Re: Models. predictions, physicallity, and observations

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From: jem (*xxx_at_xxx.xxx*)
Date: 03/07/05

Date: Mon, 07 Mar 2005 08:21:20 −0500

AllYou! wrote:

> "jem" <xxx@xxx.xxx> wrote in message news:LpEVd.92183$bu.70873@fed1read06...
>
>>AllYou! wrote:
>>
>>>"jem" <xxx@xxx.xxx> wrote in message news:zx_Ud.89657$bu.65695@fed1read06...
>>>
>>>>AllYou! wrote:
>>>>
>>>>>"jem" <xxx@xxx.xxx> wrote in message news:h7%Td.89049$bu.32479@fed1read06...
>>>>>

*>>Yes, re. observable world as anchor, but what's observed *is* what's*
>>real − nothing that's not observable (in principle) can be considered
>>real, and everything that is observable must be considered real.

> I don't believe that our difference on this issue is relevant to that about which we most
> disagree, however, to the extent that it's of any interest, I maintain that there is no
> way for a person to know if what they observe is real.

Sure there is − by *defining* that which is real as that which is observed. The only way Nature can be understood is by observing its effects, and it's been recognized that there's nothing to be gained by considering a broader "reality" than this.

Newton believed his laws related
> to the real world, but as we now believe, they were only an approximation. The world of
> natural phenomena was the same then as it is now (I think), so either he knew what reality
> was then, or he did not. And if he was wrong, what's to say we're not wrong?

Obviously the *view* of reality isn't static − new observations are made continually, and new views of reality can result.

> Moreover, how do you know that you senses are not betraying you? How do you know that
> your existence is not akin to the scenarios presented in so many si−fi movies recently,

> like the matrix?

Senses can't betray − you sense what you sense. That said, Physics tries to ensure objectivity in the reports of what's sensed (i.e. measured), by requiring repeatability. Don't confuse what's sensed with what's inferred from what's sensed.

> I've considered your argument, but I'm afraid that this is a philosophical issue upon
> which we've reached an impasse. There is only one reality, and we'll only know what it is
> whenever we know that we've uncovered every secret which nature hides from us. Until
> then, all we have is our perceptions of what we observe.

Well, what I said is the same as what you just said, except that I added that the clues for uncovering Nature's secrets come *only* from observations of Nature's phenomena.

>>Yes, that's not a good thing to do, but you're an offender in this
>>regard. You don't clearly distinguish between Nature and models created
>>to imitate Nature.

> I beg to differ. I've given detailed explanations here over the last few months that I
> believe that all we can do is to build models based upon what we observe. I clearly
> understand the difference to which you refer, and ask you to show otherwise. What is it
> that I've said in this thread which lead you to that conclusion?

Many things you've said have led me to that conclusion. Here's an obvious example:

"For instance, what is it that caused a clock to have lost *time* as a result of having gone on a trip at relativistic speeds? Well, too often the answer is the curvature of spacetime or that spacetime was in some other way responsible and that's the answer. But if spacetime is just a mathematical concept, then we've got the cause and effect backward. Spacetime is curved because of some natural phenomenon, and not the reason for the change in some natural phenomenon."

Clearly, you haven't recognized that "spacetime" is an element of a model. When "spacetime" is proposed as the cause of "lost time", the proposition deals strictly with the model and implies nothing about the "real world" (i.e. "spacetime" is not proposed as the cause of any "natural phenomena").

> However, I think you and others consistently refuse to draw the distinction between what
> we observe and mere concepts and dismiss any insistence for that distinction as a
> philosophical issue. I maintain that it's fundamental to the pursuit of science.

As illustrated by the example I just gave, you're the one who doesn't make the distinction.

>>And the mature interpretation of "understanding" coincides with
>>"predictability".

> Nothing I've said is inconsistant with that..

Your continued attempts to look beyond the measurements are inconsistent with it. The potential for additional understanding ends at the measurements.

>>>OK, I'll follow your lead down this road. That which is capable of stimulating the
>>>senses, or that which is capable of effecting that which can stimulate the senses, is
>>>observable, and that which is observable is physical, and that which is physical is
>>>external. We are passive recipients of these stimuli.
>>>
*>>>So the dividing line between *mere* concepts (which I call internal) and that which is*
>>>physical (which I call external) is whether or not that entity is capable, directly or
>>>indirectly, of stimulating the senses.

>>The notion of "stimulating senses" is too vague. Whose senses?
>>Stimulate how? E.g. dreams can stimulate senses, but I don't think you
>>mean to include dreams on your list of physical things.
>>
>>Physics deals with this issue more concretely by considering as physical
>>(i.e. the things of interest to Physics) only the (repeatable)
>>measurements that can be obtained (in principle) by instruments created
>>to react to the environment.

> And I maintain that's too vague. You've not closed the loop. Measurements of what?

There's no attempt made to give names to *what* is measured except in models created to mimic the measurements (where the "what's" have *defined* behaviors). There's no attempt made because it's been realized that it can add nothing to the understanding of what's going on.

It
> is not sufficient to declare something a physical by simply declaring that an instrument
> reacts to something without ever demonstrating the physicality of that something.

There is no *something* being declared "physical" other than the measurement itself − "physicality" is demonstrated by changes in the readings of measuring devices.

We're
> caught in a chicken and egg argument. What came first, the thing, or the measurement of
> it?

The measurement is all that is of interest to Physics − the "thing" is irrelevant.

Well in this case, the only reason to perform a measurement is to quantify something.
> Why quantify it? Because we're curious about it. And how did that happen? Because we
> sensed it in the first place. We observed it, we're curious about it, we measure it.

We don't measure an "it" that we're curious about. Our (i.e. Physics') curiosity is about the measurement itself, i.e. how measurements are impacted by changes in the environment to which measuring devices are exposed.

> Here's another try. If physics is a field of study, then what do we study? Do we just
> decide to perform random measurements and then see how all of that data fits together? Or
> do we study that which we've observed in order to understand it better?

A random process is one way (often a good way), or perhaps previous results may suggest a narrower focus. What does this have to do with any of the above?

>>"Knowing" isn't addressed above.

> The issue of reality was addressed above. You're asking about aspects of reality, and I
> reject that a discussion of reality is relevant to anything of science. Concepts such as
> truth, knowledge, and reality are not matters of science. They all imply an absolute, and
> humans are incapable of absoluteness.

Are you absolutely sure about that?

>>>and I cannot observe space or time.

>>You observe what you observe, period. You build models (ie.
*>>hypothetical Natures), which contain *defined* entities like "space" and*
>>"time", in an attempt to produce a model whose hypothetical observables
>>correspond to the actual observables of Nature. And you realize that
>>even though you may be able to match up the observables, you can't infer
>>that the entities of your models are also entities of Nature.

> That's too vague also. We can infer that the entities of our model are also entities of
> Nature as long as we assure that these entities are the results of observations. We
> define the entities in our model based upon observations, and we should not assume that
> entities which are nothing more than mere concepts can affect anything.

If we were to make the assumption that "the entities of our model are also entities of Nature" then we'd be conferring a real existence upon the concepts. In doing so, the model entity "spacetime" (for example) would become something that exists in Nature, and not "merely" a concept.

Of course, as I've indicated repeadedly above, there's no good reason for making such an assumption.

>>>>Again the assumption Science makes is that there is no more to reality
>>>>than the phenomena. Any aspect that has no associated phenomena is
>>>>unknowable in principle, so what sense would it make to consider it an
>>>>aspect of reality?

>>>I know nothing of reality. I've only concluded that neither space nor time is observable.

>>You changed the subject. You said you have no way of knowing reality.
>>I asked you how something you're incapable of knowing can be considered
>>an element of reality. That's what you should respond to.

> I can't answer how something can be an element of something I know nothing about. I'm
> giving you my reason why we cannot consider that anything is an element of reality,
> because we know nothing of reality. We can only assume that which is observable rises
> from Nature, but we must also recognize that this is an assumption.

For Physics, reality is what's observed − it's a matter of definition,
not discovery.

>>Re, the new subject:
>>
>>Clearly the readings of measuring instruments are observable. A clock
>>is a measuring instrument. Time is the reading of a clock. Ergo, time
>>is observable.

> This is the heart of the matter. You seem to be saying that a clock measures time again,
> yet elsewhere, you've denied this. If a clock is a measuring instrument, then what does
> it measure?

A clock produces a measurement. The name given to the measurement is
"time". It stops there − it's simply of no value to assign a name to a
hypothetical *what* that the clock is measuring.

And if your answer is time, then how does that square with your other
> statement:
>
> "The above quote from me is intended only to imply that "time" is not something which
*> *has* measureable properties, but that rather that it *is* a measureable property of a*
> clock."
>
> So is time a property of a clock, or is time what a clock measures

The point that I (and others) have made to you so many times over the
last several months is that in the way Physics uses the term, "time"
is the measurement the clock produces.

>>Space too, in the sense that space is frequently used as a synonym for
>>distance.

> Too vague.

Judging by the effects, that seems to be the case for everything I've
said to you.

>>>... Where is the model of time? Where is the theory which allows for a test of the observability of time? Where have you
>>>demonstrated that time in anything more than a mathematical construct?

>>OK, my turn to offer a warning. I've told you before, regarding this
>>"time dilation" issue, that you can't lock on to the English language
>>descriptions as if they were etched in stone. Such descriptions
>>represent attempts to translate the mathematics of the models into
>>terse, common language statements. As such they're bound to be somewhat
>>incomplete and/or inaccurate. Bear that in mind.
>>
>>To address your above questions, the "model of time" is the Lorentz
>>Transformation (suitably extended if accelerated motion is involved),
>>and the "time" that's referred to in the transformation equations is
>>compared to the "time" that's indicated by observed clocks. It's as
>>simple as that.

> Not good enough. You've done nothing but assert time. This ties into the arguments I've
> made above WRT the chicken and egg, so I'll let that rest as my response to this.

"Time" is asserted. "Distance" is asserted. "Temperature" is asserted.
And on and on for *every* term that represents a measurement. Each of those things is *asserted* to be the *name* for the measurement produced by a specific measuring device.

>>BTW (and we've gone around on this before too), in the SR model, the
>>"process which a (standard) clock facilitates" is not slowed. In fact,
>>(standard) clocks are presumed to be completely unaffected by movement.

> So the twin will age less, the atomic clock with have lost time, but the standard clock
> will not have lost time? either I misunderstood your comment, or you've got to explain
> this inconsistancy.

The SR model presumes the use of "standard/ideal" clocks − all the conclusions of the model are based on this presumption. An atomic clock is a standard clock to some degree (as is a pendulum clock to a much lesser degree). Assuming SR is correct, the extent to which the measurements of any particular clock differ from those of a standard clock determines (in part) the extent to which experimental results will differ from the corresponding theoretical predictions.

Moreover, a clock can "lose time" relative to another clock without any change at all in the rates at which the clocks tick. If you don't understand this then we shouldn't be discussing anything about Relativity until the more basic issues are cleared up.

>>You have to recognize the distinction between the "real world" and
>>models of it. When temperature is described in terms of heat (or
>>average kinetic energy of a collection of microscopic particles), that
>>description applies to the entities of a model. Temperature in the
>>"real world" is simply the reading that appears on a thermometer when
>>it's exposed to the environment.

> I've got that. However, you've not addressed the inconsistencies of your statements. Is
> time the measurement of something? If so, what? You're the one who came up with the

> analogy of temperature, but it seems to fall apart here. If I'm wrong, please enlighten
> me. What does time quantify?

A measuring device produces a measurement (i.e. a number), and the measurement itself is all that's of interest. There's no good purpose served by looking beyond the measurement and giving a name to some *thing* that's been measured.

>>Well, obviously "Science" doesn't have a goal. The people who do
>>science have goals which, just as obviously, aren't all the same. I
>>described what I believe to be the prevelant view at present (goal =
>>prediction).
>>
>>The "why questions" have answers only within models. In fact,
>>essentially all discussion in Physics concerns the entities of models.
>>The only time the "real world" comes into play is when it's necessary to
>>"collect a sample" for comparison against what's been anticipated by a
>>model.

> I've got the whole model thing. In fact, I've described it here plenty of times. We
> agree on that. But I don't see that I've said anything which is inconstant with that
> notion, or which is negated by it. IMO, to say that the pursuit of science has no goal
> leads to the very errors which I argue we're committing. We may as well build models of
> fantasies and cartoons if science has no goal, and those who believe that it has no goal
> are doing just that.

Perhaps you should reread what I wrote − you've obviously misinterpreted it.

> How do you suppose we began this endeavor? We crawled out from under the rocks, saw the
> sun, and set about the task of figuring out what it was. We attempted to predict if night
> would come, and if day would return. We attempted to predict where we could find food.
> We attempted to predict when it would be cold, and when it would be hot. We attempted to
> predict where a stone would land if we threw it. On and on. We built a model of what we
> observed by creating theories. Nothing has changed from then until now except that we've
> built a much more sophisticated and reliable model. But the goal is that same. We
> attempt to build an ever broader model of an ever widening set of observables, and we do
> so because we want to better understand the phenomena which affect us.

Yes that's right, provided that "observables" are considered to be observations (i.e. phenomena), and not some hypothetical entities which give rise to the phenomena.

>>>Post the question as to why a clock will appear to have lost time after having gone on a
>>>trip, and see what you get for answers.

>>The answer is "because it does". It just happens to be what happens.

> I can at least live with that one. But many of your compadres here with give time
> dialtion as the reason, and it is to those assertions I reply.

"Time dilation" is an answer for why the *model's* clock "lost time"
after having "gone on a trip".

>>Models get created for the purpose of imitating the behavior that Nature
>>happens to make happen, but although the behavior of the entities in
>>models (e.g. lost time) can be explained, those explanations don't carry
>>over into Nature, regardless of how "reliable" the models happen to be.

> I know.

So you say, but demonstrate otherwise.

*>>>>>>You say there's a *clear* distinction between physical and conceptual.*
>>>>>>So what is it? It should be a rule that will permit the unambiguous
>>>>>>classification of anything into one category or the other (or "none of
>>>>>>the above").

>>>>>That which is capable of affecting us (e.g., stimulating our senses), either directly or
>>>>>indirectly, is physical. As I explained, that was the whole goal of physics to begin
>>>>>with.

>>>>"Things that can stimulate senses" is all−inclusive. Everything that
>>>>can be referred to has the potential to stimulate senses.

>>>That definition is the line between what is physical and what is not. I can refer to
>>>mathematics, but that isn't physical. I can refer to Mickey Mouse, but that's an
>>>abstraction. I can refer to lying, but that's a concept. Only that which stimulates our
>>>senses is physical.

>>Each of your examples is capable of stimulating the senses. In fact,
>>"recognition" isn't possible in the absence of sense stimulation, so the
>>only things that don't stimulate senses are those things that we're
*>>oblivious of, and the "things" that *everyone* is oblivious of can't be*
>>considered to be elements of reality.

> I don't buy it. A cartoon only stimulates the senses to the extent that it affects us
> intellectually, and then the emotions which ensue affect us physically. But without the
> intellectual aspect of it, there would have been no effect whatsoever.

The first effect in each of your examples is via the sense mechanisms,
which occurs prior to any stimulation of the "intellect" (which BTW
needs definition).

At any rate, do you really believe a convoluted definition like

"That which is capable of affecting us without first affecting our
intellects (e.g., stimulating our senses) either directly or indirectly,
is physical"

is preferrable to "physical is measureable"?

Physics isn't
> *concerned with cartoons (yet) because of the recognition that the cartoon (not the means*
> *of conveying it) is just a concept. It cannot affect our bodies exept to the extent that*
> *it affects our intellect first. And there's also the recognition that there's no sense in*
> *studying them because they were born of the imagination of the mind. It is those types of*
> *entities which we must assure that do not weave their way into the model.*

Limiting the "objects of interest" to measurements is sufficient to
ensure we don't confuse ourselves.

>>No, but it's not relevant. "Conceptualization" has no applicability
>>here. All that's of interest is quantification i.e. identifying the
>>number of items in an collection. This act alone is what's implied by
>>the word "counting".

> Not so. Counting is more than mere identification. Counting is quantification. If
> counting were just identification, then all we'd have to do is put unique labels on each
> person who went through the turnstile. Those labels would identify the people. But just
*> because they have labels which look like *1, 2, 3* instead of *a, b, c* or *&, $, %**
> doesn't mean that we've counted them. All it means is that we've identified them. That
> part of it can be done by machine and is not an intellectual process. However, to advance
*> this process to quantification, which is how we first used the term in our *debate**,
*> requires the intellectual process of matching the concepts like *many* and *few* and*
*> *large* and *small* as well as ordering the symbols in order to *determine* something*
> about the quantity. If counting was mere identification, then you'd have no issue with
> using symbols like .....$,&,@,$,>,M,A,(,=.....for that process, yet as you can see,
> this would not achieve the goal.

Just look up the word "counting" for crying out loud. You won't find
any requirements for what the counter needs to understand about the
results obtained. I've said all I intend to on this matter−of−fact subject.