Re: Epistemology 201: The Science of Science

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> [context is discussion of 4 color problem]
>
> >Well, they verified the cases by computer.
>
> Lots of mathematics is verified with pencil and paper. Does the use
> of pencil and paper make it empirical.

Yes, the idea can cover pencil and paper as well. It doesn't make their use empirical, but it does show how fragile the concept can become.

> > But how do you prove an algorithm
is
> >correct?
>
> The same way that you demonstrate that a mathematical proof is
> correct. Oh, by the way, there are many incorrect proofs in the
> published literature.

Yes, I think you're right. There is no algorithm that can check algorithms, but we could do it on a case−by−case basis I suppose. I didn't do this when they accepted the proof though, by the sounds.

> > The 'proof' of the
four
> >colour problem is partially inductive.
>
> If that is correct, then all logic is partially inductive.

I'm not quite sure I follow your reasons here, but I don't think there is disagreement for the most part.

> >The computer literally did the colouring of maps and counting of the colours.
>
> The computer was used as a book keeping tool, to keep track of
> details to numerous for ordinary human attention. This is not an
> empirical investigation, except in the strange meanings you seem to
> be giving to "empirical".

While I'd like to take credit for the strangeness, but it was Chaitin (and Tymoczko for the four colour problem). The strange meaning of "empirical" here is the lack of correctness proof in algorithms, trust in their implementation, trust in computers. You wouldn't run the proof on one computer once, it would be run on different computers using different algorithms several times before accepting the proof.

If it turns out that something is not provable due to incompleteness