by committing an actus reus.[44] Moreover, where action verbs operate transitively, there must be someone or something on the receiving end of the action specified by the verb. One cannot damage or intimidate without doing so to a thing or a person, respectively. Crucially, action verbs also imply the operation of the intellectual and volitional powers characteristic of human behaviour in a way that descriptions of bodily movements do not.

Thus, when we talk of following someone, we mean not only that someone was doing the following and that someone else was being followed, but that the former knew he was following the latter. In other

[41] See e.g. Non-Fatal Offences Against the Person Act 1997, ss. 9(1)(c) and 10(1) [Irl.] in relation to persistently following someone.

[42] Although this principle is often flouted in practice, as indeed it is in the offences mentioned in the preceding footnote.

[43] Hart was first to champion the importance of "the logical character of the verbs of action" in criminal law theory and doctrine: Hart, "Ascription", 186–90.

[44] Although it should be noted that the deodand (whereby personal chattels that accidentally caused the death of a human being were forfeited to the Crown for pious uses) survived in English law until the nineteenth century: W. Holdsworth, *A History of English Law*, 4th ed., vol. 2 (London 1936), 46–47.

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words, following someone is not the same as walking behind them, nor yet the equivalent of the lower limb movements involved in doing so or brain states that can be correlated with doing so. Likewise, when we claim that a defendant shot someone or demanded money with menaces, we are implying that he took himself to be doing whichever of these things is at issue, whereas a description of the bodily movement involved carries no such implication.[45]

Similarly, action verbs also imply the power of choice. The claim that the defendant forcibly stole something or created a substantial risk of death or serious injury would be incoherent without the assumption that he was acting at will. Hence our inclination to withdraw a claim of this type if it turns out the agent was subject to *force majeure* or otherwise couldn't help what he did. In this sense, action verbs operate as condensed provisional ascriptions of agency. They presuppose that the subject of the verb possesses the inherent intellectual and volitional powers just described and are routinely understood in these terms by lawyers and non-lawyers alike.[46]

The procedural implications of these simple truths are also straightforward. Thus, when proving actus reus, prosecutors do not proceed by introducing descriptions of bodily movements or brain states. As we have seen, viewed independently of the action verbs that denote their proscribed circumstantial features and results, bodily movements per se are never enough for actus reus and, consequently, can never be voluntary in the right way. Nor could descriptions of brain states suffice in this regard; as has been shown, brain states cannot be mapped onto human actions such as "demanding money [with menaces]" or "defacing legal tender".[47] Finally, prosecutors do not appeal to an occult process called "willing" when trying to prove that bodily movements were voluntary.[48]

On the contrary, the prosecutor's stock-in-trade is to introduce behavioural evidence that can be subsumed under the action verb specified by the relevant actus reus and leave matters thus. Accordingly, prosecutors typically rely on what might be called unambiguously exemplary or illustrative action verbs such as shooting, stabbing, strangling, beating, breaking, smashing, burning, intimidating, stealing, lying, cheating and so on, when proving actus reus. Why? Because they take it for granted that action verbs of this sort operate as condensed

[45] Thus, saying the defendant "crooked his finger" in these circumstances will not do as a description of the actus reus of homicide, just as an attempt to separate "the action of his vocal chords [. . .] from the resulting sound issueing from his mouth and its intended meaning to the hearer" will not suffice as a statement of the actus reus of demanding money [with menaces]: *Timbu Kolian v The Queen* [1968] HCA 66, (1968) 119 C.L.R. 47, 69 (Windeyer J.).

[46] See Section V.

[47] For detailed discussion, see McAuley, "Mens Rea", 456–61; and Sections VI, IX, X.

[48] See Section VI.

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provisional ascriptions of agency in the manner described in the preceding paragraphs, and because they know the law recognises this truth in the form of the presumption of voluntariness and the rules governing the manner in which the presumption may be rebutted.[49]

Moreover, both defence counsel and the courts also proceed on this basis.[50] As we shall see in the next section, denial-of-agency claims are routinely adjudicated by reference to the requirements of knowledge and choice presupposed by action verbs. Moreover, it will be noticed that they have, and can have, no purchase where these requirements have been met, evidence of clouded consciousness or other seeming impediments to action notwithstanding. In other words, it will be seen that the conduct element of actus reus goes to the voluntariness or otherwise of the defendant's behaviour in the sense in which that term is being used here, namely, as convenient shorthand for the manifest ability of human beings to do things on purpose, take things into consideration when doing them and act at will. As the case law will show, where these powers are evidently intact, the plea of involuntariness runs out of oxygen; at that point, it has reached its conceptual limits as a denial-of-agency claim and becomes unavailing.

V. Adjudicating Denial-of-Agency Claims

We have already noticed that doing things at will is an expression of the power of choice; the defendant could have done otherwise or he could have done nothing. The power to act voluntarily thus encompasses a wide range of perceptual and intellectual abilities that cannot be reduced to bodily movements and, by virtue of being abilities, can only be verified in performance. Although the list is not comprehensive, these typically include the ability to recognise where one is and what one's doing, to remember key facts about one's actions and those affected by them, to draw on previously acquired information and knowledge in the course of one's activities and to decide on this or that course of action.[51] Although doing any of these things may give rise to bodily movements, we have seen that it is a mistake to assume that they always entail them.

Moreover, as intellectual powers can only be verified in performance, it follows that behavioural evidence is the only valid measure of whether the defendant actually could have done otherwise in the circumstances.[52] Thus,

[49] In Barwick C.J.'s elegant phrase, the presumption operates "*sub silentio*" unless and until rebuttal evidence is introduced: *Ryan v The Queen* [1967] HCA 2, (1967) 121 C.L.R. 205, 213.

[50] "[A] man's act is presumed to be voluntary unless there is evidence [to the contrary, usually by the defence]": *Bratty v Attorney General for Northern Ireland* [1963] A.C. 386, 413 (H.L.) (Lord Denning).

[51] "If we are to succeed in doing such simple things as strike a match, kick a football [. . .] we must have a capacity to control the movement of our limbs in certain ways, *we must be able to recognize certain objects for what they are, and we must have certain knowledge* [. . .] *of the consequences of manipulating them or interfering with them*": H.L.A. Hart, *Punishment and Responsibility: Essays in the Philosophy of Law* (Oxford 1968), 91 (emphasis added).

[52] See notes 8–14 above.

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an abundance of contextual evidence the defendant was in control of his actions at the relevant time will normally trump an earlier denial-of-agency claim, just as compelling witness evidence of lack of control, or a want of evidence of control, will usually be enough to support such a claim.[53] Likewise, evidence the defendant was acting for a reason or out of revenge when he did the contested deed will usually be fatal to a plea of involuntary action.[54] There is and can be no additional requirement to show that his bodily movements, even where these are relevant, were preceded or guided by mental or brain states of "volition" or "willing" or, alternatively, were not so directed. Nor is there any need to take cognizance of immediately antecedent cortical activities or "promptings" in this connection.[55]

Apart from the fact that there are no such things as mental or brain states of the aforementioned kind,[56] the ability to do or refrain from doing something at will is what acting voluntarily means. When demonstrated in performance, it is valid evidence *of* voluntary conduct. Accordingly, it makes no sense to say that a defendant who plainly could have done otherwise on the behavioural evidence before the court must nonetheless be acquitted because of the prosecution's failure to adduce additional evidence of accompanying mental or brain states. Or, indeed, that he should be convicted on foot of such "evidence" where behavioural evidence is lacking. In other words, the ability to do or refrain from doing things at will, like the intellectual powers generally, can only be verified in the crucible of behavioural performance. There is no alternative means of determining its role in human affairs and, by extension, as a fundamental requirement of actus reus.[57]

It will be argued in this section that the criminal law's approach to the issue of voluntary conduct follows the pattern outlined in the immediately preceding paragraphs. It will be seen that the judges routinely treat the ability to do otherwise as the measure of voluntary conduct and rely exclusively on evidence of performance when assessing whether a defendant had that ability in the circumstances. The jurisprudence will also show that behavioural performance is key to judicial assessment of the purely intellectual powers associated with the ability to do otherwise – such as being able to recognise and remember things and use information and knowledge germane to one's chosen course of conduct.

The following examples should suffice to illustrate these points. In *Kilbride v Lake* the defendant was convicted of operating a motor

[53] See Section V.
[54] *The Queen v Rabey* (1980) 32 N.R. 451 (S.C.C.).
[55] See Section IX.
[56] See Sections VI, VII.
[57] See McAuley, "Mens Rea", 454–55.

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vehicle without displaying a current warrant of fitness, notwithstanding that he was able to prove the required warrant had been attached to the vehicle when he parked it. The conviction was quashed on appeal, Woodhouse J. holding that, as the evidence disclosed that "some extraneous cause" was responsible for its removal, the appellant's "resulting omission to [display] the warrant was not within his [. . .] control" and so did not satisfy the voluntary act component of actus reus. In the judge's opinion:

> It is a cardinal principle that [. . .] a person cannot be made criminally responsible for an act or omission unless it was done or omitted in circumstances where there was some other course open to him. If this condition is absent, any act or omission must be involuntary [. . .] [T]he condition that there must be freedom to take one course or another involves free and conscious exercise of will in the case of an act, or the opportunity to choose to behave differently in the case of omissions.[58]

In *R. v Robinson-Pierre (Symieon)*, the appellant was convicted of being the owner of a dog that caused injury while being out of control in a public place. The evidence disclosed the dog attacked and bit two police officers and that the defendant replied there was nothing he could do when they asked him to call the dog off. The Court of Appeal allowed the appeal against conviction on the grounds that, without prejudice to Parliament's power to dispense with the requirement when creating criminal offences, the jury should have been asked to consider whether the defendant could have prevented the attack, bearing in mind that the animal was not under his control at the time of the attack and that he refused to call it off and turned back into his residence as the attack took place. In short, whether he could have done otherwise but spurned the opportunity to do so.[59]

In *R. v Coley (Scott)* the defendant got up at night in his parents' house, dressed in dark clothing and a balaclava, selected a hunting knife from his collection of knives, entered his next-door neighbour's house using a key that had been made available to his parents by the neighbour, made his way to the bedroom and stabbed the neighbour's partner repeatedly with the knife, chiefly to the chest, arm, back and head.[60] The victim was seriously injured and would have died but for the timely intervention of another neighbour and paramedics. The defendant was convicted of attempted murder, notwithstanding his claim that he had blacked out and woken up outside the victim's bedroom door, heard the neighbour scream as he entered the bedroom and blacked out again such that he had no memory of the incident until he emerged from the bushes in a nearby garden after the event had concluded and the alarm had been raised.

[58] [1962] N.Z.L.R. 590, 593 (N.Z.S.C.).
[59] [2013] EWCA Crim 2396, [2014] 1 W.L.R. 2638, at [42]–[43] (Pitchford L.J.).
[60] [2013] EWCA Crim 223, [2013] M.H.L.R. 171, at [4] (Hughes L.J.).

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The appeal spanned a number of issues including the claim that the blackouts meant he was acting involuntarily when he inflicted the near-fatal wounds and so should have been acquitted on grounds of automatism. Three psychiatrists testified that the defendant had no abiding mental illness or disorder but may have been suffering from a brief psychotic interlude when he did the deed that could have been brought on by heavy cannabis use. Although the appeal was decided on the issue of intoxication,[61] the Court of Appeal rejected the denial-of-agency claim on its own merits:

> In the present case the doctors were asked several times whether the defendant was acting "consciously" when he did the deed [. . .] He was plainly not unconscious in the sense of comatose [. . .] On the other hand, his mind may well, if the doctors were right, have been affected by delusions or hallucinations and in that sense his detachment from reality might be described by some as an absence of conscious reality. Such condition, however, clearly falls short of involuntary [. . .] action. In the present case [. . .] the doctors were at some pains to explain that the defendant would, despite their hypothesis of psychotic episode, have been capable of complex, organised behaviour. It is plain that a person acting under a delusion may act in such a way, and clearly this defendant did. He must have made the decision to dress specifically for his intrusion next door, and to arm himself with his knife. He made the decision to find the keys and to let himself in. That was not, as it seems to us, capable of being described as involuntary action.[62]

These remarks merit careful scrutiny, especially insofar as they settle on the ability to engage in "complex, organised behaviour" as the criterion of voluntary conduct – in effect, an extrapolation from long settled case law on the action component of motoring offences.[63] Notice, in particular, that the ability to engage in "complex organised behaviour" falls to be tested in performance, by reference to the defendant's ability to do things that qualify or count as bits or patterns of such behaviour. Hence the Court's reliance on his elaborate preparations – his chosen ensemble, choice of weapon and mode of entry – as a basis for the conclusion that his behaviour "was not, as it seems to us, capable of being described as involuntary action". Notice, too, that the purely intellectual aspects of the defendant's modus operandi – his decision-making powers and his memory – were also evaluated in performance terms. As the Court noted, his success in locating the keys to his neighbour's house shows he knew his parents had a set and that he remembered where they were kept.

[61] "Quite apart from the fact that the evidence was of voluntary, if irrational action, the defence of automatism is not available to a defendant who has induced an acute state of involuntary behaviour by his own fault": ibid., at [24] (Hughes L.J.).
[62] Ibid., at [23] (Hughes L.J.).
[63] See *Watmore v Jenkins* [1962] 2 Q.B. 572; *Broome v Perkins* (1986) 85 Cr. App. R. 321.

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To say the least, the aforementioned powers transcend the defendant's ability to move his body or limbs in this or that direction.[64] Similarly, it makes no sense to insist that his proven ability to rely on his memory and decision-making powers to facilitate his rampage is merely inferential evidence of voluntary conduct that can be trumped by claims he might have been deluded or hallucinating at the relevant time. As the judgment makes clear, his actions constitute a pattern of "complex, organized behaviour". In other words, they count as voluntary conduct in the sense that they are instances of what is meant by that concept. Consequently, they are in no sense dependent on supplementary or alternative assertions or hypotheses about companion mental or cortical states[65] and, in the final analysis, can only be defeated by other behavioural evidence that the defendant could not have done otherwise in the circumstances.[66]

Naturally, this conclusion is not intended to gainsay the criticism, made by Horder and others,[67] that the criminal law should be more responsive to defendants whose "effective control" of their actions may have been compromised by delusions or hallucinations of the kind at issue in *R. v Coley*. The point being made here is that this should not be done by bending the pivotal concept of voluntary conduct – the ability to do otherwise – out of shape. As the Court of Appeal recognised, the possibility the defendant's "mind, if the doctors were right, may have been affected by delusions or hallucinations" goes to the issue of criminal capacity rather than agency. It thus falls to be accommodated, if at all, under that rubric, perhaps by means of a more expansive plea of diminished capacity than is currently on offer in these latitudes.[68]

VI. Volitions as Mental and Brain States

Arguably the most damaging feature of the argument from bare bodily movement is its reduction of the notion of voluntary conduct to a set of causal relations.[69] As we have seen, when used to describe how the criminal law itself is supposed to handle actus reus, the key causal relationship is said to be between mental states called volitions and the

[64] See Hart, *Punishment*, 91.
[65] See G. Ryle, *The Concept of Mind* (London 1963), 63.
[66] See Sections VI and VII for further discussion of this point.
[67] See J. Horder, *Ashworth's Principles of Criminal Law*, 9th ed. (Oxford 2019), 70; J. Horder, "Pleading Involuntary Lack of Capacity" [1993] C.L.J. 298; B. McSherry, "Criminal Responsibility, 'Fleeting' States of Mental Impairment, and the Power of Self-Control" (2004) 27 International Journal of Law and Psychiatry 445.
[68] See F. McAuley and J.P. McCutcheon, *Criminal Liability*, 2nd ed. (Dublin 2022), 295–99.
[69] "To be criminally responsible, a defendant must be found to possess certain mental states at the time a crime was committed, and these mental states must be causally related to criminal harm for which the defendant has been arrested": K. Siffert, "Non-Eliminative Reductionism" in Donnelly-Lazarov (ed.), *Neurolaw*, 71–72.

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muscular contractions involved in bodily movements.[70] As will be seen in due course, when discussing the relevance of experimental neuroscience to actus reus, the critical relationship is said to involve the causal role of antecedent brain activity in the production of bodily movement.[71] In other words, in both cases bodily movement is said to be powered or driven by a prior efficient cause, albeit that in the latter case the implication is that the causal relationship between brain activity and bodily movement casts doubt on the very idea of voluntary conduct.

The principal difficulty with this line of reasoning is that there is no such thing as a mental state of volition.[72] One cannot be in a state of volition, as volition is not a state. Unlike genuine mental states, such as anger and anxiety, it is not a condition one can be in. And one cannot be in it because, unlike genuine mental states, it lacks the qualities of temporal duration and variable intensity. Thus, while it makes perfect sense to say someone was in an angry state or a state of anxiety, it is literally nonsensical to ask whether he was in a voluntary state, much less whether he was in a very or only mildly voluntary state. As the case law discussed in the preceding section illustrates, acting voluntarily is an expression of the power of choice and it make no sense to describe someone as being in a state of choice, much less in a state of power.

On the contrary, as the reasoning in those cases makes clear, where voluntariness is at issue, the appropriate question is whether the defendant had the power of choice in the circumstances: in short, whether he could have done otherwise. Hence Woodhouse J.'s insistence in *Kilbride v Lake* that there "must be some other course open to him" to warrant the conclusion the defendant was acting voluntarily. Hence, too, the Court of Appeal's conclusion in *R. v Robinson-Pierre* that the jury should have been asked whether the defendant "could have prevented the attack" on the police officers; and in *R. v Coley* that the issue of voluntariness turned on whether the evidence showed the defendant was capable of "complex, organised behaviour" when he perpetrated the near-fatal attack on his neighbour.

Notice, moreover, the distorting effect of asking whether any of the aforementioned defendants were in a voluntary state at the relevant time – for example, whether Robinson-Pierre was in a state of willing or volition when he declined to call off the dog or whether Coley was in a voluntary state when he stabbed his neighbour. To see this clearly, consider the common or garden example of losing one's footing in a public place and bumping into a fellow pedestrian as one falls over.

[70] See Section II.

[71] "The physiology says that our brains make our movements": M. Hallett, "Volition: How Physiology Speaks to the Issue of Responsibility" in Sinnott-Armstrong and Nadel (eds.), *Conscious Will*, 66. See also Section VIII.

[72] The argument on this point is based on Ryle's account of volition in Ryle, *Concept*, 63.

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In these circumstances, politeness and civility normally lead to an apology by the faller even if the stumble was plainly involuntary. He might say something like "I'm so sorry, I must have slipped on something" or "My apologies, I lost my balance when I heard the loud bang", the clear implication being he couldn't help what happened.

What the faller can be guaranteed not to say is "I'm so sorry, but I was not in a state of voluntariness or volition when I bumped into you", nor yet "So sorry, but I didn't have an accompanying volition prior to bumping into you". Why? Because, apart from attracting puzzled looks, a response along these lines is nonsensical when determining whether an agent could or could not have helped what he did. And it is nonsensical because to act voluntarily is not to do two things, namely, willing followed by acting.[73] Rather it is to do one thing, namely, something the agent could have refrained from doing, such as the defendant in *R. v Coley* attacking his neighbour with a knife, just as involuntary action is doing something the agent could not have helped, such as falling over in the immediately preceding example.

As we have seen, although this insight is embedded in ordinary language and legal doctrine alike, it is missing in much of the discourse surrounding neuroscience and actus reus because of the a priori assumption that voluntary action consists of bodily movements powered by prior mental states of volition or willing. In other words, because of adherence by many in the law and neuroscience community to the fallacy that acting voluntarily *is* doing two things rather than one: namely, engaging in an act of willing, followed by moving one's body in accordance with the terms of a prior volition. To put it mildly, criminal lawyers can be forgiven for savouring the irony of being told, by scientists and philosophers, that a time-honoured criterion of voluntary conduct that relies exclusively on behavioural evidence that can be verified in open court would benefit from being replaced by one that presupposes entirely unwitnessable causes as one of its operating conditions.

The foregoing reasoning also applies, *mutatis mutandis,* to the celebrated claim by Benjamin Libet, and endorsed by his followers, that volition is, at least in part, some kind of brain state, a "readiness potential" ("RP"), as it is generally styled in the neuroscience literature.[74] A fortiori, it applies to the claim that, progress in neuroscience permitting, it may be possible at some point in the future to identify brain states that completely trump behavioural evidence of voluntary conduct.[75] As we have seen, acting voluntarily consists of the ability to choose between alternative courses of action and brains do not have abilities and cannot make choices. The relatively

[73] Ibid., at 62: "It is clear why I reject this story. It is an inevitable extension of the myth of the ghost in the machine."
[74] See Section VIII.
[75] See Section X.

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limited volitional capacities of animals apart, these are the exclusive province of human beings. Thus, while it may or may not be possible to identify the specific brain states or patterns of electrical activity in the brain that precede the exercise of the power of choice, as Libet claimed to have done, it is a category error to treat these phenomena as identical or to reduce the latter to the former.[76] Certainly, we cannot make choices without our brains, but we make the choices, not our brains.

It is, therefore, nonsensical to say that a defendant who could have done otherwise was nonetheless acting involuntarily because of the condition of his brain. Naturally, this conclusion is without prejudice to cases where there is medical evidence the defendant was suffering from some kind of brain abnormality or injury that compromised his intellectual powers.[77] Depending on its strength, expert evidence of this kind may lead to acquittal on the grounds of automatism. Notice, however, that, even in such cases, medical evidence going to automatism must be corroborated by the ordinary behavioural evidence before the court. Hence the Supreme Court of Canada's emphasis on the importance of "bystander evidence" and "testimony on the issue of motive" in this connection,[78] coincidentally echoing one of the central themes of this article, namely, that behavioural evidence of performance in the ebb and flow of life is the only valid measure of whether or not a defendant was able to exercise her intellectual powers, including the ability to perform an act at will.

Contrary to the repeated claims of neuroscientists and cognitive psychologists, brains do not operate in that realm and so cannot provide such evidence.[79] As the case law eloquently attests, it is illogical to suggest that the defendant's choice of weapon in *R. v Coley* was somehow made or even prompted by his brain, just as it exceeds the bounds of sense to insist his brain decided on his choice of costume and headgear as he embarked on his spree of nocturnal violence. As the Court of Appeal explicitly acknowledged in that case, there is an unbridgeable logical gap between the finding that someone was capable of manifestly "complex, organised behaviour" and the conclusion that he was nonetheless engaged in "involuntary action".

VII. Volitions as Efficient Causes

Comparable considerations apply to the discussion of causation in this context. For if volitions cannot be mental states, it follows they cannot be mental states that cause bodily movements. As Ryle pointed out in his

[76] See Section IX.
[77] For discussion, see McAuley, "Mens Rea", 440.
[78] *R. v Stone* [1999] 2 S.C.R. 290 (S.C.C.), at [192] (Bastarache J.).
[79] See Section IX.

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seminal account of the matter, there is no empirical evidence for the existence of acts of volition or willing as efficient causes of bodily movement.[80] As we have seen, agents themselves do not speak in these terms when describing their own voluntary acts. Strikers do not say "I'm delighted I caused myself to score the winner" when being interviewed on Match of the Day, still less "I'm delighted I caused myself to score the winner by willing myself to do so". Nor do third parties resort to this idiom when describing the voluntary acts of others. As criminal lawyers will confirm, prosecutors do not say "we will establish that the defendant caused himself to shoot the victim at point blank range by introducing evidence that he willed himself to pull the trigger", just as defence counsel will not be heard to say "we will prove that the defendant did not cause himself to shoot the victim by showing that no volition preceded the pulling of the trigger".

Indeed, if they did speak in these terms there would be much head-scratching on the bench and in the jury room, not to mention the public gallery. Why? Because agents and observers alike know intuitively that, when we move our bodies, we do not cause them to move.[81] We simply move them.[82] Thus, when the defendant in *R. v Coley* put on his balaclava and fetched his hunting knife, he did not cause himself to make those bodily movements, he simply made them. Admittedly, we move our bodies by exercising the power of movement we know we possess. However, powers, like reasons, are not causes.[83] As we have seen, we can choose not to exercise them and can tell whether others were in a position to do so by examining their performances in the ebb and flow of everyday life. Similarly, although we may have a strong reason for doing something – such as mowing the lawn or putting the bins out – we can still choose not to do it. In other words, as doing things at will or by choice, like doing them intentionally, knowingly or recklessly, is part of the stuff of human behaviour, it cannot at the same time be a cause of it, at least not in the sense of efficient causation.

On the contrary, as Wittgenstein insisted, if acts of volition and reasons for acting were efficient causes of bodily movements, it would follow that they could produce such movements of their own accord.[84] Thus, a defendant who decided to assassinate his sworn enemy and made

[80] Ryle, *Concept*, 63.

[81] "Such a division is quite at variance with the ordinary man's experience of the way in which his own actions appear to him": Hart, *Punishment*, 101.

[82] For discussion, see P.M.S. Hacker, *Human Nature: The Categorical Framework* (Oxford 2010), 154–56.

[83] Ibid., at 179; E. Marcus, *Rational Causation* (Cambridge, MA 2012), 93.

[84] "Examine the following description of a voluntary action: 'I form the decision to pull the bell at 5 o'clock, and when it strikes 5, my arm makes this movement.' – Is that the correct description, and not this one [. . .] 'and when it strikes 5, I raise my arm?' – One would like to supplement the first description: 'and see! my arm goes up when it strikes 5.' And this 'and see!' is precisely what doesn't happen here. I do not say 'See, my arm is going up when I raise it'": L. Wittgenstein, *Philosophical Investigations*, trans. by G. E. M. Anscombe (Oxford 1958), § 627.

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elaborate plans to shoot him as he exited his hall door at 7.00 AM on a fixed date and lay in wait for him at the appointed time and place would, on this account, see his finger compressing the trigger as his quarry hove into view. But this is obviously mistaken, as, discounting an accident, his finger will move if and only if he moves it at the relevant time. In other words, notwithstanding his earlier resolve to do so or, indeed, the presence of a strong reason for doing so, and allowing for the possibility the gun might jam or he turns out to be a poor shot, the defendant still has to pull the trigger in order to achieve his aim and objective.

Notice, however, that accidentally pulling the trigger in these or similar circumstances is not necessarily involuntary in the eyes of the law. Nor are the criminal courts inclined to accept a plea of involuntariness in cases of this kind. On the contrary, the better view is the plea will be rejected in such cases if the defendant's actions, taken as a whole, have the colour of doing something he could have avoided doing. Thus, in the leading case *Ryan v The Queen*,[85] the High Court of Australia rejected the claim that a sudden movement by the victim might have spooked the appellant who, in the course of a robbery, had pointed a loaded shotgun at his neck and head such that the fatal shot might have been fired accidentally. In the opinion of the Court, it was enough that the defendant had deliberately curated the circumstances in which the fatal shot was fired, arguments about the precise philosophical status of the act of firing the weapon notwithstanding.

In other words, the decision on the issue of voluntariness in *Ryan v The Queen* was predicated on a contextual analysis of what the defendant did and said in the theatre of action in which he found himself, not on the bodily movement immediately involved in the shooting, still less on whether the movement of his trigger finger had been actuated by a prior act of volition. In short, the court treated volition as an inherent intellectual power rather than an efficient cause of the bodily movement involved in it. The defendant could have helped what he did, such that the fact that squeezing the trigger might have been accidental and, therefore, involuntary, was irrelevant. As we have seen, this approach speaks to the classic methodology of the law when dealing with denial-of-agency claims, whereas the argument from prior acts of volition relies on relations between occult mental states and bodily movement for which, in the nature of things, there is no empirical evidence, no criterion of assessment and no possibility of generating either.

VIII. Libet Experiments

Another way of stating this conclusion is that focusing on bodily movements when looking for the springs of voluntary conduct puts the searchlight in

[85] [1967] HCA 2.

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precisely the wrong place. For it deflects attention away from the only consideration that matters, namely, whether the defendant could have done otherwise in the circumstances. As we have seen, that question can only be answered by reference to the behavioural evidence before the court and thus cannot be answered by focusing on bare bodily movement, as the latter has been stripped of the very attributes – especially the inherent power of choice – that constitute behavioural evidence. Hence the unverifiable hypothesis that human actions are bodily movements caused by prior acts of volition. Hence, too, the hope that experimental neuroscience will eventually solve the riddle of voluntary conduct by uncovering its roots in patterns of electrical activity in the brain.[86]

Alas, research along these lines is unlikely to fare any better than the "prior acts of volition" hypothesis. It makes no sense to talk about brains being able to do otherwise, still less to suggest that patterns of electrical activity in the brain might be shown to undermine an agent's manifest ability to do so. The manifest ability to do otherwise is what is meant by voluntary conduct, such that evidence of electrical activity in the brain is neither here nor there once it has been established on the behavioural evidence that the defendant actually could have done otherwise. So, like the emphasis on causal acts of volition, the tendency to identify voluntary conduct, either wholly or in part, with electrical activity in the brain is another case of barking up the wrong tree. By looking for the answer in the wrong place (the brain), neuroscience is likely to produce the wrong answer (patterns of electrical activity) while missing the right one (the ability to do otherwise as manifested in behavioural performance).

In order to see this clearly, let us look at some of the findings of experimental neuroscience in this area. Let us begin with the seminal experiments conducted by Benjamin Libet and colleagues in the 1980s. For purposes of exposition, we shall rely primarily on Libet's account of his research results as presented in an oft-cited collection of essays in his honour, *Conscious Will and Responsibility*.[87] In addition to Libet's elegant summary of his own experimental findings, that work includes contributions from a wide range of supporters and critics, in a variety of affected disciplines including criminal law, of his principal contention that voluntary conduct is an endogenous process that originates in the brain. The collection thus provides a valuable window on the climate of opinion in which his ideas were forged and received.

As is well known, Libet's experiments were designed to test the proposition, first canvassed by Kornhuber and Deecke in 1965,[88] that

[86] See e.g. Davis, "Efficient Causation", 139.
[87] B. Libet, "Do We Have Free Will" in Sinnott-Armstrong and Nadel (eds.), *Conscious Will*.
[88] H. Kornhuber and L. Deecke, "Hirnpotentialanderungen bei Willkurnbegungen und passive Bewegungen des Menschen: Bereitschaftspotential und reafferente Potentiale" (1964) 281 Pflugers Archive 52.

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identifiable patterns of electrical activity in the brain – the so-called RP – invariably precede actual bodily movements. Accordingly, participants in the experiments were asked to press a key "at any time they felt the urge or wish to do so" and to note the time on a specially purposed laboratory clock at that precise moment. These results were then compared with electroencephalogram ("EEG") data that measured neuronal activity in the cortex, the outermost portion of the brain known to be associated with higher cognition, in the run up to the key-pressing.

Libet found that RPs in these circumstances "began with onsets averaging 550 ms before activation of the involved muscle" and concluded that "the brain was evidently beginning the volitional process well before the activation of the muscle that produced the movement". Strikingly, he also found that the RP preceded the moment at which participants "became aware of the wish or urge to act", albeit by only approximately 200 ms; and that "this relationship was true for every group of 40 trials and in every one of the nine subjects studied". Accordingly, he concluded that the brain process or RP that leads to voluntary action begins "about 400 ms before the appearance of the conscious will to act".[89] However, the fact that "conscious will (W) does appear about 150 ms before the muscle is activated" had an important bearing on this conclusion. According to Libet, it showed "[c]onscious-will could thus affect the outcome of the volitional process even though the latter was initiated by unconscious cerebral processes". For "[c]onscious-will might block or veto the process, so that no act occurs".[90]

Libet's picture of voluntary action was quickly adopted as the template for the experimental investigation of the neuroscience of the will. As the breadth of contributions to *Conscious Will and Responsibility* (19 in all, penned by a total of 29 authors, many of them still active in the literature) illustrates, it was quickly accepted by experimental neuroscientists as the gold standard in the area. Indeed, the contemporary literature suggests it is still seen in these terms, albeit that neuroscientists and cognitive psychologists now accept that key aspects of Libet's methodology were seriously flawed.[91] No less striking is the fact that Libet's preconceptions about human behaviour – that it is essentially a matter of bodily movements powered by volitions – continue to be taken for granted by many of his followers and critics, even including, as we have seen, prominent legal commentators unconvinced

[89] The above quotations are all from Libet, "Free Will", 2.

[90] Ibid., at 5. See also B. Libet et al., "Time of Conscious Intention to Act in Relation to Onset of Cerebral Activity (Readiness Potential): The Unconscious Initiation of a Freely Voluntary Act" (1983) 106 Brain 623; B. Libet, "Unconscious Initiative and the Role of Conscious Will in Voluntary Action" (1985) 8 Behavioral and Brain Sciences 529.

[91] See e.g. W.P. Banks and E.A. Isham, "Do We Really Know What We Are Doing? Implications of Reported Time of Decision for Theories of Volition" in Sinnott-Armstrong and Nadel (eds.), *Conscious Will*.

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the "readiness potential" hypothesis poses a significant threat to the concept of criminal responsibility.[92]

Thus, *Conscious Will and Responsibility* makes no mention of the comprehensive critique of Libet's findings published by Bennett and Hacker in 2003, in which they showed that volition was neither a "wish" nor an "urge", does not presuppose "conscious will" and thus could not possibly operate as imagined by Libet and his followers.[93] Still deaf to these concerns, a prominent figure in the emerging sub-discipline of neurolaw has recently declared that "[v]ariants of Libet's original experiment have confirmed the basic premise, that brain activity changes before the basic 'decision' to act, and sophisticated neuroimaging can detect activity up to ten seconds before a free choice that accurately predicts that choice".[94]

In similar vein, a recent contributor to the Journal of Neuroscience has said that the experimental findings by Libet and successors "have had an unrivalled influence upon the prevailing view that both our conscious will and subsequent actions are caused by prior neural activity".[95]

IX. Libet in the Dock

Bennett and Hacker's[96] well-known criticisms of Libet's experiments have been amplified by Pardo and Patterson[97] and will not be rehearsed here. Nor will Mitchell's recent claim that "the readiness potential is not in fact a signal of the intention to move that occurs long before subjective awareness but rather is an artefact of the way the data are analysed".[98] I shall argue instead that Libet's picture of human volition makes no sense from a legal point of view and that his claim that voluntary action is an endogenous process that originates in the brain, but can be facilitated or inhibited by the "conscious will", should be rejected on those grounds alone. We have already seen that the claim that the will is a mental state or volitional act that causes bodily movement has no purchase in the criminal law. Apart from the fact that it is a demonstrable piece of fiction, there is nothing in the body of doctrine governing the ascription

[92] See Section II.

[93] See M.R. Bennett and P.M.S. Hacker, *Philosophical Foundations of Neuroscience* (Malden, MA 2003), 228–31, repeated in M.R. Bennett and P.M.S. Hacker, *Philosophical Foundations*, 2nd ed. (Chichester 2022), 244–51.

[94] Davis, "Efficient Causation", 131, citing C.S. Soon et al., "Unconscious Determinants of Free Decisions in the Human Brain" (2008) 11 Nature Neuroscience 543.

[95] K. Fifel, "Readiness Potential and Neuronal Determinism: New Insights of Libet Experiment" (2018) 38 The Journal of Neuroscience 784, 786.

[96] Bennett and Hacker, *Philosophical Foundations*, 2nd ed., 244–51.

[97] M. Pardo and D. Patterson, "Philosophical Foundations of Law and Neuroscience" (2010) University of Illinois Law Review 1212, 1231–35; M. Pardo and D. Patterson, *Minds, Brains, and Law: The Conceptual Foundations of Law and Neuroscience* (Oxford 2013), chs. 1, 2.

[98] K.J. Mitchell, *Free Agents: How Evolution Gave Us Free Will* (Princeton, NJ 2023), 185, citing A. Schurger et al., "What Is the Readiness Potential?" (2021) 25 Trends in Cognitive Science 558.

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of actus reus to suggest we need to take it seriously and much to suggest it would be a grave mistake to do so.[99]

Libet and his followers' reliance on the physical act of pressing a button as the paradigm case of an endogenous process originating in the brain is also seriously misguided. For an agent might press a button for any one of countless different reasons. For example, he might be sending an email, buying a bottle of water from a vending machine, launching a missile from a submarine, turning on the dishwasher, ordering child pornography on the Internet, booking a flight on an iPhone or sending a text message demanding money with menaces. Thus, even if we accept, *arguendo*, that the bodily movement of pressing a button might have been initiated by antecedent electrical activity in the brain, the matching RP allegedly involved in this process cannot possibly tell us anything about what the agent was actually doing.[100] As the foregoing examples illustrate, that matter can only be determined by reference to the attributes of human behaviour that transcend bare bodily movement: viz., the agent's plans and intentions and the intellectual powers that enable him to pursue them in the real world of human interaction.[101]

Consequently, given the law defines one of those powers – that of voluntary action – as the ability to do otherwise and, bearing in mind the latter is verifiable only in the realm of behavioural performance, the claim that it somehow originates in the brain is logically and legally unsustainable. The appellant in *Ryan v The Queen*[102] pointed the shotgun at his victim to facilitate the robbery of a jewellery store where the latter happened to be working on the fateful day. In the final scene in Shakespeare's *Othello*, the eponymous hero murders Desdemona by suffocating her with a pillow because he has long since fallen for Iago's treacherous slander that she's been unfaithful to him with Cassio.[103] The defendant in *R. v Coley*[104] donned his macabre disguise and stealthily entered his neighbour's house better to accomplish his plan to slaughter at least one of the occupants.

Even if we insist that these dastardly deeds have their origins in the psychological makeup or moral character of their perpetrators and that these

[99] See Sections IV–VII.

[100] For an interesting discussion of this point, see A.L. Roskies, "Why Libet's Studies Don't Pose a Threat to Free Will" in Sinnott-Armstrong and Nadel (eds.), *Conscious Will*. See also U. Maoz et al., "Neural Precursors of Decisions That Matter: An ERP Study of Deliberate and Arbitrary Choice" (2019) 8 Elife, e39787, who claim to have found no evidence of any "readiness potential" where the agent saw his or her bodily movement as morally consequential.

[101] See McAuley, "Mens Rea". See also D. Patterson, "Neuroscience and the Explanation of Human Action" in Donnelly-Lazarov (ed.) *Neurolaw*, 21 ("Mental life – e.g., believing, intending, deciding – is lived in the space of reasons and not in the space of causation".); S. Brinkman, "Mental Life in the Space of Reasons" (2006) Journal for the Theory of Social Behaviour 1, 2–3; B. Donnelly-Lazarov, "Intention in Criminal Law: The Challenge from Non-Observational Knowledge" (2017) 30 Ratio Juris 451. See also M. Thompson, *Life and Action* (Cambridge, MA 2008), 112, arguing that "a 'space of reasons' [. . .] is inscribed *within* every intentional action proper" (emphasis in original).

[102] See Section VII.

[103] See W. Shakespeare, *Othello* (Cambridge 2005), 5.2.85–130.

[104] See Section V.

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in turn might be influenced by some combination of genetic and neural inheritance, there is plainly no warrant for supposing they were initiated by their brains. For they all speak to choices, decisions, motives, calculations and reasons that go to the intellectual capacities of human beings in the hurly burly of life and that can only be verified in that dimension. A fortiori, that conclusion applies to cases such as *Ryan v The Queen*, where the efficient cause of death may not have been a voluntary act of any kind, endogenous or otherwise.[105] So, it makes no sense to talk about brains in teleological terms: viz., as strategising about armed robbery, smarting from the sting of marital betrayal, contemplating the mechanics of suffocation or pondering the most effective disguise when planning a murderous assault.[106] Naturally, this does not preclude the important role in human behaviour of relatively fixed factors that, to one degree or another, an agent may be unable to control. We know, for example, that Othello's susceptibility to Iago's intrigue was rooted in his own credulous nature and that Iago was able to exploit this weakness to the full.[107]

Notice, however, that this does not affect the conclusion that Othello's homicidal act was voluntary and would be so treated by the criminal law. As it was perpetrated in explicit defiance of Desdemona's desperate pleas of innocence,[108] it was, to coin a phrase, a clear instance of "complex, organised behaviour",[109] his palpable blindness to Iago's machinations notwithstanding. By parity of reasoning, there can be no doubt that any claim that Othello's twisted calculations and modus operandi were somehow dictated by a matching pattern of antecedent electrical activity in his brain would not survive contact with the modern criminal law doctrine that a defendant who manifestly could have done otherwise on the behavioural evidence before the court is, *ipso facto*, acting voluntarily.

Nor can it be squared with what has been described as the stuff of actus reus.[110] As we have seen, the latter turns on the logical properties of action verbs and so cannot be reduced to bodily movements or brain states. In the result, Libet's concept of "readiness potential" misses the target even in respect of offences where bodily movement is involved. Moreover,

[105] See Section VII.

[106] Yet this is the default position of many neuroscientists. "There should be no doubt that our data finally demonstrate that brain activity can predict a decision long before it enters awareness": J.-D. Haynes, "Beyond Libet: Long-Term Prediction of Free Choices from Neuroimaging Signals" in Sinnott-Armstrong and Nadel (eds.), *Conscious Will*, 87, passim.

[107] Iago: "The Moor is of a free and open nature/That thinks men honest that but seem to be so;/And will as tenderly be led by th' nose/As asses are": Shakespeare, *Othello*, 1.3.395.

[108] Desdemona: "And have you mercy too! I never did/Offend you in my life; never lov'd Cassio/But with such general warranty of heaven/As I might love. I never gave him token": ibid., at 5.2.60; "O, banish me, my lord, but kill me not": ibid., at 5.2.80.

[109] Othello (redoubling his efforts as Desdemona cries out during the act of suffocation): "What voice is this? Not dead? not yet quite dead/I that am cruel am yet merciful;/I would not have thee linger in thy pain/So, so.": ibid., at 5.2.90.

[110] See Section IV.

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because it is tethered to bodily movements, it can tell us nothing at all about offences whose actus rei involve no bodily movements whatsoever.[111]

X. Status of Psychological Predicates

It remains to consider why we should prioritise the legal criterion of voluntary conduct being defended here. The answer to this question opens up the final theme of this article, namely, that it is a mistake to regard the psychological predicates associated with criminal liability as untutored, folk hypotheses about human behaviour that may one day be replaced by the more sophisticated findings of experimental neuroscience.[112] As we have seen, when an appellate court decides that a defendant was acting voluntarily, intentionally or knowingly, its decision does not consist of an approximate or speculative assessment of the facts in dispute. On the contrary, the decision expresses the conclusion (1) that the defendant did or said something that counts as acting voluntarily, intentionally or knowingly and (2) that this was established beyond reasonable doubt on the behavioural evidence put to the trier of fact.

Thus, there is nothing hypothetical about the Court of Appeal's conclusion in *R. v Coley* that the defendant knew his parents had a set of keys to his neighbour's house. Why? Because that finding was based on the only criteria we have for saying that someone knows something, namely, performances that demonstrate knowledge.[113] It will be recalled there was clear evidence the defendant used the keys to gain unforced entry to the neighbour's house. Similarly, there is nothing remotely hypothetical about that court's conclusion in the same case that it exceeds the bounds of sense to claim that someone who was manifestly capable of "complex, organised behaviour" was nonetheless acting involuntarily. Once again, its decision turned on the only criterion we have for resolving this question, namely, the availability of conclusive behavioural evidence that counts as acting voluntarily.

Unfortunately, many neuroscientists miss this feature of the ascription of criminal liability because of their failure to see that criteria are not hypotheses just as hypotheses are not criteria. We simply do not need any more evidence that Othello was acting voluntarily when he killed Desdemona than the abundant behavioural evidence we already have, including the testimony of our eyes and ears, his open declaration of

[111] See Section III.

[112] Thus, P.S. Churchland, the high priest of this position, has declared that "once folk psychology is held at arm's length and evaluated for theoretical strength in the way that any theory is evaluated, the more folkishly inept, soft and narrow it appears to be": P.S. Churchland, *Neurophilosophy: Towards a Unified Science of the Mind/Brain* (Cambridge, MA 1986), 395. See also S.J. Morse, "Determinism and the Death of Folk Psychology: Two Challenges to Responsibility from Neuroscience" (2008) 9 Minnesota Journal of Law, Science & Technology 1; Haynes, "Beyond Libet", 92. For an elegant critique of the argument from replacement, see Patterson, "Neuroscience", 12–18.

[113] For discussion, see McAuley, "Mens Rea", 449–50.

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intention to kill her before the event[114] and his admission of guilt afterwards.[115] This information counts as overwhelming constitutive evidence of voluntary conduct and thus cannot be a falsifiable hypothesis about its role in human behaviour at one and the same time. In addition, as reasons are neither "urges" nor "unihibited volitions", Othello's reason for killing Desdemona – his mistaken belief she had betrayed their marriage vows with Cassio[116] – cannot be the product of a matching brain state in the way Libet and his followers imagine. There is, therefore, no basis for the claim that a true picture of Othello's actions must await a computer readout of the pattern of antecedent electrical activity in his brain, much less that such evidence might qualify or even trump the available behavioural evidence.[117]

Certainly, the latter claim can be formulated as a hypothesis about human behaviour. As we have seen, that is what Libet and his followers have been doing for the past 40 years: conducting experiments designed to show that human behaviour is an endogenous process that has its origins in the brain. The point being made here is that these experiments cannot possibly succeed because they are based on a category mistake about human behaviour. They treat it as bodily movement activated by electrical activity in the brain that can be inhibited by acts of volition, thus removing from consideration its distinguishing marks, the very things that make human behaviour what it is, namely, the manifest ability of human beings to move their bodies at will and to act intentionally, knowingly and recklessly.

As the jurisprudence of the criminal law demonstrates, these intellectual powers cannot be reduced to bodily movements or to combinations of bodily movements and efficient mental or neuronal causes and are neither polite fictions nor crude suppositions that can be put to one side in order to gain a clearer view of human behaviour. Rather, they are part of what is meant by human behaviour and, consequently, must be treated as a priori data in any credible hypothesis about it. Although not themselves completely immune to the allure of causal hypotheses when explaining human behaviour, historians, economists, criminologists and social scientists generally have long since acknowledged this truth. Even geneticists seem prepared to accept it.[118]

It is high time neuroscientists caught up.

[114] Othello: "By heaven, I saw my handkerchief in's hand/O perjur'd woman! Thou dost stone my heart,/And mak'st me call what 'I intend to do/A murder, which I thought a sacrifice./I saw the handkerchief": Shakespeare, *Othello*, 5.2.65.

[115] Othello (referring to Desdemona's dying attempt to conceal his crime): "She's like a liar gone to burning hell:/'Twas I that killed her": ibid., at 5.2.135.

[116] Othello (looking at Desdemona's near lifeless body): "'Tis pitiful, but yet Iago knows/That she with Cassio hath the act of shame/A thousand times committed": ibid., at 5.2.215.

[117] Referring to "the general trend in neuroscience of volition" in 2011, Patrick Haggard stated: "although we may experience that our conscious decisions and thoughts cause our actions, these experiences are in fact based on readouts of brain activity in networks of brain areas that control voluntary action": P. Haggard, "Decision Time for Free Will" (2011) 69 Neuron 404.

[118] See Mitchell, *Free Agents*.

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