

Re: Well Ordering the Reals

Source: <http://sci.tech-archive.net/Archive/sci.math/2005-11/msg02398.html>

- *From:* Virgil <ITSnetNOTcom#virgil@xxxxxxxxxxx>
 - *Date:* Thu, 17 Nov 2005 13:08:38 -0700
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In article <MPG.1de57c06b8282edc98a717@xxxxxxxxxxxxxxxxxxxxxxxxxxxx>, Tony Orlow <aeo6@xxxxxxxxxxx> wrote:

> Virgil said:
>> In article <MPG.1de5394567f6ae1998a712@xxxxxxxxxxxxxxxxxxxxxxxxxxxx>, >> Tony Orlow <aeo6@xxxxxxxxxxx> wrote:
>>
>>> David R Tribble said:
>>
>>>> If your N and 2^N-1 were really different (infinite) numbers, then your >>>> ...111(2) and your "unit infinity" also must be different numbers.
>>>> They are. $N=1:000...000$1111 might be considered a poorly formed >>>> version
>>>> of $N-1$, but one really can't tell how that relates to $1:000...000$. I am >>>> not
>>>> sure why you say this anyway.
>>
>>
>> TO posits a sequence starting with an infinite sequence of 0's and >> ending with an reversed infinite sequence of zeros, which he denotes by >> 000...000.
> Yes, it is an "uncountably" infinite string of 0's.

Any kind of infinite is impossible.

>>
>> If we call those zeros that are only a finite number of places from the >> left end of his hypothetical infinite string "initial digits" and those >> only a finite number of places from the right end "terminal digits", one >> must ask where the initial digits and terminal digits get connected to >> each other.

> Certainly, no countably infinite subsequence can make it halfway across any > uncountably infinite sequence, so those in finite positions with respect to > the > right can never reach those in finite positions with respect to the left.
>>
>>> Clearly there can never be any initial digit immediately followed by a >>> terminal digit as that would only make a finite string.

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- > Absolutely!
- >>
- >> Are there "middle digits" that are infinitely many places from both ends?
- >> If so, how do the initial or terminal digits connect up with them.

- > Yes, there have to be bits between the initial and terminal countably finite
- > strings. In fact, within the uncountably infinite sequence of bits, there
- > must
- > be uncountably many disjoint countably infinite subsequences. The question of
- > the boundaries between these sequences, of where there finite positions from
- > the left or right end, is one that cannot be clearly answered.

Sensible people will continue to say that until such questions as how one can move sequentially from initial digits to middle digits are satisfactorily answered, such transitions cannot occur.

And in the absence of such transitions, the properties that TO alleges of his $\ast N$ members renders $\ast N$ vacuous.

- > On a finite
- > scale, it certainly seems obvious that no single step can ever go from a
- > finite
- > to an infinite position, and yet, it is (or should be) obvious that if there
- > are truly an (uncountably) infinite number of elements in the sequence

But it is equally obvious that any such assumption is self-contradictory, and so valid only in a system that is itself self-contradictory, like TOMatics.

- , that
- > there must be positions infinitely far apart. This is a paradox, not in that
- > there is a distinct contradiction logically, but in that we cannot imagine
- > how
- > this transition could occur.

Let us consider the case where all terminal digits of some $\ast n$ in $\ast N$ are 1's and all others in that string are 0's. What is the "next" member of $\ast N$?

- >>
- >> It is just as clear that no initial digit or terminal digit can be
- >> adjacent to a middle digit unless the successor to a finite natural can
- >> be infinite.

- > On the finite scale it makes no sense.

On any scale it makes no sense. TO complains that standard treatments on infinite are counter intuitive, and then proposes to "fix" things by creating such extremely counter intuitive notions as "strings" that consists of infinitely many unconnected, or at least so far unconnectable, pieces.

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That "cure" is far worse than the disease.

- > On the infinite scale, if you picture
- > the number line as the interval $[0,1]$,

The number line can be related to the OPEN interval $(0,1)$ by an order isomorphism, but not to the closed interval.

- > then the initial sequence appears just
- > as the points immediately adjacent to 0,

But the "points immediately adjacent to 0" are not sequentially orderable, as the initial digits of a string must be.

So TO falls on his face again.

- and the terminal points are
- > immediately adjacent to 1,

But the points "immediately adjacent to 1" are not sequentially orderable, as the terminal digits of a string must be.

- > and the vast majority are between them. Ask
- > yourself
- > whether all points a finite number of points from the endpoints

The set of "all points a finite number of points from the endpoints" of $(0,1)$ is the empty set.

- > looks any
- > different from that picture, and ask yourself where the first point is that
- > is
- > a finite distance from either point.

There is no such "point is that is a finite distance from either point" in any standard real line.

- > The paradox is there, but it's simply a
- > matter of perspective.

The only perspective that allows one to ignore that contradiction (not mere paradox) is the closing of one's eyes to avoid seeing anything,

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> I don't think there is any "semi-infinite" scale that
> would resolve this at all. We just have to live with it.

WE do not have to live with any such thing. If TO chooses to live in such mental squalor, his choice need not injure others.

>>>>

>>>> However, it is provably true that your N , 2^N-1 , and ...111(2) are all
>>>> exactly the same (infinite) number. I've pointed this out to you
>>>> several times, and you have never proven otherwise.

>>

>>> I certainly can't prove that within your system. Our systems are
>>> incompatible.

>>

>> TO's system is incompatible with every system, including itself.

> Oh Virgil, shut up. It's comments like that that make me toss most of your
> posts.

It is the logic in my posts (that proves TO's constructions to be mere sophistry) that TO objects to, and cannot logically refute.

So TO's counter-arguments, when he manages to make any, consist entirely of hand-waving and, in the realm of sophism, piling Pelion on Ossa.

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• *References:*

- ◆ ***Re: Well Ordering the Reals***
◇ *From: Robert Low*
- ◆ ***Re: Well Ordering the Reals***
◇ *From: Tony Orlow*
- ◆ ***Re: Well Ordering the Reals***
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◇ *From: Virgil*
- ◆ ***Re: Well Ordering the Reals***
◇ *From: Tony Orlow*

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