

Scholarly life with scientific research and publications

Hadi Nur

Professor of Chemistry and Director of Centre for Sustainable Nanomaterials, Ibnu Sina Institute for Scientific and Industrial Research

Universiti Teknologi Malaysia

These are some of the failures that have never regretted in my life

1987	Failed to enter Department of Mechanical Engineering, the Institut Teknologi Bandung (ITB) as an undergraduate student, but fortunately entered Department of Chemistry ITB as the second choice of the entrance examination (<i>Sistem Penerimaan Mahasiswa Baru</i>).	29 years ago
1988	Failed to finish his study at Faculty of Dentistry, Universitas Padjadjaran (UNPAD). Dropout in second semester. Unable to study in two universities, UNPAD and ITB at the same time.	28 ago
1995	Failed to be sent by the Institut Teknologi Bandung (ITB) to pursue my PhD study at KU Leuven, Belgium. At that time, I was a candidate for lecturer in the Department of Mechanical Engineering, Program Study of Materials Engineering, ITB.	22 years ago
 1997	My first paper submitted to <i>Journal of Molecular Catalysis A: Chemical</i> was rejected to be published in this journal. "Nothing new" said the reviewer.	19 years ago
1998	Failed to be a lecturer at Department of Mechanical Engineering, Program Study of Materials Engineering, ITB although finished the exam for Civil Servants (CPNS). Economic crisis is hitting Indonesia at that time. This is the main reason why I left ITB.	18 years ago
1999 – 2002	Failed to speak Japanese even though almost three years living in Sapporo, Japan.	17 years ago

19th century scientist

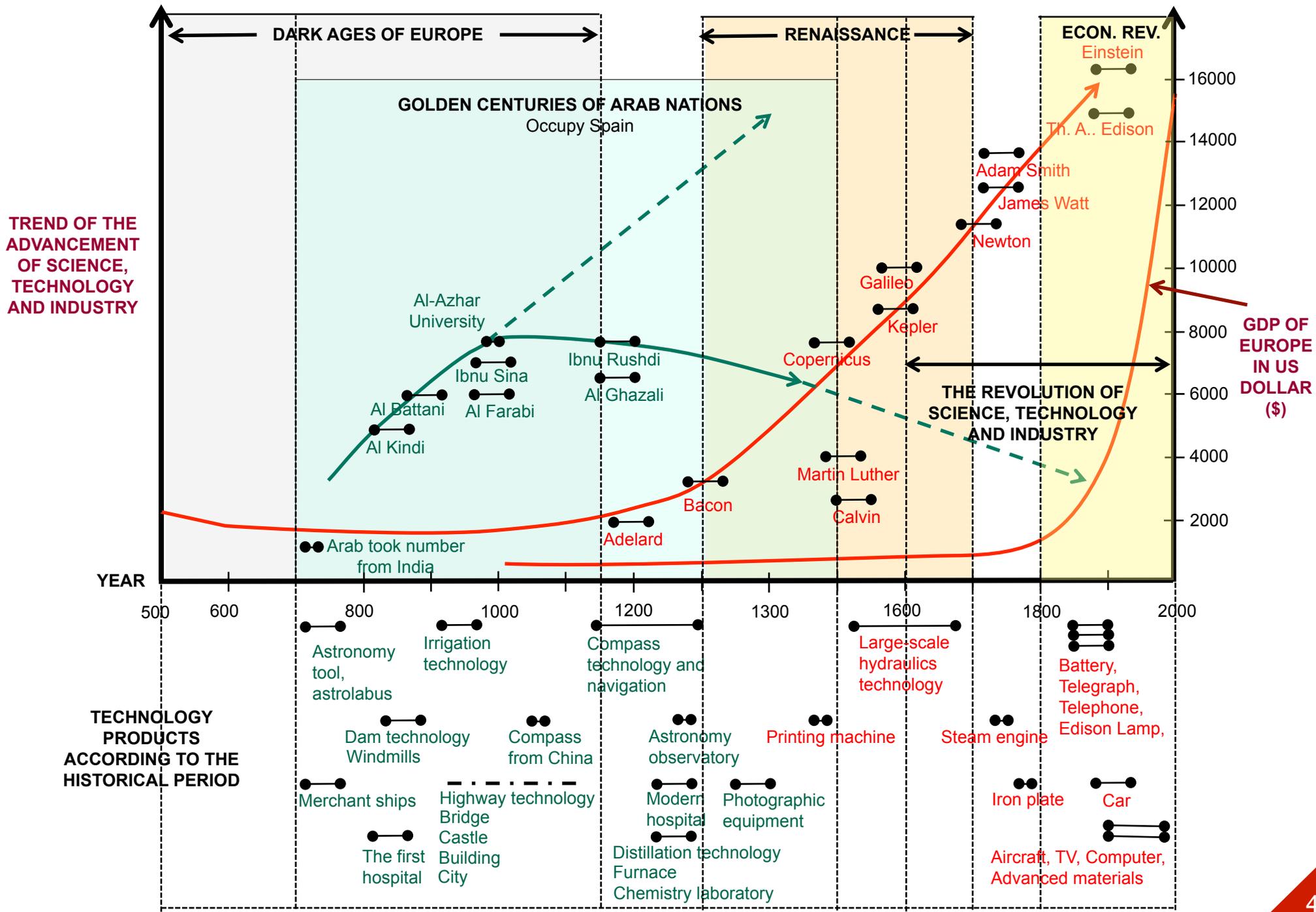
I must find the
explanation for this
phenomenon in order
to truly understand
Nature...

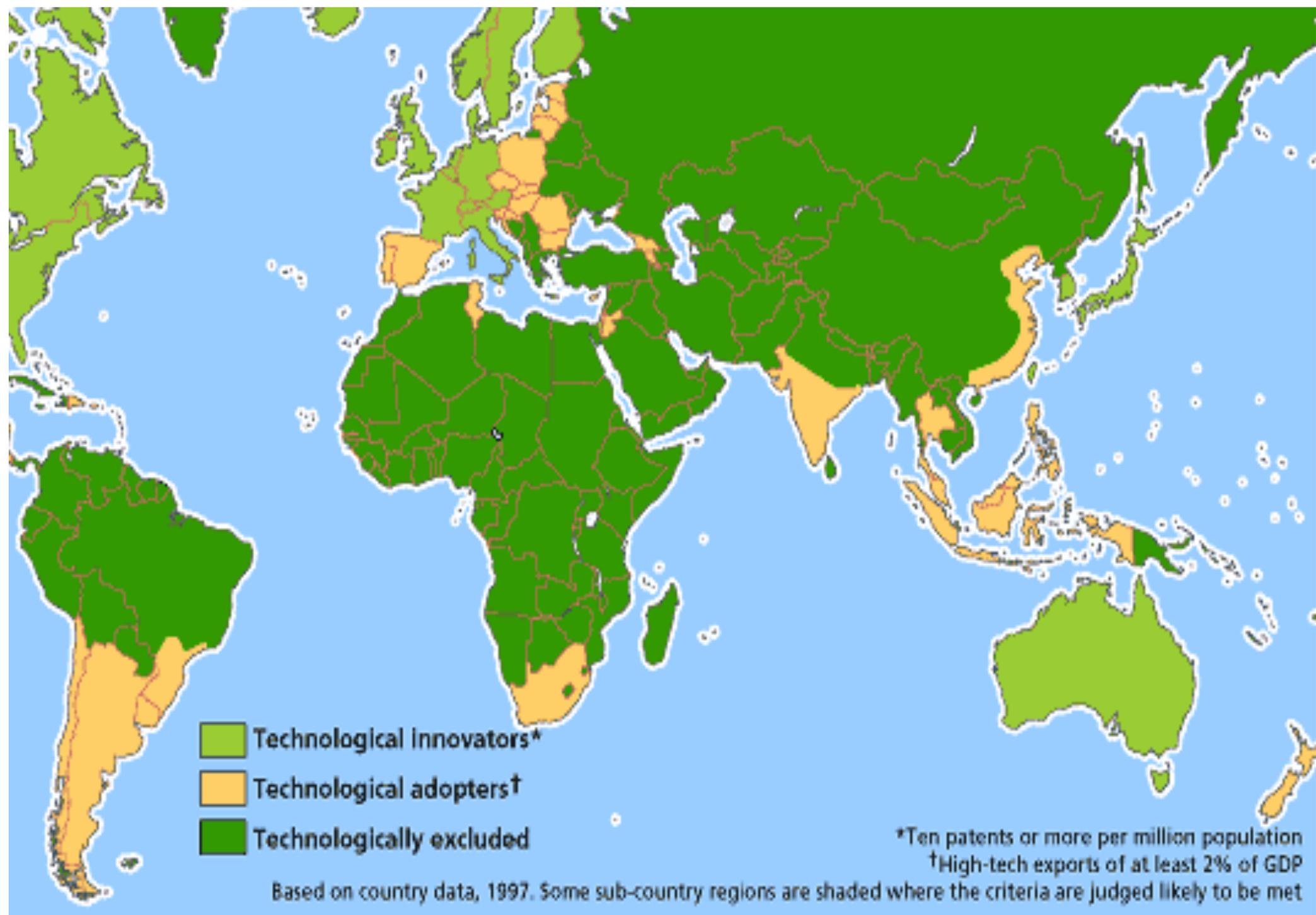


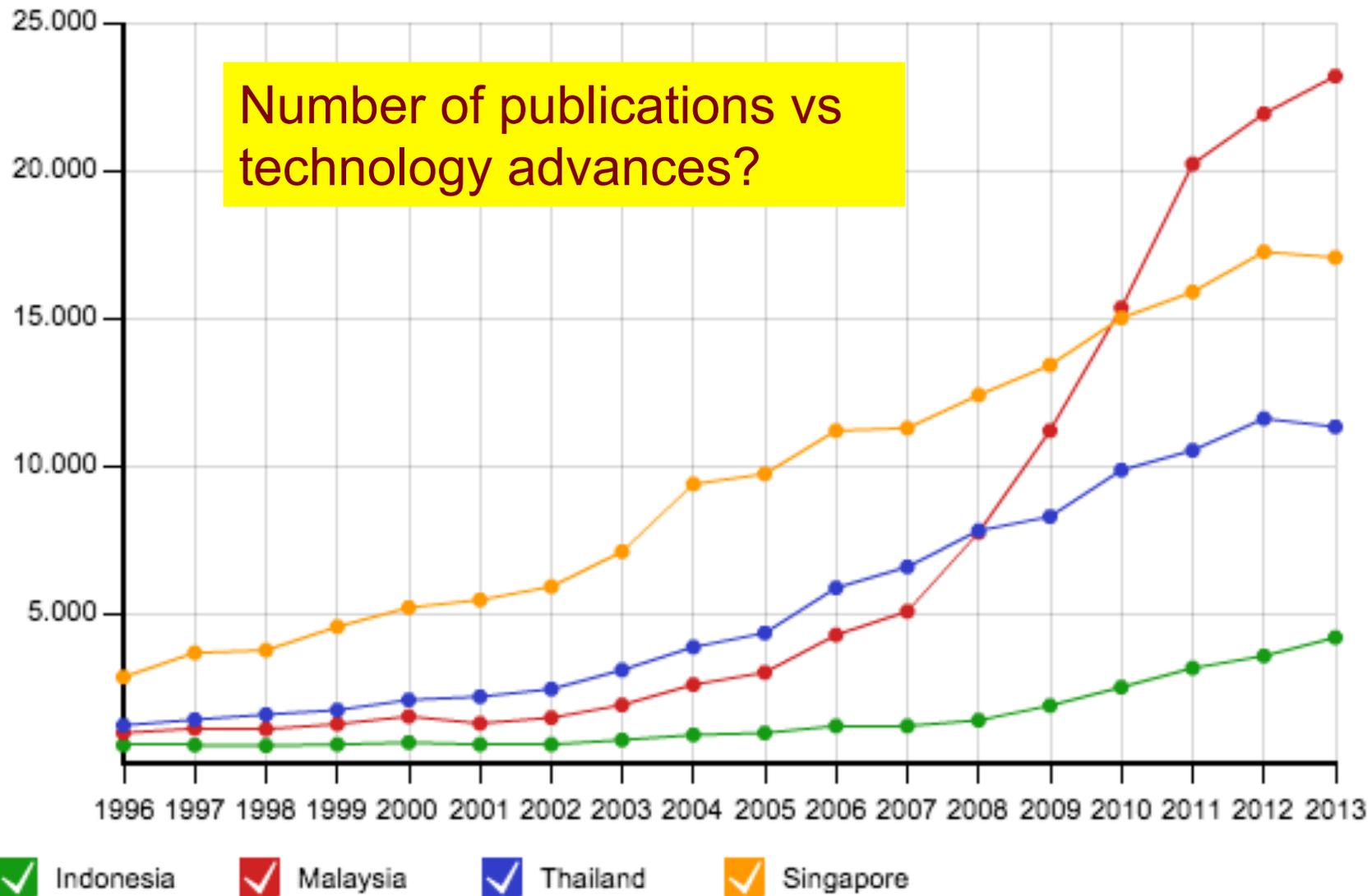
21st century scientist

I must get the
result that fits my
narrative so I can
get my paper into
Nature..





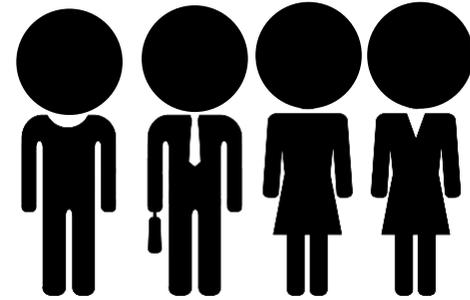
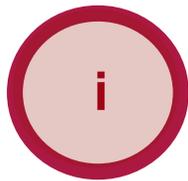




INPUT

**RESEARCH
STRATEGY &
INFRASTRUCTURE**

OUTPUT



**BOOKS
PAPERS
REPORTS
PROCEEDINGS
THESES**

Perspective: Impact, not impact factor

2011/01/01

Dzulkifli Abdul Razak



(From left) Mohd Kamal Hassan, Shamsul Amri Baharuddin and Dr Lai-Meng Looi pave the way in the academic sector as Distinguished Professors

THE year 2010 ended on a rather good note with the appointment of Malaysia's first three Distinguished Professors. Professor Tan Sri Mohd Kamal Hassan, Professor Datuk Shamsul Amri Baharuddin and Professor Dr Lai-Meng Looi are leading the way as announced by Higher Education Minister Datuk Seri Mohamed Khaled Nordin.

More than the monetary perks they received, this accolade marked a new milestone in recognising scholarly personalities and achievements among Malaysians. The Distinguished Professors are role models who can be emulated, especially by the younger and future generations of a knowledge society that we aim to evolve into. For too long our idols have been celebrities with rather different lifestyles and, at times, values. These Distinguished Professors set another path to become a celebrity of the intellectual kind. This augurs well for Malaysia, which until now has yet to nurture a vibrant intellectual community.

It is a breath of fresh air that Distinguished Professors are not selected just based on the usual numbers and tangible indicators normally associated with success. But more importantly, the award highlighted their stature as thought leaders and thinkers who shape ideas and give credence to the more intangible part of intellectual life.

That too, counter-akin to cloister, groome

It is a breath of fresh air that Distinguished Professors are not selected just based on the usual numbers and tangible indicators normally associated with success. But more importantly, the award highlighted their stature as thought leaders and thinkers who shape ideas and give credence to the more intangible part of intellectual life.

But this is not necessarily the way that the future scientific world would want to be perceived as, as science takes a more central role in the world of ideas. One can easily identify with Carl Sagan and Stephen Jay Gould who have captured the imagination of millions in the public arena with their intellectual prowess. So too Richard Feynman, who created his popular legacy with his notable lecture in 1959 titled There's Plenty of Room at the Bottom, long before he received the Nobel Prize for Physics. He was allegedly alluding to the realm of nanotechnology.

Indeed what distinguished them from the others is the "impact" that they made, especially on society, rather than just the "impact factor" that has now dominated the world of knowledge. "Impact factor" is often understood as "a measure reflecting the average number of citations" of articles published in journals. The higher the impact factor, the more the journal is deemed important, and likewise the articles published in them. While the impact factor is frequently regarded as a standard of quality, it is not without controversy, especially among non-Science disciplines which do not fully subscribe to the idea. In many ways, knowledge has been distorted by the impact factor as researchers hold on to the publish-or-perish maxim.

The Open Ed 2011 conference, themed Impact and Sustainability, in Barcelona, Spain brought the issue of open education into focus. This means more and more materials are available without cost so that they will have a greater impact on society when more people have access to them. The notion that knowledge is monopolised by profit-making journals is being raised. It is not a novel thought but it was not until Massachusetts Institute of Technology (MIT) in the United States decided to "give away" its courses that the idea is revived. In Britain, however, the Open University has been doing this for more than 40 years, offering free online courses in almost all disciplines on the OpenLearn website. You can go to YouTube for free downloads.

In this regard, MIT Professor Rebecca Henderson was quoted as saying: "My deep belief is that as academics we have a duty to disperse our ideas as far and as freely as possible." It is about trying to share the world's knowledge, improve access and bring about more equity -- an educational impact that has long been an elusive target. Education is increasingly blamed for the widening disparities instead as we assess the achievements of the Millennium Development Goals (2000-2015), for example.

Locally, the formation of the National Professors Council some six months ago seems to support the notion that intellectuals too are responsible for raising the community's stature by engaging it on a knowledge platform.

As we ring in the New Year, this idea must be mainstreamed so that intellectuals and the education that they help to shape become even more relevant and have an influence on society at large, rather than an exclusive few.

Happy New Year.

*The writer is vice chancellor of Universiti Sains Malaysia

The New York Times



A Possible Breakthrough in Explaining a Mathematical Riddle

By KENNETH CHANG
Published: September 17, 2012

Numbers, addition, multiplication — the basic stuff of grade-school arithmetic — are suddenly the excited talk of cutting-edge mathematicians.

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On Aug. 30, with no fanfare, Shinichi Mochizuki, a mathematician at Kyoto University in Japan, dropped onto the Internet four papers.

The papers, encompassing 500 pages and four years of effort, claim to solve an important problem in number theory known as the abc conjecture.

(No, it does not involve the alphabet; it has to do with integers and prime numbers, and the letters represent mathematical variables used in equations.)

He has remained quiet since then. Others have not.

“I hope it’s right,” said Minhyong Kim, a mathematician at the University of Oxford in England and the Pohang University of Science and Technology in South Korea. “It would be a fantastic breakthrough.”

What is even more fascinating is that Dr. Mochizuki has devised new mathematics machinery that he employs for the proof.

The abstract ideas and notations that mathematicians manipulate are unfathomable to most people. Dr. Mochizuki’s new mathematical language — on his Web page, he describes himself as an “inter-universal geometer” — is at present incomprehensible even to other top mathematicians.

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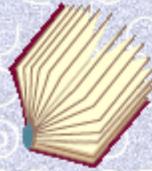
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Papers of Shinichi Mochizuki

List of Papers

General Arithmetic Geometry

- [1] The Geometry of the Compactification of the Hurwitz Scheme. [PDF](#)
- [2] On Semi-Positivity and Filtered Frobenius Crystals. [PDF](#)
- [3] Correspondences on Hyperbolic Curves. [PDF](#)
- [4] Extending Families of Curves over Log Regular Schemes. [PDF](#)
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Mochizuki, Shinichi

Kyoto University, Research Institute for Mathematical Sciences, Kyoto, Japan

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The local pro-p anabelian geometry of curves	Mochizuki, S.	1999	Inventiones Mathematicae	40
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Extending families of curves over log regular schemes	Mochizuki, S.	1999	Journal für die Reine und Angewandte Mathematik	22
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Absolute anabelian cuspidalizations of proper hyperbolic curves	Mochizuki, S.	2007	Kyoto Journal of Mathematics	18
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A version of the Grothendieck conjecture for p-adic local fields	Mochizuki, S.	1997	International Journal of Mathematics	15
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Semi-graphs of anabelioids	Mochizuki, S.	2006	Publications of the Research Institute for Mathematical Sciences	14
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Galois sections in absolute anabelian geometry	Mochizuki, S.	2005	Nagoya Mathematical Journal	12
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A theory of ordinary p-Adic curves	Mochizuki, S.	1996	Publications of the Research Institute for Mathematical Sciences	12
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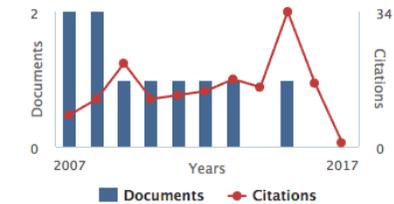
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Author History

Publication range: 1995 - 2015

References: 285

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Transparency in scientific publications (eLife)

The screenshot shows a web browser displaying an eLife article. The browser's address bar shows the URL `elife.elifesciences.org/content/2/e00672`. The page header includes navigation links for "About eLife", "Submission & Review", and "eLife Journal". The article title is "Discovery of a metabolic alternative to the classical mevalonate pathway" by Nikki Dellas, Suzanne T Thomas, Gerard Manning, and Joseph P Noel. A tooltip for Gerard Manning is open, showing his affiliation with the Salk Institute for Biological Studies and his present address at Genentech. The article abstract is partially visible, discussing the discovery of a new enzyme (MPD) and IPK in a putative alternative MVA pathway. On the right side, there are options to "View article with eLife Lens", "Reference tools" (Download, Open, Share), and a "Jump to:" section with a table of contents.

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Discovery of a metabolic alternative to the classical mevalonate pathway

Nikki Dellas, Suzanne T Thomas, Gerard Manning, Joseph P Noel

Howard Hughes Medical Institute, Salk Institute for Biological Studies, United States

DOI: <http://dx.doi.org/10.7554/eLife.00672>
Published December 2013
Cite as eLife 2013;2:e00672.

Gerard Manning
Razavi Newman Center for Bioinformatics, Salk Institute for Biological Studies, La Jolla, United States
Present address: Department of Bioinformatics and Computational Biology, Genentech, San Francisco, United States
Contribution: Instructed Nikki Dellas on methods and interpretations of deep phylogenetic analyses described in the article, carried out computational methods described, provided an evolutionary context for the article, and together with Nikki Dellas drafted the initial article and edited the initially submitted article
For correspondence: manning@manninglab.org
No competing interests declared

Eukarya, pathway absent from isoprenoid carbon functional IPKs also exist in Bacteria and Eukarya. Furthermore, amongst a subset of species within the bacterial phylum Chloroflexi, we identified a new enzyme catalyzing the missing decarboxylative step of the putative alternative MVA pathway. These results demonstrate, for the first time, a functioning alternative MVA pathway. Key to this pathway is the catalytic actions of a newly uncovered enzyme, mevalonate phosphate decarboxylase (MPD) and IPK. Together, these two discoveries suggest that unforeseen variation in isoprenoid metabolism may be widespread in nature.

DOI: <http://dx.doi.org/10.7554/eLife.00672.001>

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Transparency in scientific publications (eLife)

The screenshot shows a web browser displaying an eLife article page. The address bar shows the URL elife.elifesciences.org/content/2/e00672. The page features a purple navigation bar with the text "Follow Randy's Nobel journey" and a top right menu with "About eLife", "Submission & Review", and "eLife Journal".

The main content area is titled "and Irwin Mark Jacobs Senior Scientist Endowed Chair." Below this, there are two expandable sections: "I+1 Decision letter" and "I-1 Author response". The "Author response" section is expanded, showing an "Editors' note: the author responses to the first round of peer review follow." and a "Reviewer #1:" section.

The reviewer's text reads: *The manuscript by Dellas and colleagues describes the characterization of an alternative mevalonate pathway in Chloroflexi bacteria that inverts the canonical order of the terminal phosphorylation and decarboxylation steps in the conversion of MVAP to IPP. The authors determine that Chloroflexi possess an enzyme originally predicted based on sequence homology to be a mevalonate 5-diphosphate decarboxylase (MDD) that instead decarboxylates mevalonate 5-phosphate. This finding, combined with the existence of an isopentenyl phosphate kinase (IPK), establishes a complete mevalonate pathway in Chloroflexi. The authors proceed to make a convincing argument for discrete changes in the active site of the Chloroflexi decarboxylase that may account for the substrate switch from MVAPP to MVAP. The results reported in this manuscript certainly enrich our understanding of the phylogenetic diversity of mevalonate pathways, but this reviewer was not convinced that the findings are particularly surprising. The "enzyme repurposing" discovered by the authors appears to reflect a rather simple tweak in substrate scope for the decarboxylase enzyme (i.e., MVAPP and MVAP only differ by a single phosphate group, so is it really unexpected that certain MDD-like enzymes might have evolved to switch substrate preference to MVAP over MVAPP?). Furthermore, as the authors note, there is already quite a bit of emerging literature on the general topic of diversification of mevalonate pathways, so this reviewer had difficulty judging the actual impact of the current manuscript. It is a solid and well-executed contribution, but appears to fall short of the high-impact study intended for a general readership journal like eLife.*

Below the reviewer's text, the beginning of the author's response is visible: "With all due respect to Reviewer 1, the repurposing of the enzyme in question, the decarboxylase of MVAPP, is totally unexpected and the simplicity of the explanation should not in any way suggest it is an obvious finding or only of incremental importance to isoprenoid metabolism. Clearly, the simplicity

On the right side of the page, there is a "Jump to:" menu with the following options: Article (Abstract, eLife digest, Main text, Introduction, Results, Discussion, Materials and methods, References, Decision letter, Author response, Leave a comment), Figures & data, Metrics, and Article & author info.

Transparency in scientific publications (SCIENTIFIC REPORTS)



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Transparency in scientific publications (SCIENTIFIC REPORTS)

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- **Do good research**
- Formulate an important research question
- Do not work alone because this is self-defeating and will likely produce poor quality research output
- Writing your manuscript
- The importance of the title
- The abstract
- Writing a cover letter to the editor-in-chief
- Choosing a journal: Be honest about the quality of your own work
- External peer review

Reasons for an instant rejection

- It lacks novelty.
- It is a descriptive work rather than a mechanistic work.
- It poses an uninteresting question that leads nowhere.
- It has a poor or inappropriate study design.

MY ROLE AS REVIEWER

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Action	My Reviewer Number	Manuscript Number	Article Type	Article Title	Status Date	Current Status	Date Reviewer Invited	Date Reviewer Agreed	Date Review Due	Date Review Submitted	Days Taken	Editor's Name	Corr. Author
Action Links	1	CATCOM-D-16-00749	Short Communication	Highly selective catalytic conversion of ethanol to propylene over yttrium-modified zirconia catalyst	Nov 10, 2016	Completed - Accept	Aug 13, 2016	Aug 18, 2016	Sep 01, 2016	Sep 24, 2016	37		WEI XIA
Action Links	1	CATCOM-D-16-00343	Short Communication	High-performance graphene quantum dot sensitized mesoporous TiO2 films as electrodes for acid orange 7 degradation under visible light	Jun 02, 2016	Completed - Reject	Apr 24, 2016	Apr 24, 2016	May 08, 2016	May 21, 2016	27		li youji
Action Links	4	CATCOM-D-15-01121	Short Communication	Ag(0) nanoflowers as an effective and recyclable catalyst for degradation of Rhodamine B with H2O2	Jan 08, 2016	Completed - Reject	Dec 24, 2015	Dec 25, 2015	Jan 08, 2016	Jan 08, 2016	14		Alireza Khorshidi
Action Links	2	CATCOM-D-15-00963	Short Communication	Catalytic Oxidation Desulfurization over PTA-dispersed MIL-101 under Mild Conditions	Oct 23, 2015	Completed - Reject	Sep 29, 2015	Sep 30, 2015	Oct 14, 2015	Oct 14, 2015	14		Yong Liu
Action Links	2	CATCOM-D-15-00532	Short Communication	Novel molybdenum-cerium based heterogeneous catalysts for efficient oxidative coupling of benzylamines under eco-friendly conditions	Jun 23, 2015	Completed - Reject	Jun 05, 2015	Jun 07, 2015	Jun 21, 2015	Jun 21, 2015	14		Benjaram M Mahipal Reddy, PhD
Action Links	3	CATCOM-D-14-00244	Short Communication	Aerosol-assisted synthesis of hierarchical porous titanium silicon molecular sieve as catalysts for cyclohexene epoxidation	Apr 08, 2014	Completed - Reject	Mar 24, 2014	Mar 25, 2014	Apr 08, 2014	Apr 07, 2014	13		guang xiong
Action Links	1	CATCOM-D-13-00013	Short Communication	Preparation and catalytic performance of cylinder- and cake-like Cr2O3 for toluene combustion	Feb 26, 2013	Completed - Accept	Jan 16, 2013	Jan 16, 2013	Jan 30, 2013	Jan 29, 2013	13		Hongxing Dai, PhD
Action Links	2	CATCOM-D-12-00539	Short Communication	Relationship between the Structure and Activity of Ruthenium Catalysts in the Catalytic Ozonation of Dimethyl Phthalate	Jun 23, 2012	Completed - Reject	Jun 08, 2012	Jun 08, 2012	Jun 22, 2012	Jun 19, 2012	11		Jianbing Wang, Dr.
Action Links	1	CATCOM-D-11-01002	Short Communication	Synthesis and catalytic activity of HZSM-5 zeolites with different crystal sizes in ethanol conversion to propylene	Nov 19, 2011	Completed - Reject	Oct 26, 2011	Oct 27, 2011	Nov 10, 2011	Nov 11, 2011	15		Dongsen Mao, PhD
Action Links	1	CATCOM-D-11-00678	Short Communication	Oxidation of SO2 catalysed by ion-exchanged zeolites in gas phase	Aug 24, 2011	Completed - Reject	Aug 01, 2011	Aug 01, 2011	Aug 15, 2011	Aug 11, 2011	10		Chien-Liang Hwang
Action Links	3	CATCOM-D-10-00641	Short Communication	Potential catalyst WO3/ZrO2 for epoxidation of the polyolefin	Aug 21, 2010	Completed - Reject	Aug 02, 2010	Aug 03, 2010	Aug 17, 2010	Aug 09, 2010	6		Mei Li, Ph.D
Action Links	1	CATCOM-D-10-00037	Short Communication	Fabrication of silicalite-1 and TS-1 hollow fibers with polyethylene imine (PEI) fibers as substrates	Feb 16, 2010	Completed - Reject	Jan 15, 2010	Jan 15, 2010	Jan 29, 2010	Feb 06, 2010	22		chunrong xiong
Action Links	2	CATCOM-D-09-01008	Short Communication	Environmental benign synthesis of β -hydroxy sulfides using cyclic carbonates catalyzed by large pore zeolites	Nov 24, 2009	Completed - Reject	Nov 05, 2009	Nov 05, 2009	Nov 19, 2009	Nov 13, 2009	8		ANIL KISAN KINAGE, Ph.D.
Action Links	2	CATCOM-D-09-00432	Short Communication	Dialkylation of naphthalene with isopropanol over H3PO4/MCM-41 catalysts for the environmentally friendly synthesis of 2,6-dialkylnaphthalene	May 19, 2009	Completed - Reject	Apr 30, 2009	Apr 30, 2009	May 14, 2009	May 18, 2009	18		Miguel Angel Vicente, Ph D
Action Links	3	CATCOM-D-08-00896	Short Communication	Superacid catalyst SO42-/ZrO2-La2O3 prepared by ultrasonic co-precipitation method and low temperature aging and its catalytic activity	Dec 16, 2008	Completed - Reject	Nov 27, 2008	Nov 27, 2008	Dec 11, 2008	Dec 12, 2008	15		Xiangfeng Chu (person removed from system)
Action Links	2	CATCOM-D-08-00637	Short Communication	V2O5 supported on cobalt-hydroxyapatite for the partial oxidation of n-pentane to anhydrides	Oct 27, 2008	Completed - Reject	Aug 29, 2008	Aug 29, 2008	Sep 19, 2008	Sep 29, 2008	31		Srekantha Babu Jonnalagadda, Ph.D
Action Links	1	CATCOM-D-08-00338	Short Communication	Preparation and photocatalytic activity of Fe-TiO2/activated carbon composites by a properly controlled sol-gel method	Jun 16, 2008	Completed - Reject	May 20, 2008	May 21, 2008	Jun 11, 2008	Jun 13, 2008	23		li youji
Action Links	2	CATCOM-D-08-00122	Letter	Study of Acidity of Zeolites Coked during Catalytic Cracking of n-Hexane and 1-Hexene by Temperature Programmed Desorption of Ammonia	Mar 17, 2008	Completed - Reject	Feb 17, 2008	Feb 17, 2008	Mar 09, 2008	Mar 10, 2008	22		George Manos, PhD
Action Links	2	CATCOM-D-07-00780	Short Communication	Preparation and photocatalytic activity of TiO2-carbon surface composites by supercritical pretreatment and sol-gel process	Jan 08, 2008	Completed - Accept	Nov 02, 2007	Nov 04, 2007	Nov 25, 2007	Nov 20, 2007	16		li youji
Action Links	1	CATCOM-D-07-00637	Short Communication	Tetrazolium based phosphotungstate complex in ionic liquid: An easy and efficient catalyst for acetylation of alcohols, amines and thiols.	Nov 05, 2007	Completed - Reject	Sep 05, 2007	Sep 05, 2007	Sep 26, 2007	Oct 04, 2007	29		Ramesh Chandra, PhD. (person removed from system)
Action Links	1	CATCOM-D-07-00222	Letter	Characterization and Catalytic Alkylation of Hydrothermally Dealuminated Nanoscale ZSM-5 Zeolite Catalyst	Jul 09, 2007	Completed - Accept	Apr 15, 2007	Apr 15, 2007	May 06, 2007	May 18, 2007	33		Chunhua Ding, Ph.D.
Action Links	1	CATCOM-D-07-00035	Short Communication	Photocatalytic degradation of methylene blue in a sparged tube reactor with TiO2 fibers prepared by a properly two-step method	Nov 02, 2007	Completed - Accept	Jan 12, 2007	Jan 15, 2007	Feb 05, 2007	Jan 30, 2007	15		zhang shi ying, PhD

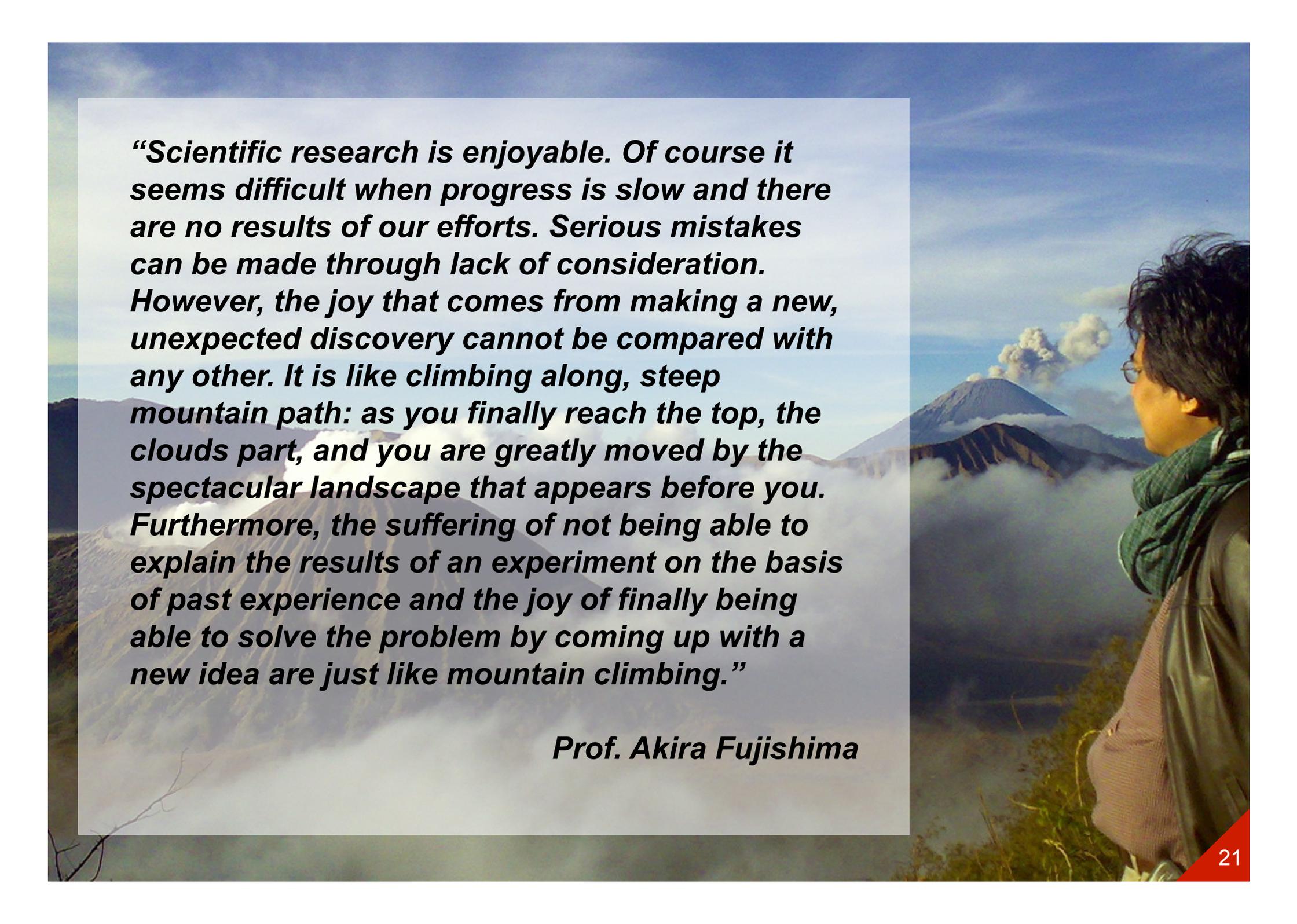
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The following are the reasons why I do not accept manuscripts for publication:

- **Originality**. Usually in a paper that is not original, the results is very easy to predict.
- **Speculation**. Discussion and conclusion are not supported by the complete set of accurate data. Because of that the jump into conclusion statement was found in the manuscript.
- **Logic**. The analytical technique used is not appropriate, nor logic in analyzing the data.

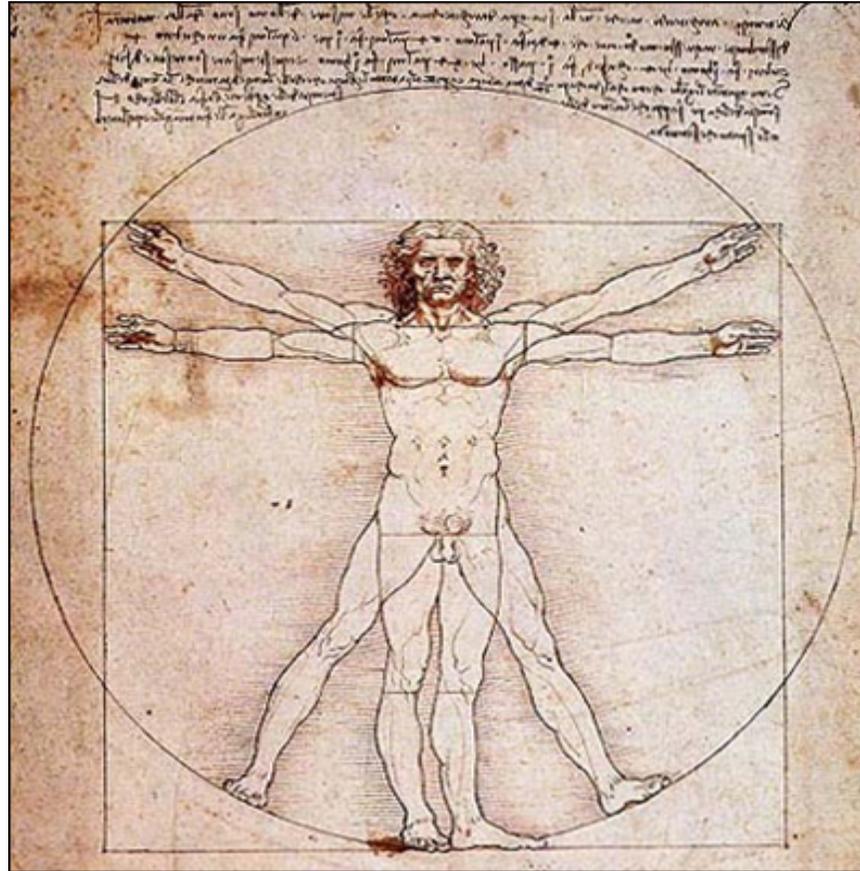
A person with dark hair and glasses, wearing a green scarf and a brown jacket, is seen in profile on the right side of the image, looking out over a vast mountain landscape. In the background, a large volcano with a plume of white smoke rises against a blue sky. The foreground is filled with rolling hills and a layer of white mist or clouds. The overall scene is serene and majestic.

“Scientific research is enjoyable. Of course it seems difficult when progress is slow and there are no results of our efforts. Serious mistakes can be made through lack of consideration. However, the joy that comes from making a new, unexpected discovery cannot be compared with any other. It is like climbing along, steep mountain path: as you finally reach the top, the clouds part, and you are greatly moved by the spectacular landscape that appears before you. Furthermore, the suffering of not being able to explain the results of an experiment on the basis of past experience and the joy of finally being able to solve the problem by coming up with a new idea are just like mountain climbing.”

Prof. Akira Fujishima

The basis of scientific research

HUMAN AND SCIENCE



THE POWER OF THE HUMAN WILL

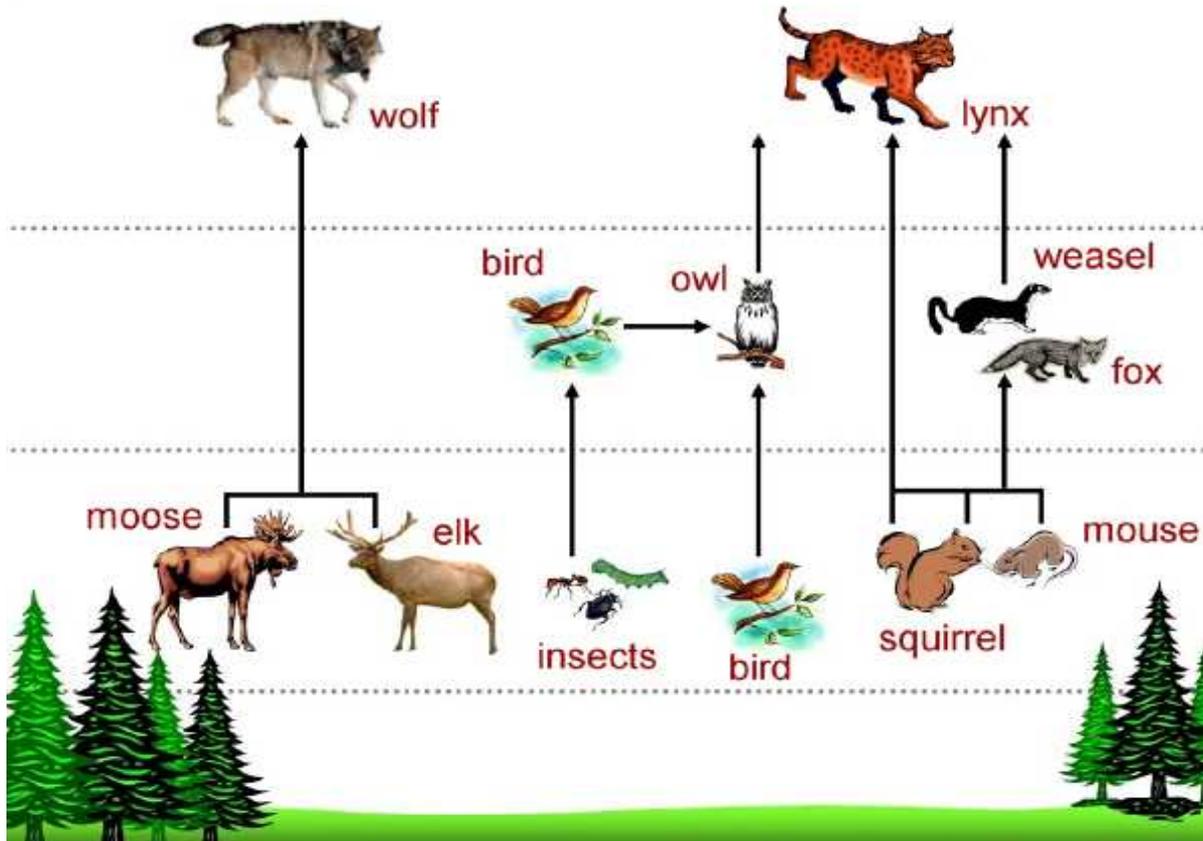
CURIOSITY



**curiosity is not found
in plants
→ waiting for food**



COMPLEX ORGANISM



FIND FOOD

FOR THAT

ANIMAL MUST MOVE

KNOW WHAT A GOOD FOOD



Once the physical survival needs are met



- **Full**
- **Secure**

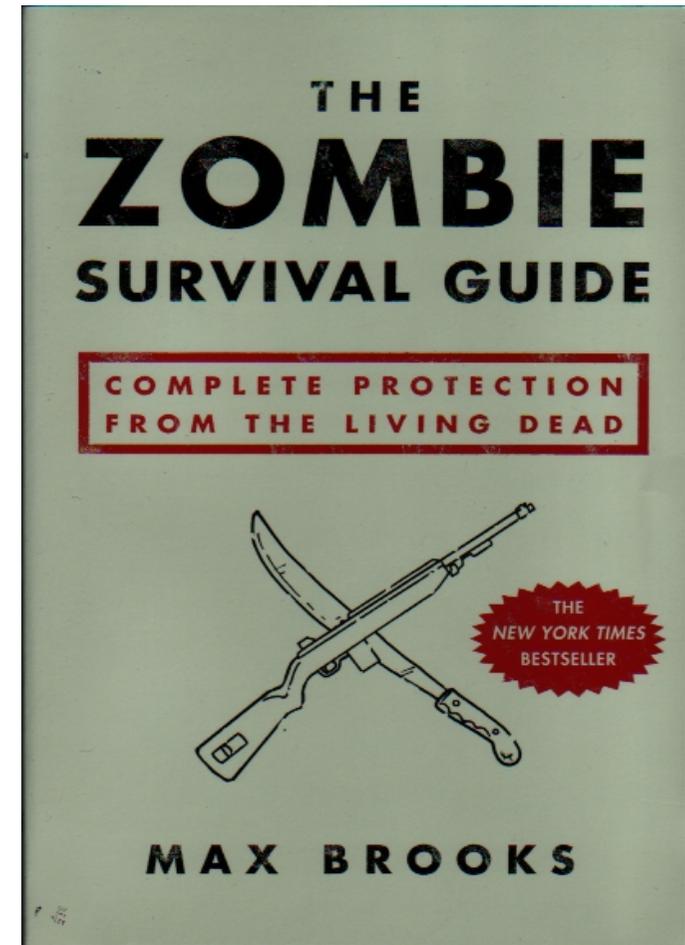
Animal → Sleep

Human → Curiosity surplus !



Curiosity for survival

**Curiosity to improve
the survival**



Finally

What is the reason?

→ the birth of
science

**Human senses
received a lot of
information and
events that demand
answers → WHY?**

Explanation:

**according to the
level of knowledge**

MYTHOLOGY

**There must be a
logical explanation**

How to explain something

- **Data gathering**
- **Compile data**
- **looking for a principle (conclusion)**

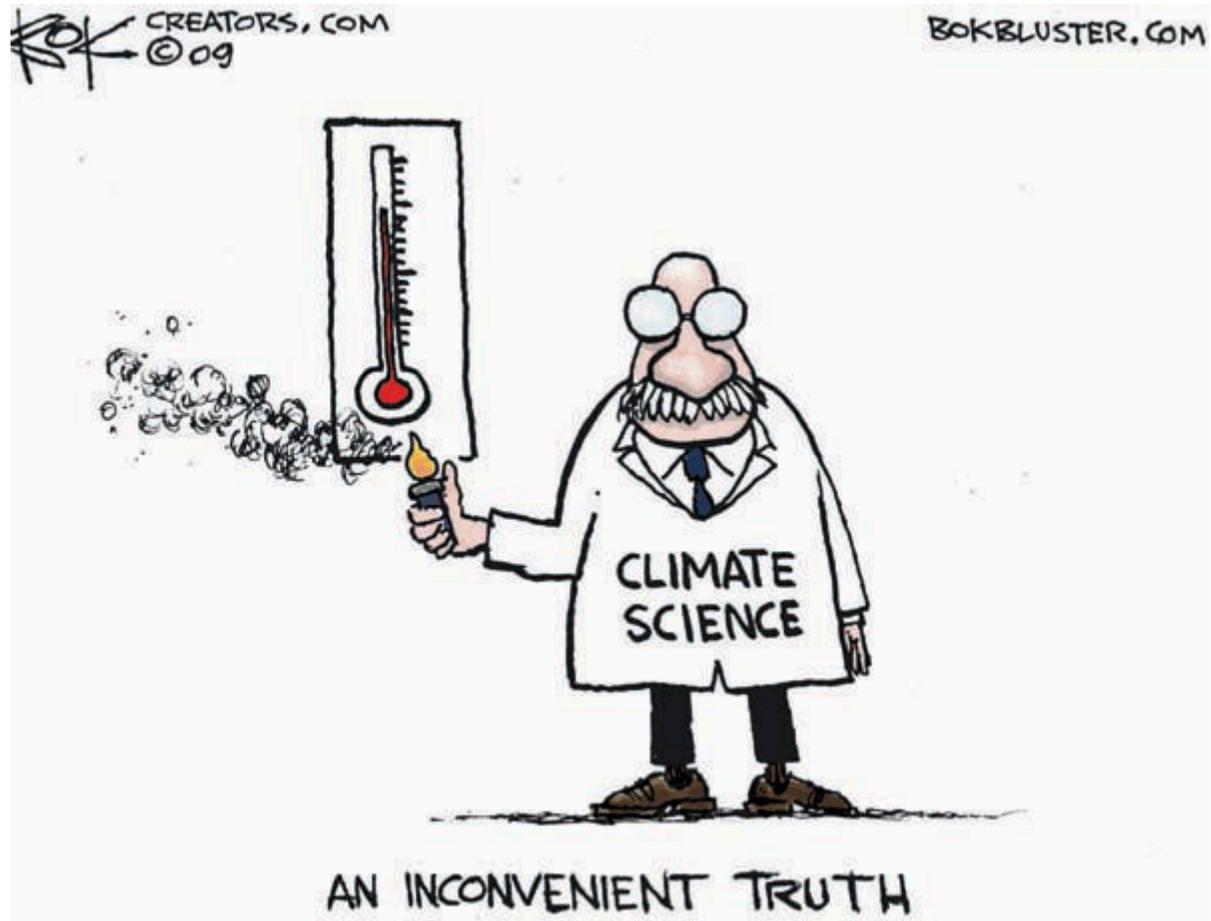


Be careful to draw a conclusion

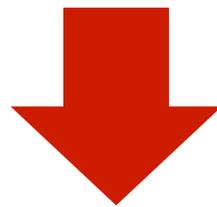
Can be trapped

- **Critical**
- **Sceptical**

HONESTY



The relationship
between the principles
or conclusion



THEORY

- Science seek to understand
- Science search for truth

**There is no absolute
truth**

**Therefore science
never stops searching
for the truth**

Fundamental Premises

- **Technological obsolescence** can occur in as little as 5-10 years!
- Excellence in research is one of the ultimate roots of **all** academic excellence, in both undergraduate and postgraduate education
- In science, no matter how spectacular the results are, the work is not completed until the results are published.

Research Philosophy

Primary aim of research is to uncover **facts of “strategic value”**

- Discovering more-and-more facts is not enough (especially trivial ones)
- Strive for **deep insight** to poorly understood questions
- Exploit **multi-disciplinary thinking**
- Welcome industry inputs

Rely on **peer review and peer pressure**

- Encourages humility
- In absence of peer review, mediocre people think that they are “big shots”

Appreciate that **fundamental research requires critical mass**

- Research teams provide critique exchange of ideas, promote competition, and foster humility
- Research teams are **incubators of “idea-multipliers”**

Create research superstars !

Good researchers Make Better Teachers

- Speed of **technological innovation** makes it mandatory to move “advanced topics” into post-graduate and undergraduate courses
 - this process provides **superior motivation** for all students
 - lecturers with excellent research credential are best suited to implement such **educational innovations**
- History has shown that long-term educational impact of serious researcher is superior to that classical “good” teacher
 - **distinction breeds distinction attitudes** as well as knowledge, are promulgated by distinguished teachers-researchers

Good Research Requires Times!

Few people can be superior researchers

- Too many trivial conference papers, few publications in first class journals are not the hallmark of superior research

Superior researchers are **intellectual “masochists”**

- They must accept the most new ideas to dead-ends
- They must learn to accept failure, yet persevere to keep trying over-and-over
- They live for the rare thrill of a “breakthrough”

Prolonged periods of personal time are required to **“think deeply”**

- High-quality research cannot be done in one`s “spare time”
- Intense concentration and “well being” are essential

Research teams provide **“idea-multiplier”**

Choice of research topics

Some traps in the choice of research topics

- 'sleepwalking' or doing good work in pursuit of illusory goals
- 'negative' and 'improvement' research
- 'tool-driven' research

Good topic

- research is driven by important scientific issues that are tackled with all the tools available

Scientist

=

**Problem
seeker**

Quality in Science

No unambiguous definition given so far

- contribution to knowledge base
- results as “product”:
 - cost effective
 - innovative
 - useful for application
 - speed

Quality in Science

- originality of work
- novelty and generic character (“seminal”)
- general value
 - for mankind
 - for social structures
 - for environment
 -

Scientific misconduct and publication

- Poor or inexistent acknowledgment of sources
- “Salami” publication (dividing a study into many publications)
- duplicate publication and data remanufacturing
- plagiarism
- Suppressing data
- fraud (inventing data)

Examples of alleged cases of major scientific misconduct and controversy

Identifier, year of disclosure	Type of case	Articles involved (retracted)	Comments
Jan Hendrik Schön, 2003	Fabricated and falsified research findings	25 (28)	See account in text for description
Steven A. Leadon, 2003	Fabricated and falsified research findings	1 (1)	University of North Carolina ad hoc committee implicated author; Leadon denied misconduct but resigned position
Alexander Kugler, 2002	Lack of proper data handling and record keeping	1 (1)	Committee at Gottingen University found him guilty of scientific misconduct; he left his university hospital position
Amitov Hajra, 1996	Fraudulent data	6 (3) plus bogus nucleotide sequences in GenBank	Reviewer noted irregularities in submitted paper; Collins checked data, repeated experiments; and quickly informed university, ORI, colleagues; Hajra barred from federally funded research and denied doctorate
Stephen E. Breuning, 1987	Fraud: reported studies never done	20 (2)	Involved 1980–1984 studies while at U. Pittsburgh; 1987: NIMH discloses misconduct. 1988: pleaded guilty in court
Robert Slutsky, 1985	Fraud: fabricated data	55 questionable; 13 considered fraudulent; 18 retracted; reports vary on these numbers	Notifications sent to journals, support-granting bodies, and co-authors
John Darsee, 1982	Fraud: fabricated data	At least eight journal articles and many abstracts were fraudulent	Lost Harvard position; banned from NIH research grants for 10 years; Harvard repaid grant money
Elias Alsabti, 1980	Fraud: Plagiarism	Copied articles of other authors, replaced names of authors with his, and sent articles to obscure journals	Asked to leave several different institutions when practice discovered. Finally left the U.S.
Waksman–Schatz 1940's	Waksman did not share credit	Schatz, a Ph.D. student, was co-discoverer of streptomycin. Waksman alone won Nobel Prize due to lack of mention of Schatz	Schatz took legal action to obtain royalties and won an out-of-court settlement. Many in scientific community were antagonistic toward Schatz. Debate continues on whether Schatz should have shared Nobel Prize or if prize was for Waksman's larger efforts

Why does fraud happen?

- Pressure to publish
- Inadequate training, not taught good practice. perhaps sometimes the opposite.
- Sloppy behaviour spilling over to fraud
- Biased by theory. Some scientists find reasons to reject results that do not fit with theory –theirs or someone famous.



Bell Laboratories, Inc.

HENDRIK SCHON CASE



Fraud in molecular electronics

October 2002

Jan Hendrik Schön (Bell Laboratories) published several breakthroughs in the field of organic molecules (polymers) behaving as transistors (electronic devices that can switch and amplify currents).

A research committee studied **16 of his 25 scientific papers and concluded his findings were fraudulent.**

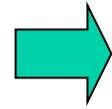
An internal report from Bell Laboratories concluded that data in 16 of Schon's papers were fraudulent.

The papers were reviewed and accepted by several prestigious scientific journals, including *Nature*, *Science*, *Physical Review*, and *Applied Physics Letters*.

In many of the papers, the fraud was obvious with data repeated point-for-point and impossibly smooth or noise-free.

- 1998 - 2002, Schön produced 100 papers, an average of one per two weeks !
- Not ordinary papers but claimed significant advances in a variety of fields—organic semiconductors, organic superconductors, inorganic superconductors, and fullerenes.

Scientific Integrity



Good research practice !

Good research practice requires proper supervision and training

Good research practice encourages openness and dissemination of results

Good research practice requires proper maintaining and storing of records.

Good research practice requires high quality outputs and good publication practice.

THANK YOU