

Philosophy 593S: Philosophy of Space and Time, Fall 2005
Handout 6: Conventionalism and Time

1. Le Poidevin

Main question: “What is it for a timepiece to be accurate?” (p.5)

Answer 1: “Conventionalism concerning the metric of time”:

“An instrument is accurate if and only if it agrees with the standard.” Which standard is *the* standard is a matter of convention.

Answer 2: “Objectivism concerning the temporal metric”:

There is a fact of the matter as to whether two temporal intervals are equivalent, independently of any conventional choice of a measuring system.

Suppose the following is true:

An instrument is accurate if and only if it agrees with the standard. But which standard is *the* standard is not a matter of convention.

Which answer is then correct?

2. Poincaré

The Difficulty: “Can we transform psychologic time, which is qualitative, into a quantitative time?” (p.211)

Claim: “from noon to one the same time passes as from two to three” “by itself” has no meaning. “It will only have that which I choose to give it.”

Claim: “To measure time they [ie, the physicists] use the pendulum and they suppose by definition that all the beats of this pendulum are of equal duration.”

What is it to suppose something by definition? Which English language word or phrase is being defined?

One candidate:

(α) “ x and y take the same amount of time” is defined as “the pendulum swings the same number of times during x as during y .”

Poincaré’s objection: “There is no rigor in the definition.” When we use the pendulum to measure time, we “implicitly assume”

(β) The duration of two identical phenomena is the same.

But it is possible that “experiment may some day contradict our postulate.”

Poincaré's objection, reconstructed:

- (1) (α) entails (β) .
- (2) (β) is a contingent truth.
- (3) No definition entails a contingent truth.
- (4) Therefore, (α) is not a definition (?).

Poincaré's alternative interpretation of astronomer's definition: "time should be so defined that Newton's law and that of *vis viva* may be verified."

Objection: There is no rigor in the definition. When we define time this way, we implicitly assume that there is some way to define time so that Newton's laws are true. But it is possible that there is no such way.

3. Van Fraassen

Claim: "the choice of a kind of clock may have certain factual presuppositions, which must be true." (p.77) Van Fraassen appears to disagree with Poincaré, then, who thought that the choice of a kind of clock *cannot* have any (contingent) factual presuppositions. Who is right?

4. Two arguments against conventionalism

Poincaré: "there is not one way of measuring time more true than another....Of two watches, we have no right to say that one goes true, the other wrong."

- (1) If x and y take the same amount of time just in case my watch ticks the same number of times during x as during y , (i.e., if "my watch goes true") then Newton's laws are false.
- (2) Newton's laws are true.
- (3) Therefore, my watch does not go true.

Poincaré's reply: "If now it be supposed that another way of measuring time is adopted, the experiments on which Newton's law is founded would nonetheless have the same meaning. Only the enunciation of the law would be different, because it would be translated into another language." (Cf. Van Fraassen p.80)

Suppose that in L "time" means "time according to my watch," and that in L' "time" means "time according to your watch." Then " $F = ma$ " is true in L' but false in L . But also "My watch goes true, and yours goes wrong" is true in L . And L is the language we speak. We seek to say those sentences which are true in the language we speak. So we do have the right to say that my watch goes true, and yours goes wrong.

Argument two: if conventionalism is true, then we should formulate laws of physics without using a temporal metric. But such laws will not be deterministic.