Re: Cantor and the binary tree

Source: http://sci.tech−archive.net/Archive/sci.math/2005−06/msg00719.html

- *From*: imaginatorium@xxxxxxxxxxxxx

- *Date*: 5 Jun 2005 06:59:26 −0700

mueckenh@xxxxxxxxxxxxxxxxx wrote:

> We have a law yielding all possible infinite strings of bits.
> We have a law connecting each spring−off, i.e., the source of a newly
> separated path with a node B:
> /
> B
> /\

I don't understand this. As far as I can see, each node 'B' has two branches from it, to left and to right, and neither identifies a single path. Rather, each one leads to another (unending, infinite) subtree.

> This is the basic element of the tree and does nowhere change. Hence it
> holds all over the tree. It yields a one−to−one relation between nodes
> and paths. Nobody can reasonably even r[a]ise the question whether there
> could be more paths than nodes.

On the contrary, I raise it. In maths, if the answer to any question is obvious, it can be dealt with quickly. Anyway, we could identify with this node the path going right, and subsequently always going left. In this way we can identify every node with a single path, showing that there cannot be more nodes than paths, but not showing the reverse (because we haven't mapped every path to a node in this way). This does not prove that there is no 1−1 mapping, but if there is one, you still have work to do to show it. (Other considerations of course show that this is indeed impossible.)

> ... And if it is meaningful to talk about
> infinity and to count infinity, then it is absolutely clear that nodes
> and paths have same number.

So false. It certainly isn't clear.

> Gottfried Helms wrote: [if your quoting levels are reliable]
> > The concept "number of" may be assigned to describe an (important)
> > property of a finite set, but if we deal with mathematical objects,

> > which are constructed to be infinite, it is better to switch to the
> > terminus "cardinality" (or maybe a better one), to not apriori throw
> > away the ability to include uncountable(*1) infinities in our
> > considerations.
>
> The idea of a bijection of a set with N is a convincing one, in many
> respects. But the idea of considering the basic element
> /
> B
> /\
> of a tree is at least as convincing. To do the last step, we could even
> neglect the terminus "node". Then I assert: There are not more
> separated paths in the tree than paths which separate themselves
> somewhere in the tree. Set theorists say: There are more separated
> paths in the tree than are separated in the tree.

Do you have any proper definitions for this "separating" stuff?

Brian Chandler
http://imaginatorium.org

.

- ***Follow−Ups***:
  - ♦ ***Re: Cantor and the binary tree***
    - ◊ *From:* mueckenh

- ***References***:
  - ♦ ***Re: Cantor and the binary tree***
    - ◊ *From:* Gottfried Helms
  - ♦ ***Re: Cantor and the binary tree***
    - ◊ *From:* mueckenh

- Prev by Date: ***Re: Maple question***
- Next by Date: ***Re: James Harris blog***
- Previous by thread: ***Re: Cantor and the binary tree***
- Next by thread: ***Re: Cantor and the binary tree***
- Index(es):
  - ♦ ***Date***
  - ♦ ***Thread***