

Decolonising math and science

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Stock question

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Introduction

The critique

Colonialism and
the church

The alternative

The
counter-reaction

- ▶ What is there to decolonise in math?

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- ▶ Isn't $1+1=2$?

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- ▶ See, one piece of paper plus one piece of paper makes two pieces of paper.
- ▶ I have no problem with this:
- ▶ This is the sort of pre-colonial math which I seek to restore as decolonial math.

- So, what is “colonial” math?

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- ▶ Also called formal math.

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- ▶ So, what is “colonial” math?
- ▶ Also called formal math.
- ▶ Created by David Hilbert and Bertrand Russell etc.
- ▶ Russell and Whitehead in their Principia Mathematica needed 378 pages to prove that $1+1=2$.

•56'101. $\vdash: R \in \check{2} . \equiv . D^*R, (I^*R \in 1$

Dem.

$\vdash . \bullet 55'16 . \bullet 11'11'341 . \supset$

$\vdash: (\exists x, y) . R = x \downarrow y . \equiv: (\exists x, y) . D^*R = t^*x . (I^*R = t^*y :$

[•11'54] $\equiv: (\exists x) . D^*R = t^*x : (\exists y) . (I^*R = t^*y :$

[•52'1] $\equiv: D^*R, (I^*R \in 1$

(1)

$\vdash . (1) . \bullet 56'1 . \supset \vdash . \text{Prop}$

•56'102. $\vdash . \check{2} = \check{D}^{*1} \cap \check{I}^{*1}$

Dem.

$\vdash . \bullet 56'101 . \bullet 37'106 . \supset$

$\vdash: R \in \check{2} . \equiv . R \in \check{D}^{*1} . R \in \check{I}^{*1} .$

[•22'33] $\equiv . R \in \check{D}^{*1} \cap \check{I}^{*1} : \supset \vdash . \text{Prop}$

•56'103. $\vdash: R \in \check{2} . \supset . \check{2} \uparrow R$

Dem.

$\vdash . \bullet 56'101 . \supset \vdash: R \in \check{2} . \supset . D^*R \in 1 .$

[•52'16] $\supset . \check{2} \uparrow D^*R .$

[•33'24] $\supset . \check{2} \uparrow R : \supset \vdash . \text{Prop}$

•56'104. $\vdash: R \in 0_r . \equiv . R = \check{\Lambda} \quad [(\bullet 56'03)]$

•56'11. $\vdash: R \in 2_r . \equiv . (\exists x, y) . x \neq y . R = x \downarrow y \quad [•20'3 . (\bullet 56'02)]$

•56'111. $\vdash: R \in 2_r . \equiv . D^*R, (I^*R \in 1 . D^*R \cap (I^*R = \Lambda$

Dem.

$\vdash . \bullet 51'231 . \bullet 55'16 . \supset$

$\vdash: x \neq y . R = x \downarrow y . \equiv . t^*x \cap t^*y = \Lambda . D^*R = t^*x . (I^*R = t^*y .$

[•13'122] $\equiv . D^*R \cap (I^*R = \Lambda . D^*R = t^*x . (I^*R = t^*y$

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•56'112. $\vdash: R \in 2_r . \equiv . D^*R, (I^*R \in 1 . C^*R \in 2$

Dem.

$\vdash . \bullet 56'111 . \bullet 54'43 . \supset$

$\vdash: R \in 2_r . \equiv . D^*R, (I^*R \in 1 . D^*R \cup (I^*R \in 2 .$

[•33'16] $\equiv . D^*R, (I^*R \in 1 . C^*R \in 2 : \supset \vdash . \text{Prop}$

•56'113. $\vdash . 2_r = \check{2} \cap \check{C}^{*2}$

Dem.

$\vdash . \bullet 56'112'101 . \supset \vdash: R \in 2_r . \equiv . R \in \check{2} . C^*R \in 2 .$

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- ▶ Do you understand one line or even one word on that page?
- ▶ No.

- ▶ This is an example of how colonial education teaches ignorance.

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- ▶ This is an example of how colonial education teaches ignorance.
- ▶ Most university students and graduates don't even know why $1+1=2$.

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- ▶ The colonially educated believe that math is universal.
- ▶ They don't apply commonsense: if math is universal, why not continue to do it the way the Egyptians did in the Rhind papyrus?
- ▶ Or Indians did in the *śulba sūtra*?

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- ▶ The Western way of doing math is declared to be **superior**, and something which **ought** to be the universal norm.
- ▶ Precolonial ways of doing math are declared inferior.
- ▶ University math teaching is premised on these beliefs about superiority which were once explicitly stated in racist terms.

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- ▶ “The history of mathematics cannot with certainty be traced back to any school or period before that of the . . . Greeks
- ▶ “Though all early **rac**es . . . knew something of numeration yet the rules . . . were neither **deduced** from nor did they form part of any science.”
- ▶ These racist beliefs are founded on **myths and dogmas of the Crusading church**.

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- ▶ Superstition: Pure deductive proofs based on reasoning are superior to empirical proofs.
- ▶ This superstition related to the Crusading church's dogma of reason (Aquinas and schoolmen).
- ▶ Let us dismantle these myths, superstitions and dogmas promoted by the church (contrary to original Christianity).

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- ▶ Plenty of counter-evidence that the book *Elements* was written by
- ▶ another person, in another time for other reasons.
- ▶ My prize of US\$ 3300 for serious evidence about Euclid stands unclaimed for **last seven years**.

- ▶ Claim of pure deductive proofs in the *Elements* total bunkum.

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- ▶ (Russell “It is a scandal that Euclid is still being taught in schools in Britain”.)

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- ▶ by a black woman
- ▶ in support of pagan religious beliefs
- ▶ (based on Egyptian mystery geometry)
- ▶ and appropriated by the Crusading church through a bad reinterpretation.

Euclid and Jesus



C. K. Raju



Multiversity



Citizens International

EUCLID AND JESUS

How and why the church changed
mathematics and Christianity
across two religious wars

C. K. RAJU

MULTIVERSITY AND CITIZENS INTERNATIONAL

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- ▶ Science is reliable since tested by experiments (empirical proofs)
- ▶ Math is the basis of science.
- ▶ Hence Western superstition that math not based on empirical proofs is “superior” to math which admits empirical proof is **contrary to commonsense**.

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- ▶ A rabbit is an animal.
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- ▶ Superior knowledge? or invalid knowledge?

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- ▶ No possibility of testing them empirically.
- ▶ To claim that mathematics is “superior” knowledge is to claim that
- ▶ Western authority (which approved those postulates) is super-reliable: more reliable than facts.

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- ▶ An erroneous deductive proof may be mistaken for a valid proof.
- ▶ The elementary proofs in the Elements were wrongly declared to be valid proofs
- ▶ **for 7 centuries by all Western scholars.**
- ▶ Empirical proofs are admittedly fallible, but never so fallible.

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- ▶ so God cannot create an illogical world but can create facts of his choice
- ▶ (Hence logical proofs are “superior”).
- ▶ However, contrary to this dogma, **even logic has to be decided empirically**
- ▶ (and may be only approximately 2-valued e.g. quantum logic).
- ▶ 2-valued logic not culturally universal either.

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- ▶ For example, Aquinas said God rules the world with eternal laws of nature.
- ▶ How to we know there are any eternal laws of nature?
- ▶ Because Aquinas knew God personally?

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- ▶ Hinduism has rta
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- ▶ However, Newton’s “laws” taught as first serious lesson in science.

- ▶ Church dogma also creeps into science through Western math.

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- ▶ Church dogma also creeps into science through Western math.
- ▶ For example, all “laws of physics” formulated as differential equations.

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- ▶ On the formalist misunderstanding of calculus

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- ▶ Church dogma also creeps into science through Western math.
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- ▶ For example, all “laws of physics” formulated as differential equations.
- ▶ On the formalist misunderstanding of calculus
- ▶ to write down the time derivative, we must suppose that time is like a line.
- ▶ Quasi-cyclic time very much part of early Christianity (Origen)
- ▶ but politically motivated curse on “cyclic” time a key aspect of post-Nicene church dogma.

The Eleven Pictures of Time

*The Physics, Philosophy, and
Politics of Time Beliefs*



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- ▶ Colonialism in India established by trickery
- ▶ not military or technological superiority.
- ▶ In this process, the church was a key ally of the colonial state.

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- ▶ In 1582 they tried to “conquer” India by doing a Constantine: they tried (and failed) to convert Moghul emperor Akbar to Christianity.
- ▶ First military victory by British came only 250 years later in 1758: won by bribing the opposing army!

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- ▶ But then introduced a new weapon: the University.
- ▶ This stabilised colonial power by inculcating loyalty among the colonised.
- ▶ The university was a church institution: Western higher education a church monopoly for centuries.

- ▶ Macaulay said (in 1847 against Marx) church education is the best means of curbing revolt.

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- ▶ Church education was designed to create missionaries, fanatically loyal to the church
- ▶ Colonial education created the colonial mind: fanatically loyal to the West.

- ▶ Therefore, de-colonisation = de-theologisation

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- ▶ Eliminate church dogmas and superstitions from math and science

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- ▶ (of math and science).
- ▶ Instead of using math and science to spread church dogmas.
- ▶ Eliminate church dogmas and superstitions from math and science
- ▶ and church myths from the history and philosophy of science.

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- ▶ developed over a thousand year period
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- ▶ by Jesuits based in Cochin who mass translated Indian texts
- ▶ as in Toledo mass translations from Arabic in 12th c.

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- ▶ precise to about ten decimal places.
- ▶ These were needed for European navigational problems of loxodromes, latitude, and longitude.

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- ▶ Eliminating that metaphysics makes calculus very easy (fat calculus text can be taught in 5 days)
- ▶ as demonstrated in teaching experiments with 8 groups in 5 universities in 3 countries.

Central University of Tibetan Studies
Sarag, Nepal
Workshop on "Calculus without limits"
22nd - 28th September, 2009
Rajendra Prasad Mahavidyalaya, Kathmandu





نشست علمی "ریاضیات از منظری دیگر"، پروفیسور سی. کی. راجو
مرکز مطالعات و همکاری‌های علمی بین‌المللی، تهران، ۱۳۹۱



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- ▶ and exposition of philosophy of zeroism in Springer encyclopedia.

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- ▶ In my booklet *Ending Academic Imperialism*.

C K Raju

ENDING

ACADEMIC IMPERIALISM

... a beginning



C i t i z e n s I n t e r n a t i o n a l

- ▶ This was followed by a curriculum development workshop

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- ▶ and the course was taught to several batches of students.







- ▶ And here is a short video of the student's reactions to the course.

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- ▶ by the South Africa editor of the *Conversation*.