

LOGICAL AND NOMOLOGICAL OBSTACLES TO FOREKNOWLEDGE OF THE FUTURE

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Abstract. A famous puzzle called “Grandmother Paradox” is used to argue against the feasibility of traveling backward in time because of the logical and nomological problems such travel involves, and not only because we don’t have the technology to make it reality. The same kind of problems would be encountered in leaping forward in time and then returning to the time of departure. We argue that a similar family of problems also arise in our having foreknowledge of the future without making any time travel. We point to the mysterious consequences of having access to a being, say a machine or a psychic, that can have infallible knowledge of the future and conveys this foreknowledge to human beings truthfully, without any lies or distortions. The cause of the said mysterious consequences is the fact that such machines or psychics will raise the same kind of logical and nomological complications we encounter in time travel scenarios, and that is a strong reason why *infallible* foretellers cannot exist. We conclude that we can have foreknowledge of the future, *in principle*, only within certain narrow limits, if at all.

Keywords: Time travel • Grandmother Paradox • Laplace’s Demon • determinism • possibility conditions of foreknowledge of future.

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An intriguing puzzle called “Grandmother Paradox” is used to argue against the feasibility of traveling backward in time because of the logical contradictions and nomological absurdities such travel involves, and not only because we don’t have the necessary technology to realize it. Similar problems arise in the case of leaping forward in time with a time machine and then returning to the time of disembarkment. In sections I and II we overview these well-known problems with time travel of either forms.¹ In later sections we show that a similar family of problems would be faced in our having foreknowledge of the future without making any time travel.



I

Many of us have fantasized about traveling back in time and witnessing with our own eyes people, places and events of times past. Why don't we seem able to actualize this fantasy, which has captivated our imaginations in many novels, movies and TV series? Are there any real obstacles to travelling backward in time other than our currently lacking the necessary technology to realize it?

A paradox called "Grandmother (or Grandfather) Paradox", which is well known to Special Relativity Theory and contemporary philosophy of time, is usually used to argue against the possibility of traveling backward in time. Imagine that you have a time machine that can take you to the past. Let us say you go back to a time when your grandmother had not given birth to any child yet, or even better, to a time when your grandmother herself was still a child. You are carrying a very effective gun with which you are planning to kill your grandmother (whatever your motivation may be). Suppose you manage to murder your young grandmother. This means that your grandmother will never give birth to your mother. As a result, you will never be born to make that time travel. So, if you could materialize this backward travel in time and succeed in killing your grandmother, the following logical contradiction would arise in the world's history: You were both born and not born. Since no logically contradictory state of affairs can hold in the world — this is one of the pillars of our logical thinking, called "the law of noncontradiction" — no actions that would lead to contradictory states of affairs can be realized. Ergo, travel back in time is logically impossible. Time always "flows" forward for everybody and everything; there is no such thing as going back in time.

Isn't it possible to somehow circumvent emergence of such logical contradictions that are barriers to time travel scenarios? It seems there may be ways to go back in time without causing any contradictory situations. For example, you get on your time machine and find where your young grandmother is, but you lose your gun before you meet her; or your gun gets stolen; or when you pull the trigger, your gun gets hopelessly stuck; or you suffer a stroke when you are preparing to kill her; or a massive earthquake occurs and you try to save your own life, etc. etc.² Since in all of these and similar circumstances you will fail to kill your grandmother, and hence stop logically contradictory situations from arising, it might be thought that time travel to the past need not be blocked by the threat of logical contradictions.

But even if travel to the past seems permissible as long as no logical contradiction is caused, the air of paradoxicality still surrounds such travel. Imagine once more that you go back in time to murder your child grandmother. Because of the threat of logical contradiction, all your attempts to kill her will be frustrated — your gun will jam, the police will arrest you before you pull the trigger, there will be a huge earthquake, you will completely forget your aim to kill your grandmother, you will

kill someone else by mistake, etc. You will be prevented by all kinds of inexplicable and mysterious obstacles. Such bizarre obstacles will stand in your way not only whenever you attempt to kill your grandmother, but also every time you try to do something more innocent but would still prevent your being born in the future. For instance, no matter what you do, you will not be able to stop your grandfather from marrying your grandmother — even if you offer large sums of money to him, or threaten him with death, or you show him fake pictures of your grandmother made with the then-unknown photoshop technology to defame her. Not only that, but all your efforts to kill the grandmothers of your peers while their grandmothers are still children will have to constantly fail because of incredible stumbling blocks. Moreover, not only you, but anyone who will travel to the past to change the course of the future will experience similar unexpected “fiascos”, and they will return to our time utterly baffled. For, in our normal life, a person who is determined to kill a child and who has made sufficient preparations for it will generally succeed and not meet a barricade of inexplicable hindrances. So, those kinds of hindrances are nomological barriers to backward time travel, since they are not compatible with the nomological laws of nature.

Of course both logical contradictions and nomologically inexplicable situations will be prohibited if time travel to the past is absolutely forbidden by the laws of nature. Those prohibitive laws will not permit construction of time machines that would take us to the past. Could these laws that allow time to flow only forward but never backward be “the solution the universe found” to block logically impossible and nomologically anomalous situations?

II

As we have seen, backward travel in time can involve logical impossibilities and nomological oddities, hence would seem likely to be prohibited by laws of nature. How about travel *forward* in time, or more precisely, jumping ahead in time and then coming back to our present? In this kind of scenario, the traveler to the future jumps to the time, say, 50 years from now, and after spending some time there, jumps back to 50 years ago again.

This kind of travel in time raises similar problems to the ones in the Grandmother Paradox. Suppose you jump to 50 years ahead in time. There you meet a person who is the grandchild of your sister. Then, when you come back to 50 years ago, you attempt to kill your sister (for whatever reason), who is still a small child. If you manage to kill your sister, who is going to become the grandmother of the person you met when you jumped ahead in time, a logical contradiction will ensue: the grandchild in question will be both born and never born. If, on the other hand, to

dispel such a contradiction, every time you set off to kill your sister a run of foiling coincidences emerges, as in the case of the Grandmother Paradox — whenever you try to kill your sister, your otherwise fail — proof gun breaks, your sister mysteriously disappears, you get a heart attack, and so on — these will be nomologically bizarre events. You also experience similar series of coincidences whenever you try to destroy the causes of objects that you ran into after your 50-year jump into the future. For instance, no matter how hard you try, you will never be able to uproot or otherwise demolish the fragile sapling which will grow into a tree 50 years from now.³

Might it still be possible to travel back or forth in time without engaging in any activity that carries a logical or nomological threat? Suppose you went back to the past but never tried to kill your grandmother or to destroy a certain sapling which is to become a giant tree later. Thus, suppose during your stay in the past, you affectionately pinched your child grandmother's cheek or picked up a stone and put it one meter away. Could your shifting the stone, for example, later turn out to cause the death of your child grandmother if she stumbles on it and falls on her head? Her death would have to be blocked (just as your attempts to kill her with your gun has to be blocked) on pain of contradicting your existence: if your shifting the stone had caused death of your grandmother, you would never have existed to make that time travel. As long as you manage to stay clear of actions that would potentially generate logically or nomologically impermissible situations, there might seem no impediment, in principle, to your making time travel. However, there is no guarantee that someone who travels to the past or future will have no evil intentions like murdering their grandmother or attempting other logically or nomologically banned ventures. Such ventures would be preempted if the laws of nature forbid time travel completely, to preclude inconsistencies in the history of the world.

III

Even if the chances of time travel look dim, is it possible, at least in principle, to foresee the future without making any time travel? Consider the following thought experiment. Suppose some day a mysterious machine appears in Central Park in New York. There is a screen and a keyboard on it. Also attached to it is a plate that says "This machine can see the future". To check if this machine can really see the future, some passers-by ask it some questions about their future by using the keyboard, such as whom they will marry, or whether they will be able to get into college, or whether the investment they are planning will be a success. After many trials people become convinced that this mysterious machine makes absolutely correct predictions and can really foresee the future. Nobody knows how this machine does it. Some people — more likely, philosophers — claim that the universe is deterministic, and this

machine is nothing other than Laplace's Demon, which features in a thought experiment proposed by Pierre Simon de Laplace in the 19. century.⁴ Some others argue that quantum physics has found plenty of empirical evidence and important theoretical arguments (such as Bell's Theorem) for the indeterministic nature of the world at the micro level. Hence, they claim, this machine must know the future directly, without making complex deterministic calculations, unlike Laplace's Demon. According to them, this machine must somehow be "taking a peek" at the future and that's why its predictions turn out to be true.⁵ People name the machine "Magnificent Soothsayer (or Magnificent Fortune Teller)" (hereafter MS) but no one can explain exactly how it manages to tell the future.

In the meantime something very interesting happens. The deaths of individuals who have asked MS how they will die, come to take only the following form: these folks never die of avoidable or preventable causes.⁶ They die only as a result of causes that are absolutely out of their control. This group of people die, for example, of diseases which the medical science of their time lack any cure for, or get killed in cosmic or other catastrophes, or die of very old age. So, those who consult MS about how they are going to die generally live a longer life than those who don't ask MS about their mode of death. They soon find an explanation for why a person's asking MS how they will die extends their life span and guarantees that they don't die of simple, avoidable causes. Suppose I go up to MS and inquire about how I will die. If MS told me that I would die in a train accident, being a person who is afraid of death and who wants to live a long life, I would never travel by train from then on. Consequently, MS *could not foresee* in my future my death in a train accident. For, if it foresaw me die in a train accident and communicated that information to me, I could escape such an avoidable death by deciding to never take a train again and would thereby falsify MS's prediction. (Let us make the following assumption here: MS will never make false predictions or lie to the people who ask it what is in store for them. Its foreknowledge is infallible. Hence it is impossible to falsify its predictions.⁷) So, if MS is to remain infallible, it should not be foreseeing my getting killed in a train accident, which entails that there would be no such death in my future. And in order for my future to be free of any fatal train accident, I should either (a) *stop* making train trips for "no explicable reason" in the rest of my life, or (b) even if I continue making such trips, I should *not die* during any one of them. In either case, MS will not foresee and communicate to me my life ending in a train accident, and thus MS's being falsified will be fended off and its infallibility will be safe. In short, I will not die of causes which I can easily stay away from, just by inquiring MS about how I am going to die. MS cannot predict, for example, that I will die of mushroom poisoning, either. For, as soon as I hear MS make that prediction, I would keep away from mushroom foods for the rest of my life, in which case MS's prediction will come out false — and this can never happen as per our assumption. So, the assumption

of the infallibility of MS necessitates either (a) my inexplicably refraining to eat any mushroom foods following my inquiry of MS about how I die, or (b) my not dying of mushroom poisoning even though I continue to consume mushroom foods.

To sum up, by simply asking MS my mode of death, I increase my chances of living a long life, because I can only be dying of unpreventable causes like incurable diseases, huge catastrophes, and the like. The same is true for everyone who asks MS about the way they will die. By just asking MS how they will die, they too will guarantee that their death will not be from causes they could escape from, and hence their chances of leading a long life will be increased. Those who fail to ask MS their mode of death, on the other hand, will continue to die of normal causes, some of which are quite easy to avoid. The average life span of those folks will be about the same as the average life span of the individuals prior to the introduction of MS to the community. So, MS does not only have the extraordinary ability to foresee the future, but also performs the miracle of extending the life span of some members of the community.

Another thing is that the more details MS conveys to the inquirer about their death, for example, the longer they will live. If MS foretells someone that their death will be caused by being crushed under a building during an earthquake, but does not tell them the place and time of the earthquake, it will be difficult for that person to avoid such a death. But if MS has the capability to reveal information about the place and time of the earthquake, the person in question will be at some other place at the time of the earthquake and will thus save their life, in which case MS will be falsified — and we don't want an MS which can be falsified, because such an MS would be uninteresting for our purposes here.

Of course people can appeal to MS not only about how they will die but also about other issues concerning their future. For instance, I can ask MS if my upcoming marriage with the woman I love will be a happy one. If MS tells me that that marriage will turn out to be disastrous, then I would change my mind about marrying her, despite the deep love I have for her. (Given MS's strong credentials, perhaps my love will be supportive of my decision when she too hears MS's prophesy.) This means that, thanks to MS, people will be saved from making miserable marriages. What is more, just by asking MS what is in store for them, folks get protected from many diseases and accidents, making investments that they will regret, running into people that they don't want to see, buying defective goods, even going out of their houses without an umbrella and getting soaked in an unexpected rain storm, etc. etc. In short, by having access to MS, the community eventually becomes composed of largely of problem-free, content, healthy, long-living individuals. The more people ask MS to foretell their futures and the more often they do so, the more health, peacefulness and longevity will reign in the community — and people will agree that this soothsayer surely deserves the title "magnificent".

It's all well and good, but here is a puzzle: With what power does MS realize these miraculous changes in the society? How is it that an ordinary community turns into a kind of utopia just because it acquires one day a machine that can see the future? All MS does is to see the future and foretell it truthfully; where does its power to *change* people's future come from? In other words, what is the *causal mechanism* by which it is able to make changes in the course of people's futures? Isn't knowing the future⁸ different from altering the future? Isn't there a paradox here? Earlier we said that an explanation is found easily for why a person asking MS how they will die extends their life span and guarantees that they don't die of simple, avoidable causes is found easily. If death from a hiking trip lied in a person's future, for example, and MS saw that and told it to the person, then they would never go on a hiking trip again, which would result in the falsification of MS's prediction — *contra* our assumption about the unfalsifiability of MS's predictions. This counts as a kind of explanation of course, but it is not a causal explanation. What is missing is the causal explanation, causal mechanism, of how MS protects the person from dying during a hiking trip and thus extends their life span.⁹ This appears to be an insurmountable nomological puzzle indeed.

IV

It might be argued that it may be possible to resolve that puzzle. If I am fated to die in a train accident, even when MS reveals to me that I am going to die in a train accident, that is how my life will end no matter what I do. No paradox or puzzle need be involved in this: maybe after a while I will totally forget what MS had told me about how I was going to die, or stop caring about it, or I will be dragged on a train despite all my resistance, to meet my destiny there. Under any one of these circumstances neither MS's prophesy would be contradicted nor would my life span get extended. We can come up with similar scenarios for all the other predictions MS makes about my future.

Surely such scenarios may sometimes come true where an individual would be unable to escape their fate. But it would be implausible to suppose that people who ask MS what lies ahead for them will always experience forgetfulness or other misfortunes. If that were to always happen, our puzzle would then become this: How come individuals, after talking to MS about their future, invariably become forgetful or uncaring or meet with curious misadventures, so that MS's prophesy won't fail? How does MS, whose only capability is to accurately foresee the future, effect those changes in peoples' behavior or cause events that prevent their escape from their ill fates?

V

The following objection might be made against the derivation of the above puzzle. We said that, if MS were to tell me that, when I am at a certain location, a dangerous germ will enter my body and I will catch a terrible disease, I would do everything in my power to stay away from that location. The assumption here is that by exercising my free will I can choose to stay away from the location in question. But how do we know that humans have free will? If we are living in a deterministic universe,¹⁰ maybe there is no such thing as free will¹¹ and I am actually powerless to change my actions in the face of MS's predictions (and hence to falsify them). If we lack free will, then our supposition that we are able to invalidate MS's predictions is undermined — whatever is determined to happen, will — for this ability presupposes that we have free will. Once this presupposition is challenged, our puzzle about what causal powers allow MS to bring about the mysterious changes in the community disappears.

We don't think this objection can eliminate our puzzle. We can define 'determinism' as the view that states that every event or state in the universe is fixed uniquely, i.e. without alternatives, by the causes of that event or state.¹² We would claim that, even if determinism is true, what a person hears from MS about their future will be *among the causes* of that person's behavior. In other words, the predictions a person obtains from MS will be added as a causal factor to the set of causes which determine the person's behavior regarding their future. There is nothing incompatible with determinism in saying this.¹³ It would be unrealistic to think that what we learn from MS about our future would have no effect on our reactions, because it goes against all we know about the causality of human behavior. In short, even if our universe is deterministic, and hence we humans are kind of "robots" that lack free will, who are unable to defy the causal factors determining all our actions and behavior, we still have our puzzle in our hands. The fact that these robots or automata tend to (or are "programmed" to) desire to live long and avoid illnesses and other unpleasant situations is sufficient for our puzzle to persist. For how does it come about that when these robots (i.e. humans) consult MS to find out what lies ahead of them, their lives become remarkably trouble-free and their longevity increases? We are still puzzled about what might be the causal explanation, causal process underlying it, even under the assumption that our world is deterministic and disallows free will.

VI

Well then, what may be the solution of our puzzle? Can we not say that existence of a being like MS is highly unrealistic and speculative, and hence we don't need to bother to solve a puzzle premised on the assumption of its existence? Why not say

that the solution to this alleged “puzzle” is to say that an imaginary soothsayer like MS simply cannot exist.

In point of fact, this is exactly the conclusion we would like to establish. We think that a being which can foresee the future *and* can convey its predictions to us should be impossible.¹⁴ This impossibility is not obvious, however. True — we have never come across a being like MS either in Central Park or anywhere else. But this cannot be evidence that such a being is *in principle* impossible. Let us think: we can obtain very detailed records and knowledge of the past (in the form of photographs, sound tracks, finger prints, fossils, cosmic background radiation and so on). Why can’t we have “records from the future” (photographs, videos, etc.) and accurate knowledge of what lies in the future? Can’t we have an explanation of this *epistemic* discrepancy between the past and the future?¹⁵

We think the explanation can be found in the unacceptable implications of the assumption about the existence of a being like MS which has access to future. We can recapitulate our argument as follows:

- (1) Let us assume that there exists a being like MS which can obtain full and truthful information about the future and can relay this information to us human beings. So, if MS informs us that some event or situation will happen, that event or situation will definitely happen. Now suppose that MS informs some person *P* that an event *E* awaits for them in the future. If *E* is a dangerous or unpleasant event for *P* and *P* has the power to prevent *E* from happening, then *P* will prevent *E*. But in that case, event *E* will both happen (since MS has veridically foreseen it) and not happen (since person *P* will prevent its occurrence) in the future. This is a logical contradiction and there is no place for logical contradictions in the world. A way to block this contradiction is for *E* to never take place and hence for MS to never foresee it.
- (2) Thus events that are unpleasant for *P* and which are in *P*’s power to prevent cannot happen. More correctly put: Depending on the frequency with which *P* consults MS about their future, the number of undesirable events in *P*’s life will go down.
- (3) But MS couldn’t be responsible for the fact that the persons who (regularly) ask for predictions from it lead smoother and relatively problem-free lives than those who don’t consult MS about their futures, because MS lacks the requisite causal powers to do it. For, according to our assumption, MS has no power other than foreseeing the future of an inquiring person and relaying that information to the person. Ergo, existence of an MS is nomologically impossible. Consequently, either there can exist no beings like MS who can see the future, or, even if it can exist (in principle), they do not communicate what they foresee to humans — as in the case of God who knows the future but won’t communicate that knowledge to us.

This argument is of the *reductio ad absurdum* form. To reiterate, the solution we propose for our puzzle is to deny that a mechanism that unflinchingly sees the future and foretells people about their future is an impossibility. In other words, we have shown that existence of beings like MS is incompatible at least with the laws of nature we know of, and hence we are justified to assert they are impossible — instead of dogmatically denying their existence from the beginning. We have thereby offered an explanation, a grounding, for the epistemic asymmetry between past and future.

Let us underscore this asymmetry with another illustration. Suppose there were records of the future (say, video records) which display some future events which are yet to come. If, for example, I ran into a record that showed my getting killed in a train accident, I would stay away from trains for the rest of my life. But then I would have falsified the record. If there *existed* records of the future, falsifying them would lead to contradiction. At this point we can repeat, *mutatis mutandis*, the arguments we presented against the possibility of an infallible MS to deny the possibility of records of the future. Hence the epistemic asymmetry between past and future: there is no problem with our having records of the past, but records of the future are logically and nomologically problematic, and the reasons are similar to the reasons undermining the possibility of MS.

VII

So far we have argued for the impossibility of a foreteller which would transfer knowledge of their future to people who might want to change the undesirable occurrences in their future (whether by exercising their free will or as a matter of their “programming” in a world without free will). The following objection might be made against our claim. If MS reveals to people only what is desirable for them in their future and hides what is undesirable, our puzzle will disappear. Since people will not want to change the favorable predictions of MS, there would be no contradictions or nomological anomalies arising. Therefore, so the objection goes, an MS that informs people only about the future events that are considered by them favorable (or harmless or unavoidable), and withholds unfavorable future events from them, or an MS that is itself unable to foresee unfavorable events, should in principle be possible. The point of the objection being that our argument to the effect that the future can *in no way* be foretold is mistaken; under the conditions just laid down, there is no reason that the future cannot be foretold by MS or by a perfect medium without any logical or nomological barriers.

Our reply to this objection would be as follows. First of all, let us emphasize that we are more interested in the question of whether humans can elicit knowledge of the future from a being that can have flawless knowledge of it, than whether

such a being could exist. An MS which would foretell us only the happenings in our future which we would find favorable or neutral would be one that *selects* or *censors* what it foretells us. But in order to do that, it needs to have a grip on the notions of “favorable” and “unfavorable”, which are notions that belong to and are invented by humans. We cannot expect nature itself to forbid MS to find out about unfavorable events in one’s future and permit MS to have access only to favorable events. Hence, if MS is to foresee the future, it must foresee all the events that will be regarded by an individual positive, negative or neutral. But seeing all kinds of events in an individual’s future and selecting only the positive ones to tell them while withholding negative ones, is not something that a “simple” fortune telling machine can do. Such an MS will have to have, in addition to having an ability to see the future, a capacity to differentiate what is desirable and what is not for a human being.

Moreover, such a selective MS will face insurmountable problems. (i) Some day a person may come up and try to foil even a prediction that is beneficial for them. This person may be someone who is curious to test if MS’s predictions are really correct or a wayward person who sometimes enjoys going against the grain. Suppose MS tells him that he will play the lottery this week and will win a large sum of money. He may obstinately refuse to play the lottery that week and to contradict MS’s prediction. We cannot claim that such people do not exist. If so, then the tasks MS has to accomplish expand: MS will need to foresee that a person will prevent a future event that is favorable to them, like winning the lottery this week, and in order to avoid being falsified, it will have to hide the person’s being destined to win the lottery from him. How can we expect MS, whose only talent is to see the future, to handle such delicate tasks that must leave no room for error? Moreover, if humans really do have free will, our MS will have to predict what the person will choose to do, and select what it foretells him accordingly. Or, alternatively, no matter how much he tries it, this person with a wayward character will be unable to forestall the favorable event in his future foretold him by MS; and while he attempts to forestall it, he will confront the kind of inexplicable obstacles similar to the ones a time traveler experiences when he tries to kill his grandmother. (For example, he will be threatened with death if he does not play the lottery that week.) (ii) Suppose person K_1 learns from the selective MS some event O will happen in his future and happily welcomes it. But this event O may be unwelcome by another person K_2 , and K_2 may hold the power to prevent O ’s occurrence. Under these circumstances, if MS is to let K_1 know that O is coming, then it must at the same time prevent K_2 from hearing about that prediction. This means that MS needs to have further extraordinary capabilities, such as being aware of people’s communication resources and possibilities, and blocking those possibilities when necessary. Or, sensing that people like K_2 (and some other people) might find O disadvantageous for themselves and attempt to prevent its occurrence, MS must hide the upcoming occurrence of O from K_1 (and those other people). In that

case, MS would have to apply a vast restriction on the amount of prophecies it could reveal to people, because, for any prediction favorable to some people, there will often be others who could manage to prevent its occurrence either by conscious or unconscious efforts. Another possibility: those who would want to stop *O* from occurring will never succeed in doing so no matter what they do. Either they will never find out that *O* is coming or, even if they do find out, they will completely forget it, or all their attempts to interrupt it will face inexplicable obstacles, etc.

VIII

Lastly, let us take a look at the following suggestion to rescue the in-principle possibility of MS. MS may make its predictions in such a vague and sketchy language — much as real fortune tellers in the real world do — that someone who hears the prediction realizes that the prediction was true only *after* the prediction comes out true. Thus suppose MS tells me “Some time during the next 5 years you will suffer a big accident which will leave you crippled”, there is not much I can do to evade that accident, because MS didn’t give me sufficient information about the specific place and time of the accident. At exactly what date and location will the accident take place and what kind of an accident will it be? Is it going to be a traffic accident or an accident at work or a misfired gun, and what part of my body will be damaged? So I can do nothing other than wait for this unpleasant event to happen. But when it really happens within the next 5 years and I am left crippled — for example when a heavy plank falls on my shoulder as I pass near a construction site and leaves me permanently disabled — it downs on me that MS’s prophecy did come out true. So, an MS that relays people its predictions with a sufficiently vague and loose language (and yet without compromising on their truth) is in principle possible: this will lead to neither logical contradictions nor nomologically unacceptable consequences.

This kind of an MS could be one which sees the future accurately itself but tells people what it sees in an imprecise language lacking in specifics, or one that can only have a foggy and partial vision of the future.¹⁶ Of course we wouldn’t want to call such a soothsayer “magnificent” anymore; perhaps we would more appropriately call it a “Mediocre Soothsayer”. In order to increase the theoretical feasibility of MS, we may even drop our requirement that it makes absolutely true, even though vague, predictions, and imagine that it makes a low percentage — perhaps even 1% or lower — of successful (and yet higher than merely chancy) predictions. So, we wouldn’t hold it against such a mediocre soothsayer, if it tells someone that they will die of poisonous mushroom ingestion and the person falsifies this prophecy by keeping away from mushrooms for the rest of their life. For it is a soothsayer that (often) makes mistakes. It may now sound more appropriate to describe it as a “Vague

and Fallible Soothsayer". Nevertheless, this soothsayer would still be one which does have *some* capacity to see the future¹⁷ and it will not face the logical and nomological entanglements we saw in the previous versions of MS.

Let us sum up the results of our inquiry into whether it is in principle (if not technologically) possible to foresee the future. Yes, it seems possible in principle, but this possibility is only as much as the possibility of the vague and erring soothsayer. The kind of MS which can flawlessly see the future and truthfully convey what it sees to humans (and other intelligent beings) faces logical contradictions and invites nomologically absurd consequences. As we see, these logical contradictions and nomologically absurd consequences are of the same kin as those we saw in connection with time travel. These problems are similar in that both the time travel and the MS scenarios are marked by the necessity to block any logical contradictions and emergence of nomological absurdities as a price of blocking logical contradictions.

References

- Bem, D. J. 2011. Feeling the Future: Experimental Evidence for Anomalous Retroactive Influences on Cognition and Affect. *Journal of Personality and Social Psychology* **100**: 407–25.
- Davies, P. 2002. How to Build a Time Machine. *Scientific American* **287**(3): 50–5.
- Earman, J. 1986. *A Primer on Determinism*. Dordrecht: D. Reidel.
- Lewis, D. 1976. The Paradoxes of Time Travel. *American Philosophical Quarterly* **13**: 145–52.
- Øhrstrøm, P.; Hasle, P. 2015. Future Contingents. In: E. N. Zalta (ed.) *The Stanford Encyclopedia of Philosophy. Winter 2015 Edition*. <https://plato.stanford.edu/archives/win2015/entries/future-contingents/#BraTimSem>. Access: 22/07/2019.
- Peterson, D.; Silberstein, M. 2010. Relativity of Simultaneity and Eternalism: In Defense of the Block Universe. In: V. Petkov (ed.) *Space, Time and Spacetime*, pp.209–37. Berlin, Heidelberg: Springer.
- Skow, B. 2009. Relativity and the Moving Spotlight. *Journal of Philosophy* **106**: 666–78.
- Smedes, T. A. 2003. Is Our Universe Deterministic? Some Philosophical and Theological Reflections on an Elusive Topic. *Zygon* **38**: 955–79.
- Smith, N. J. J. 2018. Time Travel. In: E. N. Zalta (ed.) *The Stanford Encyclopedia of Philosophy. Summer 2018 Edition*. <https://plato.stanford.edu/archives/sum2018/entries/time-travel/>. Access: 22/07/2019.

Notes

¹For a more detailed discussion of some of those issues and more, see Smith (2018).

²That these kinds of events would circumvent logical contradictions in travel backward in time was first pointed out in Lewis (1976).

³Another paradoxical consequence of leaping-forward-then-backward in time is this. Suppose you leaped one year ahead and saw in a mathematical journal the proof of a difficult theorem. You carefully copied down the proof. Then you leaped one year back and let one

of your students write down the proof. Suppose then that the student submitted the proof to that journal and the proof got published in the journal. Now, you are not the one who proved the theorem; you simply copied it down without even understanding it. Neither is the student the one who came up with the proof; he too wrote it down without understanding it and submitted it to the journal. Then who actually discovered the proof? (Davies 2002, p.55).

⁴In the famous thought experiment of the 19th century French mathematician, physicist and astronomer Pierre Simon de Laplace, an imaginary being or demon (what we may today call Laplace's machine or computer) which operates in a Newtonian deterministic universe, can know the entire history and future of the universe to the minutest detail. If the precise position and momentum of every particle in the universe at time t is inputted as data to this demon, the demon could compute, by using its limitless power of data processing and computation and the Newtonian laws of mechanics, the position and momentum of every particle in the universe at any other time t' , whether t' is before or after t .

⁵Let us make two points here. First, we do not commit to any assumption as to whether the world is deterministic or indeterministic. In an indeterministic world, alternative possible futures can be represented with the branching-time model (see Øhrstrøm and Hasle 2015). In this model the future is determinate (though not determined) and unique (unlike in the many-worlds interpretation of Quantum Mechanics). Since we can assume MS to be "taking a peek" into this determinate future, rather than calculating the future like Laplace's Demon, it doesn't matter whether the world is deterministic or not as far as our arguments are concerned. Secondly, it seems that making a prophesy, say, by taking a peek into the future, commits us to the view that the present and the future both *exist* at any given time point, as defended by the Moving Spotlight Theory (see, for example, Skow 2009) or by the theory of "Block Time" (or "Block Universe") mentioned in our footnote 15. If the future does not already exist at present, an MS that operates by taking a glance at the future would seem to be infeasible.

⁶Except the ones among them who have suicidal tendencies or are totally indifferent towards death.

⁷Could it be possible to "fool" MS nevertheless? Suppose there is an apple and a pear in front of you and you ask MS to predict which one of them you are going to choose to eat within the next minute. But you have the following plan of action in your mind: if MS predicts that you are going to pick the apple, you will eat the pear, and if it predicts that you are going to pick the pear to eat, you will eat the apple. In case MS predicts that you will eat neither of them, or predicts you will eat both of them, you are determined to eat one and only one of them. Wouldn't MS then be falsified in each of these jointly exhaustive possibilities? And doesn't this example show that an infallible soothsayer is impossible? We think it need not show such an impossibility, because MS still has a way out of this quandary: *refusing* to make a prediction under these circumstances. MS will not be able to make any prediction, because all of the alternative predictions are closed to it, since I have planned to foil each one of them — just as a prediction that I will die in a train accident is closed to MS as I would foil that prediction. In cases like this MS can get out of its impasse by declining to make any prediction (by, say, having its screen black out or its fuse blowing).

⁸By the way, science can also know the future by making predictions. It can predict that if I continue to smoke this heavily I will die within 10 years, for example. But science cannot predict exactly what kind of effect this prediction will have on me (at least at the present

stage of science). Put in other terms, the predictions of science are not game-theoretic. The prediction of science has the form, “If you continue to smoke this much, you will die within 10 years”. Science would be ready to acknowledge that its prediction may turn out false in case I don’t continue to smoke heavily. But MS (and Laplace’s Demon) have to predict the future correctly and *unconditionally*.

⁹Unless we permit a very strange and extraordinary species of causation whereby we accept causal efficacy of events that will never occur. Imagine once again that I ask MS how I am going to die. If my death in a train accident *did* lie in my future, MS would let me know it and I would never take a train to travel from then on, and as a result I wouldn’t die in a train accident. Here the effect — which does occur — is my not dying in a train accident (despite my continuing to travel by train), and the cause of that — which never occurs, and hence is not foretold me by MS — is my death in a train accident. The causally atypical situation here is that a *counterfactual* chain of events (my death in a train accident, MS’s foreseeing it, conveying it to me, my avoidance of train travel from then on) results in an *occurrent* event (my not dying in train accident).

¹⁰The question whether MS must be included as part of a deterministic universe and what kinds of complications arise when it is or it is not included is an interesting question on its own, but since those issues are not directly relevant to our concerns in this paper, we will not discuss them. The same issues are discussed also in the context of Laplace’s Demon in the literature. See, for example, Smedes 2003, pp.969–71.

¹¹Let us mention that there is a philosophical position called compatibilism, which holds that determinism and existence of free will are not mutually exclusive. Given our concerns in this section, we don’t need to get into a discussion of whether compatibilism is a correct view or not.

¹²Although it is not an easy matter to give a precise definition of ‘determinism’, the definition we gave above will do for our purposes. For the problems involved in precisely explicating the notion of determinism, see, for example, Earman (1986).

¹³If MS’s knowing the future is not, unlike Laplace’s Demon’s, by way of making calculations about the future states of the universe based on the present state of the universe, but somehow taking a peek into the future or by being a kind of time travel machine that can visit the future and then come back, then MS’s prophesies are caused by the *future events and states* of the universe. That is to say, MS is something that operates by actualizing “backward causation”, i.e. the kind of causation wherein something that occurs later in time causes something that occurs earlier in time: something that occurs in the future causes our obtaining knowledge of its occurrence today through MS. The concepts of backward causation and determinism do not exclude each other.

¹⁴We don’t want to claim here the impossibility of a God who can see the future. The important difference between God and MS in this context is this: we can’t ask God what awaits us in the future. At least, ordinary people who can’t communicate with God (unlike prophets and others who claim they can talk to God) cannot consult God about what future has in store for them.

¹⁵According to some views about time, there is no difference between past, present and future in an *ontological* sense. Past, present and future exist altogether on an equal footing, and have the same status with respect to their reality. That is to say, the future and the past are no less real than the present. This view, supported by the special theory of relativity and

approved by Einstein, is called theory of “Block Time” or “Block Universe” (see, for example, Peterson and Silberstein 2010). This theory pictures the universe as a 4-dimensional “frozen” block where time is a dimension integrated into the three dimensions of space and does not “flow”. In this model of the universe, the difference between past and present is only epistemic for us; so we can’t find records and remains of the future in the same sense as we can find records and remains of the past.

¹⁶Some very vague predictions can also be falsified. Suppose MS tells me that I will die of some disease without telling me which disease, I can commit suicide just to make its prediction fail, for example.

¹⁷Could at least some of the fortune tellers in the real world actually be vague and partially truthful soothsayers? Even if they are usually imprecise and often wrong, is it possible that they have a vision of the future at least to *some* extent? Daryl Bem, a psychologist from Cornell University, claims on the basis of experiments he conducted that even ordinary people have the ability to see the future, even though to a small but nevertheless statistically significant measure (see Bem 2011). If Bem is right, at least some of us may have the ability to foresee the future, although vaguely and with a small percentage of success. Bem’s results, which he has published in a respectable journal, have led to heated controversy.

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