Lecture Notes on Free Will and Determinism

Update – Added Oct. 7, 2004

There are now additional books and papers of mine, expanding on the topics of these lecture notes, available online.

- For an expansion of the discussion of Sections 2-5 (Logical Determinism, Epistemic Determinism, and Modal Concepts) see "Foreknowledge and Free Will", in the *Internet Encyclopedia of Philosophy*.

- For more on the concepts explored in Section 4 (Truth, Possibility, and Necessity), see " ' The ' Modal Fallacy ".

- For more on the concepts explored in Section 6 (Physical [Causal] Determinism, Laws of Nature), see

    - *The Concept of Physical Law*, 2nd edition.
    - "Laws of Nature", in the *Internet Encyclopedia of Philosophy*.
    - "A Neo-Humean Perspective: Laws as Regularities".

Contents

1. Introduction and Conditions for Free Will

What does it mean to have free will? To have free will at least two conditions must obtain.

1. We must have two or more possibilities 'genuinely open' to us when we face a choice; and
2. our choice must not be 'forced'.

The concept of free will plays a central role in our thinking about the world, particularly in our apportioning praise and blame, and in our finding persons *morally responsible* for things they have done.

All sorts of conditions serve to diminish moral responsibility (and blameworthiness). We do not hold persons morally responsible for their actions when they are

- under the influence of a powerful medication having unexpected psychological effects

- very young (since the young are unable to predict [foresee] the consequences of their actions and may themselves not have mature concepts of right and wrong)

- delirious

- coerced, e.g. by someone putting a knife to their throats or a gun to their heads.

  (An aside: The French Existentialist philosopher, Jean Paul Sartre [1905-1980], who fought as a Partisan in the Second World War against the Nazis, refused to accept as an excuse for complicity, "But it was my life or theirs [i.e. the innocent victims of the Nazis]". Sartre argued that even under such dire circumstances, one is still morally responsible for one's actions and one is free to choose life or death, and that in some instances choosing life is an immoral choice.)

- physically forced by a person or thing of superior strength

The list of 'excusing conditions' has grown steadily over the years.

- For example, recently in a court case, a man was found not guilty of murder on the grounds that he was sleepwalking during the killing (including driving his car to the victim's house across town).

Many other 'factors' influencing behavior have been proposed:

- one's genetic makeup (over which one has no control)

- one's environment and upbringing (again over which one has little, if any, control)

- one's education which, at least in one's early years, is – again – beyond one's control

But when all these 'influencing' and 'controlling' factors are considered, is there any room left for the exercise of one's own freedom? Can one truly *choose*? Or is free choice, ultimately, a myth and/or an illusion?

The 1992 film, *Swoon*, recounted the notorious murder (1924) committed by Nathan Leopold, Jr. and Richard Loeb and its aftermath. (A thinly-disguised

account of the murder was also the plot of an earlier film (1959), *Compulsion*.) In the real-life case, the most famous trial lawyer of the day, Clarence Darrow (1857-1938), was engaged to defend the murderers. Darrow was not able to get the killers freed; he didn't even try: they had confessed. But he was able to keep his clients from receiving the death penalty. Indeed, Darrow never lost a client to the death penalty in his entire career. When Darrow defended persons accused of murder, he used a standard argument. He argued that his clients were not *morally responsible* for their actions. Here are some of his typical views (from his writings and speeches):

- "Every one knows that the heavenly bodies move in certain paths in relation to each other with seeming consistency and regularity which we call [physical] law. ... No one attributes freewill or motive to the material world. Is the conduct of man or the other animals any more subject to whim or choice than the action of the planets? ... We know that man's every act is induced by motives that led or urged him here or there; that the sequence of cause and effect runs through the whole universe, and is nowhere more compelling than with man."

- "[Man's] legs are levers with which he walks. His back is a lever, by which he is able to lift things, through the contraction of the muscles. His arms are levers which he uses in all the activities of life. There is nothing about him that anybody can find ... which isn't mechanical."

- "The principal thing to remember is that we are all the products of heredity and environment; that we have little or no control, as individuals, over ourselves, and that criminals are like the rest of us in that regard."

Clarence Darrow

Darrow was one of the most skillful orators of his time. Using arguments like these, he was able to convince every jury before whom he argued that his clients were not deserving of the death penalty.

(An aside – Darrow was also the lawyer for the defense in another of the most famous trials early in this century. In July 1925, John T. Scopes (1900-1970) went on trial in Dayton, Tennessee, for violating a recent (March 13) state law against teaching Darwin's Theory of Evolution in the state's public schools. The trial attracted international coverage and came to be known as "The Scopes 'Monkey Trial'". Scopes was defended by Clarence Darrow and Dudley Field Malone. The prosecution was led by the US former Secretary of State, William Jennings Bryan. Scopes was found guilty and was fined $100; but his conviction was later overturned on a technicality. On July 26, Bryan died of apoplexy. The law under which Scopes was convicted was not repealed until 1967 (only 30 years ago!). The trial, and especially the clash between Darrow and Bryan, has been dramatized in the excellent film, "Inherit the Wind" (1960). The film was remade in 1988 with a different cast.)

It is interesting to note that one of Darrow's biographers reports that although Darrow constantly insisted that his clients did not deserve blame, he himself was a very vain, prideful, man who thought that he, himself, deserved high praise. That biographer comments that Darrow never quite saw, or admitted, this inconsistency in his own views.

There is an illuminating and particularly disconcerting consequence of Darrow's views. If Leopold and Loeb were not morally responsible for their behavior, it was because of what others had done to them. But these others, in turn, were not morally responsible for what they had done, since they were the product of what had earlier been done to them. And so on, and so on. The argument works like a line of dominos, it is – in effect – the domino theory of moral nonresponsibility. If someone is to be regarded as not morally responsible for what he does because he is the product of someone else's actions, then, ultimately, no one is responsible for anything he/she does.

How compelling are the reasons to accept the first step of this argument? Is none of us morally responsible for his/her actions? Is freedom to choose, is some degree of moral responsibility, an illusion, a myth? What are the philosophical arguments that we are never free to choose? What are the opposing arguments that we are – at least sometimes – free to choose?

Some philosophers portray the situation as if there were only two competing views, in effect that these views exhaust the possibilities. They put determinism on one side and freedom (i.e. freedom to choose) on the other.

But his simple classification does not do the debate justice. There are other possibilities. For example, as have some other philosophers, I have argued in my book *The Concept of Physical Law*, that one can subscribe without contradiction to *both* of these theories: to determinism **and** to free will. I will try to explain, briefly, how I think that this is possible. (Such theories – that determinism holds **and** that we have (at least some significant degree of) free will – are called "compatibilist theories", and philosophers who subscribe to such theories are called "compatibilists".)

As we will soon see, there is not just one concept of determinism, but three: (i) **logical determinism**; (2) **epistemic determinism**; and (iii) **causal determinism**.

The first turns on the notion of truth; the second on knowledge, in particular on the consequences of God's foreknowledge, if there is a God; and the third on the belief that every event in the universe has a cause.

Only the third of these three kinds of determinism poses a serious threat to the existence of free will. But to see this, we need to see the logical flaws in the first two versions of determinism.

The first version of determinism, so-called 'logical determinism', is often called, alternatively, 'the problem of future contingents'. ("Logical" in the title is not meant

to contrast with "illogical", but instead refers to a particular concept of logic, namely truth itself.)

2. Logical Determinism (or, Logical Fatalism)

Here is Aristotle's problem of tomorrow's sea battle (reconstructed and considerably embellished).

> Two admirals, A and B, are preparing their navies for a sea battle tomorrow. The battle will be fought until one side is victorious. But the 'laws' of the excluded middle (every statement is either true or false) and of noncontradiction (no statement is both true and false), require that one of the statements, 'A wins' and 'B wins', is true and the other is false. Suppose 'A wins' is (today) true. Then whatever A does (or fails to do) today will make no difference; similarly, whatever B does (or fails to do) today will make no difference: the outcome is already settled. Or again, suppose 'A wins' is (today) false. Then no matter what A does today (or fails to do), it will make no difference; similarly, no matter what B does (or fails to do), it will make no difference: the outcome is already settled. Thus, if every statement is either true or false (and not both), then planning, or as Aristotle put it 'taking care', is illusory in its efficacy. The future will be what it will be, irrespective of our planning, intentions, etc.

Is it possible to 'escape' the sting of the conclusion of this argument? How might one argue against accepting the conclusion that planning (for the future) is useless?

There have been three ways that have been proposed to avoid having to accept the conclusion.

Proposal One: One might argue that propositions are not true in advance of the events described. Propositions 'become' true when the events described occur.

Objections to Proposal One: (1) When did it 'become true' that Bush won the 1988 election? When the votes were counted? When it was clear that he would win? When 'the deciding vote' was cast? (2) When did Germany lose World War Two? When the Allies' invasion force landed on the beaches of Normandy? When the British invented and were able to use radar against the German Luftwaffe? When Alan Turing and his team broke the German secret code? When ...? (3) Is it not true *now* that tomorrow copper will conduct electricity?

The questions in the preceding paragraph strongly suggest that it will prove problematic in the extreme to try to put precise times on the (supposed) occurrence of a proposition's 'becoming true'. Moreover, propositions, you'll recall, are supposed to be abstract entities, entities which do not exist in space and time; but if they do not exist in time, how can their properties change at some particular

time?

Another Objection to Proposal One: To argue that propositions about the future acquire a truth-value only when the described event occurs (i.e. in the future) will entail abandoning the law of the excluded middle: propositions about the future will not, then, have truth-values *now*, i.e. prior to the occurrence of the predicted event. Adopting Proposal One would require our creating a far more complicated logic. This is not to say that this proposed solution is completely without merit; but it is to say that we ought to try to find some other solution before resorting to such a major revision of logic.

What other ways might one, then, propose to avoid the conclusion of the argument about tomorrow's sea battle?

Proposal Two: Disjunctions (i.e. statements of the form "P or Q" [in this particular case "A wins or A does not win"] are true, but not the individual disjuncts (components, i.e. "A wins"; "A does not win").

Objection to Proposal Two: The proposal is terribly peculiar. We are inclined to say that a disjunction is true just because (at least) one of its disjuncts is true. If neither P nor Q is true, how can "P or Q" be true? And, further, just as in the previous case, this Proposal also entails abandoning the law of the excluded middle: while "A wins or A does not win" has a truth-value now, neither of the two propositions "A wins" and "A does not win" has a truth-value. So, once again, we would prefer a less radical solution.

Proposal Three: The truth of propositions does not 'make' events happen (occur).

Consider**:** My wearing a short-sleeved shirt today [Oct. 28] is what makes (the proposition expressed by) "Swartz is wearing a short-sleeved shirt on Oct. 28, 1997" **true**. It is not the other way round. Logical fatalism confuses the semantic (truth-making) order. It makes it appear that the truth of a proposition 'causes' an event to occur. It is, rather, that the event's occurring tomorrow 'makes' (but does not cause) the proposition to be true today. This is not 'backwards causation': the relation between an event and the truth of the proposition describing that event is not a causal relation whatever. It is a semantic relation.

The logic of the preceding paragraph can perhaps be made apparent by switching the example to one of speaking about the past rather than the future.

John Lennon was shot and killed in 1980. Let's suppose a group of ten persons is arguing about the year of his death. Alice says that it was 1976; Betty, that it was 1977; Cathy, that it was 1978; Denise, that it was 1979; Edith, that it was 1980; Freda, that it was 1981; etc.

Of the ten claims made, only Edith's is true. The other nine are false. Now ask yourself: Does Edith's making a true claim today (about the year of Lennon's death) account for Lennon's killing? Did Edith's asserting a truth today about Lennon's killing somehow or other 'force' Mark David Chapman to fire five bullets into

Lennon's chest? Of course not. Now what if the year of the discussion were 1975? Alex says, "Lennon will be killed in 1976." Bellamy says that it will happen in 1977. Charles, that it will happen in 1978. Damien, that it will happen in 1979. Eduardo, that it will happen in 1980. Frank, that it will happen in 1981. Graham, that it will happen in 1982. Etc. Of the ten discussants, one, namely Eduardo, gets it 'right'; the other nine make false predictions. Does Eduardo's true prediction (in 1975) somehow or other 'force' Mark David Chapman to fire five bullets into Lennon's chest five years later, in 1980? Of course not.

Similarly you and I can make all sorts of predictions – some true, some false, some on the basis of excellent evidence ("There will be a lunar eclipse on Sept. 19, 2499"), some on the basis of no evidence whatever ("Simon Fraser University will remove all tuition fees in 1999") – but those that are true do not 'force' the predicted events to occur.

The future will be just what it is going to be. None of us can change the future. But that does not mean that we do not have free will.

> I **cannot** change the future – by anything I have done, am doing, or will do – from **what it is going to be**. But I **can** change the future from **what it might have been**. I may carefully consider the appearance of my garden, and after a bit of thought, mulling over a few alternatives, I decide to cut down the apple tree. By so doing, I change the future from what it might have been. But I do not change it from what it will be. Indeed, by my doing what I do, I – in small measure – contribute to making the future the very way it will be.
>
> Similarly, I cannot change the present from the way it is. I can only change the present from the way it might have been, from the way it would have been were I not doing what I am doing right now. And finally, I cannot change the past from the way it was. In the past, I changed it from what it might have been, from what it would have been had I not done what I did.
>
> We can change the world from what it might have been; but in doing that we contribute to making the world the way it *was*, *is*, and *will be*. We cannot – on pain of logical contradiction – change the world from the way it was, is, or will be.
>
> — *Beyond Experience*, by Norman Swartz, Chapter 8, pp. 226-227.
> Copyright © University of Toronto Press, 1991.
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Objection to Proposal Three: *None.*

I personally think that Proposal Three is the best (and dare I say?, the correct) reply to the problem of Logical Determinism. Logical Determinism may *appear* to pose a threat to the existence of free will, but that is only because it misrepresents

the nature of the relation between a true proposition and the state-of-affairs in the world that accounts for that proposition's being true. It is the way the world was, is, and will be that account for propositions being true. It is not the other way round.

3. Epistemic Determinism (or, The Problem of Foreknowledge)

The following is the standard argument for Epistemic Determinism. It alleges to show that foreknowledge is incompatible with free will.

> If x knows that you are going to do (some action) A, then you must do A. But if you must do A, then you have no choice in the matter. Thus if x knows (beforehand) what you are going to do, then you have no free choice. Put another way: foreknowledge is incompatible with free will.

We will call this version of the Problem of Foreknowledge, the 'secular' version.

Often the argument is presented in its 'religious' version. In this second version, what is of primary interest to us is the relationship between omniscience and free will. For our purposes, I/we are neither assuming that God does exist nor assuming that God does not exist. We are simply examining the logical relationship between two concepts. (The puzzle occurs whether one is a theist or an atheist**:** Does foreknowledge preclude free will?)

> God is omniscient, i.e. God knows everything (that is true) about the past, the present, and the future. In addition (it has been claimed), God has given human beings free will so that human beings can choose between good and evil.
>
> But if God knows beforehand what you are going to choose, then you must choose what God knows you are going to choose. If you must choose what God knows you are going to choose, then you are not truly choosing; you may deliberate, but eventually you are going to choose exactly as God knew you would. There is only one possible upshot of your deliberating.
>
> Thus if God has foreknowledge, then you do not have free will; or, equivalently, if you have free will, then God does not have foreknowledge.

The religious version of the argument for Epistemic Determinism is more than just a theoretical curiosity. A number of Christians have accepted the argument, and in doing so, have proceeded to live their lives in a different manner than many others, including the majority of Christians. Philosophical arguments can, and sometimes do, have profound effects on persons' lives. When they do, we owe it to ourselves to assure ourselves that the arguments are genuinely sound.

Both versions of the argument – the secular and the religious – are valid (i.e. the premises logically guarantee the conclusion). But are the premises *true*? As we might suspect, they are not. But what, then, is the error? Where does the falsity lie? To answer these latter questions, we will need to make a detour to examine some logical concepts, those having to do with *possibility*, *actuality*, and *necessity*.

4. Interlude: Possibility, Actuality, and Necessity

4.1 Truth and Possibility

Everything that is actual (or actually true) is possible (i.e. possibly true).

We may ask an injured patient; "Can you (i.e. is it possible for you) to raise your arm?" If the patient then raises his arm, then that is proof-positive that it is possible for him to do so. (Note, however, if he does *not* raise his arm, that does not show that it is not possible for him to do so.)

Thus:

> Actual truth is a sufficient condition for possible truth. (I.e. whatever is true is possible).

And equivalently,

> Possible truth is a necessary condition for actual truth. (I.e. whatever is not possible is not actual).

(Put still another way: Everything that is [actually] true is possibly true; but not everything that is possibly true is [actually] true.)

Examples of possibly true propositions:

1. New Westminster, BC, is north of Bellingham, Washington.
2. Table salt dissolves in water.
3. Pierre Trudeau was the first Canadian to travel in a space capsule.
4. There are three times as many women in Canada as there are men.
5. $2 + 2 = 4$
6. All aunts are female.
7. Some pigs can levitate.

4.2 Truth and Necessity

A proposition is said to be 'necessarily true' (or 'logically true') if it is true under all possible circumstances. Examples of necessarily true propositions:

1. $2 + 2 = 4$
2. All aunts are female.
3. Whatever is blue is colored.
4. There are either fewer than 20 students in the room or there are more than

10. (This statement may be unobvious; but if you think about it you may come to see that it cannot be false.)

5. It is false that some triangle has exactly four sides.

Clearly, whatever is necessarily true is actually true.

> Necessary truth is a sufficient condition for actual truth. (I.e. what is necessarily true is actually true.)

And equivalently,

> Actual truth is a necessary condition for necessary truth. (I.e. whatever is not actual is not necessary.)

(Everything that is necessarily true is actually true; but not everything that is actually true is necessarily true.)

In short,

> Necessary truth is a sufficient condition for actual truth.

And

> Actual truth is a sufficient condition for possible truth.

Finally, just to make life difficult:

> Necessary truth is **not a necessary condition for** actual truth.

4.3 "I might do A"; "I do A"; and "I must do A"

When we consider the actions we take and the choices we make, we conceive of them as falling into three categories: (1) what we might do (i.e. that which is possible); (2) what we actually do; and (3) what we must (or have to) do (i.e. that which could not be otherwise).

	Possible	**Actual**	**Necessary**
Past	"I could have done A." "It was possible for me to have done A."	"I did A."	"I had to do A."
Present	"I could do A (now)." "I might do A	"I do A (now)." "I am	"I have to do A (now)." "I must do A (now)."

	(now)." "It is possible for me to do A (now)."	doing A (now)."	"I cannot do otherwise than A (now)."
Future	"I might do A (in the future)." "I can do A (in the future)." "It will be possible for me to do A."	"I will do A (in the future)."	"I will have to do A (in the future)." "I must do A (in the future)." "I will not be able to do otherwise than A (in the future)."

5. Epistemic Determinism (Resumption of discussion, following Interlude)

Terms such as (i) "possible", "may", "can", "could" (which signify *possibility*) and terms such as (ii) "must", "has to", "necessarily", "could not [or do] otherwise" (which signify *necessity*) are said to be **modal** terms. We will, for convenience, call the former class – those that signify possibility – "*weak* modal terms", and we will call the latter class – those that signify necessity – "*strong* modal terms".

In English (and in a great many other natural languages as well), it is common to express the relationship of necessary condition using a strong modal term (underlined in these examples) in the consequent of an if-then sentence.

- "If Paul has two sons and a daughter, then he <u>has to</u> have at least two children."

- "If you have pneumonia, then you <u>have to</u> have fluid in at least one of your lungs."

- "If you have a fever, then your internal body temperature <u>must</u> be greater than normal."

Now, each of the preceding, as ordinarily understood, is **true**. But they are misleading. They are stated in such a manner as to conceal, and indeed distort, their 'internal logic' (so to speak).

Let's look at the first of these: "If Paul has two sons and a daughter, then he has to have at least two children."

The antecedent of this sentence expresses a true proposition. (Paul is my brother and he does have two sons and a daughter.) Thus according to the valid inference rule (known as "Modus Ponens") which allows us to infer the consequent of any

true conditional statement whose antecedent is true, we should be able to infer: "Paul has to have at least two children."

Something is clearly amiss. While it is true that Paul *does* (in fact) have at least two children (he has three), it is false that he *has to have* three. He doesn't *have to have* any. He doesn't *have to have* one. He doesn't *have to have* two. He doesn't *have to have* three. He doesn't *have to have* four. Etc., etc. Put another way: There is no necessity in Paul's having any children, let alone having three. There is no necessity for Paul (just as there is no necessity for anyone else) to have at least two children.

There is something, then, seriously in error in the following argument (or inference):

> If Paul has two sons and a daughter, then he has to have at least two children.
> Paul has two sons and a daughter.
> ———
> Paul has to have at least two children.

The source of the logical error lies (as suggested above) in placing the strong modal term in the consequent, where it *appears* to 'modify' that proposition (the 'then-clause').

However, the logical role of the strong modal term is to modify the **relationship** between the antecedent (the 'if-clause') and the consequent (the 'then-clause'); its role is not to modify the consequent alone.

Although the following sentences are not especially idiomatic (stylish), they do at least reveal, far better than the preceding three sentences, the correct underlying logic of the claims being made.

- "<u>It has to be that</u> (if Paul has two sons and a daughter, then he has at least two children)."

- "<u>It has to be that</u> (if you have pneumonia, then you have fluid in at least one of your lungs)."

- "<u>It must be that</u> (if you have a fever, then your internal body temperature is greater than normal)."

I am not suggesting that we reform our sentences and learn to speak in this latter, stilted, fashion. What I am suggesting is that when we utter sentences of the form "If *so-and-so*, then it must be that *such-and-such*", we understand their underlying logic (in most cases) to be: "It must be that (if *so-and-so*, then it is *such-and-such*)."

Finally, we can apply these several logical niceties to the problem of Epistemic Determinism. Let's recall the argument that initiated this current discussion:

ORIGINAL Version of the Argument for Epistemic Determinism

Premise 1: If x knows that you are going to do [some action] A, then you must do A.

Premise 2: But if you must do A, then you have no choice in the matter (i.e. you will not be able to do otherwise than A).

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Thus: If x knows (beforehand) that you are going to do A, then you have no free choice (i.e. you will not be able to do otherwise than A).

Or, put another way:

Foreknowledge is incompatible with free will.

As should now be clear, the first premise – because of the way we ordinarily state necessary conditions – appears to be true. But if taken literally, at face value, as is being done in this argument, the first premise is **false**.

If, however, we take some care to express the first premise in a non-misleading way, so that it expresses correctly the underlying logic, then the conclusion above **does not follow from the (corrected) premises.**

CORRECTED Version of the Argument for Epistemic Determinism

Premise 1: It must be that (if x knows that you are going to do [some action] A, then you will do A).

Premise 2: But if you must do A, then you have no choice in the matter.

――――――――

Thus: If x knows (beforehand) that you are going to do A, then you will do A.

The supposed problem – that foreknowledge is incompatible with free will – disappears once the logic of the fallacious argument is corrected.

5.1 Concluding remarks about epistemic determinism

The notion that foreknowledge, and in particular God's foreknowledge, is

incompatible with free will is not a mere semantic trifle. It is not just word-chopping. For some persons, believing that God's foreknowledge is incompatible with free will has had, and for some persons will have, a profound affect on their lives.

Some persons who believe that there is an omniscient (i.e. all-knowing) God have accepted the fallacious argument which we have been reviewing, and not knowing that it is fallacious, have come to believe that they have no free will.

Others, also being beguiled by the argument, have – in believing that they do have free will – rejected the idea that there can be an omniscient God.

In both cases, these persons might have lived, or would live, rather different lives if they were to see that they have fallen victim to a subtle logical confusion. Sometimes logical errors do have the most profound, indeed lifelong, consequences for persons who do not perceive those errors.

> **Foreknowledge** no more 'forces' the future to be a certain way, than true reports in history books 'force' the past to have been a certain way.

6. Causal Determinism (or, Physical Determinism)

6.1 Paradoxes of Freedom

We will begin with two views that are so antithetical to one another that we can properly speak of them as being paradoxical. The problem is that many persons find themselves inclined to subscribe to **both** views (or, more exactly, to the premises and conclusions of both of the following arguments).

Argument #1 – There is No Moral Responsibility

Premise 1: Every action is either **caused** or **uncaused** (i.e. a random occurrence).

Premise 2: If an action is caused (recall Darrow), then that action was not chosen freely and the person who performed that action is not morally responsible for what he/she has done.

Premise 3: If an action is uncaused (i.e. is a random occurrence), then the person who performed that action is not morally responsible for what he/she has done.

> Thus: We are not morally responsible for what we do.

[Advanced material. Note: the first premise of the argument above is not the logically stronger premise "Every action is caused or every action is uncaused." This latter proposition is probably false. Modern, quantum, physics suggests that it is false. The argument above uses a much weaker premise, "Every action is either caused or uncaused." This latter premise is perfectly compatible with quantum physics. Compare "Every rectangle is square or every rectangle is non-square" with "Every rectangle is square or non-square". The former claim is false; the latter, true.]

The conclusion of this argument (that there is no moral responsibility) is unsettling, indeed for many persons, it is frightening. But, in addition to its psychological effects, there is a logical problem insofar as the foregoing argument seems to have presuppositions which are at odds with the following line of argumentation:

**Argument #2 - Causal Determinism is a Necessary Condition
for Moral Responsibility**

Premise 1:   Unless there are extenuating circumstances, persons are (to be) held morally responsible for their actions.

Premise 2:   Being unable reasonably to have foreseen the consequences of their actions is one such extenuating circumstance. (Recall that young children who cannot reasonably foresee the consequences of their actions are not to be held morally responsible for the consequences.)

Premise 3:   In order to be able to anticipate or foresee the likely (or even the remotely likely) consequences of one's actions, the world must not be random, i.e. the world must be fairly regular (or causally determined).

——————

Thus: Moral responsibility requires that there be causal determinism.

The conclusion of the Argument #2 can be put another way:

Causal determinism is [contrary to premise 2 of Argument #1] not only compatible with free will, it is a necessary condition of free will!

The 'logical tension' between these competing views is intolerable. There has to be some error somewhere in these two arguments.

My own view is that the error occurs in premise 2 of Argument #1. I will argue (below) that it is false that causal determinism makes free will nonexistent. (I will argue that both arguments are valid, but only the second is sound [i.e. all of its premises are true]. The first argument, while valid, has a false premise, thus making that argument unsound.)

For me to try to show this, I will have to examine more closely the concept of what it is for an event or an action **to be caused**.

6.2 Laplace's View

In his *Philosophical Essay on Probabilities* (1814), the French astronomer and mathematician, Pierre Simon Laplace (1749-1827) wrote:

> An intellect which at any given moment knew all the forces that animate Nature and the mutual positions of the beings that comprise it, if this intellect were vast enough to submit its data to analysis, could condense into a single formula the movement of the greatest bodies of the universe and that of the lightest atom: for such an intellect nothing could be uncertain; and the future just like the past would be present before our eyes.

By "all the forces that animate Nature", Laplace means "the laws of nature". And by "[knowing] the mutual positions of the beings that comprise it [i.e. Nature]", Laplace means "having a 'snapshot' description of the position and motion (at some instant of time) of every object in the universe".

This view – which, naturally, came to be called "Laplacian Determinism" – was widely adopted by many scientists and philosophers until early in the Twentieth Century. It is the view that the entire future course of the universe is 'laid out' as a consequence of two factors: (1) the laws of nature, and (2) the state of the universe at any one moment of time. Of course only a 'vast intellect' (presumably God) would be able to handle so much data; no human being, even with the largest computer available, could perform the calculation. Laplace's claim was intended merely to explain the 'principles' by which the universe operates; he did not believe, nor has anyone (that I know of since) believed that we human beings could perform the calculation.

But our inability to perform the calculation notwithstanding, the *philosophical* view remains: the future course of the universe, our own behavior (choices, actions, etc.) included, is completely determined by the laws of nature and the state of the universe at any one moment.

6.3 Example of a Scientific Explanation

According to Laplacian Determinism, in principle (although not always in practice)

whatever happens (whether physical, chemical, biological, social, economic, psychological, geological, etc.) is to be accounted-for by citing the **natural laws** of the universe and **antecedent (and sometimes prevailing) conditions**.

Let's look at an example (or more exactly, the sketch or outline of an example). We'll assume that your car radiator has cracked. (This example is a famous one, created by Carl Hempel.) How did that come about?

There are two kinds of 'components' in the explanation (the two that Laplace highlighted).

Natural Laws

1. The breaking strength of brass is ...
2. Brass contracts m% in having its temperature lowered from $+2^o$ Celsius to -6° Celsius.
3. Water expands n% on freezing.
4. The freezing point of water is 0° Celsius.
5. etc.

Antecedent Conditions

A. The radiator in your car is made of brass.
B. The outside temperature last night fell from $+4^o$ Celsius to -11° Celsius, and remained at that low temperature for 7 hours.
C. The car was parked in the driveway with no protective cover.
D. The car radiator was full of water.
E. There was no antifreeze in the radiator.
F. The radiator was sealed.
G. etc.

Conclusion

   The radiator cracked.

The same model (account) holds for human behavior. Suppose that John has brought Claudia a bouquet of flowers. How can we explain this behavior?

Natural Laws

1. Whenever persons of personality type G_{437} learn of a desire of their loved ones, they try to satisfy that desire.

---

2. etc.

Antecedent Conditions

A. John and Claudia are lovers.
B. Claudia has told John that she would like a bouquet of flowers.
C. John has the money and opportunity to buy a bouquet of flowers.
D. John has personality type G_{437}.
E. etc.

Conclusion

John buys Claudia a bouquet of flowers.

There seems – in this account of the way the universe 'works' – to be no opportunity for the exercise of free choice. (See premise #2 [above] in Argument #1, "There is No Moral Responsibility".) The Natural Laws are 'given' (i.e. not of our choosing); and the antecedent conditions, equally, are 'given' (i.e. not of our choosing). Our behavior is completely 'causally determined' by the laws of nature and antecedent conditions. There is no 'room', in this account (again, recall Darrow), it would appear, for free choice.

We need to probe more deeply. What **are** natural laws?

6.4 Prescriptive Laws versus Descriptive Laws

Examples of *prescriptive* laws:

- Keep off the grass.
- Anyone convicted of falsifying his/her income tax returns is liable for a fine of three times the amount owing.
- Don't cheat.
- In Canada, drive motor vehicles on the right-hand side of public roads.
- Honour thy father and thy mother: that thy days may be long upon the land which the LORD thy God giveth thee. (*Bible*, King James Version, Exodus 20:12)

Prescriptive laws:

1. are edicts	They are issued by persons or bodies with authority or power to do so.

2. are violable	They can be observed or broken. One is not forced to keep off the grass. One can choose whether to walk on the grass, even when there is a "Keep off the grass" sign clearly displayed.
3. carry incentives/ disincentive	Prescriptive laws will sometimes impose punishments for violation (see, e.g. the law above concerning falsifying one's income tax return); and (sometimes) they will offer rewards for compliance (see e.g. the last in the list above).

Examples of *descriptive* laws:

- F = ma (The magnitude of a force on an object is equal to the magnitude of that object's mass times the magnitude of that object's acceleration. Newton's Second Law of Motion.)

- $2H_2 + O_2 \rightarrow 2H_2O$ (Two molecules of hydrogen will combine with one molecule of oxygen to form two molecules of water.)

- Equal increments of sensation are associated with equal increments of the logarithm of the stimulus, or (putting this another way) the just noticeable difference in any sensation results from a change in the stimulus which bears a constant ratio to the value of the stimulus. (The Weber-Fechner Law, a[n approximate] law of psychology.)

- An organism is able to be in one of the states belonging to a family of semantically related mental states only if it is able to be in many of the others. E.g. If I can think the thought that "Jane loves John", I can think the thought that "John loves Jane". (The psychological law of Systematicity.)

Descriptive laws:

1. are factual truths, not logical ones	"The boiling point of sulfur is 444.6^o Celsius" expresses a factual truth. "Every number has a double" expresses a logical truth.
2. are true for every time and every place in the universe	There are no descriptive laws that hold just for the planet earth (or the Andromeda Galaxy, for that matter), nor are there any that hold just for the Eighteenth Century or just for the Mesozoic Era.

3. contain no proper names	Descriptive laws may contain general concepts, such as "mass", "color", "aptitude", "capital", "diabetes", "return on investments", etc.; but may not contain such terms as "the Fraser River", "the planet Earth", "$59.22", "June 18, 1935", "CBC", etc.
4. are universal or statistical claims	"(All pure) copper conducts electricity" expresses a descriptive law. Similarly, "51.2% of all human births are male" (if true) expresses a descriptive law. But "Stars exist" (although true) does not express a descriptive law: it is neither a universal nor a statistical claim.
(Advanced material – not covered in PHIL 100) 5. are conditional claims, not categorical ones	See, e.g., *The Concept of Physical Law*, by Norman Swartz, Chapter 2, pp. 14-36 . Second edition available online at http://www.sfu.ca/philosophy/physical-law/.

6.5 Laws of Nature

The term "laws" in "laws of nature" reveals the historical origins of the latter expression. At the dawn of modern science (in the 16th and 17th Centuries), when scientists began to discover the underlying orderliness of Nature, they explained this orderliness as being the handiwork of God. They believed that the 'principles' according to which the Universe operates were, just like the very existence of the Universe itself, a creation of God.

Thus, it was to be expected that they would identify these 'principles' as God-given laws. Early scientists in this modern period (beginning in the 16th Century) regarded these principles as prescriptive laws, but with one exception: the laws of nature differ from God's moral laws in that *laws of nature are non-violable*. One can, on this view, contrary to God's moral edicts, murder another person; but one can not violate any of God's Laws of Nature. One can not, for example, according to this view, defy the 'Law' of Gravity, or the 'First Law' of Thermodynamics, etc.

In time, this earlier view of the nature of Laws of Nature has given way to a more secular, non-supernatural (or more exactly, a non-theistic), conception. Since the mid- to late-19th-Century, the view (theory, if you like) of Laws of Nature has moved from conceiving of them as being Prescriptive edicts to conceiving of them as Descriptions of the Universe. Natural Laws, on this later, contemporary, account are regarded as forming a proper subclass of the class of true, factual, propositions.

As we saw above (in Section 6.4), Descriptive Laws are not 'just any' true propositions but are universal (or statistical) truths which contain no proper names.

Now, how does all of this bear on the problem of Causal Determinism and its supposed incompatibility with Free Will?

6.6 "The laws of nature are not of our choosing"

Recall the example (in Section 6.3) of John buying Claudia a bouquet of flowers. In discussing that example, I wrote:

> There seems – in this account of the way the universe 'works' – to be no opportunity for the exercise of free choice. ... The Natural Laws are 'given' (i.e. not of our choosing); and the antecedent conditions, equally, are 'given' (i.e. not of our choosing). Our behavior is completely 'causally determined' by the laws of nature and antecedent conditions. There is no 'room', in this account ..., it would appear, for free choice.

I chose my words carefully. In the first sentence, I wrote "seems"; and in the last, "it would appear". For, on that earlier occasion, I wanted merely to *present* the argument; I did not want to endorse it, or to say that I thought the argument correct.

Indeed, I think that that earlier argument is mistaken. And we now have sufficient philosophical and logical tools to address the problem.

I want to suggest that the claim in that argument – the claim that the Laws of Nature are not of our choosing – is a relic of the earlier view that Laws of Nature are God's inviolable prescriptions to the Universe.

If we **fully abandon** the view that the Laws of Nature are **prescriptions**, then the way is open for us to rescue the theory that Free Will exists.

6.7 Do Laws of Nature *Govern* the Universe?

Three centuries ago, and indeed continuing right into the Nineteenth Century, the standard view of Laws of Nature was that they are edicts of God, and that just as His moral laws *ought* to guide our behavior, the laws of Nature *do* govern all of the universe. The behavior of **everything** in the universe – from the tiniest subatomic particle, through to single-celled creatures, and on to human beings, entire societies, planetary systems, galaxies, and finally clusters of galaxies – is governed by the Laws of Nature. That is, everything that happens in the universe (except perhaps for God's occasional miraculous interventions) accords with the Laws of Nature.

In my book, *The Concept of Physical Law*, and in a number of articles, I have tried to show that the supposed changeover, beginning in the late-nineteenth century,

from the view that natural laws are prescriptions to the view that they are descriptions, was not carried through completely. Although a very great many persons say that they regard natural laws as nothing more than descriptions of the universe, they still harbor views that are appropriate only for a prescriptive theory.

One can find in the writing of many contemporary scientists and philosophers two claims which – I allege – are inconsistent with one another:

1. The laws of Nature are descriptions.
2. The laws of Nature govern the world (or, as it is sometimes expressed, whatever happens does so in accord with the laws of Nature).

There is something more than a little strange in these two views. The second would seem to be the proper companion to the view that laws of nature are **pre**scriptions, not **de**scriptions. How, we might ask, can a **description** govern the world?

Put another way, I think that the source of the problem of causal determinism and its supposed incompatibility with free will lies in the failure of many persons to fully shake off the historical view that laws of nature **govern** the world.

On a strictly descriptivist view, laws of nature do not **govern** the universe. To govern the universe, laws of nature would require unknown (dare I say, magical?) powers. Moreover, the view that laws of nature govern the universe turns the semantic theory of truth upside-down. It presupposes a theory which I think is, ultimately, unintelligible, namely an anti-Tarskian theory that propositions do not 'take their truth' from the way the world is, but rather 'impose' their truth on the world. We will do well to abandon this outmoded, supernatural, theory.

The way out of the puzzle about free will and causal determinism is to adopt a thoroughly modern view of natural laws, removed once and for all from its supernatural, theistic, origins.

6.8 Physical Determinism is No Threat to Free Will

Many persons (again, recall Darrow) who have argued that physical determinism poses a threat to the existence of free will are, I believe, still operating with the remnants of the theory that laws of nature are akin to inviolable prescriptions. They have dropped the Prescriber (i.e. God) out of their view of natural laws, but they still persevere with the view that laws of nature 'act like' prescriptions.

If, however, one adopts a thoroughgoing descriptive view of natural laws, the problem of free will **does not even arise**. On the view I am proposing, there simply is no problem of free will. We make choices – some trivial, such as to buy a newspaper; others, rather more consequential, such as to buy a home, or to get married, or to go to university, etc. – but these choices are not forced upon us by the laws of nature. Indeed, it is the other way round. Laws of nature are (a subclass of the) true descriptions of the world. Whatever happens in the world, there are true descriptions of those events. It's true that you cannot 'violate' a law of nature, but that's not because the laws of nature 'force' you to behave in some certain way.

It is rather that whatever you do, there is a true description of what you have done. You certainly don't get to choose the laws that describe the charge on an electron or the properties of hydrogen and oxygen that explain their combining to form water. But you do get to choose a great many other laws. How do you do that? Simply by doing whatever you do in fact do.

For example, if you were to choose(!) to raise your arm, then there would be a timelessly true universal description (let's call it "D_{4729}") of what you have done. If, however, you were to choose not to raise your arm, then there would be a (different) timelessly true universal description (we can call it "D_{5322}") of what you did (and D_{4729} would be timelessly false).

Contrary to the earlier claim – that the laws of nature are not of our choosing – I am here suggesting that a very great many laws of nature **are** of our choosing. But it's not that we reflect on choosing the laws. I don't wake up in the morning and ask myself "Which laws of nature will I create today?" No, it's rather that I ask myself, "What will I do today?", and in choosing to do some things rather than others, my actions – i.e. my choices – make certain propositions (including some universal statements containing no proper names) true and other propositions false.

A good example of the view I am advocating can be found in the proposition, attributed to Sir Thomas Gresham (1519?-1579) but already known earlier, called – not surprisingly – "Gresham's Law":

> [Gresham's Law is] the theory holding that if two kinds of money in circulation have the same denominational value but different intrinsic values, the money with higher intrinsic value will be hoarded and eventually driven out of circulation by the money with lesser intrinsic value.

(In effect what this 'law' states is that 'bad money drives out good'. For example, in countries where the governments begin issuing vast amounts of paper money, that money becomes next-to-worthless and people hoard 'good' money, e.g. gold and silver coins, and that 'good' money ceases to circulate.)

Why, when paper money becomes virtually worthless, do people hoard gold? Because gold retains its economic value – it can be used in emergencies to purchase food, clothing, flight (if need be), medicine, etc., even when 'bad' paper money will likely not be able to be so used. People do not hoard gold under such circumstances because Gresham's 'Law' forces them to do so. Gresham's 'Law' is purely descriptive (not prescriptive) and illustrates well the point I am making: descriptive laws are not causal agents – they do not force the world to be some particular way rather than another.

The manner in which we regard Gresham's 'Law' ought, I suggest, to be the way we regard all laws of nature. The laws of physics and chemistry are no different than the laws of economics: all laws of nature – of physics, of chemistry, of biology, of economics, of psychology, of sociology, etc. – are nothing more, nor anything less,

than (a certain subclass of) true propositions.

Perhaps you are beginning to see that I am offering the same sort of solution to the presumed problem of causal determinism that I offered above for the problems of logical and of epistemic determinism. The truth of propositions, whether singular (containing proper names) or universal/statistical (and free of proper names), does not force the world to be one way rather than another. The world unfolds, including our actions and choices. And whichever way it does unfold, propositions 'look after themselves'. They take their truth from the way the world is. They don't 'force' the world to be any particular way at all.

6.9 Concluding Remarks

The view of natural laws that I have just proposed is certainly not shared by all philosophers, indeed it is most probably not shared by the majority of philosophers. It is not, however, a unique view; there are other philosophers who argue similarly to the way I have.

What I ask my students is that they try to understand the issues and the sides in the debates. Your subscribing to one side or the other should come only in time, after you have had a chance to think through the issues as carefully as you can.

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