Re: Cantor and the binary tree

Source: http://sci.tech−archive.net/Archive/sci.math/2005−06/msg00730.html

- *From*: mueckenh@xxxxxxxxxxxxxxxxx
- *Date*: 5 Jun 2005 07:53:31 −0700

imaginatorium@xxxxxxxxxxxxx wrote:
> 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.

One path enters that node, such that one path is newly created by the
node. It does no matter which one is considered as the new one.
Further, you are right, a whole new tree as large as he old one is
created by each node. But for this new tree and each of its nodes the
same holds as for the old one.
>
> > 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).

Where should the other paths come into being? Where should they be
separated, if not n a node?

> 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.)

It is my purpose to show that there is no consistent math in the
infinite. Therefore other consideration may yield other results.
>
> > ... 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.

If you would not know anything of Cantor, I am sure you would not
hesitate a second to agree.
>
> > 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?

It is indeed difficult for me to see where you see problems. Above you
see the fundamental element of the tree. One path coming in is
separated into two paths going out. Each element increases the number
of separately visible paths by 1. You say that the tree contains
countably many of these elements but uncountably many paths. I think,
that cannot be mantained. How would you try to explain it?

Regards, WM

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- ***Follow−Ups***:
  - ***Re: Cantor and the binary tree***

- ◊ *From:* imaginatorium
- ♦ ***Re: Cantor and the binary tree***
  - ◊ *From:* Virgil

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

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