GODEL’S INCOMPLETENESS THEOREM. ENDS IN ABSURDITY OR MEANINGLESSNESS GODEL IS A COMPLETE FAILURE AS HE ENDS IN UTTER MEANINGLESSNESS

CASE STUDY IN THE MEANINGLESSNESS OF ALL VIEWS

By

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Godels incompleteness theorem ends in meaninglessness. A case study in the view that all views end in meaninglessness. As an example of this is Gödel's incompleteness theorem. No matter how faultless Godels logic may be his theorem is invalid ie illegitimate as he uses illegitimate axiom and an impredicative statement Gödel is a complete failure as he ends in utter meaninglessness. Godels theorems are invalid for 6 reasons: he uses the axiom of reducibility- which is invalid, he constructs impredicative statements - which are invalid, he cannot tell us what makes a mathematical statement true, Godels sentence G is outlawed by the very axiom of the system he uses to prove his theorem ie the axiom of reducibility -thus his proof is invalid, he falls into 3 self-contradictions and 3 paradoxes ,

What Gödel proved was not the incompleteness theorem but that mathematics was self contradictory – see Nagel and Bunch below.. But he proved this with flawed and invalid axioms and impredicative definitions thus showing that Godel's proof is based upon a misguided system of axioms and impredicative definitions and that it is invalid as its axioms and impredicative definitions are invalid. For example Godels uses the axiom of reducibility but this axiom was rejected as being invalid by Russell, Wittgenstein as well as most philosophers and mathematicians. Thus just on this point Godel is invalid as by using an axiom most people says is invalid he creates an invalid proof due to it being based upon invalid axioms and impredicative definitions

Godel states "the most extensive formal systems constructed up to the present time are the systems of Principia Mathematica (PM) on the one hand and on the other hand the Zermel-Fraenkel axiom system of set theory … it is reasonable therefore to make the conjecture that these axioms and rules of inference are also sufficient to decide all mathematical questions which can be formally expressed in the given axioms. **In what follows it will be shown that this is not the case but rather that *in both of the cited systems* there exist relatively simple problems of the theory of ordinary numbers which cannot be decided on the basis of the axioms"** (K Godel , On formally undecidable propositions of principia mathematica and related systems in *The undecidable* , M, Davis, Raven Press, 1965,pp.5-6)

All that he proved was in terms of PM system -so his proof has no bearing outside that system he used.. All that Gödel proved was the lair paradox

Gödel used impedicative definitions- Russell and Poincare rejected these as they lead to paradox

Godel , K , On Undecidable propositions of formal mathematical systems, in *The undecidable* , M, Davis, Raven Press, 1965, p.63)

Gödel used the axiom of reducibility -Russell abandoned this –some say it leads to paradox (K. Godel, op.cit, p.5)

Gödel used the axiom of choice mathematicians still hotly debate its validity- this axiom leads to the Branch-Tarski and Hausdorff paradoxes (K.Godel, op.cit, p.5)

Gödel used Zermelo axiom system but this system has the skolem paradox which reduces it to meaninglessness or self contradiction

Godel proved that mathematics was inconsistent

From Nagel -"Gödel" Routeldeg & Kegan, 1978, p 85-86

Gödel also showed that G is demonstrable if and only if it's formal negation ~G is demonstrable. **However if a formula and its own negation are both formally demonstrable the mathematical calculus is not consistent** (this is where he adopts the watered down version noted by bunch) **accordingly if** (just assumed to make math's consistent) the calculus is consistent neither G nor ~G is formally derivable from the axioms of mathematics. **Therefore if mathematics is consistent** G is a formally undecidable formula Gödel then proved that though G is not formally demonstrable it nevertheless is a true mathematical formula

From Bunch
"Mathematical fallacies and paradoxes" Dover 1982" p .151

Gödel proved

~P(x,y) & Q)g,y)
in other words ~P(x,y) & Q)g,y) is a mathematical version of the liar paradox. It is a statement X that says X is not provable. **Therefore if X is provable it is not provable a contradiction**. If on the other hand X is not provable then its situation is more complicated. If X says it is not provable and it really is not provable then X is true but not provable **Rather than accept a self-contradiction mathematicians settle for the second choice**

Thus Godel by using invalid axioms and impredicative definitions only succeeded in getting the inevitable paradox that his axioms and impredicative definitions ordained him to get. In other words he could have only ended in paradox for this is what his axioms and impredicative definitions determined him to get. Thus his proof is a complete failure as his proof. that mathematics is inconsistent was the only result that he could have logically arrived at since this result is what his axioms and impredicative definitions logically would lead him to; because these axioms and impredicative definitions lead to or end in paradox themselves. All he succeeded in getting was a paradoxical result.. Godel by using those axioms and impredicative definitions he could only have arrived at a paradoxical result

Gödel stated **the systems which satisfy assumptions 1 and 2 include the Zermelo-Fraenkel** but this system ends in meaninglessness. There is the Skolem paradox which collapses axiomatic theory into meaningless

Bunch notes op cit p.167

“no one has any idea of how to re-construct axiomatic set theory so that this paradox does not occur”

COROLLARY Other mathematicians have so called proved that ZF is undecidable. But the undecidability of ZF is based on the assumption that it is consistent. The Skolem paradox shows ZF is inconsistent. There fore Godel should not have used it in his paper in support of his theorems. Godel use ZF in his incompleteness proof as an example of an undecidable system but Godel would have known of the Skolem paradox and as such ZF is inconsistent Thus Godel has not proven ZF is undecidable since ZF is inconsistent

NOTE

Some say Godel did not use the axiom of reducibility

Godels paper is called

On formally undecidable propositions of Principia. Mathematica and related systems

if godel does not use axioms from PM then his paper cannot be about undecidable propositions in PM-thus he misleads us

if Godel does not use AR then what axioms from PM does he use. If he uses none then his paper is not about undecidable propositions in PM and he is lying when he says

" ...(we limit ourselves here to the system PM) …"

TO GIVE DETAIL- Godel uses the axiom of reducibility

GODEL STATES

"The general result as to the existence of undecidable propositions reads:

Proposition VI: **To every ω-consistent recursive class c of formulae** there correspond recursive class-signs r, such that neither v Gen r nor Neg (v Gen r) belongs to Flg(c) (where v is the free variable of r).

Proof:

Etc

Etc"

"**In the proof of Proposition V**I the only properties of the **system P** employed were the following:

1. **The class of axioms** and the rules of inference (i.e. the relation "immediate consequence of") are recursively definable (as soon as the basic signs are replaced in any fashion by natural numbers).

2. Every recursive relation is definable in the system P (in the sense of Proposition V).

Hence in every formal system that satisfies assumptions 1 and 2 and is ω-consistent, undecidable propositions exist of the form (x) F(x), where F is a recursively defined property of natural numbers, and so too in every extension of such "

"P is essentially the system obtained by superimposing on the Peano **axioms** the **logic of PM"**

AXIOMS OF P

"I.

Gödel uses only three of the Peano postulates; the others are supplanted by the axion-schemata defined later.

1. $\sim(Sx_1 = 0)$

Zero is the successor of no number. Expanded into the basic signs, the axiom is: $\sim(a_2 \forall (\sim(a_2(x_1)) \vee a_2(0)))$

This is the smallest axiom in the entire system (although there are smaller theorems, such as 0=0).

2. $Sx_1 = Sy_1 \supset x_1 = y_1$

If x+1 = y+1 then x=y. Expanding the ⊃ operator we get: $\sim(Sx_1 = Sy_1) \vee (x_1 = y_1)$ And expanding the = operators we get: $\sim(a_2 \forall (\sim(a_2(Sx_1)) \vee a_2(Sy_1))) \vee (a_2 \forall (\sim(a_2(x_1)) \vee a_2(y_1)))$

3. $x_2(0).x_1 \forall (x_2(x_1) \supset x_2(fx_1)) \supset x_1 \forall (x_2(x_1))$

The principle of mathematical induction: If something is true for x=0, and if you can show that whenever it is true for y it is also true for y+1, then it is true for all whole numbers x.

[178]II. Every formula derived from the following schemata by substitution of any formulae for p, q and r.

1. $p \vee p \supset p$

2. $p \supset p \vee q$

3. $p \vee q \supset q \vee p$

4. $(p \supset q) \supset (r \vee p \supset r \vee q)$

III. Every formula derived from the two schemata

1. $v \, \forall \, (a) \vee \text{Subst } a(v|c)$

2. $v \, \forall \, (b \supset a) \vee b \supset v \, \forall \, (a)$

by making the following substitutions for a, v, b, c (and carrying out in I the operation denoted by "Subst"): for a any given formula, for v any variable, for b any formula in which v does not appear free, for c a sign of the same type as v, provided that c contains no variable which is bound in a at a place where v is free.[23]

IV. Every formula derived from the schema

1. $(\exists u)(v \, \forall \, (u(v) \equiv a))$

on substituting for v or u any variables of types n or n + 1 respectively, and for a a formula which does not contain u free. T**his axiom represents the axiom of reducibility** (the axiom of comprehension of set theory).

V. Every formula derived from the following by type-lift (and this formula itself):

1. $x_1 \, \forall \, (x_2(x_1) \equiv y_2(x_1)) \vee x_2 = y_2$.

This axiom states that a class is completely determined by its elements."

Godel states that he is going to use the system of PM

" before we go into details lets us first sketch the main ideas of the proof … the formulas of a formal system (**we limit ourselves here to the system PM**) …" ((K Godel , On formally undecidable propositions of principia mathematica and related systems in *The undecidable* , M, Davis, Raven Press, 1965,pp.-6)

Godel uses the axiom of reducibility and axiom of choice from the PM

Quote

http://www.mrob.com/pub/math/goedel.htm

"A. Whitehead and B. Russell, Principia Mathematica, 2nd edition, Cambridge 1925. In particular, we also reckon among the axioms of PM the axiom of infinity (in the form: there exist denumerably many individuals), and **the axioms of reducibility and of choice (for all types)" ((**K Godel , On formally undecidable propositions of principia mathematica and related systems in *The undecidable* , M, Davis, Raven Press, 1965, p.5). NOTE HE SAYS HE IS USING 2ND ED PM- WHICH RUSSELL ABANDONED REJECTED GAVE UP DROPPED THE AXIOM OF REDUCIBILITY.

AXIOM OF REDUCIBILITY

(1) Godel uses the axiom of reducibility axiom 1V of his system is the axiom of reducibility "As Godel says "this axiom represents the axiom of reducibility (comprehension axiom of set theory)" (K Godel , On formally undecidable propositions of principia mathematica and related systems in *The undecidable* , M, Davis, Raven Press, 1965,p.12-13)

"IV. Every formula derived from the schema

1. $(\exists u)(v \forall (u(v) \equiv a))$

on substituting for v or u any variables of types n or n + 1 respectively, and for a a formula which does not contain u free. This axiom represents the axiom of **reducibility** (the axiom of comprehension of set theory)" (K Godel , On formally undecidable propositions of principia mathematica and related systems in *The undecidable* , M, Davis, Raven Press, 1965,p.12-13)

. Godel uses axiom 1V the axiom of reducibility in his formula 40 where he states "x is a formula arising from the axiom schema 1V.1 ((K Godel , On formally undecidable propositions of principia mathematica and related systems in *The undecidable* , M, Davis, Raven Press, 1965**,**p.21

“ [40. R-Ax(x) ≡ (∃u,v,y,n)[u, v, y, n <= x & n Var v & (n+1) Var u & u Fr y & Form(y) & x = u ∃x {v Gen [[R(u)*E(R(v))] Aeq y]}]

x is a formula derived from the axiom-schema IV, 1 by substitution “(K Godel , On formally undecidable propositions of principia mathematica and related systems in *The undecidable* , M, Davis, Raven Press, 1965)

http://www.mrob.com/pub/math/goedel.html

what godel calls the axiom of reducibility is his streamlined version of
russells axiom

http://www.math.ucla.edu/~asl/bsl/1302/1302-001.ps.

"The system P of footnote 48a is Godel’s
streamlined version of Russell’s theory of types built on the natural
numbers as individuals, the system used in [1931]. The last sentence ofthe footnote
allstomindtheotherreferencetosettheoryinthatpaper;
KurtGodel[1931,p. 178] wrote of his comprehension axiom IV, foreshadowing
his approach to set theory, “This axiom plays the role of [Russell’s]
axiom of reducibility (the comprehension axiom of set theory).”

from the collected works of godel volume 3
godel states 1939

http://books.google.com/books?id=gDzbuUwma5MC&pg=PA119&lpg=PA119&dq=godel+axiom+of+reducibility&source=web&ots=-t22NJE3Mf&sig=idCxcjAEB6yMxY9k3JnKMkmSvhA#PPA119,M1

"to be sure one must observe that the axiom of reducibility appears in different mathematical systems under different names and forms"

he is noting AR has different forms

Godel uses the axiom of reducibility in the reasoning of his proof. As he states

http://www.mrob.com/pub/math/goedel.html

In the proof of Proposition VI the only properties of the system P employed were the following:

1. **The class of axioms** and the rules of inference (i.e. the relation "immediate consequence of") are recursively definable (as soon as the basic signs are replaced in any fashion by natural numbers).

2. Every recursive relation is definable in the system P (in the sense of Proposition V).

Hence in every formal system that satisfies assumptions 1 and 2 and is ω-consistent, undecidable propositions exist of the form (x) F(x), where F is a recursively defined property of natural numbers, and so too in every extension of such

The class of axioms are

http://www.mrob.com/pub/math/goedel.html

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Zero is the successor of no number. Expanded into the basic signs, the axiom is: $\sim(a_2 \forall (\sim(a_2(x_1)) \vee a_2(0)))$

This is the smallest axiom in the entire system (although there are smaller theorems, such as 0=0).

2. $Sx_1 = Sy_1 \supset x_1 = y_1$

If x+1 = y+1 then x=y. Expanding the ⊃ operator we get: $\sim(Sx_1 = Sy_1) \vee (x_1 = y_1)$ And expanding the = operators we get: $\sim(a_2 \, \forall \, (\sim(a_2(Sx_1)) \vee a_2(Sy_1))) \vee (a_2 \, \forall \, (\sim(a_2(x_1)) \vee a_2(y_1)))$

3. $x_2(0).x_1 \, \forall \, (x_2(x_1) \supset x_2(fx_1)) \supset x_1 \, \forall \, (x_2(x_1))$

The principle of mathematical induction: If something is true for x=0, and if you can show that whenever it is true for y it is also true for y+1, then it is true for all whole numbers x.

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by making the following substitutions for a, v, b, c (and carrying out in I the operation denoted by "Subst"): for a any given formula, for v any variable, for b any formula in which v does not appear free, for c a sign of the same type as v, provided that c contains no variable which is bound in a at a place where v is free.[23]

IV. Every formula derived from the schema

1. $(\exists u)(v \, \forall \, (u(v) \equiv a))$

on substituting for v or u any variables of types n or n + 1 respectively, and for a a formula which does not contain u free. **This axiom represents the axiom of reducibility** (the axiom of comprehension of set theory).

V. Every formula derived from the following by type-lift (and this formula itself):

1. $x_1 \forall (x_2(x_1) \equiv y_2(x_1)) \vee x_2 = y_2$.

This axiom states that a class is completely determined by its elements.

Now to show how the axiom of reducibility is used in the reasoning of the proof

Godel says

http://www.mrob.com/pub/math/goedel.html

"The general result as to the existence of undecidable propositions reads:

Proposition VI: **To every ω-consistent recursive class c of formulae** there correspond recursive class-signs r, such that neither v Gen r nor Neg (v Gen r) belongs to Flg(c) (where v is the free variable of r).

Proof: Let c be any given recursive ω-consistent class of formulae. We define:

$Bw_c(x) \equiv (n)[n <= l(x) \rightarrow$ **Ax**$(n \text{ Gl } x) \vee (n \text{ Gl } x)\ \varepsilon\ c \vee$

$(Ep,q)\{0 < p,q < n\ \&\ Fl(n \text{ Gl } x, p \text{ Gl } x, q \text{ Gl } x)\}]\ \&\ l(x) > 0{:}>$ (5)

(cf. the analogous concept 44)

etc

etc"

Now Ax is

42. $Ax(x) \equiv Z\text{-}Ax(x) \vee A\text{-}Ax(x) \vee L_1\text{-}Ax(x) \vee L_2\text{-}Ax(x) \vee$ **R-Ax**$(x) \vee M\text{-}Ax(x)$

Now **R-Ax is**

40. $R\text{-}Ax(x) \equiv (\exists u,v,y,n)[u, v, y, n <= x\ \&\ n \text{ Var } v\ \&\ (n+1) \text{ Var } u\ \&\ u \text{ Fr } y\ \&\ Form(y)\ \&$

$x = u\ \exists x\ \{v \text{ Gen } [[R(u)*E(R(v))] \text{ Aeq } y]\}]{:}>$

x is a formula derived from the axiom-schema IV, 1 by substitution (ie the axiom of reducibility

IT MUST BE NOTED THAT GODEL IS USING 2ND ED PM BUT RUSSELL ABANDONED REJECTED GAVE UP DROPPED THE AXIOM OF REDUCIBILITY IN THAT EDITION – which Godel must have known. Godel used a text in PM that based on Russells revised version of PM in 2nd ed PM Russell had rejected abandoned dropped as stated in the introduction. Godel used a text with the axiom of reducibility in it but Russell had abandoned rejected dropped this axiom as stated in the introduction. Godel used a rejected text as it used the rejected axiom of reducibility.

The Cambridge History of Philosophy, 1870-1945- page 154

http://books.google.com/books?id=I09hCIlhPpkC&pg=PA154&vq=Russell+repudiated+Reducibility&dq=taken+out+2nd+ed+principia+russell+axiom+of+reducibility&source=gbs_search_r&cad=1_1&sig=-LmJ1voEsKRoWOzml_RmOLy_JS0
Quote

"In the Introduction to the **second** **edition** of **Principia**, **Russell** repudiated **Reducibility** as 'clearly not the sort of **axiom** with which we can rest content'…Russells own system with out reducibility was rendered incapable of achieving its own purpose"

quote page 14
http://www.helsinki.fi/filosofia/gts/ramsay.pdf.

"Russell gave up the **Axiom** of **Reducibility** in the **second** **edition** of **Principia** (1925)"

Phenomenology and Logic: The Boston College Lectures on Mathematical Logic and Existentialism (Collected Works of Bernard Lonergan) page 43

http://books.google.com.au/books?id=Pd5YaLwZugUC&pg=PA43&lpg=PA43&dq=axiom+of+reducibility+second+dropping&source=web&ots=a27lIUxvQU&sig=auv4udKq0S-F6KQ_Xxsh0US6QrI&hl=en

"In the second edition Whitehead and Russell took the step of using the simplified theory of types dropping the axiom of reducibility and not worrying to much about the semantical difficulties"

In Godels collected works vol 11 page 133

http://books.google.com.au/books?id=lgDGTYNcOY4C&pg=PA133&lpg=PA133&dq=in+the+second+edition+of+principia+the+axiom+of+reducibility+is+dropped+collected+works&source=web&ots=SC8yKFL8Lf&sig=yikmJswN8xTsENEuQmK-iLznOYs&hl=en
it says AR is dropped
quote

In the second edition of Principia (at least in the introduction) ...the axiom of reducibility is
dropped

Godels paper is called

ON FORMALLY UNDECIDABLE PROPOSITIONS

OF PRINCIPIA MATHEMATICA AND RELATED

SYSTEMS

but he uses an axiom that was abandoned rejected given up in PRINCIPIA MATHEMATICA thus his proof/theorem has nothing to do with PRINCIPIA MATHEMATICA AND RELATED SYSTEMS at all

Godels proof is about his artificial system P -which is invalid as it uses the ad hoc invalid axiom of reducibility

Godel constructs an artificial system P made up of Peano axioms and axioms including the axiom of reducibility- which is ABANDONED REJECTED GAVE UP DROPPED in the edition of PM he says he is is using. This system is invalid as it uses the invalid axiom of reducibility. Godels theorem has no value out side of his system P and system P is invalid as it uses the invalid axiom of reducibility

Russell following Wittgenstein took it out of the 2nd ed due to it being invalid. Godel would have known that. Russell Ramsey and Wittgenstein new Godel used it but said nothing .Ramsey points out AR is invalid before Godel did his proof. Godel would have known Ramsey's arguments Ramsey would have known Godel used AR but said nothing. Every one knew AR was invalid and was dropped from 2nd ed PM they all knew godel used it but nooooooooooooo one said -or has said anything for 76 years.

Corollary 1 Godel did not destroy the Hilbert Frege Russell programme to create a unitary deductive system in which all mathematical truths can be deduced from a handful of axioms

Godel is said to have shattered this programme in his paper called "**On formally undecidable propositions of Principia Mathematica and related systems**" but this paper it turns out had nothing to do with "*Principia Mathematica*" and related systems" but instead with a completely artificial system called P Godel uses axioms which where abandoned rejected dropped in 2nd ed PM. Godel used a text in PM that based on Russells revised version of PM in 2nd ed PM Russell had rejected abandoned dropped as stated in the introduction. Godel used a text with the axiom of reducibility in it but Russell had abandoned rejected dropped this axiom as stated in the introduction. Godel used a rejected text as it used the rejected axiom of reducibility. Thus his proof/theorem cannot apply to PM thus he cannot have destroyed the Hilbert Frege Russell programme and also his system P is artificial and applies to no system anyways

Corollary 2 Mathematics is meant to be a rigorous deductive discipline based upon sound principles

but

Godel using invalid axioms throws maths into crisis because it now turns out that maths is not based upon sound principles since ad hoc principles can be used if they apparently give the right result

To reiterate e the axiom of reducibility used by Godel it is ad hoc and unjustifiable as the

The Stanford Dictionary of Philosophy states that ", **many critics concluded that the axiom of reducibility was simply too ad hoc to be justified philosophically**."

With this admission and the fact that godel used an ad hoc principle the foundations of maths have been destroyed for any one can now use any ad hoc principle to prove anything take Fermats last theorem any one can now create an ad hoc principle which will prove the theorem

Thus Godel using ad hoc axioms throws mathematics into crisis by shattering its logical foundations and by showing that truth can be arrived at by any ad hoc avenue
thus showing the myth of mathematics as a rigorous deductive discipline based upon sound principles

IT SHOULD BE NOTED

Godel sentence G is outlawed by the very axiom he uses to prove his theorem ie the axiom of reducibiility -thus his proof is invalid-and thus godel commits a flaw by useing it to prove his theorem

http://www.enotes.com/topic/Axiom_of_reducibility russells axiom of reducibility was formed such that impredicative statements where banned

http://www.scribd.com/doc/32970323/Godels-incompleteness-theorem-invalid-illegitimate

but godels uses this AR axiom in his incompleteness proof ie axiom 1v and formular 40

and as godel states he is useing the logic of PM ie AR

“P is essentially the system obtained by superimposing on the Peano axioms the logic of PM” ie AR

now godel constructs an impredicative statement G which AR was meant to ban

The impredicative statement Godel constructs is
http://en.wikipedia.org/wiki/G%C3%B6del%27s_incompleteness_theorems

“the corresponding Gödel sentence G asserts: “G cannot be proved to be true within the theory T””

now godels use of AR bans godels G statement thus godel cannot then go on to give a proof by useing a statement his own axiom bans

but by doing so he invalidates his whole proof and his proof/logic is flawed

we have a dilemma

```
DILEMMA

1)
if godel is useing AR then he cannot use G as it is outlawed
thus his proof collapses

2) if godel is not useing AR then he is lying when he tells
us he is
and thus his theorem cannot be about PM and related systems
```

(2) "As a corollary, the **axiom** of **reducibility** was banished as irrelevant to mathematics **...** The **axiom** has been regarded as **re-instating** the semantic **paradoxes" - http://mind.oxfordjournals.org/cgi/reprint/107/428/823.pdf**

2)"does this mean the paradoxes are reinstated. The answer seems to be yes and no" - http://fds.oup.com/www.oup.co.uk/pdf/0-19-825075-4.pdf)

3) It has been repeatedly pointed out this Axiom obliterates the distinction according to levels and compromises the vicious-circle principle in the very specific form stated by Russell. But The philosopher and logician FrankRamsey (1903-1930) was the first to notice that the axiom of reducibility in effect collapses the hierarchy of levels, so that the hierarchy is entirely superfluous in presence of the axiom. **(http://www.helsinki.fi/filosofia/gts/ramsay.pdf)**

4) Russell Ramsey and Wittgenstein regarded it as illegitimate Russell abandoned this axiom – in 2nd ed PM- and many believe it is illegitimate and must be not used in mathematics

Ramsey says

Such an axiom has no place in mathematics, and anything which cannot be proved without using it cannot be regarded as proved at all.

This axiom there is no reason to suppose true; and if it were true, this would be a happy accident and not a logical necessity, for it is not a tautology. (THE FOUNDATIONS OF MATHEMATICS* (1925) by F. P. RAMSEY

the standford encyclopdeia of philosophy says of AR

http://plato.stanford.edu/entries/principia-mathematica/

"many critics concluded that the axiom of reducibility was simply too ad hoc to be justified philosophically"

From Kurt Godels collected works vol 3 p.119

http://books.google.com/books?id=gDzbuUwma5MC&pg=PA119&lpg=PA119&dq=godel+axiom+of+reducibility&source=web&ots=-t22NJE3Mf&sig=idCxcjAEB6yMxY9k3JnKMkmSvhA#PPA119,M1

"the axiom of reducibility is generally regarded as the grossest philosophical expediency "

Godel would have know all these criticism by Russell Wittgenstein and Ramsey but still used the axiom. Russell Witgenstein and Ramsey would have know Godel used this invalid axiom in his artificial system P but said nothing

NOTE

Some say the axiom Godel used was the the axiom schema of comprehension.

this axiom is from set theory not PM

some say he does not use the axiom of reducibility

godels paper is called

On formally undecidable propositions of Principia. Mathematica and related systems

note not undecidable propositions in set theory

if godel does not use axioms from PM then his paper cannot be about undecidable propositions in PM-thus he misleads us

godels tells us he is limiting himself to PM

" before we go into details lets us first sketch the main ideas of the proof … the formulas of a formal   system (we limit ourselves here to the system PM) …"

godels tell us PM has the axiom of reducibility

"A. Whitehead and B. Russell, Principia Mathematica, 2nd edition, Cambridge 1925. In particular, we also reckon among the axioms of PM the axiom of infinity (in the form: there exist denumerably many individuals), and the axioms of reducibility"

godel tells us his system P is made up of Peano and PM

"P is essentially the system obtained by superimposing on the Peano axioms the logic of PM"

he tells us axiom 1v of system is AR

"IV. Every formula derived from the schema

1. (∃u)(v ∀ (u(v) ≡ a))

on substituting for v or u any variables of types n or n + 1
respectively, and for a a formula which does not contain u free. This
axiom represents the axiom of reducibility (the axiom of comprehension
of set theory)

he tells us his formular 40 uses AR

40. R-Ax(x) • (∃u,v,y,n)[u, v, y, n <= x & n Var v & (n+1) Var u & u

Fr y & Form(y) & x = u ∃x {v Gen [[R(u)*E(R(v))] Aeq y]}]:>

x is a formula derived from the axiom-schema IV, 1 by substitution (ie **the axiom of reducibility)**

if godel does not use axioms from PM then his paper cannot
be about undecidable propositions in PM-thus he misleads us

if Godel does not use AR
then what axioms from PM he does he use
for if he uses none then his paper is not about undecidable
propistions in PM and he is lying when he says

" ...(we limit ourselves here to the system PM) …"

GODEL INCOMPLETENESS THEOREM IS ONLY APPLICABLE TO THE INVALID SYSTEM P- HE INCORRECTLY GENERALISES IT TO OTHER SYSTEMS

Godels system P is not his object theory but is his main theory from which he derives his incompleteness theorem

godels incompleteness theorem reads- note it says to every ω-consistent
recursive class c of formulae

Godel's first Incompleteness Proof at MROB at MROB

Proposition VI: **To every ω-consistent recursive class c of formulae** there correspond recursive class-signs r, such that neither v Gen r nor Neg (v Gen r) belongs to Flg(c) (where v is the free variable of r).

now
1) he derives his incompleteness theorem from system P which is made up of peano and PM but decietfully says it applyies to other system

quote

In the proof of Proposition VI the only properties of the system P employed were the following:

1. The class of axioms and the rules of inference (i.e. the relation "immediate consequence of") are recursively definable (as soon as the basic signs are replaced in any fashion by natural numbers).

2. Every recursive relation is definable in the system P (in the sense of Proposition V).

Hence in every formal system that satisfies assumptions 1 and 2 and is ω-consistent, undecidable propositions exist of the form (x) F(x), where F is a recursively defined property of natural numbers, and so too in every extension of such

[191]a system made by adding a recursively definable ω-consistent class
of axioms. As can be easily confirmed, the systems which satisfy
assumptions 1 and 2 include the Zermelo-Fraenkel and the v. Neumann axiom systems of set theory

note his theorem says

to every ω-consistent recursive class c of formulae

but he has only proved his theorem for system P ie PM
so he cant extend that to to every ω-consistent recursive class c of
formulae

he thus trys to decieve us by saying a proof only relevant to system PM is relevant to every ω-consistent recursive class c of formulae

2 after useing peano and PM in his proof he says

WITHOUT PROOF that footnote 16

16 The addition of the Peano axioms, like all the other changes made in the system PM, serves only to simplify the proof and can in principle be dispensed with.

he has only said that peano and PM can be dropped in any proof after
making his deceitfull extention of his theorem and then

this is deceitfull circular reasoning

in other words
he reasons incorrectly and deceitfully

example

i have used system P to make my proof but my proof is general to other systems which are not P[WITHOUT PROOF]thus we can drop system P in other incompleteness proofs [WITHOUT PROOF]

from these decietfull acts people have argued that the system P proof is only an object proof

but
it is the main proof -as godel tell us

quote
"In the proof of Proposition VI the only properties of the system P employed were the following"
and from that proof he gets his incompleteness theorem AND FROM NO WHERE ELSE

ZERMELO AXIOM SYSTEM

Godel specifies that he uses the Zermelo axiom system- (K Godel , On formally undecidable propositions of principia mathematica and related systems in *The undecidable* , M, Davis, Raven Press, 1965,p.28.)

quote
http://www.mrob.com/pub/math/goedel.html

"In the proof of Proposition VI the only properties of the system P employed were the following:

1. The class of axioms and the rules of inference (i.e. the relation "immediate consequence of") are recursively definable (as soon as the basic signs are replaced in any fashion by natural numbers).

2. Every recursive relation is definable in the system P (in the sense of Proposition V).

Hence in every formal system that satisfies assumptions 1 and 2 and is ω-consistent, undecidable propositions exist of the form (x) F(x), where F is a recursively defined property of natural numbers, and so too in every extension of such

[191]a system made by adding a recursively definable ω-consistent class of axioms. As can be easily confirmed, **the systems which satisfy assumptions 1 and 2 include the Zermelo-Fraenkel** and the v. Neumann axiom systems of set theory,47"

IMPREDICATIVE DEFINITIONS
Godel used impredicative definitions

Ponicare Russell and philosophers argue these types of definitions are invalid
Ponicare Russell point out that they lead to contradictions in mathematics

Quote from Godel
“ The solution suggested by Whitehead and Russell, that a proposition cannot say something about itself , is to drastic... We saw that we can construct propositions which make statements about themselves,… ((K Godel , On undecidable propositions of formal mathematical systems in *The undecidable* , M, Davis, Raven Press, 1965, p.63 of this work Dvis notes, “it covers ground quite similar to that covered in Godels orgiinal 1931 paper on

undecidability," p.39.)

What Godel understood by "propositions which make statements about themselves"

is the sense Russell defined them to be

'Whatever involves all of a collection must not be one of the collection.' Put otherwise, if to define a collection of objects one must use the total collection itself, **then the definition is meaningless.** This explanation given by Russell in 1905 was accepted by Poincare' in 1906, who coined the term impredicative definition, (Kline's "Mathematics: The Loss of Certainty"☺

Note Poincare called these self referencing statements impredicative definitions

texts books on logic tell us self referencing ,statements (petitio principii vicious circle) are invalid
http://en.wikipedia.org/wiki/Vicious_circle_principle

Many early 20th century researchers including Bertrand Russell and Henri Poincaré. Frank P. Ramsey and Rudolf Carnap accepted the ban on explicit circularity,
The **vicious circle principle** is a principle that was endorsed by many predicativist mathematicians in the early 20th century to prevent contradictions. The principle states that no object or property may be introduced by a definition that depends on that object or property itself. In addition to ruling out definitions that are explicitly

circular (like "an object has property P iff it is not next to anything that has property P"), this principle rules out definitions that quantify over domains including the entity being defined.

Godels has argued that impredicative definitions destroy mathematics and make it false

http://www.friesian.com/goedel/chap-1.htm

Gödel has offered a rather complex analysis of the vicious circle principle and its devastating effects on classical mathematics culminating in the conclusion that because it **"destroys the derivation of mathematics from logic, effected by Dedekind and Frege, and a good deal of modern mathematics itself" he would "consider this rather as a proof that the vicious circle principle is false than that classical mathematics is false"**

Yet Godel uses impredicative definitions in his theorems

" The solution suggested by Whitehead and Russell, that a proposition cannot say something about itself , is to drastic... We saw that we can construct propositions which make statements about themselves,… ((K Godel , On undecidable propositions of formal mathematical systems in *The undecidable* , M, Davis, Raven Press, 1965, p.63 of this work Dvis notes, "it covers ground quite similar to that covered in Godels orgiinal 1931 paper on undecidability," p.39.)

The impredicative statement Godel constructs is http://en.wikipedia.org/wiki/G%C3%B6del%27s_incompleteness_theorems#First_incompleteness_theorem

"the corresponding Gödel sentence *G* asserts: "*G* cannot be proved to be true within the theory *T*""

Now it is statements like this that Russell and Poincare et al said creates paradox and should be outlawed – we will see how this creates paradox below when the self-contradiction in Godels first and second incompleteness theorem are shown [due to his construction of impredeicative statement]

also

Godel used Peanos axioms but these axioms are impredicative and thus according to Russell Poincaré and others must be avoided as they lead to paradox.

Axiom 3 of Godels system P

http://www.mrob.com/pub/math/goedel.html

3. $x_2(0).x_1 \forall (x_2(x_1) \supset x_2(fx_1)) \supset x_1 \forall (x_2(x_1))$

The principle of mathematical induction: If something is true for x=0, and if you can show that whenever it is true for y it is also true for y+1, then it is true for all whole numbers x.

But the axiom is impredicative

quote

http://en.wikipedia.org/wiki/Preintuitionism

”This sense of definition allowed Poincaré to argue with Bertrand Russell over Giuseppe Peano's axiomatic theory of natural numbers.

Peano's fifth axiom states:

* Allow that; zero has a property P;
* And; if every natural number less than a number x has the property P then x also has the property P.
* Therefore; every natural number has the property P.

This is the principle of complete induction, it establishes the property of induction as necessary to the system. Since Peano's axiom is as infinite as the natural numbers, it is difficult to prove that the property of P does belong to any x and also x+1. What one can do is say that, if after some number n of trails that show a property P conserved in x and x+1, then we may infer that it will still hold to be true after n+1 trails. But this is itself induction. And hence the argument is a vicious circle.

From this Poincaré argues that if we fail to establish the consistency of Peano's axioms for natural numbers without falling into circularity, then the principle of complete induction is improvable by general logic. "

GODEL ACCEPTED IMPREDICATIVE DEFINITIONS

quote

http://www.friesian.com/goedel/chap-1.htm

"recent research [9] has shown that more can be squeezed out of these restrictions than had been expected:

all mathematically interesting statements about the natural numbers, as well as many analytic statements, which have been obtained by impredicative methods can already be obtained by predicative ones.[10]

We do not wish to quibble over the meaning of "mathematically interesting." However, "it is shown that the arithmetical statement expressing the consistency of predicative analysis is provable by impredicative means." Thus it can be proved conclusively that restricting mathematics to predicative methods does in fact eliminate a substantial portion of classical mathematics.[11]

Gödel has offered a rather complex analysis of the vicious circle principle and its devastating effects on classical mathematics culminating in the conclusion that because it "destroys the derivation of mathematics from logic, effected by Dedekind and Frege, and a good deal of modern mathematics itself" he would **"consider this rather as a proof that the vicious circle principle is false than that classical mathematics is false**."[12]"

GODEL CAN NOT TELL US WHAT MAKES A STATEMENT TRUE

Now truth in mathematics was considered to be if a statement can be proven then it is true

Ie truth was s equated with provability

http://en.wikipedia.org/wiki/Truth#Truth_in_mathematics

"…from at least the time of Hilbert's program at the turn of the twentieth century to the proof of Gödel's theorem and the development of the Church-Turing thesis in the early part of that century, **true statements in mathematics were generally assumed to be those statements which are provable in a formal axiomatic system**.

The works of Kurt Gödel, Alan Turing, and others **shook this assumption, with the development of statements that are true but cannot be proven within the system**"

Now the syntactic version of Godels first completeness theorem reads

Proposition VI: **To every ω-consistent recursive class c of formulae** there correspond recursive class-signs r, such that neither v Gen r nor Neg (v Gen r) belongs to Flg(c) (where v is the free variable of r).

But when this is put into plain words we get

http://en.wikipedia.org/wiki/G%C3%B6del%27s_incompleteness_theorems#Meaning_of_the_first_incompleteness_theorem

"Any effectively generated theory capable of expressing elementary arithmetic cannot be both consistent and complete. In particular, for any consistent, effectively generated formal theory **that proves certain basic arithmetic truths, there is an arithmetical statement that is true,**[1] **but not provable in the theory** (Kleene 1967, p. 250)
For each consistent formal theory *T* having the required small amount of number theory … **provability-within-the-theory-*T* is not the same as truth**; the theory *T* is incomplete."

In other words there are true mathematical statements which cant be proven
But the fact is Godel cant tell us what makes a mathematical statement true thus his theorem is meaningless
Ie if Godels theorem said there were gibbly statements that cant be proven
But if godel cant tell us what a gibbly statement was then we would say his theorem was meaningless

mathematician have so much invested in godels incompleteness theorem
much maths is reliant on it but at the time godel wrote his theorem he had no idea of what truth was as peter smith the Cambridge expert on Godel admitts

http://groups.google.com/group/sci.logic/browse_thread/thread/ebde70bc932fc0a7/de566912ee69f0a8?lnk=gst&q=G%C3%B6del+didn%27t+rely+on+the+notion+PETER+smith#de566912ee69f0a8

Quote:

> Gödel didn't rely on the notion
> of truth

but truth is central to his theorem
as peter smith kindly tellls us

http://assets.cambridge.org/97805218...40_excerpt.pdf

Quote:

> Godel did is find a general method that enabled him to take any theory T
> strong enough to capture a modest amount of basic arithmetic and
> construct a corresponding arithmetical sentence GT which encodes the claim 'The
> sentence GT itself is unprovable in theory T'. So G T is **true** if and only
> if T can't prove it
>
> If we can locate GT
>
> , a Godel sentence for our favourite nicely ax-
> iomatized theory of arithmetic T, and can argue that G T is
> **true**-but-unprovable,

and godels theorem is

http://en.wikipedia.org/wiki/G%C3%B6...s_theorems#Fir...

Quote:

Gödel's first incompleteness theorem, perhaps the single most celebrated result in mathematical logic, states that:

For any consistent formal, recursively enumerable theory that proves basic arithmetical **truths**, an arithmetical statement that is **true,** but not provable in the theory, can be constructed.1 That is, any effectively generated theory capable of expressing elementary arithmetic cannot be both consistent and complete.

you see godel referes to true statement
but Gödel didn't rely on the notion
of truth

now because Gödel didn't rely on the notion
of truth he cant tell us what true statements are
thus his theorem is meaningless

this puts mathematicians in deep shit because all the modern idea derived
from godels theorem have no epistemological or mathematical worth for we
dont know what true statement are
without a notion of truth we dont know what makes those statements true
thus the theorem is meaningless

Some naive argue that provability is the criterion of what makes a maths statement true
Ie if you can prove a statement then it is true
But as shown above godels theorem showed "…For each consistent formal theory *T*
having the required small amount of number theory

… **provability-within-the-theory-*T* is not the same as truth**; the theory *T* is incomplete."

But for the point of argument if we accept provability makes a statement true then godel still cant tell us **what makes them true those mathematics statements which are true but cant be proven**

Thus his theorem is still meaningless

Some argue that Tarskis semantic theory of truth can fit Godels theorems

But Tarskis theory of truth is logically flawed where in fact truth is never really defined . The problem with Tarskis theory is it requires a metalangauge and we get an ad infinitum

If a grammar of a language must be in its metalanguage, as Tarski seems to require, than the grammar of this metalanguage must be in its metalanguage. Thus we have a notion of truth in the object language dependent on the notion of truth in the metalanguage. But the notion of truth in the metalangague is itself dependent on the notion of truth in its meta-meta-language

As is stated in

Philosophy of logic
By Dale Jacquette, Dov M. Gabbay, John Hayden

http://books.google.com.au/books?id=1xEVkzuX5e0C&pg=PA142&lpg=PA142&d...

"the indefinitely ascending stratification of metalanguages in which the truth or falsehood of sentences is permitted for only the lower tiers of the hierarchy **never reaches an**

end point at which the theorist can say that truth has finally been defined"

So neither Godel nor Tarski can tell us what makes a mathematical statement true
Thus again Godels theorm is meaningless

Interesting there is a theorem that says truth is undefinable ie Traski undefinabiity theorem This theorem means no one not even godel can tell us what truth is
Tarskis theorem- means no mathematician including **godel** can tell us what **truth** is-thus godels theorem is meaningless

. http://en.wikipedia.org/wiki/Tarski%27s_undefinability_theorem
Tarski's undefinability theorem, stated and proved by Alfred **Tarski** in 1936, is an important limitative result in mathematical logic, the foundations of mathematics, and in formal semantics. Informally, the theorem states that arithmetical **truth** cannot be defined in arithmetic

bear in mind tarskis theorem is meaningless has he cant tell us why it is true
if he can tell us why it is true
then he ends in paradox

Thus apart from godel not telling us what makes amaths statement true tarskis theoem mean it is meaningless as well as going by tarskis theorem no one can tell us what truth s since truth is undefinable

Thus godels theorem is meaningless as he cant tell us-and no one can tell us-what makes a math statement true

GODEL DID NOT DESTROY THE HILBERT FREGE RUSSELL PROGRAMME TO CREATE A UNITARY DEDUCTIVE SYSTEM IN WHICH ALL MATHEMATICAL TRUTHS CAN CAN BE DEDUCED FROM A HANDFUL OF AXIOMS

Godel is said to have shattered this programme in his paper called "On formally undecidable propositions of Principia Mathematica and related systems"

For two reasons Godel did not destroy the Hilbert Frege Russell programme

1)

Godels paper it turns out had nothing to do with Principia Mathematica and related systems" but instead with a completly artificial system called P Godel uses axioms which where not in his version of PM thus his proof/theorem cannot apply to PM thus he cannot have destroyed the Hilbert Frege Russell programme and also his system P is artificial and applies to no system anyways

2) being unable to tell us what makes a mathematical statement true Godels theorem is meaningless

Thus

Godels theorems are invalid for 5 reasons: he uses the axiom of reducibility- which is invalid, , he constructs impredicative statements - which are invalid ,, he falls into 2 self-contradictions and 3 paradoxes Gödel is a complete failure as he ends in utter meaninglessness. His meaningless/paradoxical result comes directly from using axioms and impredicative definitions that lead or end in paradox. Even if Godel did not prove that mathematics was inconsistent Gödel proved nothing as it was totality built upon invalid axioms and impredicative definitions; All talk of what Godel achieved is just another myth mathematicians foist upon an ignorant population to beguile them into believing mathematician know what they are talking about and have access to truth.

GODEL IS SELF-CONTRADICTORY

First contradiction

Godels first theorem ends in paradox –due to his construction of impredicative statement

Now the syntactic version of Godels first completeness theorem reads

Proposition VI: **To every ω-consistent recursive class c of formulae** there correspond recursive class-signs r, such that neither v Gen r nor Neg (v Gen r) belongs to Flg(c) (where v is the free variable of r).

But when this is put into plain words we get http://en.wikipedia.org/wiki/G%C3%B6del%27s_incompleteness_theorems#First_incompleteness_theorem

Gödel's first incompleteness theorem states that:

> Any effectively generated theory capable of expressing elementary arithmetic cannot be both consistent and complete. In particular, for any consistent, effectively generated formal theory that proves certain basic arithmetic truths, there is an arithmetical statement that is true,[1] but not provable in the theory (Kleene 1967, p. 250).

Now truth in mathematics was considered to be if a statement can be proven then it is true

Ie truth is equated with provability

http://en.wikipedia.org/wiki/Truth#Truth_in_mathematics

"…from at least the time of Hilbert's program at the turn of the twentieth century to the proof of Gödel's theorem and the development of the Church-Turing thesis in the early part of that century, **true statements in mathematics were generally assumed to be those statements which are provable in a formal axiomatic system**.

The works of Kurt Gödel, Alan Turing, and others **shook this assumption, with the development of statements that are true but cannot be proven within the system**"

http://en.wikipedia.org/wiki/G%C3%B6del%27s_incompleteness_theorems#Meaning_of_the_first_incompleteness_theorem

“Any effectively generated theory capable of expressing elementary arithmetic cannot be both consistent and complete. In particular, for any consistent, effectively generated formal theory **that proves certain basic arithmetic truths, there is an arithmetical statement that is true,[1] but not provable in the theory** (Kleene 1967, p. 250)
For each consistent formal theory *T* having the required small amount of number theory … provability-within-the-theory-*T* is not the same as truth; the theory *T* is incomplete.”

Now it is said godel PROVED
"there are true mathematical statements which cant be proven"
in other words
truth does not equate with proof.

if that theorem is true
then his theorem is false

PROOF
for if the theorem is true-because he proved it
then truth does equate with proof- as it is implied that his proof makes the theorem true
but his theorem says
truth does not equate with proof.
thus a paradox
THIS WHAT COMES OF USING IMPREDICATIVE STATEMENTS

SECOND CONTRDICTION

Godels theorem means All provable mathematics statements cant be true including his own theorem

godel proved that there are true mathematic statements which cant be proven

(Now if there is only one definition of what makes a mathematics statement true)
so that entails then that what ever a true mathematics statement is a condition of it being true must be that it cant be proven

that means then
that all provable mathematic statements cant be true
(if there is only one definition of what makes a mathematics statement true)
as a condition on being true is that it must be non-provable
Thus godel giving a proof of his theorem means his theorem cant be true as a condition on being true is that it must be non-provable

This place godels theorem in a paradox
If his theorem is true then his theorem must be not true
Or
He has proved his theorem but his theorem means then his theorem cant be true as a condition on being true is that it must be non-provable

Or
Godels theorem is considered true but if it is true then it cant be true as he has proved his theorem but his theorem means then his theorem cant be true as a condition on being true is that it must be non-provable
Note from above godel cant tell us what makes them true those mathematics statements which are true but cant be proven

Also if there is more than one definition as to what makes a maths statement true this would mean truth in mathematics is relative thus making the notion of a true statement absurd or meaningless

Example

It would mean that maths statement A would be true under truth definition A but false under truth definition B

Thus

Making the truth of statement A meaningless

THIRD CONTRADICTION

Godels second theorem ends in paradox– impredicative

The theorem in a rephrasing reads

http://en.wikipedia.org/wiki/G%C3%B6del%27s_incompleteness_theorems#Proof_sketch_for_the_second_theorem

The following rephrasing of the second theorem is even more unsettling to the foundations of mathematics:

If an axiomatic system can be proven to be consistent and complete from within itself, then it is inconsistent."

But

godel is useing a a mathematical system
his theorem says a system cant be proven consistent

this must then apply to the system he used to create the theorem
thus his theorem applies to itself

thus paradox

if godels theorem is true within this system-or outside it
ie a system cannot be proven to be consistent
then his theorem is in paradox
as
it can only be proven if his logic is consistent within that system
if his theorem is true
then he has proven his logic is consistent within that system
but his theorem says this cannot be done

THIS WHAT COMES OF USING IMPREDICATIVE STATEMENTS

But here is a contradiction Godel must prove that a system cannot be proven to be consistent based upon the premise that the logic he uses must be consistent . If the logic he uses *is* not consistent then he cannot make a proof that is consistent. So he must assume that his logic is consistent so he can make a proof of the impossibility of proving a **system to be consistent.** ***But if his proof is true then he has proved that the logic he uses to make the proof must be consistent, but his proof proves that this cannot be done***

CRITICISMS

1

Some say Godel did not use the e axiom of reducibility in he incompleteness theorems

Others say he only used the axiom of reducibility in his object theory but not his meta-theory

Godels paper is called

On formally undecidable propositions of Principia. Mathematica and related systems

if godel does not use axioms from PM then his paper cannot be about undecidable propositions in PM-thus he misleads us

if Godel does not use AR then what axioms from PM he does he use for if he uses none then his paper is not about undecidable propistions in PM and he is lying when he says

" ...(we limit ourselves here to the system PM) …"

Godels statements indicate that he did use AR in both his meta-theory and so called object theory

If he did not use all axioms of the systems of PM then when he states

"we now show that the proposition [R(q);q] is undecidable in PM" (K Godel , On formally undecidable propositions of principia mathematica and related systems in *The undecidable* , M, Davis, Raven Press, 1965, p.8) he must have been lying

Godels states

quote

“ before we go into details lets us first sketch the main ideas of the proof … the formulas of a formal system (**we limit ourselves here to the system PM)** …”(K Godel , On formally undecidable propositions of principia mathematica and related systems in *The undecidable* , M, Davis, Raven Press, 1965, p.6)

Godel uses the axiom of reducibility and axiom of choice from the PM

he states

“A. Whitehead and B. Russell, Principia Mathematica, 2nd edition, Cambridge 1925. In particular, we also reckon among the axioms of PM the axiom of infinity (in the form: there exist denumerably many individuals), and the **axioms of reducibility and of choice (for all types)**” (K Godel , On formally undecidable propositions of principia mathematica and related systems in *The undecidable* , M, Davis, Raven Press, 1965, p.5)

on page 7 he states **(**(K Godel , On formally undecidable propositions of principia mathematica and related systems in *The undecidable* , M, Davis, Raven Press, 1965)

"now we obtain an undecidable proposition of the system PM"

Clearly this undecidable proposition comes about due the axioms etc which PM uses

Godel goes on

"the ternary relation z=[y;z] also turns out to be definable in PM" (ibid, p,8)

Godel goes on

"since the concepts occurring in the definiens are all definable in PM" (ibid,p.8)

Godel has told us PM is made up of axiom of reducibility, etc so
these definiens must be defined interms of these axioms

Godel goes on
"we now show that the proposition [R(q);q] is undecidable in PM"(K Godel , On formally undecidable propositions of principia mathematica and related systems in *The undecidable* , M, Davis, Raven Press, 1965, p.8)) - again this must mean undecidable within PMs system ie its axioms etc

further
Godel e goes on
"we pass now to the rigorous execution of the proof sketched above and we first give a precise description of the formal **system P for which we wish to prove the existence of undecidable propositions**" (K Godel , On formally undecidable propositions of principia mathematica and related systems in *The undecidable* , M, Davis, Raven Press, 1965, p.9)

Some call this system P the object theory but they are wrong in part
for Godel goes on
"P is essentially the system which one obtains by building the logic of PM around Peanos axioms..." K Godel , On formally undecidable propositions of principia mathematica and related systems in *The undecidable* , M, Davis, Raven Press, 1965,, p.10)

Thus P uses as its meta-theory the system PM ie its axioms of choice reducibility etc (he has told us this is what PM SYSTEM IS). Note from above the version of PM he is using did not contain the axiom of reducibility. So system P is completely artificial and invalid as it uses the invalid axiom of reducibility.

Thus P is made up of the meta-theory of PM and Peanos axioms. Note from above the version of PM he is using did not contain the axiom of reducibility. So system P is completely artificial and invalid as it uses the invalid axiom of reducibility.

Thus by being built on the meta-theory of PM it must use the axioms of PM
etc and these axioms are choice reducibility etc

That P is the meta theory is clearly seen when Godels gives us his general proof of undecidability which uses P

He states

The general result as to the existence of undecidable propositions reads:

Proposition VI: To every ω-consistent recursive class c of formulae there correspond recursive class-signs r, such that neither v Gen r nor Neg (v Gen r) belongs to Flg(c) (where v is the free variable of r).

Proof: Let c be any given recursive ω-consistent class of formulae. We define:

$Bw_c(x) \equiv (n)[n <= l(x) \rightarrow Ax(n\ Gl\ x) \vee (n\ Gl\ x)\ \varepsilon\ c \vee$

$(Ep,q)\{0 < p,q < n\ \&\ Fl(n\ Gl\ x,\ p\ Gl\ x,\ q\ Gl\ x)\}]\ \&\ l(x) > 0$ (5)

(cf. the analogous concept 44)

$x\ B_c\ y \equiv Bw_c(x)\ \&\ [l(x)]\ Gl\ x = y$ (6)

$Bew_c(x) \equiv (\exists y) y\ B_c\ x$ (6.1)

(cf. the analogous concepts 45, 46)
Etc
Etc

"in the proof of theorem V1 no properties of the system P were used other than the following
1) the class of axioms and the riles of inference- note these axioms include reducibility
2) every recursive relation is definable with in the system of P
hence in every formal system which satisfies assumptions 1 and 2 [which uses system PM] and is w - consistent there exist undecidable propositions ". (ibid, p.28)

CLEARLY GODEL IS MAKING SWEEPING CLAIMS JUST BASED UPON HIS P PROOF Clearly P is part of the meta- theory. Note from above the version of PM he is using AR **was abandoned rejected given up DROPPED**. So system P is completely artificial and invalid as it uses the invalid axiom of reducibility. Thus his theorem has no value outside this invalid artificial system P
If godel tells us he is going to using the axioms of PM but only use some of them in fact then he is both wrong and lying when he tells us that
"we now show that the proposition [R(q);q] is undecidable in PM" K Godel , On formally undecidable propositions of principia mathematica and related systems in *The undecidable* , M, Davis, Raven Press, 1965,,p. 8)

and
"the proposition undecidable in the system PM is thus decided by metamathemaical arguments" K Godel , On formally undecidable propositions of principia mathematica and related systems in *The undecidable* , M, Davis, Raven Press, 1965,, p.9)

Thus simply
Godel tells us
1) he is using the axioms of PM
2) there are propositions which are undecidable in the system PM
2)P uses as its meta-system the axioms of PM
3) so the proof in P must use PMs axioms

3) if he does not use all the axioms of PM then he is lying to us when he say "there are undeciable propositions in PM, and P

So is Godel lying on these points
As I have argued the axiom of AR he uses is invalid and flawed thus making his theorems invalid flawed and a complete failure

2

There are 3 paradoxes in Godels proof

1 paradox

Godel makes the claim that there are undecidable propositions in a constructed system [PM and ZF] that dont depend upon the special nature of the constructed system [PM and ZF]
Quote

As he states

"It is reasonable therefore to make the conjecture that these axioms and rules of inference are also sufficent to decide all mathematical questions which can be formally expressed in the given systems. In what follows it will be shown that this is not the case but rather that in both systems cited [PM and ZF] there exist relatively simple problems of ordinary whole numbers [undecidability] **which cannot be decided on the basis of the axioms.** [NOTE IT IS CLEAR] This situation [undecidability **which cannot be decided on the basis of the axioms].** does not depend upon the special nature of the constructed systems [PM and ZF] **but rather holds for a very wide class of formal systems** among which are included in particular all those which arise from the given systems [PM and ZF] by addition of finitely many axioms" (K Godel , On formally undecidable propositions of principia mathematica and related systems in The undecidable , M, Davis, Raven Press, 1965, p.6).(K Godel , On formally undecidable propositions of principia mathematica and related systems in The undecidable , M, Davis, Raven Press, 1965, p.6)

Thus Godel says he is going to show that undecidability is not dependent on the axioms of a system or the speacial nature of PM and ZF

Also

Godels refers to PM and ZF AS FORMAL SYSTEMS

"the most extensive formal systems constructed .. are PM ZF" ibid, p.5 so when he states that

"This situation does not depend upon the special nature of the constructed systems but rather holds for a very wide class of formal systems"
he must be refering to PM and ZF as belonging to these class of formal systems- further down you will see this is true as well

thus he is saying

the undecidability claim is independent of the axioms of the formal system but PM is a formal system

Godel says he is going to show undecidabilitys by using the system of PM (ibid)
he then sets out to show that there are undecidable propositions in PM (ibid. p.8)

where Godel states

"the precise analysis of this remarkable circumstance leads to surprising results concerning consistence proofs of formal systems which will be treated in more detail in section 4 (theorem X1) ibid p. 9 note this theorem comes out of his system P

he then sets out to show that there are undecidable propositions in his system P -which uses the axioms of PM and Peano axioms.

at the end of this proof he states

"we have limited ourselves in this paper essentially to the system P and have only indicated the applications to other systems" (ibid p. 38)

now

it is based upon his proof of undecidable propositions in P that he draws out broader conclusions for a very wide class of formal systems

After outlining theorem V1 in his P proof - where he uses the axiom of choice- he states "in the proof of theorem V1 no properties of the system P were used other than the following

1) the class of axioms and the riles of inference- note these axioms include reducibility

2) every recursive relation is definable with in the system of P

hence in every formal system which satisfies assumptions 1 and 2 [which uses system PM] and is w - consistent there exist undecidable propositions ". (ibid, p.28)

CLEARLY GODEL IS MAKING SWEEPING CLAIMS JUST BASED UPON HIS P PROOF . Note from above the version of PM he is using AR **was abandoned rejected given up DROPPED** So system P is completely artificial and invalid as it uses the invalid axiom of reducibility. Thus his theorem has no value outside this invalid artificial system P

Godel has said that undecidability is not dependent on the axioms of a system or the special nature of PM and ZF

There is a paradox here

He says every formal system which satisfies assumption 1 and 2 ie based upon axioms - but he has said undecidablity is independent of axioms

2 paradox

Also there is a contradiction here

Godel has said undecidablity is not dependent on PM yet says it is hence" in every formal system which satisfies assumptions 1 and 2 [which uses system PM] and is w - consistent there exist undecidable propositions "

Thus the paradox undedciablity is not dependent of the axioms of a system or PM but is dependent on the axioms of the system and PM

In the above Godel must be referring to PM and ZF as they are formal systems

but he has said

"This situation does not depend upon the special nature of the constructed systems [PM ZF] but rather holds for a very wide class of formal systems"

now P is constructed with the axioms of PM and Peano axioms "P is essentially the system which one obtains by building the logic of PM around Peanos axioms..." K Godel , On formally undecidable propositions of principia mathematica and related systems in The undecidable , M, Davis, Raven Press, 1965,, p.10)

so clearly undecidability is dependent on the quirky nature of PM-which is a formal system but

he has told us undecidable propositions in a formal system are not due to the nature of the formal system but he is making claims about a very wide range of formal systems based upon the nature of formal system P. Note from above the version of PM he is using AR **was abandoned rejected given up DROPPED.** So system P is completely artificial and invalid as it uses the invalid axiom of reducibility. Thus his theorem has no value outside this invalid artificial system P

QUOTE

[undecidability]does not depend upon the special nature of the
constructed systems [PM and ZF] but rather holds for a very wide class of formal systems

contradict this

hence in every formal system which satisfies assumptions 1 and 2 [depending on the special nature of formal system P WHICH USES PM] and is w - consistent there exist undecidable propositions

HE HAS SAID UNDECIDABILITY DOES NOT DEPEND UPON THE NATURE OF PM YET SAYS UNDECIABILITY IN FORMAL SYSTEMS- OF WHICH PM- IS ONE IS DEPENDENT ON PM

put simply

Undecidability is independent on nature of PM, yet is dependent on the nature of PM.

thus undecidability is not dependent on the nature of the [PM and ZF] but he has said undecidability is dependent upon the nature of formal system P which uses PM thus

“[undecidability] does not depend upon the special nature of the constructed systems [PM and ZF] but rather holds for a very wide class of formal systems “

Contradicts this

“hence in every formal system which satisfies assumptions 1 and 2 [depends upon the special nature of formal system PM] and is w - consistent there exist undecidable propositions ”.

Thus when Godel states

"hence in every formal system [PM example] which satisfies assumptions 1 and 2 and is w [Dependent on the special nature of P and thus PM] - consistent there exist undecidable propositions"

he is creating paradox and circularity of argument

he says undecidability is independent of formal system PM and ZF yet deriving assumptions dependent on this formal system PM he says those formal systems that have these assumption have undecidability and he states ZF has these assumptions (ibid, p.28)

put simply

Undecidability is independent on nature of PM, yet is dependent on the nature of PM.

clearly Godel is in paradox and invalid due to meaninglessness

3 paradox

There is another paradox in Godels incompleteness theorem

As we have seen undecidability in a formal system is dependent on the system PM but the system PM has undecidability

Godel tells us that among those very wide range of formal systems that have undecidability are to be included those systems which arise from PM by the addition finitely many axioms

As he states

“It is reasonable therefore to make the conjecture that these axioms and rules of inference are also sufficent to decide all mathematical questions which can be formally expressed in the given systems. In what follows it will be shown that this is not the case but rather that in both systems cited [PM and ZF] there exist relatively simple problems of ordinary whole numbers which cannot be decided on the basis of the axioms. [NOTE IT IS CLEAR] **This situation does not depend upon the special nature of the constructed systems [PM and ZF] but rather holds for a very wide class of formal systems** among which are included in particular all those which arise from the given systems [PM and ZF] by addition of finitely many axioms”

In other words PM is included in those systems which have undecidablity

Thus we have the paradox that while PM is used to find if a formal system is undecidable it is undecidable itself

i.e.

hence in every formal system which satisfies assumptions 1 and 2 [from P which uses system PM] and is w - consistent there exist undecidable propositions

In other words the very system which is used to find undecidability is included in the set of undecidable systems

PM is part of the very set it is used to create

Gödel's proof shows for some class of formal systems, they can not be both complete and consistent

if a system is consistent it will be incomplete
If PM is consistent it is incomplete i.e it has statements which cannot be proven true or false
thus

PM is used to prove that a system has statements which cannot be proven true or false
but
PM can only prove this if all its statement can be proven to be true
but
PM has statements which cannot be proven true or false
thus
it cant prove anything
but it is used to prove if systems are undecidadble

thus a paradox

PM being undecidable cant be used to create the set of undecidable systems of which it belongs-if it belongs to the set it cant prove anything and if it dont belong to the set it is not undecidable[/b]

Thus we have the situation overall that clearly Godel is in paradox and invalid due to meaninglessness

1) there is circularity/paradox of argument he says his consistency proof is independent of the nature of a formal system yet he bases this claim upon the very nature of a particular formal system P- which includes PM which is itself undecidable
2) he is clearly basing his claims for his consistency theorems upon the systems PM and P

P and PM are the meta-theories/systems he uses to prove his claim that there are undecidable propositions in a very wide range of formal systems

We have a dilemma
1)either Gödel is right that his claims for undecidability of formal systems
are independent of the nature of a formal system

and thus he is in paradox when he makes claims about formal systems based
upon the special nature of P - AND THUS PM

OR
2) he makes claims about formal systems based upon the special nature of P
and PM
that would mean that PM and P are the meta-systems/meta-theory through
which he is make undecidable claims about formal systems

thus indicating the axioms of PM and P are central to these meta claims
there by when I argue s these axioms are invalid then Godels

incompleteness theorem is invalid and a complete failure.

Thus either way Godels incompleteness theorem are invalid and a complete failure :either due to the paradox in his theorem or the invalidity of his axioms. Godels theorems are invalid for 5 reasons: he uses the axiom of reducibility- which is invalid ie illegitimate , , he constructs impredicative statements - which are invalid ie illegitimate, he ends in two self-contradictions, he falls into 3 paradoxes

Appendix

IMPREDICATIVE DEFINITIONS
AXIOM OF REDUCIBILITY

Poincare outlawed impredicative definitions But the problem of outlawing impredicative definitions vas that a lot of useful mathematics would have to be abandoned "ruling out impredicative definitions would eliminate the contradiction from mathematics, but the cost was too great " (B, Bunch, op.cit p.134) Also as Russell pointed cut the notion of impredicative definitions was paradoxical as the property applies to itself "is the property of being impredicative itself impredicative or not" (this is another analog of Gretling's paradox.) (ibid, p.134.). Russell tried to solve the paradoxes by his theory of types Russell and Whitehead explained the logical antinomies as Being due to a vicious circle their theory of types 'was means to irradiate these vicious circles by, making them by definition not allowed (E, Carnuccio , Mathematics and logic in history and contemporary thought, Faber & Faber 1964, 344-355.)-[but Godel says be disagrees with Russell and uses them in his impossibility proof] (K Godel , On formally undecidable propositions of principia mathematica and related systems in *The undecidable* , M, Davis, Raven Press, 1965, p.63) But the theory of types cannot over come the syntactical paradoxes i.e. liar paradox." (E, Carniccio op.cit, p.345.) Also this procedure created unending problems such that Russell had to introduce his axiom of reducibility (Bunch, op.cit, p,.135). But even though the axiom with the theory of types created results that don't fall into any of the known paradoxes it leaves doubt that other paradoxes want crop up. But this axiom is so artificial and create a whole nest of other problems for mathematics that Russell eventually' abandoned it (Bunch, ibid, p.135.) Godel uses this axiom in his impossibility' proof. (K. Godel, op.cit, p.5) "Thus these attempts to solve the paradoxes all turned out to involve either paradoxical notions them selves or to artificial that most mathematicians rejected them

AXIOM OF CHOICE

Godel used the axiom of choice in his impossibility proof (K.Godel, op.cit, p.5)" But ever since its use by Zermelo there have been problems with this axiom "Cohen proved that he axiom of choice is independent of the other axioms of set theory. As a result you can have Zermeloian mathematics that accept the axiom of choice or various non-Zermeloian mathematics that reject it in one **way or another... Cohen also proved that there is a Cantorian mathematics in which the continuum hypothesis is true and a non-Cantorian mathematics in which it is denied (B, Bunch, op.cit, p.169). If the axiom of choice is kept then we get the Branch-Tarski and Hausdorff paradoxes Now "mathematicians who have thought about it have decided that the Branch-Traski is one of the paradoxes that "you just live with it" (ibid, p.180.) As Bunch notes "rejection of the axiom of choice means rejection of Important parts of "classical" mathematics and set theory. Acceptance of the axiom of choice however has some peculiar implications of its own i e Branch-Tarski and Hausdorff paradoxes (ibid,p. 169-170).**

SKOLEM PARADOX

Bunch notes op cit p.167

“no one has any idea of how to re-construct axiomatic set theory so that this paradox does not occur”

from

http://www.earlham.edu/~peters/courses/logsys/low-skol.htm

> Insofar as this is a paradox it is called Skolem's paradox. It is at least a paradox in the ancient sense: an astonishing and implausible result. Is it a paradox in the modern sense, making contradiction apparently unavoidable?

from

http://en.wikipedia.org/wiki/Skolem's_paradox

> the "paradox" is viewed by most logicians as something puzzling, but not a paradox in the sense of being a logical contradiction (i.e., a paradox in the same sense as the Banach–Tarski paradox rather than the sense in Russell's paradox). Timothy Bays has argued in detail that there is nothing in the Löwenheim-Skolem theorem, or even "in the vicinity" of the theorem, that is self-contradictory.
>
> However, some philosophers, notably Hilary Putnam and the Oxford philosopher A.W. Moore, have argued that it is in some sense a paradox.

The difficulty lies in the notion of "relativism" that underlies the theorem. Skolem says:

In the axiomatization, "set" does not mean an arbitrarily defined collection; the sets are nothing but objects that are connected with one another through certain relations expressed by the axioms. Hence there is no contradiction at all if a set M of the domain B is nondenumerable in the sense of the axiomatization; for this means merely that within B there occurs no one-to-one mapping of M onto Z0 (Zermelo's number sequence). Nevertheless there exists the possibility of numbering all objects in B, and therefore also the elements of M, by means of the positive integers; of course, such an enumeration too is a collection of certain pairs, but this collection is not a "set" (that is, it does not occur in the domain B).

Moore (1985) has argued that if such relativism is to be intelligible at all, it has to be understood within a framework that casts it as a straightforward error. This, he argues, is Skolem's Paradox

Zermelo at first declared the Skolem paradox a hoax. In 1937 he wrote a small note entitled "Relativism in Set Theory and the So-Called Theorem of Skolem" in which he gives (what he considered to be) a refutation of "Skolem's paradox", i.e. the fact that Zermelo-Fraenkel set theory -- guaranteeing the existence of uncountably many sets-- has a countable model. His response relied, however, on his understanding of the foundations of set theory as essentially second-order (in particular, on interpreting his axiom of separation as guaranteeing not merely the existence of first-order definable subsets, but also arbitrary unions of such). Skolem's result applies only to the first-order interpretation of Zermelo-Fraenkel set theory, but Zermelo considered this first-order interpretation to be flawed and fraught with "finitary prejudice". Other authorities on set theory were more sympathetic to the first-order interpretation, but still found Skolem's result astounding:

* At present we can do no more than note that we have one more reason here to entertain reservations about set theory and that for the time being no way of rehabilitating this theory is known. (John von Neumann)

* Skolem's work implies "no categorical axiomatisation of set theory (hence geometry, arithmetic [and any other theory with a set-theoretic model]...) seems to exist at all". (John von Neumann)

* Neither have the books yet been closed on the antinomy, nor has agreement on its significance and possible solution yet been reached. (Abraham Fraenkel)

* I believed that it was so clear that axiomatization in terms of sets was not a satisfactory ultimate foundation of mathematics that mathematicians would, for the most part, not be very much concerned with it. But in recent times I have seen to my surprise that so many mathematicians think that these axioms of set theory provide the ideal foundation for mathematics; therefore it seemed to me that the time had come for a critique. (Skolem)

from
http://www.earlham.edu/~peters/courses/logsys/low-skol.htm

Insofar as this is a paradox it is called Skolem's paradox. It is at least a paradox in the ancient sense: an astonishing and implausible result. Is it a paradox in the modern sense, making contradiction apparently unavoidable?

> Most mathematicians agree that the Skolem paradox creates no contradiction. But that does not mean they agree on how to resolve it

attempted solutions
Bunch notes

“no one has any idea of how to re-construct axiomatic set theory so that this paradox does not occur”

http://www.earlham.edu/~peters/courses/logsys/low-skol.htm

> One reading of LST holds that it proves that the cardinality of the real numbers is the same as the cardinality of the rationals, namely, countable. (The two kinds of number could still differ in other ways, just as the naturals and rationals do despite their equal cardinality.) On this reading, the Skolem paradox would create a serious contradiction
>
> The good news is that this strongly paradoxical reading is optional. The bad news is that the obvious alternatives are very ugly. The most common way to avoid the strongly paradoxical reading is to insist that the real numbers have some elusive, essential property not captured by system S. This view is usually associated with a Platonism that permits its proponents to say that the real numbers have certain properties independently of what we are able to say or prove about them.
>
> The problem with this view is that LST proves that if some new and improved S' had a model, then it too would have a countable model.

> Hence, no matter what improvements we introduce, either S' has no model or it does not escape the air of paradox created by LST. (S' would at least have its own typographical expression as a model, which is countable.

then the faith solution

> Finally, there is the working faith of the working mathematician whose specialization is far from model theory. For most mathematicians, whether they are Platonists or not, the real numbers are unquestionably uncountable and the limitations on formal systems, if any, don't matter very much. When this view is made precise, it probably reduces to the second view above that LST proves an unexpected limitation on formalization. But the point is that for many working mathematicians it need not, and is not, made precise. The Skolem paradox has no sting because it affects a "different branch" of mathematics, even for mathematicians whose daily rounds take them deeply into the real number continuum, or through files and files of bytes, whose intended interpretation is confidently supposed to be univocal at best, and at worst isomorphic with all its fellow interpretations.

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