
Free will and determinism

The latter half of Part I was principally concerned with questions about the physical possibility of failed attempts and of projects not undertaken. In this chapter and the next, we look at the complement of those discussions: at the supposed physical necessity of events that do occur.¹

We also broaden somewhat the compass of our investigations to include not only Necessitarianism but all theories that would vie with Regularity. I am especially concerned to challenge any theory – whether it be a Necessitarian theory, a Prescriptivist account, or any other Autonomous account – that alleges that what happens in the world ‘accords with’ or ‘is governed by’ physical law.

‘The’ problem of free will versus determinism is an artifact of the Autonomy Theory of physical laws.

Once upon a time, an immigrant arrived from Mars. He was a product of Martian culture, which, as we all know, means he was reared on the Regularity Theory. He had recently begun his graduate studies in philosophy, but he had been offered the opportunity to complete those studies on Earth, and he eagerly accepted. Here he enrolled in a joint program in ethics and psychology. But it was not long before he was experiencing some profound difficulties. Certain of the problems his professors addressed were thoroughly familiar to him, echoing as they did traditional problems addressed by academics and reflective thinkers at home on his distant planet. He could perfectly well comprehend questions about diminished responsibility, excusing conditions, the contrast between motives and causes, and the efficacy and justification of punishment.

¹ The one paper that has informed my thinking more than any other on this subject is Scriven’s “An Essential Unpredictability in Human Behavior” (1965), an important, unjustly neglected paper that deserves to be anthologized.

But other problems proved well-nigh incomprehensible to him. In particular, he was deeply puzzled why anyone would think that determinism posed a threat to free will and to one's being accountable for one's actions (some of them anyway). In his view of physical necessitation, according to his theory, that is, of what a physical law is, there was no tension, no conflict, between someone's being free and at the same time having her actions subsumable under one or more physical laws.

From time to time, persons with whom he discussed the problem characterized his position as "compatibilism." But this only deepened the Martian's frustration. He could perfectly well see why, for example, theories of certain Christian apologists might be called "compatibilist." To be sure, there is a *prima facie* tension in positing an all-good Creator and in admitting that this world is beset with evil. Reconciling those two views really did seem to him to be aptly described as "compatibilism." But the present case was different. It struck him as odd to call his way of looking at things "compatibilism." After all, one did not stick that particular label on his belief, for example, that doubts and itches should coexist.

Every attempt to explain 'the problem' to him sooner or later posited a class of physical laws to which the events of the world, including human (and Martian) actions, were supposed to comply. The vocabulary changed as different philosophers attempted to explain the problem. Some spoke of events being "governed" by these laws; others talked of events happening "in accord" with these laws; and still others preferred to say that "given these laws and the antecedent state of the universe, something other than what happened, could not have happened." In every case, one kept coming up against this troublesome set of laws.

The Martian remained baffled. Back home on Mars, philosophers certainly used to talk about physical laws, too. But they never seemed to be having these particular problems. As they conceived of laws, these problems did not even arise.

Finally, our local philosophers (i.e., Earth folk) asked the Martian to explain what his notion of physical law was and the nature of its relationship to human (and Martian) behavior.

At first the Martian was nonplussed. He certainly had not reckoned on coming to Earth to give a seminar. He was supposed to be here to learn. So he asked for some time to prepare himself, to try to put his own thoughts in order. He clearly was not prepared to explain why he

could not understand their problem. (One can *admit* incomprehension; but *explaining* it is far more difficult.) And so he spent the next few months intensively reading local philosophy trying to piece together our prevailing philosophical system, which generates so many puzzles for so many of us. Eventually, he thought he understood, and, with some trepidation, he offered his first seminar to his new colleagues.

THE MARTIAN'S FIRST SEMINAR

When I first undertook to learn English at home, my instructor warned me that you English speakers are sometimes perversely economical with vocabulary, that you will sometimes use one word to express two different concepts. For example, you here in Western Canada use the single word “know” to cover two different concepts, whereas we on Mars use “savoir” and “connaître.”² It would never occur to anyone at home that there is any commonality between these two concepts.

So it is, too, with your use of the word “law.” At home, we have a word “edict” that translates pretty closely into your language as an “order,” “proclamation,” “command,” or some such thing. We also have another term, which is unpronounceable among English speakers, but which would translate into a phrase such as “grand physical truth,” or something like that. An example of such a grand physical truth is the proposition “No mass travels faster than the speed of light.” Another example would be “The charge on an electron is 4.803×10^{-10} esu.” And still another is “Whenever someone runs, his heart rate increases.” Oddly enough, you English speakers call both proclamations and grand physical truths by the same name, “laws.” Back home, it would not occur to anyone to see much, if any, commonality between these two classes of things, still less to call them by the same name.

I suppose this latter difference in our languages is to be accounted for by the fact that we have had very different intellectual evolutions. For one thing, the religious bent of mind seems missing in the Martian. We never did have an Aquinas, a Suárez, or a Montesquieu who seriously promoted the view that what we call grand physical truths are God’s proclamations to

² [How extraordinary that Martians should use the same words as Quebecers. What are we to make of this? Sheer coincidence? Convergent evolution? Interplanetary telepathy? Or, perhaps there really were itinerant ancient astronauts, francophone ones at that. –N.S.]

moving objects, electrons, beating hearts, and the like. And thus we never needed a J. S. Mill or a Karl Pearson to point out the ambiguity in the use of the single word (“law”) to cover these two remarkably different cases.

All of you claim to understand the two different senses in which you use the term “law,” but, after turning the matter over for some months now, I have reluctantly been forced to conclude that you really do not keep the two concepts separate. So much of what you want to say about physical laws (grand physical truths) seems appropriate only for proclamations, orders, commands, and the like. Let me explain.

The prevailing picture among you is something of this sort: Given antecedent conditions and physical laws (grand physical truths), the subsequent behavior of things is determined. Oddly enough, we Martians *say* just about the same thing. But we do so for different reasons, and differ in what sense we give to the term “determined” that occurs here.

Many of you have a notion that objects behave “in accord with” physical laws. You have a notion that physical laws are something like causal agents, that, given these laws, physical things, both material objects and human agents, cannot but behave in the way they do. (One is tempted to say physical things “have no say in the matter,” but that would make the anthropomorphism so blatant that doubtless everyone would balk. But no matter how neutral you try to make this description, it does seem to me to be at heart an anthropomorphic account, a remnant perhaps from deepest antiquity, when it was quite respectable to regard all Nature as animate. But I digress, and this is obviously anthropological speculation of a pretty untestable kind.) Try as I might, I cannot free myself of the belief that you folks harbor a notion that together initial conditions and physical laws are coercive agents. Von Wright captured the flavor of this attitude perfectly when he offered this characterization of (ontic) determinists:

The statement that it will certainly be raining tomorrow can be understood ... in an *ontic* sense, meaning that the facts which are true of the world, together with the laws (“laws of nature”) regulating the development of the world, *determine* tomorrow’s weather in such a way that *it* is certain to be raining tomorrow.³ (1974, p. 21)

Von Wright has aptly summarized a position that is widely believed. I am sure it lies at the root of many persons’ thinking about the problem of free will and determinism. But it is not *always*

³ The odd emphasis on the word “it” arises out of a contrast, not here quoted, with another interpretation in which the certainty is epistemic and resides in *us*.

submerged and merely a presupposition. Some authors, particularly those analyzing the concept of physical law, have been forthright and have subscribed to this view quite explicitly. Witness:

Popper:

Natural laws set certain limits to what is possible... Natural laws *forbid* certain events to happen, ... they have the character of *prohibitions*. (1959a, p. 428)

Swinburn:

What happens is not solely a function of which laws operate. Laws state the subsequent effect of certain initial conditions, and what happens is a function as much of the initial conditions as of the laws.⁴ (1970, p. 4)

Reichenbach:

Physical phenomena ... do not always openly display the rules followed by them; but physicists have been able to show that all such phenomena are controlled by very precise rules. (1954, p. 14)

Note the terminology: Laws (/rules) “set limits,” “forbid,” “have the character of prohibitions,” and “control physical phenomena.” And, “what happens is a function . . . of the laws.”

In a popular book, intended for lay readers, the physicist Heinz Pagels (1978) has written:

Genes just do what they are told to do by the laws of chemistry. (p. 110)

Looking for the natural laws is a creative game physicists play with nature.... the goal is finding the physical laws, the internal logic that governs the entire universe. As scientists search for natural laws the ancient excitement of the hunt fills their minds; they are after big game – the very soul of the universe. (p. 292)

Physical laws are ... unlike social “laws” which simply stipulate invariances. The difference between social law and physical law is the difference between “thou shalt not” and “thou cannot.” (p. 293)

The universality of physical laws is perhaps their deepest feature – all events, not just some, are subject to the same universal grammar of material creation. This fact is rather surprising, for nothing is less evident in the variety of nature than the existence of

⁴ Swinburn, note, assigns laws a dual role: of *stating* effects and of being themselves the *causal determiners* of events.

universal laws. Only with the development of the experimental method and its interpretative system of thought could the remarkable idea that the variety of nature was a consequence of universal laws be in fact verified. (p. 296)

The prose here is forgivably overblown in the way in which popularizations often are. Pagels, we may be sure, does not believe, for example, that the laws of chemistry literally speak. But if we disregard his picturesque metaphors, we are still left with the same kind of notion evidenced in the writings of Popper, Reichenbach, and Swinburn: Physical laws, if they don't actually 'command,' at least *influence* behavior. In his words (above): "The goal is finding the physical laws, the internal logic that *governs* the entire universe"; "all events ... *are subject to* the same universal grammar of material creation"; and "the variety of nature ... [is] ... a *consequence of* universal laws" (italics added).

I do not believe that Popper, Swinburn, Reichenbach, and Pagels are eccentric in what they profess. To the contrary, I am sure that they have done no more than make explicit a view that is very widely subscribed to. Indeed, the view is *so* widely held and so familiar that Pagels can caricature it without having it appear utterly ludicrous. Nonetheless, this account of physical laws is importantly wrong. Physical laws simply do not have the kinds of properties or powers here being attributed to them.

A great many persons with whom I have spoken explicitly deny that they hold the view that I am suggesting is virtually pandemic. But their denials notwithstanding, I still think they do hold such views. I say this because their *examples* betray this very concept. For, on the one hand, they will claim that the 'necessity' assigned to physical laws is not ontic, but epistemological, that it reflects a privileged status of a certain class of propositions in our (current) corpus of science; whereas, on the other hand, they will persist with arguing that there is a 'real' difference between, for example, it being an accident that no moa lives to the age of fifty, that there is no 40 kg diamond, etc., and it being a physical necessity that no massy object travels faster than the speed of light. In particular, they will argue that certain counterfactual propositions reveal the difference. "Even if there never is a meteor impact that cleaves a watery planet asunder, there *could* be; but there *could not* be a meteor that travels faster than light."

This difference they try to highlight may be said by them to be no more than epistemological, but in fact it usually goes deeper. That it does go deeper is revealed in another counterfactual claim they will make, namely, that even if we human beings *had never done science*, even if,

more extremely, we *had never even existed*, it would still be true that it would be merely an accident that no meteor ever destroys a watery planet, but it would be a physical necessity that no meteor ever travels faster than light. For such a theorist, the difference between the two counterfactual claims does not, then, ultimately rest on our knowledge of the world or on our doing science; it goes beyond to a real difference *in the world itself*. It would obtain even if we were totally ignorant of such matters; indeed, even if we were never to have existed.

But if we are not to adopt this standard account, what other is there? Let us see.

At an earlier time, philosophers used to worry about the threat that *logical* determinism seemed to pose for free action. Aristotle was troubled by its being true today that there would be a sea battle tomorrow (1963; *De Interpretatione*, section 18b17). If it were true today that such a battle would occur tomorrow, then it seemed *determined*, nay *destined*, that the battle would occur.

But gradually it became clear that the sense of “determined” at play in this case is no cause for concern. Its being true today that the battle occurs tomorrow does not cause, force, or coerce the battle’s taking place. It is rather that what happens tomorrow brings it about (and this is a *semantic* relation, not a *causal* one) that a certain proposition is true today, and always has been for that matter (see Ryle 1960; Bradley 1967; and Bradley and Swartz 1979, pp. 104-7). What necessity is operative here is just the necessity of the Principle of Identity; that is, it is necessarily true that if (and only if) a sea battle occurs tomorrow, then it is true today that that battle will take place. Note that even if there were any random events tomorrow, those random events would be *fully determined* in this just mentioned sense of “determined.” I grant, of course, that the concept of randomness is problematic, but we need not particularly concern ourselves with it here. (See “Randomness” in Pagels 1983, pp. 82-9; and von Mises, 1961.)

Obviously, the moral to be drawn is that logical determinism poses no threat whatever to freedom of action. Indeed, many future contingents have the truth-values they do today precisely because tomorrow I will freely choose to do something, for example, brush my teeth with Brand X toothpaste rather than Brand Y.

Doubtless, some of you will now be thinking that I have gone too far and am now begging precisely the very question at issue here, the question of how to reconcile free will with physical

determinism. For many of you have convinced yourselves that while *logical* determinism poses no threat to free action, *physical* determinism does, and that in what I have said about freely choosing Brand X, I have thoroughly confused the two senses of “determined.”

We are at last at the heart of the matter. On whose side does the confusion lie, on mine in treating logical and physical determinism alike, or on yours in thinking them to be importantly different?

Let me state it as forcefully as I can: The *only* difference between logical determinism – as it is usually depicted in traditional examples – and physical determinism has to do with the *generality* of the propositions involved.

I put it to you that the following two cases, one of ‘logical’ determinism and the other of ‘physical’ determinism, differ *only* in that the latter invokes a universal generalization.

‘Logical’ determinism

It is true today, that is, February 27, 2467, that the prime minister of Canada brushes her teeth tomorrow with BriteWhite toothpaste.

- ∴ On February 28, 2467, the prime minister of Canada brushes her teeth with BriteWhite toothpaste.

‘Physical’ determinism

A white precipitate is formed whenever a silver nitrate solution is mixed with a sodium chloride solution. (physical law)

Efrem is now mixing a silver nitrate solution with a sodium chloride solution.
(initial conditions)

- ∴ A white precipitate will shortly form.

The grand physical truth (physical law) does not force, coerce, or what have you, the events of the world. The sense in which it determines what happens is as gentle as that in the case of logical determinism (it is, in fact, identical to the latter). And logical determinism is more gentle by far than the softest breeze or the lightest feather. Physical determinism poses no threat to human behavior simply because it does not force or coerce or constrain or necessitate any behavior whatsoever, neither that of the most insensate lump of clay nor that of the most unfathomable dreamer among us.

The problem of reconciling free will with physical determinism is a chimera. *Nothing* acts ‘in accord’ with physical laws, not electrons, planets, or human beings. Rather, it is because, for example, all planets travel in elliptical orbits (we’ll pretend that they do) that the proposition that they do is a grand physical truth (physical law). Similarly, it is because human beings avoid pain (we’ll pretend that they all do), that the proposition that human beings avoid pain is a grand physical truth.

Traditional solutions to the free-will problem infrequently manage to elicit from you much conviction. Defining an action as “free” if it is not coerced, forced by torture, or extracted by threat, drug, hypnosis, etc., although exactly correct, certainly has not put an end to the controversy. This Hobbesian solution strikes most of you as at best only a partial solution, because, even of this class of actions, you are still inclined to say (or think) that they ‘take place under the sway of physical necessity.’

The stumbling block to a fully satisfactory solution to the free-will problem is the mistaken theory of physical laws. It is interesting and significant to note that, in the several-hundred-year history of the freewill debate, this has been the *least* examined feature.

A case in point: On February 9 and 10, 1957, twenty-four of the most respected philosophers and philosopher-scientists of that time met in a symposium in New York City to discuss determinism and freedom. (The proceedings have been published; see Hook 1958.) Although many of the participants wrestled with the question of whether any physical laws might be stochastic, or whether ultimately they are all universal, no one stopped to inquire about the analysis of the concept of physical law itself. The closest anyone came to even touching on the matter was Brand Blanshard, who asked what is the sense of “must” in “given A, B must occur” (Hook 1958, p. 4). Surprisingly, however, no sooner had Blanshard raised the question, saying that it cannot be evaded, than he dropped it altogether, hoping “you will not take it as an evasion if at this point I am content to let you fill in the blank in any way you wish” (p. 4). He never returned to his question. Later, Hempel briefly showed (pp. 158-60) how crucial it is to settle the issue, how very different theories of determinism result according to how one understands this “must.” But Hempel’s reply was just propaedeutic; the necessary enlightenment was not forthcoming, either from him or from anyone else in the symposium.

A second example: In a penetrating essay (“One Determinism,” Honderich 1979), Honderich reaches conclusions that he admits some others will find “intolerably dark”: “that one can only

act as one actually does” (p. 260); “that we cannot decide in ways other than we do” (p. 263); and, “that our actions are never free or voluntary” (p. 263). The error that leads to these conclusions occurs almost immediately at the beginning:

To say of a state that it had a cause is to imply, rather than assert, that the state was the effect of some sufficient set of conditions. *It will make no substantial difference* if one understands sufficiency in terms of constant conjunction or in terms of some stronger notion. (p. 245; italics added)

What Honderich thinks makes *no* difference, I maintain, makes *all* the difference.

Of course, seventeenth-century scientists were right to insist that there are physical laws. And of course, twentieth-century existentialists were right to insist that we are often, usually, free to choose. Freedom is no illusion. It is false that, although we ‘feel free,’ seeming even to experience freedom, deep down ‘behind the appearances’ we are constrained by physical necessity. The relationship between freedom and physical necessity has been utterly misconceived, and this for the reason that the relationship between anything’s happening and physical necessity has been misconceived.

Right now I am wearing a blue shirt. My wearing a blue shirt constitutes the *truth-grounds* of the proposition that I am wearing a blue shirt. My wearing a blue shirt *accounts* for that proposition’s being true. Colloquially, we are inclined to put the point by saying that my wearing a blue shirt ‘makes’ the proposition true. Yet this ‘makes’ is not a causal relationship, but a semantic one. It cannot possibly be causal because the truth of the proposition is not an event; it is not the sort of thing that *could* be caused.

But if my wearing a blue shirt does not cause the truth of the proposition, even less does the truth of that proposition cause or ‘necessitate’ my wearing a blue shirt. What *is* necessitated is only the identity proposition, “If the proposition that I am wearing a blue shirt is true, then I am wearing a blue shirt.” Aristotle made much the same point in the *Categories*. His writing “is in a way the cause of,” I take to be his denial that the relationship is genuinely causal, but is instead, as I have chosen to characterize it, semantic:

If ... [a man] ... exists, then the statement in which we assert his existence is true, and conversely, if the statement in which we assert his existence is true, he exists. But the truth of the statement is in no way the cause of his existence, though his existence is in a way the cause of the truth of the statement.⁵ (Aristotle 1963, sections 1015-20)

⁵ This particular translation is not that of Ackrill (Aristotle 1963) but occurs – unattributed – in Prior 1967. The anonymous translator in the latter case has produced much the more idiomatic piece of prose.

No runner, bullet, rocket, electron, or indeed any physical object, travels beyond the speed of light. That this is so ‘makes’ it a grand physical truth (physical law) that no massy object travels beyond the speed of light. The latter proposition does not ‘constrain’ massy objects, any more than the true proposition that I am wearing a blue shirt necessitates my wearing a blue shirt, or that its being true that a man exists necessitates or causes that man to exist. Events ‘make’ (but do not cause) propositions to be true; true propositions, even if they happen to be physical laws, do not necessitate events, either by themselves or in concert with other propositions.

There is a remarkable consequence of this conceptual reorientation that I am urging. It is this: It is partly up to us to decide what the grand physical truths (physical laws) of the world are. By choosing to do this rather than that, we ‘make’ it a timeless truth of this world that, in such and such circumstances, persons do this.

Beware. I am not saying that it lies entirely within our province to choose the grand physical truths of this world. But what I am saying is that it is not wholly outside our will, either. We are not straws driven by the irresistible winds of natural necessity.

All sorts of physical laws seem to be quite outside my sphere of influence. I cannot (I have tried) cause a friend to regrow a severed leg by waving my hands. Nor can I choose that it is a grand physical truth that human beings have three sets of adult teeth. Experience has shown me that this is the sort of world in which these things are not up for grabs, that no amount of willing and trying on my part will bring about these desired effects.

But the world is not totally beyond our control, and certain – indeed many – physical laws derive their truth from our choosing and doing certain things. Suppose I am faced with a unique situation: I am cast in the role of arbiter in the dispute as to whether or not this society should use merged-gender or sex-distinct mortality tables. Let’s suppose, further, that no one before or after me is ever posed this same vexious question. I choose that we will use merged-gender tables.

And by so choosing I make it a grand physical truth (physical law) that whenever *A*, that is, someone is posed this problem, he does *B*, that is, chooses that merged-gender mortality tables be used.

The number of physical laws is for all practical purposes infinite.⁶ Adopt the view that laws are nothing other than general statements of what happens, and one has the means to accommodate free will. Human beings (and Martians) – as a sheer matter of fact – have evolved to a sufficient degree of complexity that their behavior can be described only by a (potentially) infinite set of laws. This situation may be as utterly determined as one could like, in the sense that every action may be subsumable under one or more universal physical laws. But it also allows human choice. I am presented with a difficult decision. There are strong arguments both for and against choosing merged-gender mortality tables. I weigh the probable consequences; I reflect on my principles of fairness; I look at previous similar, but not precisely the same, precedents; I try to balance the cost-savings against the measures of outrage; and eventually I *decide*. Nothing *forced* my decision, although it was completely determined in the sense of being deducible from timelessly true physical laws and antecedent conditions. But note (and this is perhaps my most important point and shows just how antithetical the Regularity account is to the Autonomy account): If I had chosen otherwise, that is, had chosen instead that the sex-distinct tables should be used, that choice, too, would have been determined. That choice, had I made it, would have, too, been subsumable under a timelessly true physical law, and would have been deducible from that law and a statement of antecedent conditions. Clearly, I could not choose both alternatives; but I could choose either. And in choosing the one, I ‘made’ *it* the one that was deducible from physical laws and antecedent conditions. But in every sense in which one could possibly want, I was free to choose the other.

Doubtless the single, most paradoxical-sounding corollary of the Regularity Theory is this: If a person is in a unique situation and chooses *B*, then his choosing something else that is logically inconsistent with *B*, for example, *C*, is physically impossible; nonetheless, his choosing *C* may well have been unconditionally possible. The way to remove the seeming air of contradiction is to remember that, according to the Regularity account, “physically impossible” means nothing more or less than that such an event (e.g., choosing *C*) never, ever occurs. But *ex hypothesi*, this

⁶ [See Chapter 9. –N. S.]

is true; for remember as well that we have just stipulated that the situation in which the chooser opts for *B* is *unique*. It is logically impossible that he should choose both *B* and *C*; so whatever he chooses, the other would thereby become physically impossible. Still, he could choose – unconditionally – the physically impossible action if he wanted to. It is his choosing one of the two alternatives that makes the other one physically impossible. But he could choose either.

Note, finally, how much better the Regularity Theory is as a basis for doing ethics than is presupposing the Autonomy Theory. The perennial worry is laid to rest about whether “ought to have done *x*” (where a person did not do *x*) is logically compatible with “could have done *x*.” We want to argue that “ought” implies “can,” but you remain troubled about whether a person “really can” do *x* in those instances where he does not. Problems like these are idle in the Regularity view of physical laws. If you will give up your distorted view of physical necessitation, all these seeming paradoxes fall away, leaving a residuum of *genuine* problems.

What makes an action ethically neutral, praiseworthy, or blameworthy remains a challenge to spell out. But that such categories should rationally be applied to some acts is not in the slightest threatened by adopting the Regularity Theory. Indeed, we can see how it is easier on this account to attribute blame. Persons who are not coerced, who are not hypnotized, who are not drugged, etc., are ‘free’ to choose as they want.

Persons who are rational, who know well what the consequences of their actions will probably be, who are not forced or coerced to perform evil, but who nonetheless do perform evil, may with perfect appropriateness be blamed. In as strong a sense as one could possibly want, they did not have to do what they did. (Although, of course, what they did was *completely* physically determined.)

In short, all the standard ways we go about assigning excuses and blame remain precisely intact. We excuse persons who are irrational, who are too young to be able to anticipate the consequences of their actions, whose actions had unforeseeable consequences, etc.⁷ And we blame persons who could see the harm of their contemplated actions but who deliberately wreaked havoc anyway, etc.

⁷ How *do* children go about learning what the foreseeable consequences of actions are? By having enough experience of the world to see what typically follows upon what. Surely not in being able to detect an underlying necessity.

So far as we can tell, our actions are determined; many of them are free; certainly many of them are praiseworthy, and some others are blameworthy. Being determined, being free, and being praiseworthy or blameworthy are the happiest of bedfellows on the Regularity Theory of grand physical truths (physical laws). There is a tension among them only when you assume that physical laws are something like irresistible forces, compelling us to behave in certain ways. Instead, conceive of those physical laws that subsume our behavior simply as propositions deriving their truth from what we *do*. Give up the idea that physical necessitation forces events to occur, and the free-will problem is solved so thoroughly that it cannot even be stated coherently.



The Martian then sat down rather abruptly. He was exhausted. (For it is – you know – a grand physical truth, er, physical law, that persons raised in an environment of low gravity experience fatigue easily on planets of high gravity.) The chairman then invited the members of the seminar to adjourn for coffee. As they were filing out, some of the audience were heard to remark that they thought the Martian’s program of changing persons’ minds would, given time, succeed; others said they thought the program would fail; still others volunteered that the program was doomed.

Coffee was followed by a dinner of Alberta beef served at a buffet in the faculty club. Toward the end of the meal, a few at the table began to press the Martian on some of what he had said. They were especially concerned about his characterizing the problem of free will as arising out of a belief that physical laws were regarded as ‘coercive agents.’ They argued that they had never thought of the problem in quite that way and wondered whether ‘the problem’ could be given a less tendentious formulation. The Martian agreed with some of their points, admitting that his motive had been to contrast the two views in as extreme a way as possible. But he also insisted that the problem remained even if one were to try to construct a far less anthropomorphic view of physical laws. As they chatted, the Martian gradually regained his volubility and felt the need for a blackboard. So several of the dinner party repaired to a small seminar room in the faculty club, and over cognac and through cigar smoke, the Martian offered an epilog.

EPILOG TO THE MARTIAN’S FIRST SEMINAR

When I arrived here a few months ago and was first introduced to the problem of free will, I was struck by the apparently insuperable difficulty, within standard theories, of reconciling determinism with one’s ability to have done otherwise than what one did. Many writers have

explicitly addressed this problem, and some have argued – as I would as well – that no account of moral responsibility is viable that does not provide for one’s having been able to have done otherwise. Thus, Mabbott writes:

I remain convinced that moral responsibility requires that a man should be able to choose alternative actions, everything in the universe prior to the act, including his self, being the same... I do not see how anything clearer can be said than that we seriously mean “he could have done otherwise” categorically. If analysis fails to do justice to this; so much the worse for analysis. (1961, pp. 301-2)

The identical requirement has been insisted upon by H. D. Lewis:

We can only retain the ideas of obligation and guilt as properly ethical ideas, if we can also believe in actions which could have been other than they were although everything else in the universe had remained the same. (1952, pp. 615-16)

Why is this requirement so difficult to satisfy? What is there in your concept of something’s having happened that implies that that occurrence could not have been otherwise? There is no comparable problem within the Regularity Theory. What, then, is the precise source of the profound difference between the two theories? I set about trying to isolate that critical difference.

The intransigent problem within your theory is supposed to go somewhat like this: Either what happens is determined, or it is not. An event is determined if its description – or better, a statement to the effect that the event occurs – is logically deducible from a statement of antecedent conditions and a statement of physical law. But – it is alleged – if an event was determined, then it could not have but happened; that is, it had to occur, and hence one was not free to choose that it should occur. But if, on the other hand, an event was not determined, which is usually taken to mean that it was a random occurrence, then, again, one was not free to choose that it should occur. In other words, we are supposed here to have a classical dilemma, in which both horns preclude free choice.

Having come from a tradition in which it would not occur to anyone that determinism and free choice were incompatible, I was not much inclined to try to argue for freedom on the basis of free choices not being determined. Instead, I set about trying to find just what it is in your

conception of determinism that makes it so unsuitable for accommodating free choice. I had, that is, to find the unstated premises that would take one from “is determined” to “is not a free choice.”

Obviously, those who claim to find a problem of free will in the standard theory were not claiming that a 's doing not- P was logically impossible. This reading of the problem would have been grossly unfair. Surely, those who are troubled and think that determinism is incompatible with free will are not denying that a 's doing not- P is logically contingent.

The second possibility I explored was to see whether the necessity that is supposed to attach to the universal law is what, somehow, makes it impossible to have done other than what one did. This, on the face of it, is a more promising tack to take. But it, too, fails to generate the problem.

If we combine the Necessitarian's account with the Determinist's (and note that they are logically independent of one another⁸), we get the following scheme for a 's doing P , (where “ \Box ” signifies that the operand is nomologically necessary):

$$\frac{\Box(x)(Sx \supset Px) \\ Sa}{\therefore Pa}$$

That is, in the case of a 's doing P , there will exist both some nomological universal generalization and some singular proposition (statement of antecedent conditions) such that, together, they logically imply Pa .

It is very tempting to argue that the sense in which Pa could not have been otherwise devolves from the nomological necessity of the universal premise. That is, it is tempting to argue that the two premises above logically imply not just Pa , but something stronger, namely, $\Box Pa$:

$$\frac{\Box(x)(Sx \supset Px) \\ Sa}{\therefore \Box Pa}$$

⁸ Determinism says that every event is a second member in a sequence that is subsumable under a universal physical law; Necessitarianism, that every physical law is nomologically necessary.

Rescher, it would seem, subscribes to this thesis:

To explain a fact scientifically is thus to adduce reasons to show why *this* fact obtains rather than some one among its possible alternatives. This requires going beyond establishing that the fact *is* actually the case to showing that (in some sense) it *had to be* the case – that it was *necessary* and inevitable, that it should be so – or at least *probable* and “to be expected.” (1970, p. 11)

... a subsumption argument will transmit the necessitarian aspects of the laws to the derivative explanatory conclusion (1970, p. 12)

From *this* version of Necessitarianism, generating the problem of free will is virtually assured and but a minor further step. Nonetheless, we should resist seeing this as the source of the problem.

In attributing nomological necessity to the conclusion of an argument in which a nomological generalization figures as a premise, it would appear that Rescher is either committing a modal fallacy or implicitly informing us that what is generally a modal fallacy is not in the special case of nomicity. In general, that some proposition, ϕ , logically follows from a set of propositions, one of which is ‘necessary,’ does not make ϕ ‘necessary.’ For example, from the true, contingent proposition that John borrowed \$1,000 and from the necessary truth that \$1,000 is more than \$800, we may validly deduce the true proposition that John borrowed more than \$800. But, clearly, the latter proposition is *not* logically necessary. If nomological necessity is unlike logical necessity in this regard, if, that is, a proposition, ψ , that is nomologically necessary *can* induce necessity in the conclusion of any argument in which ψ occurs essentially, then we will need powerful reasons to convince us of this exceptional modal property. Rescher has not, so far as I can see, produced those reasons. Nor do I think that his claims about the ‘inheritability’ of nomicity comport with those of other Necessitarians. His particular views on this matter seem more idiosyncratic than representative of his school.

Necessitarians are committed to maintaining that whatever is logically implied by a nomological necessity is itself a nomological necessity. But Pa is not implied by a nomological necessity (i.e., $\Box(x)(Sx \supset Px)$) does not – by itself – imply Pa , and hence there is no inducement to regard Pa as being nomologically necessary. The source of the Determinist’s problem seems to be elsewhere.

A third possibility presents itself: If the antecedent conditions – Sa in our example – were themselves nomologically necessary, then one could, plausibly and validly,⁹ infer the necessity of the conclusion from the joint necessity of the premises. But from where could the nomological

⁹ The relevant inference rule would be:

$$(\alpha \ \& \ \beta) \rightarrow \gamma, \ \Box\alpha, \ \Box\beta \ \vdash \ \Box\gamma$$

necessity of the antecedent conditions arise? Only from the necessity of their (still earlier) antecedents and the necessity of (presumably) still other physical laws. Clearly, we have here the incipient generation of an infinite, or at least a very protracted, series of events stretching back into prehistory. We have a domino theory of nomological necessity: An event is nomologically necessary if any of its causal antecedents was. Two possibilities arise:

(i) At some time in the past, either a finite time ago or an infinite time ago, events *acquired* the property of nomological necessity. (Remember, if the universe is infinitely old, it will have infinite proper parts.) According to this alternative, at some point in the past the events in the universe ‘switched’ from being mere occurrences to being nomologically necessary. The trouble with this alternative is that it fails to explain why or how such a transition could have come about. (If this planet is held on Atlas’s shoulders, he has to stand *somewhere*; if this event is necessary because its predecessor was, the predecessor’s necessity has to come about from *its* predecessor’s.) The infinite regress cannot be arbitrarily terminated.

(ii) Events did not acquire the property of nomological necessity, but have always had it: from the very first moment, if the world had a temporal beginning; for all past eternity, if the world is infinitely old. The trouble with this second scenario, however, is that it conflicts with one of the principal tenets of Necessitarianism, namely, the idea that there is a very wide range of diverse – and incompatible – ‘initial conditions’ all individually consistent with the set of physical laws. Popper puts it this way:

Natural necessity or impossibility ... imposes *structural* principles upon the world. But it still leaves a great deal of freedom to the more contingent singular facts – the initial conditions. (1959a, p. 430).

Popper is here using the expression “initial conditions” not as it figures in the common parlance of scientists and engineers but in a specialized, extended, cosmogonical sense. Lacking a standard term, he has appropriated this term, and consequently what he writes may appear slightly misleading. There are, of course, no *initial* (first) conditions in an infinitely-old world. And Necessitarianism does not presuppose a finitely-old world. Clearly, a theory about the modal status of physical laws must be formulated to be neutral on the empirical question as to the age of the universe. When Necessitarians speak of wide-ranging possible diversity among ‘initial conditions,’ they mean that, among those possible worlds (finite or infinite) that share

the same nomologically necessary laws, wide variations occur from world to world in their respective singular historical facts (see Popper 1959a, pp. 433, 435). In short, Necessitarianism does *not* attribute nomological necessity to antecedent conditions.

Three possibilities, then, as to what the missing premises might be do not work. Whatever sense it is that is operative in “*a* could not have done otherwise than *P*,” it is neither logical necessity or nomological necessity. That is, “*a* does *P*” is neither logically necessary nor nomologically necessary (even if it happens to follow logically from a set of premises one of which is nomologically necessary). What, then, *is* the sense of “impossibility” operative in the theory that has it that “*a* could not have done otherwise than *P*”?

Let’s compare my suggested alternative with the standard view of the matter. Both theories would deduce the occurrence of *Pa* from the antecedent conditions and universal laws. The only *formal* difference between the two would lie in the fact that in one scheme the universal generalization would bear the modal property of nomological necessity, whereas in the other it would not. In both cases, the conclusions would be identical:

<p><i>Regularist</i></p> $\frac{(x)(Sx \supset Px)$ Sa <hr style="width: 100%;"/> $\therefore Pa$	<p><i>Necessitarian</i></p> $\frac{\Box(x)(Sx \supset Px)$ Sa <hr style="width: 100%;"/> $\therefore Pa$
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The sense in which “*Pa*” in the second case, but not in the first, “could not be otherwise” has nothing to do with anything that shows up in the formal machinery above. What makes for the impossibility in the Necessitarian’s case, and lack of it in the Regularist’s, has to do with the truth-conditions of the universal premises in the two arguments.

Consider, again, my choosing whether society is to use merged-gender or sex-distinct mortality tables. Suppose I have announced my decision, and the question arises of whether my uncoerced decision was truly free. Let’s see how and why the answer to this question will vary according to the two competing accounts.

According to the Necessitarian account, I – obviously – could not choose or change the antecedent conditions: Whatever antecedent conditions are the causal determiners of my choosing, they are temporally prior to my deliberations; that is, they are in the past relative to the

time of my deliberating and hence – at that time, the time of my deliberating – beyond my control. I cannot change the past. But neither, according to this theory, can I change (or choose) the physical laws ‘governing’ what subsequent effects are to follow upon (i.e., occur immediately after as a result of) such antecedent conditions. In short, there is *nothing* open to my choosing. I can choose neither the causal antecedents of my choice nor the physical laws governing the causal effects of such circumstances. In such a situation (which turns out to be *every* situation), there is nothing whatever to choose. Genuine choice, and hence free will, is an illusion.

The Regularity account concurs in only part of the Necessitarian’s analysis. The Regularist agrees that one cannot undo the past and that one cannot, therefore, at the time of one’s deliberating choose the antecedent conditions of one’s upcoming choice.¹⁰ But as to the second part of the argument, the Regularist disagrees. According to the Regularity account, one can (sometimes, at any rate) choose the universal law that is to apply in the case of one’s choosing. One does that, not by assembling all the laws (whatever that would mean) and selecting one, but rather simply by doing what one chooses to do. The physical law follows automatically or, as I said earlier, ‘semantically.’ Our doing what we do ‘makes’ some universal proposition(s) timelessly true and others timelessly false. We did have a choice, and by exercising it we selected the covering law. There *was* something in the situation that was open to us. In short, the missing premise in the ‘causal version’ of the problem of free will is the claim that physical laws have autonomous truth-conditions, that their truth does not derive solely and wholly from what happens, but that whatever happens does so in accord with physical laws.

We are free to the extent that we choose the grand physical truths that subsume our behavior. Or, putting this another way, we are free to the extent that the truths describing what we do derive solely from what we do. To the extent that the true statements describing our behavior have truth-conditions logically prior to what we do, to that extent our behavior ‘could not have been otherwise’ than to have satisfied these descriptions. If the physical laws of this world are autonomous, we are not free; if we are free, then the physical laws are not autonomous.

¹⁰ “Men make their own history, but they do not make it just as they please; they do not make it under circumstances chosen by themselves, but under circumstances directly encountered, given and transmitted from the past.” (Marx 1963, p. 15)

I want to emphasize that I am not drawing the contrast between the Autonomy and Regularity theories by saying that on the former account physical laws are ‘already true’ prior to their instances, and that on the latter account, physical laws ‘become true’ when they are (first?) instanced. This latter, Diodorean, theory has no role in these discussions. Logical priority is not temporal priority. According to both accounts, Autonomy (and hence Necessitarianism and Prescriptivism) and Regularity alike, physical laws are timelessly, or omnitemporally, true. When Necessitarians and Prescriptivists assert that a physical law has *logical* priority over an event that it governs, they do not mean (although it is true) that the law was true ‘before’ the event occurred; rather, what they are saying is that it was not the event – and others like it – that account for the truth of the law, but it is the other way around: It is because the law is true that the event (given certain antecedent conditions) occurs. The Regularist totally rejects *this* notion of logical priority.

On several critical points, the Autonomy and Regularity theories are in total agreement: (1) By hypothesis, I will choose *B*, that merged-gender mortality tables be used; (2) my choice is completely ‘determined’, that is to say, the sequence of my actions falls under, is subsumed by, one or more physical laws; and (3) those physical laws are timelessly true. The difference lies in our accounts of the nature of logical priority. Regularists insist that logical priority is just the semantic ‘truth-making’ relation: Events occur (and states obtain), and it is because these events occur (and states obtain) that certain singular and universal propositions are true. Propositions ‘take,’ as it were, their truth from what happens. Autonomists, that is, Necessitarians and Prescriptivists, have a quite different concept of logical priority. According to the common element of their theories, physical laws are true ‘logically prior’ to events; indeed, among the class of universal truths whose subjects are never, ever instanced (realized or actualized), some are true and others false. And it is because of the truth of certain of these universal propositions that the world is the way it is. According to Autonomy Theory, physical laws are true, and events – how shall we put this? – ‘conform to,’ ‘comply with,’ ‘are governed by’ these laws.

Terms such as “conformity,” “compliance,” and “governance” are anthropomorphic. Can the Autonomy Theory be couched in more neutral terms? Might it be described, less tendentiously perhaps, as the theory that events ‘accord with’ physical laws? I can imagine an Autonomist

saying: “It is not that one’s behavior must *comply* with the relevant covering laws **L**; it is just that, inasmuch as **L** are the relevant covering laws, then one *will* behave in such and such a fashion.” But this defense strikes me as being founded on an equivocation on the word “will.”

“One will behave in such and such a fashion” may be used to make a prediction or to issue a command (or both). But if it is not the imperative mood that is being invoked by the Autonomist in her saying “If **L** are the relevant covering laws, then one will behave in such and such a fashion,” then nothing whatever by way of explaining the mysterious relationship between a law’s being true and an event’s occurring has been offered. If “will behave” is meant *purely* as a prediction, then the Autonomist has failed utterly to explain *why* behavior ‘accords with’ physical laws.

What lies behind the attractiveness of the view that physical laws are, if not quite logically necessary, then nomologically so, is a venerable view about the nature of logical necessity itself. For centuries, philosophers have conceived of logical necessity as imposing constraints on the world. The world *had to be* such that two plus two equals four; that God *could not but* make moving planets travel in elliptical paths or in some other way; that it *had to be the case* that if Aristotle was a philosopher and Aristotle was a Greek, then someone was both a Greek and a philosopher. The world, it seemed, could not but ‘comply’ with *these* kinds of laws.

But even here, in talking of logical necessity, conceiving of the operative relation between a law and events as that of the latter *complying* with (the dictates of?) the former, and the former as ‘imposing constraints on’ (or coercing) events, states-of-affairs, etc., is a mistake. At the very least, it is no longer the only way of viewing the relationship.

With the availability of possible world semantics, one is no longer confined to an idiom in which logical necessity is made to appear as coercion. Logical necessity may now instead be regarded as universality of truth among possible worlds. “The number of sides of a square *has* to (i.e., must) equal the number of interior angles” becomes, without a trace of residual or implied coercion: “In all possible worlds, the number of sides of a square *is* equal to the number of interior angles.”

What sanctions, if not indeed prompts, thinking of physical laws as necessary, as having autonomous truth-conditions, is the picture that also portrays logical truths as having

autonomous truth-conditions, as being logically prior to events and states-of-affairs, and as setting constraints on what occurs in the world. But logical truths do not have these latter properties. Logical truths, like any others, that is, contingent truths, *take* their truth from the way the world is; they do not, as it were, *impose* their truth on the world. (See Bradley and Swartz 1979, pp. 58-62.) Consider the contingent proposition that hydrogen is more plentiful than helium. In some possible worlds, this proposition is true; in others, it is false. In every possible world, however, the truth-value of this contingent proposition is ‘determined’ by the way that world is; that is, those worlds in which hydrogen happens to be more plentiful than helium are worlds in which this contingent proposition is true; in all other possible worlds, this proposition is false. But now consider the results of disjoining first the one and then the other of the following two propositions to the proposition that hydrogen is more plentiful than helium.

- P_i Some persons are allergic to bee stings.
 P_{ii} It is not the case that hydrogen is more plentiful than helium.

The first of the two constructed disjunctive propositions, namely,

- P_{iii} Hydrogen is more plentiful than helium, or some persons are allergic to
 bee stings

will be true in all those worlds in which hydrogen is more plentiful than helium. P_{iii} will also be true in all those possible worlds in which some persons are allergic to bee stings. Together, these two sets of possible worlds do not exhaust the entire set of possible worlds, and hence the first, P_{iii} , of these two disjunctive propositions is contingent. Now the important point is that the identical account can be given of the nature of the relationship between the truth of the second of these two disjunctions,

- P_{iv} Hydrogen is more plentiful than helium, or it is not the case that hydrogen
 is more plentiful than helium

and the ‘facts’ that make it true. P_{iv} will be true in all those possible worlds in which hydrogen is more plentiful than helium, and it will also be true in all those worlds in which hydrogen is not more plentiful than helium. Unlike the preceding case, these two sets of possible worlds do exhaust the entire set of possible worlds, and hence P_{iv} is necessarily true. But the essential point is that the truth of P_{iv} ‘comes about’ in identically the same way as the truth of the preceding

contingent proposition P_{iii} , that is, by fitting the facts. The ‘direction’ of logical priority does not mysteriously ‘reverse itself’ for the necessary truth P_{iv} . The semantic truth-making relationship still runs *from* the world *to* the proposition. The necessary truth, P_{iv} , doesn’t ‘force,’ ‘coerce,’ or ‘constrain’ the world; no more so than does the truth of the contingent disjunction, P_{iii} . The only semantic difference, then, between a contingent truth and a logically necessary truth is that the latter is true in *more* possible worlds than the former. No difference in logical priority need be posited. But if logical necessity need not be conceived to ‘dictate’ the form of the world, then still less should nomological necessity be conceived to have such occult powers.

The theory that physical laws take their truth from what happens rather than that events ‘comply with’ physical laws is often dismissed in deference to the view that one must attribute to physical laws some kind of nonlogical necessity to solve the problems of, for example, counterfactuals, vacuously true conditionals, etc. If each of these requirements can be met within the Regularity Theory, and if abandoning the Autonomy Theory solves the free-will problem, then I think one has powerful reasons for switching theories.

Neither theory – neither Regularity nor Autonomy (the latter nowadays nearly universally advanced in Necessitarian raiment rather than in its older guise within Prescriptivism) – is clearly superior on all counts. The Autonomy Theory seems to match more closely ordinary notions of physical possibility. But even on that score, it has stubborn problems epistemologically: No one has ever succeeded in adducing a satisfactory empirical test for nomicity, and indeed there seems to be excellent reason to suppose that it is impossible in principle. But the more serious defect of the Autonomy Theory is its consequence that freedom of choice is an illusion. In this latter regard, in being perfectly compatible with there being human freedom, the Regularity Theory is clearly superior.

Somewhere back a few hundred years ago, you got a crucial piece of theory upside down. You have postulated the wrong order of logical priority between events and physical laws. There are not two different orders, one between ordinary, run-of-the-mill propositions and events, and another between physical laws (and logical truths) and events. What makes the proposition that I am wearing a blue shirt true is my wearing a blue shirt. What makes the physical law (under which my choice is subsumed) true is that I choose *B*. I am wearing a blue shirt, not because the proposition that I am wearing a blue shirt is true, but because I considered, and acted upon, the

facts that the shirt was clean, readily available this morning, and matches my blue trousers. Similarly, I choose *B*, not because it is true that whenever *A*, then *B*. I choose *B* because I have been requested to look into the matter of mortality tables, because I have thought about the two alternatives, and finally because *B* seems to me to be the better choice. Logical priority runs in one direction only: 'From' events (and states-of-affairs), 'to' propositions (whether they be singular or general, contingent or noncontingent). Logical priority does not mysteriously and unaccountably reverse direction – as the Autonomy Theory would have it – in the case of physical laws.

It is not too late to 'put the theory of physical laws right, but you will have to make some profound adjustments at its foundations. I commend that rethinking to you.