Re: Humble pie.

Source: http://sci.tech−archive.net/Archive/sci.logic/2004−06/2285.html

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From: Will Twentyman (*wtwentyman_at_read.my.sig*)
Date: 06/29/04

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Date: Mon, 28 Jun 2004 22:14:48 −0400
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Andrew wrote:

> "Will Twentyman" <wtwentyman@read.my.sig> wrote
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>
>>The error is in your construction, not in Cantor.
>>
>>Andrew, either you do or do not have all the integers on your "list".
>>If they are all there, it is infinite, no matter how improbable that
>>seems to you. If they are not all there, then your construction failed
>>to do what you claimed it did, which is put them all there. We have
*>>been trying to show you how your construction can be valid *and* have an*
>>infinite number of integers on it. This is what you consistently refuse
>>to see.
>
> Time for me to eat some humble pie and admit that my demonstrations were
> flawed and that others were right all along. I now see the major flaw that
> I had steadfastly refused to even consider. My profound apologies.
>
> I clearly see that in formulating my demonstration I had inadvertently
> assumed the very fact I was supposed to be arriving at. Because of this
> error I had not shown that the infinite character possessed by the natural
> numbers had not merely been transferred from the end to somewhere else
> within the list.
>
> It was an honest mistake caused by over familiarity with a specific
> phenomena, which lulled me into thinking I was proving it when in fact I was
> merely using it. Thank you for waking me up to this fact (esp. Will and
> Leonard for sticking it out so long).
>
> It is possible to give a demonstration of the underlying fact I assumed,
> which should make more sense − especially as it is now possible to remove
> all notions relating to the continuum which caused much argument before, and
> to leave a simple demonstration founded only upon the properties of natural
> numbers.
>
> Here it is;−
>

> There are two reasons for believing that the set of natural numbers can, in
> some sense, be 'complete'.

You desperately need to define what you mean by complete. Anything relying on this concept is likely to be pure nonsense until it is defined.

> The first depends upon Cantor's proofs of the
> uncountability of certain sets. This is based upon the idea that for any
> supposed complete list of the elements of certain sets (such as the set of
> real numbers), a novel element not already in the list can be demonstrated,
> and after adding that to the list yet another novel element can be shown,
> and so on, and so on (e.g., via the diagonal argument). This is taken as
> proof that the set in question must have a higher order of infinity than the
> set of natural numbers since, even if supplied with a supposed complete
> list, an infinity of elements guaranteed to not already be in the list can
> be demonstrated. If it can not be considered that the list is in fact
> complete, then such demonstrations become meaningless, since it is no great
> achievement to show the existence of novel elements guaranteed to not
> already be in the list if the list is known beforehand to be incomplete.
> And that is the first reason for believing that the set of natural numbers
> can in some sense be 'complete'.

You appear to be talking about whether a set is countable.

> The second reason springs directly from the first, in that, according to
> such determinations, the set of natural numbers has an order of infinite
> magnitude less than that of the set of real numbers because the real numbers
> can not be exhaustively paired, one−to−one, with any list of natural
> numbers. Conversely, this means that the set of real numbers must be able
> to exhaust the set of natural numbers via one−to−one pairings (otherwise
> one−to−one pairings have no meaning). In this sense, the set of natural
> numbers must be considered to have been taken in its entirety, and so
> actually be 'complete' in some sense.

This makes very little sense. You appear to be talking about thing that are correct, but with very bizarre terminology.

> Now, a few simple facts about the set of natural numbers which I hope are
> seen to be fair comment. The set has a least element, i.e., the single
> unit, but it has no greatest element. Also, there is no natural number
> which, starting from the single unit, can not in principle be discovered by
> repeat applications of a successor function (i.e., by adding single units).
> Since the single unit is finite, and all subsequent discoveries via the
> successor function increase the magnitude by only one finite unit, the
> direct consequence is that no single natural number can ever be infinite in
> extent − i.e., there is no natural number for which !!!. . . is a valid
> formulation (taking "!" as a symbol for a single unit and ". . ." to
> represent a whole non−terminating string of single units).

This is correct. Every natural number has a finite number of digits.

> In addition to these properties, the set of natural numbers itself has the
> quality of being "infinite", but it has a particular manifestation of
> infinity. Consider the first three of its elements in unary form;−
>
> !
> !!
> !!!
>
> In this way it is plain to see that with each subsequent natural number the
> list of individual units grows in only one direction, i.e., to the right.

This is strictly a result of formatting.

> Since each individual natural number must contain only a finite quantity of
> such units, the infinity belonging to the set of natural numbers is revealed
> purely through the inability to ever exhaust the successor function. In
> other words, the set of natural numbers is infinite because the successor
> function can always 'discover' a new next number greater than the last, and
> not because of the quantity of individual units which may be present in any
> single natural number, which must always remain finite.

The natural numbers is a set of infinitely many finite quantities.

> But this raises an interesting question − what can we say should be the
> consequence if it were possible to have the set of ALL natural numbers in
> the form of a list? Clearly, this must in some way render the successor
> function no longer valid, since this list is supposed to be complete any
> application of the successor function must no longer be able to produce an
> element not already in the list − otherwise the list could in no way be
> considered to be complete. At the same time no single number in the list
> could ever be said to have an infinite quantity of constituent units or it
> would no longer be a member of the set of natural numbers.

You cannot apply the successor function to a list. You apply it to
elements on the list. If you do so, you will produce a different
element of the list. You cannot apply the successor function to the
list of natural numbers because lists are not in its domain.

> The curious thing about this particular conjunction of circumstances is that
> the fundamental manifestation of infinity that the set of natural number
> shows to us is dependent upon the continued validity of the successor
> function, not upon the specific magnitudes of the individual natural numbers
> in the list. If this is then rendered ineffective, what further reason do
> we have for believing that the list must retain its infinite character?

This makes no sense.

[rest deleted]

You are still trying to deal with ideas informally. Once you start
formalizing these concepts, you will begin seeing the flaws in your

argument. Major flaws that are apparent: not defining your terms, not understanding/defining the domain and range of a function, not understanding the importance of unambiguous representations.

I will be honest, I didn't read the portion I snipped because at this point you had stopped talking about things that make any sense. You switched from poorly defined to erroneous. Start with clear definitions, then you will be less likely to encounter errors.

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