Re: Successor Axiom: on what grounds TF?

Source: http://sci.tech−archive.net/Archive/sci.logic/2005−02/0572.html

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From: The Ghost In The Machine (*ewill_at_sirius.athghost7038suus.net*)
Date: 02/06/05

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Date: Sun, 06 Feb 2005 16:10:02 GMT
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In sci.logic, |−|erc
<h@r.c>
 wrote
on Sun, 6 Feb 2005 17:27:27 +1000
<36lvelF4r0freU1@individual.net>:
> <Helene.Boucher@wanadoo.fr> wrote in
>> |−|erc wrote:
>>
>> > ok I'll have a go.
>> >
>> > Natural numbers is just another word for successors.
>> >
>> > Hence, suc() can be defined and has equivalent meaning to
>> the−natural−numbers.
>>
>> Natural numbers are the union of 0 and the successors of natural
>> numbers. suc() is a function and so normally is not thought to have
>> equivalent meaning to a set, the natural numbers.
>
> addition and multiplication, and all of arithmetic can be coded with
> a single function twice().
>
> twice(twice((twice(twice())twice))) twice(twice(twice())) twice() = twice(twice(twice(twice())))
>
> + 3 1 = 4
>
> where twice(x y) = x(xy)

Erm, if you're defining twice(x y), what is twice() and twice(x) ?
Not to mention twice?

If I define:

  a = twice()
  b = twice(a)
  c = twice(b)

then the above expression breaks down into twice(twice((b twice))) c a = twice(c)

Also, if x is a number, then what is x(xy)? Or is that x(x y)?

>
> **accuracy of formula subject to 10 year old memory of reading*
>
>
>>
>> >
>> > *we define 0 AND suc() but 0 is not needed, suc() with no parameter*
>> *can be 0.*
>> >
>> > *But Natural numbers are meaningless without some abstraction*
>> *comparison property,*
>> > *namely equals, so equals and successor are codefined and they "fit".*
>>
>> *Sorry, I don't understand this.*
>
>
> *natural numbers and the relation equals cannot be defined seperately.*

Well, in Peano's Axioms:

1. Zero is a number.
2. If a is a number, the successor of a is a number.
3. zero is not the successor of a number.
4. Two numbers of which the successors are equal are themselves equal.
5. (induction axiom.) If a set S of numbers contains zero and also the
   successor of every number in S, then every number is in S.

#4 requires a definition of equals somewhere, along with succ
and number; #1 either defines or requires zero.

Apparently there's a true but unprovable result here, too, at least
according to Mathworld:

http://mathworld.wolfram.com/PeanosAxioms.html
http://mathworld.wolfram.com/PeanoArithmetic.html

but I can't say I'm familiar with it.

>
> *Herc*
>

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#191, ewill3@earthlink.net
It's still legal to go .sigless.