Re: New countable infiniity logic

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From: Shmuel (Seymour J.) Metz (*spamtrap_at_library.lspace.org.invalid*)
Date: 10/29/04

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In <b453b903.0410270806.5d16d12c@posting.google.com>, on 10/27/2004
at 09:06 AM, whit0911@umn.edu said:

>not as equally infintesimally close

Are you under the impression that that string of words has any
meaning?

>may also generate the infintesimals that you describe

Nowhere in the text that you quote does he use the word
"infinitesimal".

>I don't see why you do not believe this function
>outputs all such actual rational repeating and irrational decimalic
>numbers as well as those that approach.

Because you defined it in such a manner that all outputs terminate in
repeating zeros. A decimal expansion terminating in repeating zeroes
cannot equal on terminating in repeating non−zero digits or digit
sequences, other than repeating nines.

>It seems to me you do not accept that the infinite set of naturals
>(or the set of naturals of infinte extent) must produce a list
>infinitely long in extent for this function.

What gives you that idea?

>I believe and assert that the only way to produce a list infinitely
>long in extent from this function is if the rational repeating and
>irrational decimalic numbers are included.

Then your definition is wrong.

>0.1, 0.01, 0.001, ... whose series includes forming the number I
>call the lowest infintesimal;

There is no such number. You are, of course, free to call a number, e.g., "joe", but if you want to communicate then you have to define what number "joe" refers to.

>0.1, 0.12, 0.123, ... whose series includes forming the
>Champernowne's irrational number ;

No. It doesn't include any irrational numbers. You have defined it in such a way as to only include rational numbers, and not even all of them. You are confusing rearranging the sequence with rearranging a subsequence, and you are confusing the contents of a sequence with its limit.

>In set notation, these individual finite decimalic numbers are
>elements that each appear only once, nevertheless all such numbers
>are used infinitely many times to form all of the series re

No.

>and further include what I call the infintesimals

No. You haven't defined "infinitesimal".

>(where the number of zeroes before the finite decimal becomes
>infinite in extent).

Meaningless. The only such sequence of digits is all zeros.

>I guess where I am still confused

You're confused about what a list is, you're confused about what set theory is and you're confusing the number of entries in a list with what is in one entry. You also seem to be using "infinite in extent" to mean several unrelated things.

>is why a function which should
>generate a list that is infinite in extent − since it is based on
>the naturals (which are themselves infinite in extent) − is
>nevertheless somehow not allowed to generate an infinite number of
>digits.

Nobody wrote anything remotely like that. What they wrote is that THE SPECIFIC FUNCTION *YOU* DEFINED DOES NOT GENERATE DECIMAL FRACTIONS WITH AN INFINITE NUMBER OF NONZERO DIGITS.

>Note: because the only way the list for this specified function
>(where a new digit is added for each succesive power of ten
>numbers inserted into the function) can be infinite in extent is
>if the number of digits themselves are infinite in extent.

As I said, you're confusing the number of entries in a list with what is in one entry. Each entry on the list that *YOU* defined has only a finite number of nonzero digits. The fact that there are an infinite number of entries doesn't change that.

>After all the function keeps adding one more digit every time an
>additional power of ten from the naturals are utilized. The number
>of digits therefore have the same property as the number of
>naturals; namely there is no largest number associated with them.

Which has nothing to do with the number on nonzero digits in any individual output of your function.

>In the same way

No.

>(where the "..." means the decimalic expansion adds the next digit
>for the intended number forever)

What do intended numbers have to do with the output of the specific function that you defined?

>Is it not obvious that the only way such infinite decimalic expanded
>numbers are able not to be included in this function is if the
>naturals themselves are not infinite in extent?

No. It isn't even true.

>While I can no more specify the value of x in X=f(x) that will
>produce any particular decimal of infinite extent from this
>specified function

It's not that *you* can't produce it; it's that IT DOESN"T EXIST.

>this fact has no bearing

The fact that it doesn't exist, however, does have bearing.

>or if you prefer − will not become a part

Meaningless.

> After all, the only way that this function would not produce an
>infinite number of digits is if there was a largest finite number N
>in the naturals

No. The only way would be if you defined it that way, which you did.

>One can no more expect a person to be able to name

It has nothing to do with being able to name it. It doesn't exist.

>if one accepts that the number of digits for this function

What do you mean by "the number of digits for this function"? There are infinitely many occurences of nonzero digits in the list of numbers your function produces, but only finitely many IN EACH INDIVIDUAL OUTPUT.

approach inifintesimally close

What do you mean by that.

>but the "actual" rational and irrational decimalic numbers are
>included as expressed by the use of the "..." in 0.333...

No. There is nothing like that in your definition.

>That number (as one example) must be present on the list

No. Your definition excludes it.

>because no other number from this particular series (0.3, 0.33,
>0.333 etc.) expresses anything other than the finiteness of the
>number of digits "d"

No, that's irrelevant.

>and they are known to be of infinite extent for this function.

Again, you are confusing the entire list with an individual number in the list.

>Did I miss anything?

Everything.

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