The Epistemological Surprise Examination Paradox

In Volume 57, Kritchman and Raz discussed the Surprise Examination Paradox: wherein, a teacher announces a surprise exam next week. The students reason a Friday exam would not be unsurprising. Similarly the exam cannot be Thursday, Wednesday, etc., so cannot ever occur. Formalizations of the announcement fall into the logical and epistemological schools (as Chow called them in 1998). In the logical school, pre-Kritchman, we say facts are surprising if they are unprovable, given the announcement and observed nonoccurrences. By imitating the above informal reasoning, the formalized announcement is contradictory.

Kritchman observes, since this announcement formalization is contradictory, the resulting formalization of “surprise” fails: contradictions prove anything; being unsurprised by things provable from contradiction, nothing surprises us (Halpern and Moses observed the same in 1986 but reacted differently than Kritchman). It is better (Kritchman suggests) to say the students are surprised by an exam if they cannot prove it before the exam. Tentatively, call φ surprising if ¬K(φ). The teacher’s announcement formalizes easily as a set of statements involving K; these statements are shown, imitating the informal paradox, to contradict certain basic axioms of knowledge.

Kritchman leads us to instead call φ surprising if ((¬K(φ)) ∨ K(1 = 0)). To remove the paradox, though, we must also account for Gödel. Most classic axiomatizations of knowledge include K(φ) → φ and K(K(φ) → φ):

knowledge is true, and we know so. Classically, the latter comes with the former by the nature of the models used. However, in 2000 Carlson introduced more general models, where \( K(K(\phi) → \phi) \) can fail while \( K(\phi) → \phi \) holds: we might not know knowledge is true, even if it is. By no longer demanding \( K(K(\phi) → \phi) \), with our new definition of surprise, the paradox vanishes (provably, using Carlson’s models). The relaxed demands are analogous to Gödel’s Incompleteness, strengthening a bridge between logic and epistemology.

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Program for the Joint Meetings

When my January 2011 issue of the Notices arrived today, I was quite surprised by the extraordinary heft of the volume. This surprise turned to disappointment when I discovered that the unusual weight was due to a printing of the program for the annual Joint Meetings, taking up over 100 pages and nearly half of the issue. In this day and age of environmental conservation and tight budgets, was it really necessary to print the entire program into thousands of copies of the Notices, especially when this information is all available online? At least, I’d think the Society could get by with mailing separate programs only to those attending the meeting. Having just paid my Society dues for the coming year, I hope they won’t be put to such needless printing and mailing expenses in 2011.

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Transylvanian History

The article “Real face of János Bolyai” by T. Dénes, which appeared in the January 2011 issue of the Notices, contains the following statement:

“In 1947, following World War II, the Treaty of Paris gave this area [a region in Transylvania] to Romania, so that is where it is found on today’s maps.”

Since this statement could give the impression that that region of Transylvania had never before belonged to Romania, here is a synopsis of the history of Transylvania in the twentieth century. The union of Transylvania with Romania was proclaimed at Alba Iulia (1918) by the elected representatives of the ethnic Romanian majority in Transylvania, following Austria-Hungary’s defeat in World War I. The Allies confirmed the union in the Treaty of Trianon (1920). The region of Northern Transylvania was granted to Hungary by the Second Vienna (Diktat) Award (1940) under the arbitration of Nazi Germany and Fascist Italy. The Treaty of Paris (1947) returned the region to Romania.

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A Mathematician’s Answer to the Historical Question

I agree with Marius Stefan in that my comment on Transylvania is “irrelevant to the article’s topic”. My only aim in including it was to clarify the reason why the town of Marosvasarhely (which played a significant role in the life of János Bolyai) can be found on the map of Romania today— for the benefit of those readers who haven’t followed the complicated history of Transylvania.

The analysis of this complex historical issue is pertinent neither to this article nor to the journal itself. Moreover, Marius Stefan does not contradict my statement, he merely expands on it.

Finally, I trust that the really significant historical misconception that my article, “Real face of János Bolyai” is trying to address has not escaped his attention.

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