

Introduction of a New Methodology to Philosophy: Logic and Physics Prove that Libertarian Free Will is Random and Not Controlled

One of the philosophical positions in the discussion about free will is libertarianism. Libertarianism claims that all will decisions must be indeterminated to be free. From critics of libertarianism comes the objection that libertarian free will would consequently be random and uncontrolled. Libertarians however insist that will decisions can be indeterminated and not random and controlled simultaneously. In order to settle the argument the terms involved here are analyzed for consistency. For this analysis a new methodology is introduced. The critical terms are not only applied to philosophical situations but also to situations from physics. If terms are contradictory in physical situations / language logic says that they must also be contradictory in philosophical situations / language. The analysis shows that libertarian free will can indeed never be controlled and is always random if it is indeterminated. However, an alternative definition for libertarian free will is proposed which would avoid the inconsistencies.

1. Introduction

In the discussion about free will there are two major philosophical positions which claim that men and women do have a free will. These positions are called compatibilism and libertarianism. Compatibilists accept the claim of neuroscience that all mental activities are determined. This includes will decisions. However, compatibilism insists that will decisions are free. On the contrary, libertarians claim that determinism can not be true if free will is to be guaranteed. Libertarianism insists, that will decisions, or at least some critical will decisions, have to be indeterminated. While libertarians insist on indeterminism for will decisions they also claim that these decisions are not random but controlled. Thus, for libertarians, will decisions are indeterminated, but also controlled and not random. Several different libertarian accounts exist, but all of these accounts claim that indeterminism is in agreement with control and does not lead automatically to chance. To examine if these libertarian accounts can be true, here a new methodology is introduced to philosophy. The first part of this new methodology is the very well known analysis of the denotation of the terms used in these accounts. This methodology was already introduced / emphasized by Wittgenstein in his 'Tractatus Logico – Philosophicus'. Wittgenstein demands that *'the object of philosophy is the logical clarification of thoughts'* and that *'philosophy should make clear and delimit sharply thoughts which otherwise are opaque and blurred'* (Wittgenstein 2003, p. 51). Logic demands that an account can by definition never be true if the critical terms used in this account contradict each other. Every account must be consistent on a linguistic and logic level. But this is obviously easier said than done. For decades, libertarians and compatibilists have disputed the question of whether the libertarian definition of free will guarantees control and excludes chance. While the compatibilists claim that the libertarian free will is random and

uncontrolled, the libertarians insist that libertarian free will is indeed controlled and not random, even though it is indeterminated. This example shows that the linguistic analysis of the terms involved alone is obviously not successful, because both parties have different opinions about the denotation of the terms.

For this reason we must introduce an additional new part to the general methodology in which the terms in discussion are not only applied to mental situations but to scenarios from physics as well. We examine what it denotes if the terms 'indeterminism' and 'control' and 'chance / random' are applied to physical systems. This can be done because the denotation of terms is, in principle, independent of the subjects and situations to which the terms are applied. 'Indeterminism' in ordinary language denotes the same as in physical language. (Physical language is the language physicists use to describe physical systems.) 'Control' in ordinary language denotes the same as in physical language. 'Chance' in ordinary language denotes the same as in physical language. This is not surprising because physical language was developed from ordinary language. Consequently the denotation of terms in physical language is a priori identical with the denotation of the same terms in ordinary language. In addition we have to assume that the same is true for philosophical language; the denotation of terms in philosophical language must in general be identical to the denotation of terms in ordinary language. To clarify this assumption it must be emphasized that, of course, philosophical language contains a lot of terms, which do not exist in ordinary language. But all new terms in philosophical language can be explained by and reduced to ordinary language. It also has to be emphasized that, even if the denotation is basically the same, the meaning of terms can differ, depending on the situation to which the terms are applied. 'Free' means something different, when applied to an electron, than, when it is applied to will decisions. But the general denotation must basically be the same. The denotation is never contradictory. Then logic says that if the denotation of terms in physical language is the same as in ordinary language, and if the denotation of terms in philosophical language is the same as in ordinary language, the denotation of terms in philosophical language must be the same as in physical language. The denotation of terms examined in this paper, namely 'indeterminism', 'control', 'random' and 'chance', is indeed identical to their denotation in ordinary language. That follows when the discussions between libertarians and compatibilists about this subject are examined.

The application of terms to physical situations can now be used to decide, if terms go together well or if they contradict each other. If the application of terms to physical systems proves that these terms contradict each other, then it is proven that these terms contradict each other in ordinary language and in philosophical language as well. Consequently every account about any philosophical subject, which uses contradictory terms to describe or explain that subject, is a priori false.

Going one step further, it should be emphasized that, once the contradiction of terms is proven by using a physical example, the contradiction is also valid for metaphysics. This means even if an account uses some metaphysical elements the account is not allowed to use terms in a contradictory way. This follows from the fact that metaphysical language is also developed from ordinary language. If something is contradictory in ordinary language it is still contradictory in metaphysical language!

2. Linguistic Analysis

Now we will first look at the definitions of the critical terms. Oxford Dictionaries (www.oxforddictionaries.com) give the following definitions:

Indeterminism: The philosophical doctrine that not all events are wholly determined by antecedent causes.

Random: Happening without method or conscious decision.

Chance: The occurrence of events in the absence of any obvious intention or cause.

Control: The act of restricting, limiting or managing something. The ability to make somebody / something do what you want.

To determine: Cause (something) to occur in a particular way or to have a particular nature.

As we can see, the definition of 'indeterminism' is indeed in accordance with the understanding of libertarianism. Libertarian free will decisions are not determined by antecedent causes. But applying the above definition of 'chance' that would mean that these indeterminated decisions then happen by 'chance', which again is then equivalent to happening 'randomly'! 'Chance' just means always that nothing before an event is causing this event. That is exactly the way, how libertarians define free will. The consequence must be that libertarian free will happens by chance only. Now let's look at the term 'control'. 'Control' denotes to manage something (like a decision) or to make something do what you want. 'Do what you want' means always, that you have to have a special wish before you can make something do just that. Without a preceding wish it is by definition obviously impossible to make something 'do what you wish'. Without a precedent wish you simply do not wish anything. So the thing you could perhaps control if you had a wish can do whatever it wants. If it would behave indeterministically it can now just behave randomly! Without control, everything happens by chance.¹ The

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¹ Actually if the thing would act deterministically it would now follow its determination. Of course without a precedent wish it would not be controlled either.

opposite is valid if you cause something to occur in a particular way. Then you determine how that thing behaves: you control it. If you rephrase the situation you can say: 'In order to control something you have to determine its behaviour'. Control requires determination! Summarizing we can say that, if we follow Wittgenstein's doctrine and clarify the thoughts, then we recognize that 'indeterminism' denotes, by definition, 'by chance' and 'indeterminism' excludes, by definition, 'control'. If will decisions are indeterminated, they are a priori random and uncontrolled! Even though a thorough investigation of the terms used in libertarian accounts seems to prove that libertarianism can never be true due to inconsistencies and contradictions not everybody will be convinced. If this were not the case, there would not be a discussion over the last thirty years between philosophers on whether libertarianism could explain free will. So although the definitions of the terms seem to show the contradictions, some people might have a different understanding of the denotation of the terms. This is now the time to apply the second part of the new methodology. All discussions about mental aspects are always a little bit abstract. That is the reason for different interpretations of the terms involved in philosophical discussions. Now the application of these terms to concrete physical situations will allow us to decide which understanding is correct.

3. Cross Check of the Linguistic Analysis with Examples from Physics

To check our understanding we will now apply the terms in discussion here to physical systems. These critical terms are 'indeterminism', 'random / chance' and 'control'. Let us start with indeterminism and let us ask what kind of systems in physics are indeterminated and what kind of systems are determined. Actually this is easier said than done because there is an open discussion in physics on whether there are any indeterminated systems at all. All physical systems and events in our daily environment are described by so called classical physics which goes back to Isaac Newton. And as Newton claimed classical physics is completely determined. But at the beginning of the 20th century physicists found out that the world of very small objects, such as atoms and molecules, which form the objects of classical physics, behaves completely differently. A new theory, quantum theory, was developed. Quantum theory, at least in the early stages, now claimed that events in the quantum world are no longer determined as in classical physics, but are indeterminated². One of the most illustrative examples of a quantum system is the

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The question of whether the world of quantum objects is determined or indeterminated is one of the most intriguing questions of physics. The founders of quantum theory indeed claimed that all events in the quantum world are indeterminated and random. But they had to introduce some principles which are now very conflicting. There is one central equation in quantum theory, the Schrödinger equation, which describes the dynamic behaviour of quantum systems. The solution of the Schrödinger equation is the so - called wave function. Generally the Schrödinger equation requires that the wave function develops totally deterministically. The founders of quantum theory introduced a so - called collapse of the wave function in case of a measurement. By the collapse the quantum system would change its state in an indeterminated and consequently random way. In the case of a radioactive nucleus

radioactive decay. All atoms consist of a nucleus and of electrons. While in most situations nuclei and electrons form a stable configuration sometimes there are nuclei, which after some time emit some kind of radiation. Physicists say the nucleus decays. If the radiation contains electrons or alpha particles (nuclei of Helium) these nuclei even change their chemical behaviour. If such a radioactive nucleus is formed at a certain time T , it can not be known when this nucleus will decay: in other words, when it will emit radiation. This also means that the timing of the actual decay is absolutely random. Some nuclei decay after the time T_1 , some nuclei decay after the time T_2 , others decay after the time T_3 and so on. For any nucleus in particular it can never be known when this nucleus will decay. The decay is absolutely random because the decay is indeterminated.³ In addition you can never control the time of a single decay. Every single decay is uncontrolled because it is indeterminated. For all physical systems ‘indeterminism’ always means ‘random’ and no indeterministic physical event can ever be ‘controlled’.

For ‘control’ there must have been an antecedent event, which would have caused the decay. We can illustrate this principle with a different example. A kind of decay also happens in atoms when an atom gets excited. Excitation of an atom means that at least one of the electrons of the atom is transferred to a higher level.⁴ After some

this would mean that as the result of the measurement of the decay the nucleus either decays or does not decay. This interpretation is not very satisfactory because we have to assume that in the universe there are a lot of radioactive nuclei, which decay even if there is nobody to perform a measurement. In order to avoid this discrepancy there was a modification of quantum theory developed by Ghirardi, Rimini and Weber, the so - called GRW – Interpretation. GRW claims that the wave function contains a part, which describes a spontaneous collapse. Though the probability for a spontaneous collapse is extremely low GRW claims that because of the huge number of quantum objects, namely atoms forming the measurement device used, the collapse of the wave function is indeed realized in every measurement. The GRW interpretation would again support indeterminism and would lead to chance for a single event. But again GRW is also applied to measurement situations and does not explain why the wave function for a radioactive nucleus in free space collapses. On the other hand there exist two interpretations of quantum theory, which are deterministic, the so called Many – Worlds – Interpretation of Hugh Everett III and the so called Bohmian Mechanics of David Bohm. We do not want to go in more details of the discussion but we just want to point out that it is an open discussion in physics if there is any indeterminism in nature at all. But for our purpose, namely to find out about possible conflicts in the use of different terms, the open discussion in physics is of no relevance. Let us just assume that quantum events are indeterminated.

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³ As it might be known, just the time of one single decay is random and can not be predicted. On the other hand the behaviour of a great ensemble of radioactive nuclei is again completely deterministic. For any sample of nuclear material it can exactly be predicted after what time the half of the sample is decayed. Actually this could be important for neural processes. If indeed there would be any quantum uncertainties play a role in neural processes one has also to take into account that not just one but many neurons are probably involved in one single neural process. This again means that a possible neural indeterminism would be cancelled out by the determinism, which is relevant for a great quantity of involved neurons.

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⁴ Normally atoms exist in the so - called ground state. That means that all electrons are in the energetically lowest state. It can happen, for example by absorption of a photon, that one electron is moved to a higher level and one of the lower levels becomes vacant.

time the excited electron will move back to the previous level and a photon will be emitted. Again the time of this decay is indeterminated and absolutely random. However there is a well known situation for atoms in which there is an excitation at first but subsequently the decay is not random anymore; rather it is stimulated and controlled. This example is the LASER (Light Amplification by Stimulated Emission of Radiation). In a LASER there exist many atoms, which are first excited by a special mechanism. That means in a LASER one first creates a state in which many atoms are transferred to an excitation. If nothing else were done, the atoms would decay one after the other, and every decay would be indeterminated and absolutely random. But now a mechanism is used, called stimulation, which involves introducing an external photon with the same frequency as the photons, which are normally created in the decay. This external photon now stimulates an excited atom to decay and as it does so, to emit a photon. A chain reaction is initiated, and all the other excited atoms fall back to the ground state and emit their photons. In this example, every emission of a photon is now determined by the stimulating photon and the following chain reaction. The emission of photons is no longer random, but controlled by an external determined action, namely the stimulation. The examination of these two physical systems, radioactive decay and LASER, illustrates the denotation of the different terms. Every physical event, which is indeterminated, like the radioactive decay, is absolutely random. Every indeterminated physical event happens by chance. No indeterminated physical event can ever be controlled because of the indeterminism. The thoroughly linguistic analysis of the terms 'indeterminated' and 'random', which we carried out above, has shown that these two terms are analytically connected. The linguistic analysis showed that every indeterminated event must a priori be random. But because this is disputed and denied by libertarians the application of these terms to physical systems undeniably proves that indeed every indeterminated event is always random. Our examples also show that every event, which is controlled, like the LASER, must be determined. Now the law of non – contradictory tells us that then every event, which is not determined, can never be controlled.

To be completely sure about the analytical connection between determinism and control we will use another example from physics. Control in physics means that you have a system, which you want to behave in a way that is determined by your actions and that is not random. In order to achieve this you first define one or more values which are typical or critical for the system and in which you want the system to be. An example for a physical system could be a nuclear power plant. It is your goal that the system works within your defined critical values. Now you constantly measure these values. If the values are outside a given range, you initiate some actions to bring the values back to the desired quantities. Control means that every deviation triggers an action in a determined way. Thus, all actions are determined

by deviations of some values and the triggering of appropriate actions. If there would be any indeterminism involved, such as a deviation not triggering an appropriate action, the system would not be controlled anymore, and in our case the nuclear power plant could consequently explode!⁵ If we now do a thorough analysis of the term ‘control’ in physical situations this analysis shows that control means ‘to set one or more goals (more precise: goal ranges) and determine some actions which are initiated if the system to be controlled moves out of the goal ranges’. So the term ‘control’ contains analytically the setting of goals and the triggering of actions in the case of a deviation. That means that ‘control’ is only given if a deviation determines an action. If any action is not determined by the deviation of the goals this action is automatically random and the entire system is no longer controlled. The application of a term, ‘control’, to a physical system shows that the linguistic analysis of that term, namely ‘control’, which lead to a contradiction between ‘indeterminism’ and ‘control’, was correct. The application of ‘control’ to physical systems shows that the terms ‘indeterminism’ and ‘control’ are mutually exclusive. No indetermined event can ever be controlled.⁶

Now we have proven that the terms ‘indeterminism’ and ‘random’ are analytically connected. This means that every event, which is indeterministic, must automatically be random. For the free will discussion it means that every indeterministic will decision happens by chance and thus does not fulfil one of the critical requirements of libertarianism. We have also proven that the terms ‘indeterminism’ and ‘control’ are mutually exclusive. Any system or event can only be controlled if the appropriate actions are determined. Any indeterministic system or event is always ‘not controlled’. For the free will discussion this means that no indeterministic will decision can ever be controlled. Thus, one of the other critical requirements of libertarianism is not fulfilled either. In summary, one can now say that libertarianism which claims that all will decisions are indeterministic must accept that these decisions then can never be controlled and that all indeterministic will decisions will always happen by chance. However, as we have mentioned,

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⁵ Because we all know that technical equipment can fail (but be aware: also failures of technical systems are not indetermined (only epistemic), but are determined on a micro level (ontological)) power plants have a lot of redundant subsystems so that a failure in one subsystem does not jeopardize the entire system. If the entire system does not trigger the appropriate actions deterministically the system would not be controlled anymore. Even if the system would not fail in the case of a deviation not triggering an appropriate action this would only happen by chance!

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For the following discussion it is important to emphasize that indeed ‘control’ is analytically connected with ‘setting a goal’. Without a goal there can never be any control. But it is also critical to emphasize that ‘setting a goal’ is a necessary condition but it is not sufficient. If you just set a goal but do not determine actions that make sure that the goal is reached nothing happens to reach the goal or if something happens so that the goal is reached that just happens by chance.

libertarianism claims that to be considered to be free, a will decision must be controlled and may never happen by chance. We have proven that both claims are contradictory and can never be fulfilled at the same time. This contradiction already stems from the definition of the terms involved. Because this contradiction seems to be disputable we have applied the terms to physical systems where the denotation of the terms becomes much more obvious. Indeed the physical examples prove beyond any doubt that the contradiction between ‘indeterminism’ on the one hand and ‘control’ and ‘not random’ on the other already exists on a logical – linguistic level. Now logic says that any account, which uses contradictory terms as an explanation, can never be true.

4. Additional Analysis of Different Prominent Libertarian Accounts

Though we have now definitely proven that libertarianism can never be true for a final confirmation of our proof we will make a short examination of some prominent libertarian accounts. After a classification of Robert Kane all libertarian accounts can be classified in two different types, either ‘agent – causal’ accounts or ‘event – causal’ accounts (Kane 2002). ‘Agent – causal’ means that the agent as a whole is responsible for any free will decision, not a special event within the agent. ‘Event – causal’ means, that a special event within the agent is responsible for any free will decision. For both types of accounts it is essential that the decision is made indetermin⁷. That means that no precedent cause can be responsible for the will decision. In all accounts there is, of course, a deliberation process. But the result of the deliberation process is not allowed to determine the decision. Then the decision would by definition be determined. One could say that the deliberation process ends at a certain time. Then, either the agent or an event within the agent makes the indetermin⁷ decision. This means that even if the deliberation process were to result in a clear choice of one option, this decision is not chosen automatically. Indeed there might be a high probability that the result of the deliberation process is chosen as the decision, but the agent or the event can also make a different decision. Now let us have a look at some libertarian accounts in detail.

Let’s start with Timothy O’Connor (O’Connor 2002/1, O’Connor 2002/2). O’Connor’s account is agent – causal. As pointed out, O’Connor connects a free will decision with a deliberation process in which the agent’s views, beliefs, intentions and desires are involved. Because for O’Connor, as for every other libertarian, the free will decision must be indetermin⁷, it is not possible that the decision is just the outcome of this deliberation process after weighting all the

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Actually this is true for **all** types of libertarian accounts even if they should not fall under Kane’s classification.

arguments. The free will decision is finally made by the agent herself, not as a result of the deliberation process, but in an indeterminated way. If the decision were made based on the outcome of the deliberation process, then in O'Connor's view it would be determined and not free. For the agent to be able to make that indeterminated decision O'Connor gives her a kind of metaphysical status. He denies the complete reduction of all mental states to physical states. He considers the agent to be a holistic entity. In this sense, the agent makes a free will decision which then is not determined by specific reasons. In contrary the agent's free will decision determines, so to speak, a posteriori the reasons for the free will decision. Now the question is whether the agent in O'Connor's account indeed has some control over the decisions, and if these decisions are not random. As we have seen, control requires by definition some kind of goals. A goal for will decisions could mean that they are controlled if they represent the agent's views, beliefs, intentions and desires. An agent's goal is to make all decisions consistent with her own value system. This is supposed to be in an optimal way, not just in an acceptable way. Technically, this happens when an agent compares within a deliberation process her options and the consequences of her choices with her views, beliefs, intention and desires. The decision is only controlled if the person's values indeed determine the outcome. In O'Connor's account this is by definition not the case. The metaphysical part of the agent is, so to speak, just an observer of the agent's deliberation process. Because the agent is forced to make an indeterminated decision she cannot fully take into account the results of the deliberation process. So at some time she has to make her indeterminated decision. Surely the decision she makes will reflect some of the considerations. But by definition O'Connor's account precludes the decision from being the best decision based on the considerations and the agent's value system. Thus, the decision might not be violating the agent's value system completely, but the agent does not control whether the decision is the best decision. That must be the case, because the lack of determinating reasons leads automatically to chance, and the decision is a priori random!

So we see that even metaphysics does not help when terms are contradictory. Even a metaphysical entity must be guided by some kind of reasons in order to execute any control. Therefore even a metaphysical entity must set goals and determine actions to achieve these goals as we have shown with the example of the nuclear power plant. Then again the metaphysical entity acts in a determined way. If the metaphysical entity acts indeterministically, she acts randomly. It should be mentioned here that all considerations in this paper are generally based on the assumption of the correctness of substance monism. The reason for this assumption is that all the philosophers considered here are also substance monists. But even if we would take substance dualism into account the situation would not change. Let us for a moment assume that substance dualism were true and that an agent, (let us

say a person), were to consist of two substances, namely the physical body and a metaphysical soul. Let us further assume that the soul would have a say in moral decisions. Then the body would use its brain to execute a deliberation process. At the end there would be an outcome, namely a decision, which the body / brain would like to make. This would happen deterministically. Now the soul comes in and changes this decision. Even then, in order to execute some kind of control and to prevent chance, there must be something within the soul which now determines the soul's decision. Now we have the same situation as before. If there would not be a determining factor within the soul, and the soul were to change the brain's decision indeterministically, the soul's decision would, by definition, be random and not controlled! What we learn here is that no kind of ontology is stronger than the language. If we use terms for any kind of objects, might they be physical, mental or even metaphysical, we can never use terms in a contradictory way. If we do so our statements are a priori false.

The second account we would like to discuss is from Randolph Clarke (Clarke 2002, Clarke 2005). Clarke's account is basically 'agent – causal'. But in addition, Clarke also sees the free will decision based on a special event within the agent, namely an indetermined decision at the end of a deliberation process. Thus, Clarke's account is also 'event – causal'. That means that the agent considers, during a deliberation process, different arguments which again represent her views, beliefs, intentions and desires. Then, at the end of the deliberation process, an indetermined event happens, the decision. But it has to be emphasized that because this decision has to be indetermined, it cannot be the result of the deliberation process in the sense that after all arguments have been weighted one argument is the strongest and thus determines the decision. As pointed out, the decision has to be indetermined. But it is not just this indetermined event that makes the decision. The agent, as an holistic metaphysical entity, also makes the indetermined decision simultaneously with the event. It follows that in Clarke's account the decision is made by the agent and an event.⁸ So two entities make the free will decision simultaneously: one event within the agent and the agent herself, but both indeterministically. Now we have an additional contradiction. There are two causes for one event. This could be possible if the two causes were related and both would contribute to the outcome. Let us again use a physical situation. If a very weak and ill person were to catch pneumonia and pass away you could argue that both situations have caused the death of the person. If the person had not caught the pneumonia the person would not have passed away, at least not just at that moment. If the person had not been weak and ill she would not have passed away, either.⁹

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Consequently Kane classifies Clarke's account as agent – causal **and** event – causal.

But in Clarke's account the situation is different because no determination is allowed: either for the agent to make the decision, or for the event to make the decision. Both have to be indeterminated. But then these two decisions are not related, because analytically there cannot be any relation between indeterminated events. Both events are independent of each other, because, by definition, all indeterminated events are not dependent on other events. It follows that it can no longer be guaranteed, that the agent and the event come to the same decision! Even in an indeterministic account there is only one possible option: either the agent chooses indeterministically the event which causes the free will decision or the free will decision is indeterministically made by an event within the agent.

But anyway the question is if in one way or the other the decision is controlled. As mentioned above every libertarian assumes that there is a deliberation process preceding the will decision. So does Clarke. But the agent does not make the decision as the result of that deliberation process. The agent just makes an indeterminated decision. Thus in contrary the agent's free will decision determines, so to speak, a posteriori the reasons for the free will decision. Now the question is whether the agent in Clarke's account indeed has some control over the decisions, and if these decisions are not random. As we have seen, control requires by definition some kind of goals. A goal for will decisions could mean that they are controlled if they represent the agent's views, beliefs, intentions and desires. An agent's goal is to make all decisions consistent with her own value system. This is supposed to be in an optimal way, not just in an acceptable way. Technically, this happens when an agent compares within a deliberation process her options and the consequences of her choices with her views, beliefs, intention and desires. The decision is only controlled if the person's values indeed determine the outcome. In Clarke's account this is by definition not the case. The metaphysical part of the agent is, so to speak, just an observer of the agent's deliberation process. Because the agent is forced to make an indeterminated decision she cannot fully take into account the results of the deliberation process. So at some time she has to make her indeterminated decision. Surely the decision she makes will reflect some of the considerations. But by definition every agent – causal account precludes the decision from being the best decision based on the considerations and the agent's value system. Thus, the decision might not be violating the agent's value system completely, but the agent does not control whether the decision is the best decision.

^{*} But even in that example there is in principle only one cause. Here it is the pneumonia. The weak health state of the agent is just the circumstance in which the pneumonia, the true cause, causes the death of the person. Thus only one cause, the pneumonia, is the primary cause. Even if someone were shot dead by two bullets simultaneously a micro level examination would show that one bullet had hit earlier than the other one and would be the actual cause for the death. An exact analysis of every event shows that there is always just one cause, all other so-called causes are just circumstances.

That must be the case, because the lack of determining reasons leads automatically to chance, and the decision is a priori random!

So what happens when the decision is made by an indeterministic event within the agent? As expected, the indeterminism again leads to chance and lack of control. During the deliberation process the agent weights the different arguments for the decision. But again the decision has to be made indeterministically. And again there is nothing, which can control the decision, so the decision is random. If we apply Clarke's account to our example of the nuclear power plant the following happens. There are two sources which can initiate an action: a person (= the agent) and a computer program (= the event). If some critical values are measured and some deviations take place, then according to Clarke's account, the person and the program would initiate actions. But it is neither guaranteed that the actions are appropriate for the current situation nor is it guaranteed that the person and the program initiate the same action. Thus, everything that happens is totally random and not in the least controlled! For the nuclear power plant this would probably lead to disaster!

Clarke tries to avoid the contradiction by also bringing additional metaphysics into play. He takes an a posteriori stance and assumes that the decision determines the reasons for the decision¹⁰. First of all backward causation now violates the principles of the theory of relativity.¹¹ But anyway, if indetermined actions taken to 'control' the nuclear power plant really prevent the nuclear power plant from exploding that just happens by chance. If any random actions succeed one cannot justify these actions a posteriori. Control requires that the appropriate actions are initiated a priori. Consequently with Clarke's methods the power plant would probably explode! It might be the case that there are different reasons for different decisions and a posteriori one can say that the decision was reasonable, but again an a posteriori justification of any reasons cannot guarantee that the best reasons led to the decision. Consequently the decision might be reasonable, but it is random and not controlled.¹²

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^{*} Obviously he assumes that the agent and the event make the same decision. Actually it is not really understandable how metaphysics is supposed to guarantee the synchronisation of the two decisions!

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^{*} Certainly one could argue that the theory of relativity does not apply to metaphysics.

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^{*} If there were not determined actions initiated to guarantee that the power plant does not explode but the explosion was avoided by chance the public would not accept any claims that the carrier controlled the nuclear power plant. Backward justification of random actions just by results is a *contradictio in adjecto*.

Now let us have a look at Kane (Kane 2002, Kane 2005). Kane's account is not agent – causal: it is, in principle, event - causal.¹³ For Kane some indeterminated events within the agent cause the free will decision.¹⁴ The special point in Kane's account is that in contrary to most other accounts he does not see every will decision as indeterminated. Indeed for Kane the most will decisions are determined, namely by the character of the agent. So for will decisions to be free it is critical for Kane that an agent can choose her character by free will decisions. Kane calls these special decisions 'Self – Forming Actions (SFAs)'. The SFAs indeed have to be indeterminated which guarantees that the agent is responsible for her character. Kane calls this the 'Ultimate Responsibility (UR)'. All additional will decisions are then determined by the character, but they can be considered free because the character was chosen freely by the agent through indeterminated SFAs. For the SFAs, Kane claims that even if they are indeterminated, they are not random, and they are under control of the agent. In complete contrast to Clarke, Kane doesn't introduce any metaphysics, but he tries to give a scientific explanation of the indeterminated but controlled creation of the SFAs. He assumes that the brain is normally in a thermal equilibrium. In the case of conflicts when the SFAs are formed some chaotic brain processes take place and amplify some quantum uncertainties.¹⁵ Kane's major point is that the forming of the SFAs happens during some special moments in the life of the agent through indeterminated decisions. Kane gives as an example the situation of a business woman. The business woman is on her way to a meeting which is extremely important for her career. En route she witnesses an assault. Now she has a conflict. On one side she wants to help the victim of the assault, on the other side she does not want to miss the meeting because missing the meeting would hurt her career chances. Now she has to make a decision. Because both options would fit into her character Kane considers this decision to be indeterminated. Eventually the business woman will make a decision which now will in the future be specific for her character. It is necessary to emphasize that the decision is not the result of the consideration process, which would consequently determine the decision by weighting the reasons. Of course, a consideration process including the weighting of reasons occurs, but the decision is actually made in an indeterminated way. In

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Actually Kane classifies his account as 'teleological intelligible'. By this classification he emphasizes his endeavour to underpin his account with some scientific explanations.

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That means that Kane's account is not just teleological – intelligible but also event – causal.

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^{*} Obviously Kane refers to the classical interpretation of quantum theory which as mentioned above assumes that quantum events are indeed indeterminated.

addition, Kane claims that the business woman has control over that decision because of her effort.

Now let us look first in Kane's scientific explanation. Beside the fact that neuroscience does not know yet how exactly the brain processes occur on a quantum level Kane's initial assumption that the brain is in a thermal equilibrium is already wrong. The complex physical system 'brain' is far, far away from any thermal equilibrium. Thus Kane's scientific explanation cannot be correct from the onset. Actually, that is good for Kane! It should be pointed out that Kane's reference to the indeterminism of quantum theory now goes in the direction of our new methodology and helps us to show that there is a contradiction. As we have mentioned above, every event, which is considered to be indeterministic in physics and, especially in quantum theory, is simultaneously random and is simultaneously not controlled. That means that even if Kane's scientific explanation were correct he himself would prove that the forming of the SFAs would be random and not controlled. But in order to be fair¹⁶ we should ignore for a moment Kane's scientific 'explanation' and check his account for linguistic consistency and logical contradictions.

The first point is that the decision, which the business woman makes, is indeterministic. Both options would fit with her character. So she just chooses one of the options. Because there are no reasons, which determine the decision as the result of a deliberation process, the outcome, namely the free will decision, is random. The decision could be made either way. If there is a situation in which two options are possible but no option is favoured by more important reasons and finally one option is chosen this choice is random. The decision was just made by chance; the other option could equally well have been chosen. The fact that there are good reasons for both options is sufficient to say that a good choice might have been made but it cannot guarantee that the best choice was made.¹⁷ Can maybe the effort provide some control? Not at all! We can use our example of the nuclear power plant. For the operation of nuclear power plants the public demands high

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¹⁶ Fair means that Kane deserves an additional look at his account because the most other libertarians do not even try to bring their accounts in correspondence with scientific knowledge

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¹⁷ Actually that is indeed the experience we sometimes have. We think about something and can not come to a clear decision. Then we decide somehow spontaneously, or, so to speak, emotionally. Consequently we indeed would concede that our decision would be random and that we could have made a different decision as well. That situation and that feeling is in agreement with the understanding of the decision making process by neuroscience. Neuroscience assumes that even after a thorough conscious deliberation process in the cortex the final decision is always made by the limbic system, our emotion centre. Note that because the limbic system works unconsciously, all decisions by the limbic system are in reference to the cortex random and uncontrolled. The cortex can not consciously influence the limbic system, so the cortex can not control the limbic system. From the view of the cortex the limbic system behaves randomly.

security standards. This can only be achieved by sophisticated control systems. Is it sufficient if the operator of the nuclear power plant assures the public that he makes some effort? Certainly not! The operator must guarantee that he controls the nuclear power plant completely! That shows us that an effort is not sufficient to guarantee control. Control requires some goal settings and some action settings, which, in case of any deviations, assure that the appropriate actions occur to guarantee the safe operation of the nuclear power plant. Effort alone does not provide control: only determination of actions guarantees control. It is obvious that control does not just mean that someone is initiating an action. One can not say 'A person has control over an action because she initiated that action'. If that were the case, every action would be controlled by definition. Instead control means to determine actions that are sufficient to reach a goal. If an agent initiates either one action or the other but there is no reason for either one then none of the initiated actions can be called controlled. In the case of the business woman, one could argue that she has two conflicting goals. Whatever she decides, she reaches one of her goals. But in any case the decision making process is not controlled it is just random! Consequently it is important not to confuse the fact, that something is initiated by an agent and that it might be reasonable, with the fact, that this action is controlled by the agent. But actually this seems to be the critical point in the entire discussion. For Kane it is critical that free will decisions make people morally responsible. Therefore some level of control seems inevitable. Because in Kane's account the agent performs a free will decision if the decision is based on good reasons and brought about voluntarily by the agent, he calls this decision 'controlled'. He calls the combination of 'voluntary, rational and intentional' 'plurality conditions'¹⁸. But now he uses for the 'plurality conditions' the term 'control', which is in contradiction to the original denotation of 'control'. But such a new definition cannot be accepted by philosophy. If any arbitrary contradictory definition of terms would be allowed, then it would be possible to make every statement true just by changing the definitions of the terms involved. Then every account about every topic can be made true by definition and philosophy would become meaningless. Summarizing, one can say that also Kane's account fails because of contradictions in his use of terms. If the forming of the SFAs were indeed indeterminated, it would be random and not controlled, simultaneously. But even though, it will probably be reasonable.

The last account we want to consider here comes from Marius Usher (Usher 2006). Usher sees himself as a compatibilist, not as a libertarian. But he claims that his

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Instead of the term 'voluntary' the author would prefer 'unopposed' to avoid a kind of a circle, e.g. to define 'free will' using the term 'voluntary'

account of free will makes control compatible with indeterminism. His major objective is to deliver a 'proper understanding of control which he misses in both compatibilist and libertarian theories'. His starting point is a probabilistic framework. Firstly, he concedes that the laws of physics might be indeterministic and lead only to probabilities; secondly, even in the case of deterministic physical laws, he assumes that it might not follow from a physical determinism, that mental states are sufficient for uniquely determining decisions and actions. The reasons for his assumptions are, on the one hand, the realisation of mental states in physical states which in his view does not lead to determinism, and on the other hand, the probabilistic nature of the environmental causes. The solution he delivers is called 'Teleological Guidance Control'. In Usher's account human behaviour is guided by goals, which he calls attractors. He assumes that also in some physical systems, e.g. lightning, attractors determine the behaviour of the systems. In his account, also mental neural networks can build attractors. Consequently even in the case of indeterministic mental states and in the case of indeterministic environmental distractions and perturbations there will be control provided by goals. The goals as attractors guide the behaviour and the will decisions. Ultimately the goals and their teleological character are the reasons that decisions are controlled independently of determinism or indeterminism.

Usher's account is a good example of accounts in which philosophers try to impress by apparently using physical and scientific situations to confirm their theories. But very often the scientific examples are incorrect and show a lack of physical and scientific understanding.¹⁹ The first thing to mention about Usher's account is that in physical theories there do not exist any attractors. Attractors are mathematical entities, which can be used to describe special physical situations. However, an attractor only expresses an a posteriori epistemic view, not an a priori ontological cause! The behaviour of physical systems is guided by the initial configuration of matter and the forces between the material objects. Consequently it is just scientific nonsense to assume that attractors guide some physical behaviour. If there are no attractors to guide physical behaviour it is questionable if there can be neural attractors to guide mental behaviour²⁰. The next topic to discuss is his mindset in relation to indeterminism, which is supposed to help the libertarian cause. Here his opinion is divided. First he brings into play indeterministic

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* Philosophers who want to use scientific situations to support their accounts are deeply advised to check their scientific scenarios with physicists or other scientists. It is a little surprising that Usher uses some false scientific explanations although he is a physicist and works in neuroscience!

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* It will certainly be true that goals will have some kind of neural representation. These neural representations are then certainly involved in further neural processes which lead to decisions / actions. But the understanding of neuroscience is that everything happens in a deterministic way.

environmental perturbations. Again, this is just an epistemic feature, which is useless in a debate about an ontological entity like the free will. In the case of decision making the indeterministic environmental perturbations must be interpreted as the different reasons, which might play a role in the deliberation process. So far this indeterminism is only given in an epistemic way: it is not known at the beginning of the deliberation process, which arguments might lead to the decision. Secondly Usher is not convinced that physical determinism leads to determinism for decisions and actions²¹. But this would be exactly the understanding of physics and neuroscience, and normally, also that of compatibilists.²² So the first kind of indeterminism discussed here is just epistemic. The second kind of indeterminism then leads back to Clarke's account. Clarke also denies the complete reducibility of mental states to brain activities and brings the metaphysical agent into play. But if that is what Usher has in mind then again even a metaphysical entity cannot execute control if her decisions are not determined.

But can the 'Teleological Guidance Control' achieve anything at all? First we have to look again at the definition of the terms. We find out that the term 'control' is analytically connected with 'guided by a goal'. So 'Teleological Guidance Control' is a pleonasm. To prove that let us again take an example from physics. For illustration we can use again our previous example of a nuclear power plant. As explained in great detail above, control means that you have a system and first you define one or more values, which are typical or critical for the system and in which you want the system to be. It is the goal that the system works within the critical values. Now these values are constantly measured. If the values are out of a given range some actions are initiated to bring the values back to the desired quantities. Control means that every deviation triggers an action in a determined way. So what we learn again is that, in a physical system, control means to take determined actions to reach a goal. In other words: control must indeed be guided by a goal, control is by definition teleological, but this is only successful if you determine actions! Consequently you determine the actions with your goal in mind, but the goal itself does not do anything! If you set a goal and do not do anything else to achieve that goal, nothing happens or, if anything does happen, it is only by chance!

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²¹ Again this is a little bit surprising because Usher works in neuroscience. Neuroscience sees all will decisions as determined. Maybe Usher refers here to the assumption of neuroscience mentioned above that not the conscious cortex makes will decisions determined by reasons only but that the limbic system moves in to make indeed the final decision unconsciously.

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²² But maybe it is not the view of all compatibilists. Some compatibilists might argue that even if the physical world is indeed deterministic the behaviour of the human mind must not be deterministic. A lot of philosophers deny the complete reduction of mental states to physics. This might open the door to accept determinism for physical states which would include states of the brain but nevertheless allow mental states not to be determined.

Now we can transform these principles to the human mind. For will decisions this means that they are controlled if they represent the person's views, beliefs, intentions and desires in the best way. A person's goal is to make all decisions consistent with her own value system. Technically that happens when a person compares, within a deliberation process, her options and the consequences of her choices with her views, beliefs, intention and desires. The decision is only controlled if the person's values indeed determine the outcome. If the person would just set a goal, and not initiate an appropriate consideration process to achieve that goal, the goal could only be achieved randomly. If any indeterminism were involved, the result would again not be controlled and if the decision represented the person's value system this would only happen by chance. In conclusion, we can say that control is indeed goal oriented, but that only works if it is completely deterministic.

5. Summary and Alternative Definition of Libertarian Free Will

Summarizing, we can say that we have proven that the terms 'indeterminism' on the one hand and 'control' on the other contradict each other. We have also proven that every indeterministic event is automatically random. First we analyzed all terms involved on a logic and linguistic level. In order to check our results for correctness we have applied all terms to situations from physics. These situations have confirmed that our linguistic analysis was correct. Actually, that is what we had expected because the denotation of terms must be the same in physical language as it is in ordinary language. The same must be true for philosophical language. All terms in philosophical language must denote the same as in ordinary language.²³ Because the contradiction of the terms 'indeterminism' on the one hand and 'control' and 'not random' on the other already happens on a logical and linguistic level it happens in all imaginable situations independently of their ontological realisations. This means that every indeterministic decision is automatically always random and never controlled. However the claim of libertarianism is that all will decisions must be indeterministic and simultaneously controlled and not random in order to call them free. Because this claim is impossible to achieve no libertarian account can a priori ever be true.

But there is a back door, an escape route for libertarians! As mentioned above, even though libertarian free will decisions are random and not controlled they are probably reasonable! This happens because also in all libertarian accounts the decision is connected to a deliberation process. The temporary result of any deliberation process is the creation of different options for a decision. Because all

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^{*} Remember: Logic then says that every term in philosophical language must have the same denotation in physical language.

acceptable options are probably based on good arguments, which are in agreement with the agent's character, all options can be considered to be probably reasonable. If the agent now chooses one of the options as the will decision, even in an indeterministic way, the decision is probably reasonable, even though it is random and not controlled! This means that libertarianism has the option to adjust its definition of free will. So far the definition of free will included the requirements that free will decisions must be indeterministic on one hand, but also controlled, not random and reasonable on the other hand. If libertarians would drop their insistence on the requirements of 'control' and 'not random' and would be satisfied with just '(probably) reasonable, voluntary and intentional' (Kane's plurality conditions) then the will decisions can still be indeterministic.²⁴ In fact, this would mean that the definition of free will by libertarianism would now come very close to the definition of free will by compatibilism. For compatibilists will decisions are considered to be free if they are based on good reasons and are in agreement with the agent's character. Note that compatibilistic will decisions are not controlled either.²⁵ With the proposed modified definition of libertarian free will, the only difference would be that compatibilistic free will decisions would be determined and not happen by chance, whereas the libertarian free will decision would be indeterministic and random. But both kinds of decisions would (probably) be reasonable, would be based on good arguments, and would be in agreement with the agent's character. Additionally the new proposed definition for libertarian free will would come closer to the understanding of neuroscience. Neuroscience claims indeed that all will decisions are determined. But neuroscience believes also, that the cortex, where conscious deliberation processes take place, does not have the final say in decisions. Neuroscience believes that the final decision is made by the unconscious limbic system, the human emotion centre. With this understanding, determination does not include the rational deliberation process in the cortex only, but also all unconscious processes in the limbic system. Consequently the deliberation process alone can not determine the will decision. If this is included, a modified libertarian account could claim that a will decision deliberated in the cortex is indeed indetermined because the limbic system chooses one of the deliberated reasonable options in an uncontrolled, random, indetermined way. Because of the elements of rationality and using Kane's

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That libertarian will decisions are only **probably** reasonable due to the indeterminism involved doesn't really hurt. Even if will decisions are made deterministically it is not guaranteed that they are reasonable. Consequently deterministic and indeterministic will decisions might be probably reasonable in most cases, but both are not always reasonable.

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^{*} They are not controlled because they are determined by the deliberation process which is based on the character of the agent which again is determined by factors outside of the control of the agent.

‘plurality conditions’ it might be justified to call a will decision free even it is indetermined, uncontrolled and random. The will decision is initiated by the agent based on a deliberation process which leads to rationality but it is also initiated indetermined, leading to freedom.

The new definition of libertarian free will would then include the requirements that the will decisions must be indetermined and (probably) reasonable, but that they must also no longer be controlled and can be, to some degree, random.

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