

Re: Updated unexpected hanging paradox bibliography

Source: <http://sci.tech-archive.net/Archive/sci.math/2005-09/msg02199.html>

- *From:* Ittay Weiss <ettaybn@xxxxxxxxxx>
 - *Date:* Fri, 09 Sep 2005 17:15:40 EDT
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> tchow@xxxxxxxxxxxxxxxx wrote:
>
> ** from his article **
>
> A teacher announces in class that an examination will
> be held on some
> day during the
> following week, and moreover that the examination
> will be a surprise.
> The students
> argue that a surprise exam cannot occur. For suppose
> the exam were on
> the last day
> of the week. Then on the previous night, the students
> would be able to
> predict that the
> exam would occur on the following day, and the exam
> would not be a
> surprise. So it
> is impossible for a surprise exam to occur on the
> last day. But then a
> surprise exam
> cannot occur on the penultimate day, either, for in
> that case the
> students, knowing that
> the last day is an impossible day for a surprise
> exam, would be able to
> predict on the
> night before the exam that the exam would occur on
> the following day.
> Similarly, the
> students argue that a surprise exam cannot occur on
> any other day of
> the week either.
> Confident in this conclusion, they are of course
> totally surprised when
> the exam occurs
> (on Wednesday, say). The announcement is vindicated

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- > after all. Where
- > did the students'
- > reasoning go wrong?
- >
- > ** end quote **
- >
- > If the students start with the assumption that it is
- > indeed *possible*
- > that the teacher is lying, then they have to admit
- > that they wouldn't
- > be
- > surprised no matter what day the teacher gave the
- > exam, nor would they
- > be
- > surprised if the teacher did not give the exam at
- > all. If they reject
- > the
- > possibility that the teacher could be lying, then, as
- > in the above
- > paragraph, they are led to conclude that the teacher
- > must be lying, and
- > hence that their assumption that the teacher can't be
- > lying must be
- > invalid.
- >
- > As far as I can see, that analysis is completely
- > correct, and there
- > really
- > is no paradox at all.
- >
- > So a question: do any of Tim's references discuss
- > that analysis?
- >

I don't agree with your analysis. Suppose T is the statement made by the teacher. Now the students say, if T is true then there can be no examination. From this they deduce $\neg T$. That is they come to the conclusion that there will not be a surprise examination. Yet they are surprised when the test is on Wednesday. At no point do you need to assume that the teacher is always telling the truth or that the students always believe the teacher. It is all a logical game. You have a statement T and you assume it is true. Then you use it to reach some conclusions.

As I see it the students are right in their argument to deduce that there can be no test at all. But they should not stop now. As was commented in a previous post, the students should now argue that since they expect no test, they will be surprised if a test was to take place.

As I said before T is then a statement that is true, yet cannot be proved from within the system. That is the students can't prove it is true but the teacher (or us) can.

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