

# Neurocalvinism

## *Calvinism as a Paradigm for Neuroscience*

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### ABSTRACT

In order to assert that the determinism of neuroscience is comparable with that of Calvinism, Dick Swaab, a leading neuroscientist, speaks of 'neurocalvinism.' To test this assertion, the author uses the classic view of Calvinism, propounded by Jonathan Edwards, as a conceptual framework. This allows the author to conclude that Edwards has a holistic understanding of human personality, that he defends compatibilism and upholds responsibility and morality. However, Swaab presents himself as an incompatibilist who has a tendency to deny responsibility and morality. Thus, in the case of Edwards, it is not possible to speak about neurocalvinism.

### KEY WORDS

neuroscience, determinism, necessity, compatibilism, free will, morality, responsibility

### 1. INTRODUCTION

Neuroscience is very popular among all kinds of people, particularly because this branch of science promises to help us to develop an understanding of ourselves. One of the most important and perplexing issues concerning

our human identity is the question of the freedom of will.<sup>1</sup> It appears that our modern understanding of a human being – characterized by having autonomous free will – is being undermined by neuroscience.<sup>2</sup> It is understandable that people are both shocked and, at the same time, hugely interested in the consequences of these discoveries, because these discoveries examine what our identities as human beings are. Among the many questions raised by contemporary research are: can a system of neurons provide for features like freedom to reason and to decide? If our decisions are simply the product of a neuronal state, how can we be held morally responsible for them?

One of the leading neurobiologists in The Netherlands is Dick Swaab who wrote a very popular book about neuroscience which attracted the interest of thousands of people.<sup>3</sup> In this book, he speaks about neuroscience as ‘neurocalvinism,’ referring to the doctrine of predestination found in Calvinism.<sup>4</sup> In making this reference, he suggests that his approach to neuroscience, and the many consequences that it has for the understanding of human responsibility, will, personality and morality are comparable with, or are at least related to, the Calvinistic view of human beings, especially in its indication of a deterministic worldview.<sup>5</sup> The suggested relationship between Calvinism and neuroscience demands that a deeper examination of the relationship between the Calvinistic and neuroscientific understandings of human beings is conducted.

After some methodological clarification, this paper describes in broad outline Jonathan Edward’s Calvinistic thoughts about free will and determinism in relation to responsibility and morality. Consequently, an investigation is made as to how Swaab’s neuroscience relates to this Calvinistic paradigm. This leads to a conclusion about the ‘Calvinistic’ character of neuroscience

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<sup>1</sup> Some current Dutch popular books: V.A.F. Lamme, *De vrije wil bestaat niet. Over wie er echt de baas is in het brein* (Amsterdam 2010); T. v.d. Laar en S. Voerman, *Vrije wil: Discussies over verantwoordelijkheid, zelfverwerkelijking en bewustzijn* [(Rotterdam 2011); M. Sie (ed.), *Hoezo vrije wil? Perspectieven op een heikele kwestie* (Rotterdam 2011).

<sup>2</sup> Much of the contemporary case for the illusory nature of free will is derived from the work of B. Libet, A. Freeman & K. Sutherland, ‘Editor’s Introduction: The Volitional Brain,’ *Journal of Consciousness Studies* 6/8–9 (1999), ix–xxiii, xvi. Cf. T. Bayne, ‘Libet and the Case for Free Will Scepticism,’ in: R. Swinburne (ed.), *Free Will and Modern Science* (Oxford 2011), 25–46, 26.

<sup>3</sup> D.F. Swaab, *Wij zijn ons brein: Van baarmoeder tot Alzheimer*, (Amsterdam 2010). Since October 2010 this book has continually been on [www.debestseller60.nl](http://www.debestseller60.nl) (accessed 2012, July 23).

<sup>4</sup> Swaab, *Wij zijn ons brein*, 381.

<sup>5</sup> C. Blakemore expresses: ‘The human brain is a machine which alone accounts for all our actions, our most private thoughts, our beliefs,’ cited by R. Tallis, *Aping Mankind: Neuromonia, Darwinitis and the Misrepresentation of Humanity* (Durham 2011), 52.

and the 'claim' that Swaab makes. In this context some considerations about the relevance of the concepts of freedom and determinism in Calvinism, and what these may add to the body of knowledge on neuroscience, are made.

## 2. METHODOLOGY

Speaking about 'neurocalvinism' and relating neuroscience to Calvinism necessarily involves looking at a problem of methodology: can neuroscience be related to theology? Isn't it anachronistic to compare a theologian of the eighteenth century with a neurobiologist of the twenty-first? Another question that concerns the broad scope of Calvinistic theology is: can it be spoken of as *the* Calvinistic theology? Questions such as these demand answers that can only be found at the level of methodology.

Firstly, a neurobiologist is talking about 'neurocalvinism'; straight away this justifies the research question about whether Calvinism has some type of relationship with neuroscience. Secondly, given the fact that a neuroscientist is asserting that neuroscience has implications for philosophy, morality, theology and humanity, it is justified that, from the point of view of philosophy, morality and theology, the claims made by the neuroscientist should be examined. Thirdly, since the turn of this century, there has been such an enormous increase in the level of cooperation between theologians and neurobiologists in understanding the coherence of brains and religion that some people have even spoken about 'neurotheology'.<sup>6</sup> This is not the ultimate proof of the correctness of the relationship between theology and neuroscience, but it is an indication that this cooperation is widely accepted. Fourthly, it can be argued that a relationship exists between theology and neuroscience, because although both academic disciplines look at personhood and identity, they both hold very different views about the problem of the human will. Fifthly, given the fact that the implications of the discoveries

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<sup>6</sup> Compare [www.ibcsr.org](http://www.ibcsr.org) and the magazine, *Religion, Brain and Behavior*; W.S. Brown, N. Murphy & H. Newton Mahony (eds.), *Whatever Happened to the Soul: Scientific and Theological Portraits of Human Nature* (Minneapolis 1999); R.J. Russell, N. Murphy, T.C. Meyering & M.A. Arbib (eds.), *Neuroscience and the Person: Scientific Perspectives on Divine Action* (Berkeley 2002); U. Lüke, H. Meisinger & G. Souvignier (eds.), *Der Mensch – nichts als Natur? Interdisziplinäre Annäherungen* (Darmstadt 2007); A.W. Geertz, 'When cognitive scientists become religious, science is in trouble: On neurotheology from a philosophy of science perspective,' in: *Religion* 39/4 (December 2009), 319–324; W. Achtner, *Willensfreiheit in Theologie und Neurowissenschaften: Ein historisch-systematische Wegweiser* (Darmstadt 2010).

made by neuroscience can justifiably be looked at from a theological point of view, it is clear that the choice of Calvinism is a given when Swaab's choice is made. A problem in the Calvinistic tradition is that this tradition is not unambiguous about free will and necessity. There is a difference, for example, between the concepts of Calvin,<sup>7</sup> Voetius<sup>8</sup> and Edwards.<sup>9</sup>

In this essay, Jonathan Edwards's concept of free will is compared with that of Swaab, because firstly, Edwards opposes the same front of self-determination as Swaab.<sup>10</sup> Secondly, Edwards opposes this front because he understands the tendencies of the modern age.<sup>11</sup> Thirdly, the fact that Edwards, despite his deterministic thinking, maintained morality and responsibility make it interesting to look at the key-structures of his thought. This leads to the formulation of the central question in this article: does Swaab rightly refer to Edwards's Calvinism to underpin his concept of human personality in relation to free will?

### 3. EDWARDS'S CONCEPT OF FREEDOM

The Arminians of Edwards's time – as far as he understood – reasoned that determinism and necessity would destroy freedom, responsibility and morality.<sup>12</sup> Edwards's opponents understood human beings as impersonal machines who acted from necessity and as the links in the chain of cause and effect. To maintain humanity they denied the necessity of human deeds and argued that human beings could not be held responsible for the deeds that they executed out of necessity. To uphold responsibility and morality, a self-determining will was necessary.

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<sup>7</sup> See P. Helm, *John Calvin's Ideas* (Oxford 2004), 157–183.

<sup>8</sup> See A.J. Beck, 'The Will as Master of Its Own Act: A Disputation Rediscovered of Gisbertus Voetius (1589–1676) on Freedom of the Will,' in: W.J. van Asselt, J.M. Bac & R.T. te Velde (eds.), *Reformed Thought on Freedom: The Concept of Free Choice in Early Modern Reformed Theology* (Grand Rapids 2010), 145–170.

<sup>9</sup> Edwards thematized free will, *WJE* 1 (*The Works of Jonathan Edwards*, New Haven 1957vv, vol. 1). Edwards identifies himself with Calvinism, *WJE* 1:131.

<sup>10</sup> Compare *WJE* 3:375; *WJE* 16:722–723. D.A. Sweeney and A.C. Guelzo understand Edwards's understanding of will as 'the engine of the Edwardsean tradition,' *The New England Theology: From Jonathan Edwards to Edwards Amasa Park* (Grand Rapids 2006), 57.

<sup>11</sup> Compare his letter to John Erskine, *WJE* 16:491; G.M. Marsden, *Jonathan Edwards: A Life* (New Haven 2003), 437–438; M.J. McClymond & G.R. McDermott, *The Theology of Jonathan Edwards* (Oxford 2012), 15.

<sup>12</sup> *WJE* 1:277, 295. The problem of free will was central, *WJE* 3:375.

In this section, the holistic dimension of Edwards's concept of freedom is explored and his qualification of the concept of freedom is examined in detail. Finally, an investigation is made into how Edwards reconciles determinism on the one hand, with responsibility and morality on the other.

### 3.1 THE HOLISTIC DIMENSION OF EDWARDS'S VIEW

Edwards understands the Arminian concept of a self-determining will as follows:

These several concepts belong to their notion of liberty: 1) That is, it consists of a self-determining power in the will, or a certain sovereignty which the will has over itself (...). 2) Indifference belongs to liberty in their notion of it, or that the mind, previous to the act of volition, is in equilibrio. 3) Contingence is another thing that belongs and is essential to it; not in the common acceptance of the word, as that has been already explained, but as opposed to all necessity, or any fixed and certain connection with some previous ground or reason of its existence.<sup>13</sup>

To achieve this freedom, Arminians isolate the will from the entirety of the human personality, which means that the functioning of the will is reduced to the moment of choosing and that choosing and willing become accidental occurrences.<sup>14</sup> A further consequence of this approach is that it is only the 'pure act' of the will that values the 'act' of the will, not the habit that caused the act.<sup>15</sup> This means that a bad heart could be an excuse for vice, but having a good disposition of the heart would be no reason to speak about virtue. The characteristic of this libertarian concept of free will is indifference.<sup>16</sup>

Edwards's deepest motivation for the rejection of this concept is theological. He cannot accept the repudiation of determinism, because he under-

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<sup>13</sup> *WJE* 1:164–165. Compare *WJE* 3:375–376.

<sup>14</sup> *WJE* 1:303–304.

<sup>15</sup> *WJE* 1:324–325, 329–330.

<sup>16</sup> *WJE* 1:303–304. Edwards opposes a certain (extreme) version of Libertarianism. For more about Libertarianism, see R.H. Kane, 'Libertarianism,' in: Fischer, Kane, Pereboom & Vargas, *Four Views on Free Will* (Oxford 2007), 5–43. Kane defends an undetermined free will, 'Responsibility, Luck, and Chance: Reflections on Free Will and Indeterminism,' *Journal of Philosophy* 96, 217–240. See also Joseph Keim Campbell, *Free Will* (Cambridge 2011); T.J. Mawson, *Free Will: A Guide for the Perplexed* (London 2011); T. Honderich (ed.), 'The Determinism and Freedom Philosophy Website,' <http://www.ucl.ac.uk/~uctytho/dfwIntroIndex.htm> (accessed 2012, July 23).

stands this to be a repudiation of the all-decreeing God.<sup>17</sup> Theological aspects of the dispute, such as these, are not included in this essay; however, efforts will be made to examine the anthropological arguments.

Edwards's criticism is specifically directed at indifference as a property of the self-determining will:

Those notions of liberty of contingency, indifference and self-determination, as essential to guilt or merit, tend to preclude all sense of any great guilt for past and present wickedness (...). All wickedness of heart is excused as what, in itself, brings no guilt.<sup>18</sup>

Edwards criticizes this concept of freedom, because its effect is the opposite of what is aimed at, namely the denial of responsibility and morality. According to Edwards, to value indifference as virtue contradicts common sense.<sup>19</sup> It implies that a cold heart and a compassionate attitude would both be valued equally by a friend in need.

Another property of this concept of freedom concerns the function of commandments and promises. Because commandments are used to take away the indifference of the will and to influence will, commandments, according to the Arminian scheme, will undermine freedom, which is against all common sense. This view leads one to the conclusion of inconsistency, because every appeal to virtue takes away the virtuous character of obedience to that appeal.<sup>20</sup> Edwards does not only deny that morality and responsibility are bound to the Arminian concept of freedom, but returns the argument; the Arminian concept of liberty of contingency, indifference and self-determination will destroy morality and responsibility instead of promoting it. To promote morality and responsibility, it is necessary to use the concepts of the habitual dispositions of the heart.<sup>21</sup> This means that the human will cannot be isolated from the entirety of the human personality:

If strict propriety of speech is to be insisted on, it may more properly be said, that the voluntary actions which is the immediate consequence and fruit of the mind's volition or choice, is determined by that which appears most agreeable,

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<sup>17</sup> *WJE* 16:722; P. Ramsey, 'Editor's introduction,' *WJE* 1:25–26. Edwards accepts the comparison with the Stoic worldview, however he rejects this concept because of the lack of freedom, *WJE* 1:372–374. Edwards defends that God chooses what is wise and most fitting, denying the arbitrariness of God's will, *WJE* 1:375–396, 418, 434.

<sup>18</sup> *WJE* 16:722.

<sup>19</sup> *WJE* 1:320–323.

<sup>20</sup> *WJE* 1:331.

<sup>21</sup> *WJE* 1:156–157.

than the preference or choice itself, but that the act of volition itself is always determined by that in or about the mind's view of the object, which causes it to appear most agreeable.<sup>22</sup>

The implication of Edwards's concept is that human will is not to be understood as a source of choices, but as an instrumental function of the human person. The alternative to this instrumental function of the human will is that an indifferent will can make choices that go completely against the strongest inclinations of human personality, which would be absurd.

This approach of Edwards coheres with another aspect of his concept. Instead of three hierarchically-ordered faculties of the soul, he speaks about two equal faculties, namely mind and will.<sup>23</sup> The affections are included in the will, which implies a less intellectualistic and a more voluntaristic and intuitive approach. Edwards denies that the human mind and the will are parts of the human soul, but understands them as being different modes of operation of the same human soul.<sup>24</sup>

In the background of Edwards's understanding of the status of human will is his worldview. As a child of the Newtonian age, he reasons from a mechanistic worldview in which the order of cause and effect form part of the basic structures of reality.<sup>25</sup> It is important to understand that Edwards applies this mechanistic worldview of cause and effect to his anthropology. This order means that it is absurd to infer that the human will causes itself. Edwards compares this absurdity with an animal which begat itself and was hungry before it had being.<sup>26</sup> In this way, Edwards confirms the absurdity of an uncaused free will and defends the stance that the will is determined by a combination of the object and the mind's view of the object.<sup>27</sup>

### 3.2 EDWARDS'S VIEW OF FREEDOM AND RESPONSIBILITY

Edwards formulates a second point of criticism of the Arminian concept of freedom and necessity:

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<sup>22</sup> *WJE* 1:144–145.

<sup>23</sup> *WJE* 1:217; 2:96. See McClymond & Dermott, *Theology of Jonathan Edwards*, 311–318; P. Ramsey shows the relation to John Locke, *WJE* 1:49.

<sup>24</sup> Cf. McClymond & Dermott, *Theology of Jonathan Edwards*, 314.

<sup>25</sup> *WJE* 1:365. See also G.M. Marsden, *Jonathan Edwards*, 440–441.

<sup>26</sup> *WJE* 1:345–346.

<sup>27</sup> *WJE* 1:144. Compare G.M. Marsden, *Jonathan Edwards*, 445.

We are said to be naturally unable to do a thing, when we cannot do it even if we will, because what is most commonly called nature does not allow it, because of some impending defect of obstacle that is extrinsic to the will, either in the faculty of understanding, constitution of body, or external objects. Moral inability is seen not in any of these things, but in either the want of inclination or the strength of a contrary inclination, or the want of a sufficient motive in view to induce and excite the act of the will, or the strength of apparent motives to the contrary (...). A woman of great honor and chastity may have a moral inability to prostitute herself to her slave. A child of great love and duty to his parents may be unable to be willing to kill his father.<sup>28</sup>

Edwards distinguishes between natural and moral necessity to explain that the human inability to behave in a moral way can be against our will or in accordance with our will; natural abilities are against our will, for example, while moral incapacities are not. However, Edwards is not completely clear about the boundary of the definition of human incapacities, although his position does have the potential to distinguish moral necessity from other necessities. In this way, Edwards qualifies the concept of necessity as maintaining responsibility as a category on the one hand, and as maintaining freedom as a category on the other. This also leads to a redefinition of freedom:

But I would observe one more thing concerning what is vulgarly called liberty, which is the power and opportunity for one to do and conduct himself as he will (...). Let the person come to his volition or choice of how he will, yet, if he is able, and there is nothing in the way to hinder his pursuing and executing his will, the man is fully and perfectly free, according to the primary and common notion of freedom.<sup>29</sup>

In Edwards's view the Principle of Alternative Possibilities is not a prerequisite condition for the maintenance of freedom and responsibility, but the conscious voluntariness of human volition is a sufficient condition for it.<sup>30</sup> For example: if a boy finds himself in a place where there is only one girl to bond with, and he loves this one girl, he loves her freely.

Apparently, Edwards unites freedom and responsibility in the same way as the Arminians in his context do. If free will cannot be saved in a certain way, responsibility is lost. This approach implies that human beings are responsible for their morally bad behavior if natural inability was not the cause

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<sup>28</sup> *WJE* 1:156–160. Edwards was among those who worked out this distinction. See P. Ramsey, 'Editor's Introduction,' *WJE* 1:37.

<sup>29</sup> *WJE* 1:164.

<sup>30</sup> Cf. Marsden, *Jonathan Edwards*, 442.



of it, and if they behaved voluntarily in this bad way. Behind this viewpoint is the conviction that moral inability is ultimately qualified as unwillingness and for unwillingness there is no excuse.<sup>31</sup> Edwards's view coheres with the distinction between human beings before and after the fall; sin did not destroy human will as a faculty, but changed its orientation. Despite sin, human will remained free but, because of the sinfulness of the heart, human beings are not free to choose good. The reverse is also true. The eschatological dimension of the work of the Spirit implies that believers' experience the highest liberty that coheres with the necessity of virtues.<sup>32</sup>

In this way, Edwards clarifies his concept of freedom by distinguishing between moral and natural inability or necessity. This distinction gave him the opportunity to uphold freedom as a guarantee for morality and responsibility.

### 3.3 CONCLUSION

Edwards denied the dismissal of determinism, he accepted the Arminian conjunction between free will on the one hand and morality and responsibility on the other, and he offered his own concept of freedom in which he appears to be a compatibilist, reconciling determinism and free will.<sup>33</sup> In his attack on the Arminian concept of a self-determining will, Edwards designed an alternative holistic concept of the human soul in which understanding and will contribute equally to human identity. In response to the Arminian concept of necessity, Edwards qualified necessity by making a distinction between moral and natural inability. In Edwards's understanding, freedom exists in the willingness of our will. In this way, Edwards could maintain determinism and necessity on the one hand, while maintaining human freedom, responsibility and morality on the other.

Against the reproach that determinism and necessity would dehumanize human beings, reducing them to machines, Edwards replied that the existence of human understanding and will upholds humanity. At the same time he clarified that the reproach actually attacks Arminians, who hold that a

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<sup>31</sup> *WJE* 1:307–308. In the tradition after Edwards, the 'Exercisers' saw evil as concentrated in the will only. See McClymond & Dermott, *Theology of Jonathan Edwards*, 608.

<sup>32</sup> *WJE* 1:364. Edwards sees the Christian life as an eschatological life, *WJE* 4:236–237.

<sup>33</sup> Edwards is a classic compatibilist. The new compatibilism (of Harry Frankfurt) makes a distinction between first-order and second-order desires. If the first-order desires are in control of the second-order desires, there is freedom.

human being is less than machine, because the so-called machine of Edwards is led by human intelligence, while their human will is led by nothing at all.<sup>34</sup>

#### 4. ASSESSMENT OF SWAAB'S VIEW

How does Swaab's view of free will compare to that of Edwards? According to Swaab, our complete personality is controlled by billions of brain cells. Every choice, even religious choice, can be related to the functioning of a part of the human brain. In other words, if the brain does not function, the human spirit does not function. Because the functioning of human spirit can be described and explained in physical terms, human will is controlled by physical laws. This explains the deterministic character of Swaab's understanding of human will. The difference between Edwards's determinism and that of Swaab is that Edwards's determinism has a metaphysical character while Swaab's physical determinism lacks this metaphysical dimension. The similarity between Edwards and Swaab is that both accept the physical order of cause and effect.

However, Edwards's approach was not on the level of brain science; Edwards's concept is open to Swaab's concept of physical determinism, knowing Edwards's acknowledgement of the physical order of cause and effect. Without being explicit about the definition of free will or justifying the use of a certain definition, it can be determined that Swaab reacts against the understanding that free will is described as the possibility of deciding or making choices without internal or external restrictions. Given this understanding of free will, he denies the possibility of a complete freedom of the will; he does not, however, define the word 'complete.'

Both Edwards and Swaab deny the libertarian concept of human free will, which proposes that the ultimate decision about our existence, willing and acting is taken in an isolated abstract human will. Although Swaab misses the finer anthropological distinctions that Edwards makes about the relationship between will and understanding, Edwards and Swaab agree that human will has to be understood and determined by the human personality, education and environment. At first glance, Edwards and Swaab seem to agree because they both oppose the same front. However, a more detailed examination reveals the differences between both views. Edwards is a compatibilist, while Swaab is an incompatibilist, and as such, their views are parallel

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<sup>34</sup> *WJE* 1:371.

to soft determinism and hard determinism respectively. Swaab denies that a deterministic worldview coheres with the free will of human beings,<sup>35</sup> while Edwards accepts and defends free will.

Edwards understands human free will as human willingness in choosing and acting, relating free will to human consciousness. Swaab understands free will against the background of the Principle of Alternative Possibilities as an interpretative paradigm for free will, and he lacks the conceptual framework to understand free will as an awareness of voluntarily choosing. On the one hand, he gives the impression that conscious willingness is no more than a product of unconscious neural brain processes; on the other hand, he is bound to this impression, because he understands consciousness as the result of unconscious processes which are controlled by physical laws.<sup>36</sup>

The fact that Edwards and Swaab both defend the coherence of free will and responsibility,<sup>37</sup> and that Swaab denies the freedom of will, implies that Swaab tends to deny responsibility in social life.<sup>38</sup> He illustrates this problem with several examples. Can a pedophile be responsible for his sexual orientation as this orientation is caused by his genetic background and the irregular development of his brain? Parallel with his acceptance that a homophile orientation is not a choice, Swaab suggests that it is also acceptable to view kleptomania and other forms of aggressive and delinquent behavior as behavior that is exhibited without choice, with all the consequences this has for accountability and responsibility.

From Edwards's perspective, Swaab makes the same mistake as the Arminians do by not distinguishing between moral and natural inability. Lack of this distinction explains the lack of human freedom and the lack of any possibility of justifying morality and responsibility. While Edwards would blame Swaab for projecting the structures of natural ability and inability upon the moral dimension of human life, Swaab would reply that morality has to be understood in physical terms, namely neural processes.

In this context, it is significant that Swaab denies the human soul.<sup>39</sup> He argues that a 'psychon' does not exist, but a 'neuron' does. Dying means that brains stop functioning. He does not see any reason to think that the soul is anything more than the functioning of billions of brain cells and thinks that

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<sup>35</sup> Swaab, *Wij zijn ons brein*, 380–381.

<sup>36</sup> See Aichtner, *Willensfreiheit*, 223–232 for the common views of neuroscientists.

<sup>37</sup> Swaab, *Wij zijn ons brein*, 385, 391.

<sup>38</sup> Swaab, *Wij zijn ons brein*, 392.

<sup>39</sup> Swaab, *Wij zijn ons brein*, 357.

the universal belief in the existence of the soul is based on anxiety about death and the desire that humans have to be reunited after death. Thus Swaab argues from the point of view of reductionism, in which the working of the soul is reduced to the functioning of brain cells.<sup>40</sup> This leads to the overall conclusion that Swaab has a monistic materialistic understanding of human personality. Swaab's physical determinism has led him to conclude that physics is the all-embracing reality of the human being and that physicalism is 'all' (the position that only physical matter is needed to account for everything that exists in nature); a sure sign of this can be seen in the title of his bestseller: *We are our brain*.

Here, the core of the difference between Edwards's and Swaab's views is explained. Edwards can accept physical determinism, but Swaab cannot accept metaphysical determinism. Edwards accepts physical determinism as the natural order of cause and effect in which humanity participates, without reducing human being to physics. In Edwards's understanding of reality, the metaphysical world bears the physical reality. As an example: the physical world is for Edwards like a map of the world, while the reality of the world cannot be explained in terms of the map. All is physics, but physics is not all. This means that Edwards's worldview cannot be characterized as physicalism, but must be understood as metaphysicalism.

Edwards's metaphysicalism made him reject the Arminian reproach that Calvinists understand the human being as a machine; the same metaphysicalism would analyse Swaab's concept of the human being as a machine. So an answer has been derived for the central question of this essay: does Swaab rightly refer to Edwards's Calvinism to underpin his concept of human personality in relation to free will? The answer is no.

## 5. CONCLUSION AND CONSIDERATIONS

Table 1. Comparison of Edwards's and Swaab's understanding of determinism and free will

Perspective	Edwards	Swaab
Metaphysics?	Yes	No
Physical determinism?	Yes	Yes

<sup>40</sup> Cf. B. Keizer, *Waar blijft de ziel?* (Rotterdam 2012), 61–62.

Libertarian understanding of will?	No	No
Compatibilism?	Yes	No
Freedom of will?	Yes	No
Responsibility and morality?	Yes	No

Table 1 illustrates the comparability of Edwards’s and Swaab’s understandings of physical determinism and the libertarian understanding of will. Edwards and Swaab differ on all other points; while Edwards is a compatibilist, Swaab is not. Edwards’s position allows the possibility of speaking about freedom of will, while Swaab denies it. Responsibility and morality are integral to the structure of Edwards’s concept of human personality, while Swaab’s concept denies any space for them. These differences go back to an acceptance or rejection of metaphysics. We can conclude that Swaab’s ‘neurocalvinism’ and Edwards’ Calvinism are not compatible.

Swaab’s approach brought us into contact with physicalism, a stance that understands reality as a closed physical system. While reductive-physicalism can easily be attacked, this is not the case with non-reductive physicalism whose main tenet is that the mind operates at a higher level of complexity and cannot be directly reduced to physical conditions, implying that mental states are a byproduct of the physical state of the brain.

Does this reveal that there is some openness here to the concept of the human soul? Scientists, philosophers and theologians are afraid of a Cartesian dualism of soul and body. While a concept of the human soul cannot be developed within Cartesian dualism, this does not indicate that we do not have to think about the concept of the human soul. This research indicates that we are not to be enclosed in physicalism. Edwards’s distinction between metaphysics and physics offers a midway between physical monism on the one hand and Cartesian dualism on the other,<sup>41</sup> namely a duality within a coherent reality which guarantees human freedom, responsibility and morality.<sup>42</sup>

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<sup>41</sup> For Edwards’s criticism of Descartes, cf. N. Fiering, ‘The Rationalistic Foundations of Jonathan Edwards’s Metaphysics,’ in: N.O. Hatch & H.S. Stout (eds.), *Jonathan Edwards and the American Experience* (Oxford 1988), 73–101, 77–78; A. Zakai, *Jonathan Edwards’s Philosophy of Nature: The Re-enchantment of the World in the Age of Scientific Reasoning* (London 2010), 27.

<sup>42</sup> G.H. Labooy pleads for metaphysics, the interaction between body and mind, and a certain independence of the mind, *Waar geest is, is vrijheid: Filosofie van de psychiatrie voorbij Descartes* (Amsterdam 2007), 262.

