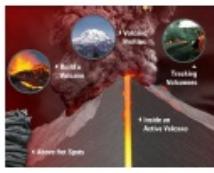


GEOBRASIL

<http://www.geobrasil.net>



Fotos tiradas do site da Nasa

***As pessoas interessadas em receber nossa newsletter via mail, podem escrever para revistadegeologia@yahoo.com.br pedindo sua adesão.

LIVROS

<http://earth-pages.co.uk/books/>

ARTIGO DA SEMANA

Does this map from 1418 prove historian's controversial claim that the New World was discovered by the CHINESE 70 years before Columbus?

<http://www.dailymail.co.uk/news/article-2449265/Who-Discovered-America--Controversial-historian-Gavin-Menzies-claims-Chinese-reached-New-World-first.html>

Gavin Menzies, a British historian, claims Chinese Admiral Zheng He set up colonies and sailed round South America before Columbus. Menzies' new book, 'Who Discovered America?' also claims the Chinese have been sailing to the New World since 40,000 BC across the Pacific Ocean

A copy of a 600-year-old map found in a second-hand book shop is the key to proving that the Chinese, not Christopher Columbus, were the first to discover the New World, a controversial British historian claims.

The document is purportedly an 18th century copy of a 1418 map charted by Chinese Admiral Zheng He, which appears to show the New World in some detail.

This purported evidence that a Chinese sailor mapped the Western Hemisphere more than seven decades before Columbus is just one of Earth-shattering claims that author Gavin Menzies makes in his new book '[Who Discovered America?](#)' - out today, just in time for the Columbus Day holiday.

'The traditional story of Columbus discovering the New World is absolute fantasy, it's fairy tales,' Mr Menzies told MailOnline.

Among Menzies other claims are that the first inhabitants of the Western hemisphere didn't come over land from the Bering Strait, but instead were Chinese sailors who first crossed the Pacific Ocean 40,000 years ago.

He also writes that DNA markers prove American Indians and other natives are the descendants of several waves of Asian settlers. Furthermore, he says a majestic fleet of Chinese ships, commanded by Zheng He, sailed around the continent of South America - 100 years before Ferdinand Magellan supposedly became the first to undertake the task.

Columbus features heavily in the book - insofar as Menzies has devoted the last 20 years to finding and laying out evidence that Columbus not only didn't discover America - he was 40 millennia late.

Mr Menzies believes that Columbus actually had a map of the world that was plotted by the Chinese Admiral Zheng He, who created the map when he sailed to the New World in 1421, more than seven decades before Columbus.

His book includes what Menzies says is a copy of that map, discovered by Beijing attorney Liu Gang in a second-hand bookshop that he says proves his theory.

The document, he says, is an 18th century copy of Admiral Zheng He's 1417 map. Mr Menzies argues that it clearly shows North American rivers and coasts, as well as the continent of South America.

Mr Menzies' assertion about Zheng He's voyage to the New World isn't new - he first wrote about it in 2002 - but the map is.

Mr Liu had the map authenticated by an appraiser from Christie's Auctions, who said that the document was 'very old' and was not a newly-made fake.

After Mr Liu brought the map forward, Menzies also had a team of historians analyze every word on it. He concluded that it was originally written in the Ming Dynasty - a Chinese period that lasted from 1368 to 1644.

In the region of the map that Mr Menzies believes refers to Peru are written the inscriptions - 'Here the people practiced the religion of Paracas' and 'Here the people practice human sacrifice' - clear references to peoples known to have inhabited Peru at the time.

The map is further corroborated, Mr Menzies says, by the Chinese names of numerous towns and regions in Peru.

He says old Peruvian maps show places with names like Chawan - Chinese for 'land prepared for sowing' and Chulin - 'wood or forest.' Ko-Lan - a remote Peruvian town at the bottom of a ravine translates to 'difficult passage.'



[Enlarge](#)

Mr Menzies believes that this portion of the map depicts the Chinese mapping of North and South America in 1418 - showing major rivers.



Explorer: Chinese Admiral Zheng He is known to have sailed the to Europe and Africa with a massive fleet of ships. Historian Gavin Menzies says he also reached the New World



Mr Menzies believes that this portion of the map depicts the Chinese mapping of North and South America in 1418 - showing major rivers.

Mr Menzies calls the story that Christopher Columbus' discovered America in 1492 a 'fairy tale' - saying he was not only not the first explorer - he was 40,000 years late

Mr Menzies has no formal training as a historian and no advanced degree from a major university - he was a submariner in the British Royal Navy - but he can no longer be called an 'amateur.'

'Who Discovered America?' is Menzie's fourth book in which he tries to re-write history and orient it East.

He has plowed millions of dollars of his proceeds from his books into continuing his world-traveling research into his theories. He has turned his north London home into a de facto research institute, employing up to six research assistants at a time.

But his theories are not accepted by the mainstream academic community. In 2008, University of London history professor Felipe Fernandez-Armesto told the Daily Telegraph that his books are 'the historical equivalent of stories about Elvis Presley in (the supermarket) and close encounters with alien hamsters.'

Even Wikipedia characterizes Menzies as a 'pseudo-historian.'

That has not stopped him from gaining millions of readers - and thousands of followers who contribute to his website and contribute research of their own.

Menzies say this map of the Ancash province of Peru shows numerous Chinese names of villages

Each of these dots represents a Peruvian town that reportedly has a Chinese name. It is claimed this is evidence of Chinese colonization before Columbus

Mr Menzies debuted his Asia-centric theories with 2002's '1421: The Year China Discovered the World.' In it, he said that the famed Chinese sailor Admiral Zheng He, who is known to have reached Europe and Africa, also crossed the Pacific Ocean to the Western Hemisphere.

He claims that Zheng He not only reached the New World, he left colonies there. His fleet also sailed around the tip of South America - through the Strait of Magellan around the Gulf of Mexico and up the Mississippi.

There is evidence, both archaeological and genetic, Menzies says, that Zheng He left his mark in California, Florida, Virginia and even the Outer Banks of North Carolina.

In 'Who Discovered America?' Menzies focuses on theories that Asians also made it to North and South America by sea long before even Zheng He.

'It appears certain that man reached the Americas by sea at least forty thousands years ago,' Menzies writes.



This Venetian map was made from information brought back from China by Marco Polo and Nicolo da Conti. Mr Menzies says it shows North and Central America - upside-down, oriented with north at the bottom

'Doubtless this date will be continuously pushed back, probably to 100,000 BC, which was when the first peoples sailed the Mediterranean to Crete and (separately) in the south from Asia to Australia.'

Most scientists believe man first widely populated the Western Hemisphere 13,000 to 16,500 years ago.

The almost universally-held theory among academics is that man came to the New World by crossing the Bering Strait land-bridge between Asia and North America.

'The more I thought about the Bering Straight theory of populating the Americas, the more ridiculous it became,' Mr Menzies writes about his investigation of the topic

Mr Menzies says the idea that man was able to cross the Pacific Ocean around 40,000 BC isn't nearly as dramatic as it seems.

'If you just go out in a plastic bath tub, the currents will just carry you there,' he told MailOnline. 'They just came with the current, it's as simple as that.'

He added: 'There's nothing terribly remarkable about. Man has been seafaring for vastly longer than convention credit has given them credit for.'

NEWS METEORITICA DA SEMANA

Erupciones volcánicas y «organismos extraterrestres»

JOSÉ MANUEL NIEVES [ABC CIENCIA](#) / MADRID

Día 02/10/2013 - 16.35h

<http://www.abc.es/ciencia/20131002/abci-erupciones-volcanicas-organismos-extraterrestres-201310021624.html#.UIFCiQciuk4.facebook>

Investigadores descubren cómo una megaerupción sucedida hace 25.000 años consiguió enviar microorganismos hasta 850 km de distancia, un nuevo mecanismo de diseminación de la vida en la Tierra

ALEXA VAN EATON Y DAVID FLYNN

Diatomea entre partículas de ceniza volcánica

Hace apenas unos días, un grupo de investigadores británicos, de la Universidad de Sheffield, aseguraban estar plenamente convencidos de haber encontrado [organismos de origen extraterrestre en nuestra atmósfera](#), a 27 km. de altura. Milton Wainwright, director de la investigación, afirmaba entonces que "la mayoría de las personas sostendrá que estas partículas biológicas deben, por fuerza, haberse desplazado a la estratosfera desde la Tierra, pero es sabido que una partícula del tamaño de las que hemos encontrado no puede elevarse desde la Tierra hasta alturas, por ejemplo, de 27 km. La única excepción podría deberse a una violenta erupción volcánica (que empujara a esas partículas hacia arriba), pero nada de eso ha sucedido durante los tres años en que hemos estado recogiendo muestras".

Ahora, un equipo de la Universidad Victoria, en Nueva Zelanda, acaba de revelar cómo una erupción explosiva sucedida hace 25.000 años consiguió enviar microorganismos hasta 850 km. de distancia, un hecho que revela la existencia de un nuevo mecanismo de diseminación y evolución de la vida en la Tierra. El estudio acaba de publicarse en la revista Geology.

[Error. Riferimento a collegamento ipertestuale non valido.](#)

Diatomea encontrada en las islas Chatham

En la década de 1970, el vulcanólogo Steve Self encontró unos curiosos restos microscópicos en los depósitos de una erupción acaecida en la isla norte de Nueva Zelanda hace 25.400 años. Se trataba de fragmentos de diatomeas, un tipo de algas unicelulares que se encierran en una fina cápsula de cristal de sílice y que a menudo se encuentran como microfósiles en rocas antiguas. A lo largo de los años, la observación de Self corrió de boca en boca entre los geólogos, casi como un rumor, hasta llegar a Alexa Van Eaton, una estudiante de doctorado en el laboratorio de Colin Wilson, profesor de la Universidad Victoria en Wellington (Nueva Zelanda).

Para Van Eaton, aquella observación nunca corroborada de que los volcanes podrían dispersar microorganismos a enormes distancias durante las erupciones abría un jugoso campo de investigación para su tesis doctoral. "Coincidía que teníamos a Margaret Harper, una experta mundial en las diatomeas de Nueva Zelanda, así que era un conjunto de circunstancias afortunadas", relata la investigadora.

La capacidad de los microorganismos de volar con el viento a lugares lejanos algo ya conocido. "Hay muchos ejemplos", señala Van Eaton. "Uno de los primeros fue documentado a mediados del siglo XIX por Charles Darwin, quien encontró diatomeas de agua dulce pegadas a las velas del HMS Beagle en el océano Atlántico, y concluyó que llegaban allí con la brisa". El pasado año, investigadores de EE.UU. probaron que las corrientes de aire a través del Pacífico transportan miles de especies de bacterias desde Asia hasta Norteamérica, demostrando así que la dispersión del llamado aeroplanton alcanza proporciones intercontinentales. Con todos estos datos en la mano, Van Eaton se planteó buscar posibles restos fósiles en depósitos volcánicos a gran distancia de la fuente original.

La supererupción del Taupo

Para ello eligió el mismo evento investigado por Self, la supererupción de Oruanui del volcán Taupo. La elección no es casual: esta erupción explosiva, la mayor ocurrida en el planeta en los últimos 70.000 años, fue de las llamadas húmedas, ya que se produjo bajo las aguas del lago Huka. Como consecuencia, los expertos estiman que el Taupo inyectó una gran cantidad de material volcánico mezclado con agua y plancton hasta la estratosfera, a una altura de 30 kilómetros. Curiosamente, el mismo rango de distancias en las que Wainwright encontró sus supuestos "organismos extraterrestres".

Van Eaton y su equipo recogieron 22 muestras de depósitos de la explosión del volcán en 11 localizaciones diferentes, hasta una distancia de 850 kilómetros en islas próximas. Y tras el análisis, lograron identificar más de 300 restos de valvas de diatomeas de agua dulce en cada muestra, concluyendo que la erupción dispersó un volumen aproximado de 600 millones de metros cúbicos de estas algas, similar a la cantidad de magma arrojada por el monte Santa Helena en 1980.

Para verificar sus resultados, tomaron muestras de estratos por encima y por debajo del de la erupción y comprobaron que las especies de diatomeas eran diferentes, pero que las del material eruptivo coincidían con las encontradas en los depósitos volcánicos del propio lago. Además, en los sedimentos distantes encontraron una especie, *Cyclostephanos novaezeelandiae*, que es endémica en la isla norte de Nueva Zelanda.

"Hasta donde sabemos, es el primer estudio que vincula de forma convincente la dispersión de microbios con una erupción volcánica", concluye Van Eaton. Pero para que su trabajo tenga un interés biológico además del geológico, la investigadora es consciente de que será necesario demostrar que las diatomeas pueden sobrevivir a estos viajes volcánicos, algo difícil de probar.

"Calor extremo en la erupción, luego frío extremo en las capas altas de la atmósfera, desecación y exposición a radiación ultravioleta... Todo esto sería bastante desagradable para la mayoría de las diatomeas", reflexiona. "Alguna podría sobrevivir, y ¿cuántos pioneros necesitas para una nueva colonia? Aún así, es más probable que las células latentes de las diatomeas u otros microbios asociados, como bacterias dentro de las envolturas, pudieran sobrevivir en número suficiente".

Vida extrema

Las implicaciones del estudio van más allá si se tiene en cuenta que existen microbios llamados termófilos extremos capaces de crecer en entornos volcánicos, por lo que la dispersión a través de todo tipo de erupciones, no solamente las húmedas, podría haber desempeñado un papel importante en la diseminación y posterior evolución de la vida en la Tierra temprana.

"Por qué no", especula Van Eaton. "Podría ocurrir en cualquier ambiente volcánico". Es más: ciertas teorías apuntan que la vida en la Tierra podría haber nacido en las fumarolas hidrotermales oceánicas. "En este caso el mecanismo primordial de dispersión serían las corrientes marinas", razona la geóloga. "Pero las erupciones pueden haber contribuido en cierto grado; es una idea interesante".

Desde el punto de vista de los vulcanólogos, el trabajo servirá como modelo para reconstruir otras erupciones históricas mediante el estudio de esta firma biológica que permite identificar la procedencia de los depósitos. Mientras, Van Eaton explora ahora antiguas erupciones en la cordillera norteamericana de Cascadey en Alaska en busca de nuevos microfósiles, al tiempo que sus colaboradores del Instituto Tecnológico de Georgia analizan los fragmentos de diatomeas de Nueva Zelanda a la caza de posibles restos de bacterias. "Quién sabe qué más puede aparecer", aventura.

Errore. Riferimento a collegamento ipertestuale non valido.

Mapa de la isla norte de Nueva Zelanda con la antigua ubicación del lago Huka, donde se produjo la erupción de Oruanui, y la posición actual de la caldera del volcán Taupo. La línea punteada marca el alcance de los materiales arrojados por la erupción con un tamaño mayor de 10 centímetros

European Space Agency Cooks a Comet



Yesterday, thousands of visitors to ESA's technical heart in the Netherlands enjoyed learning more about ESA space missions, including Rosetta – the daring spacecraft that will rendezvous with a comet next year. Rosetta has been in deep-space hibernation since June 2011 while on the loneliest leg of its 10-year journey through space to its destination: comet Churyumov–Gerasimenko. The spacecraft will wake up early next year and rendezvous with its target comet several months later, taking images of its dust–ice nucleus and studying the gases jetting from the surface. It will be the first mission to follow a comet as it moves towards the Sun, watching as its

activity changes over time. In November 2014, Rosetta will deploy its Philae lander to the surface of the comet for an even closer view. As part of the Rosetta display at the ESTEC open day, visitors could ask questions of mission manager Fred Jansen and comet expert Gerhard Schwehm, while learning more about comets in the 'cook a comet' demonstrations.

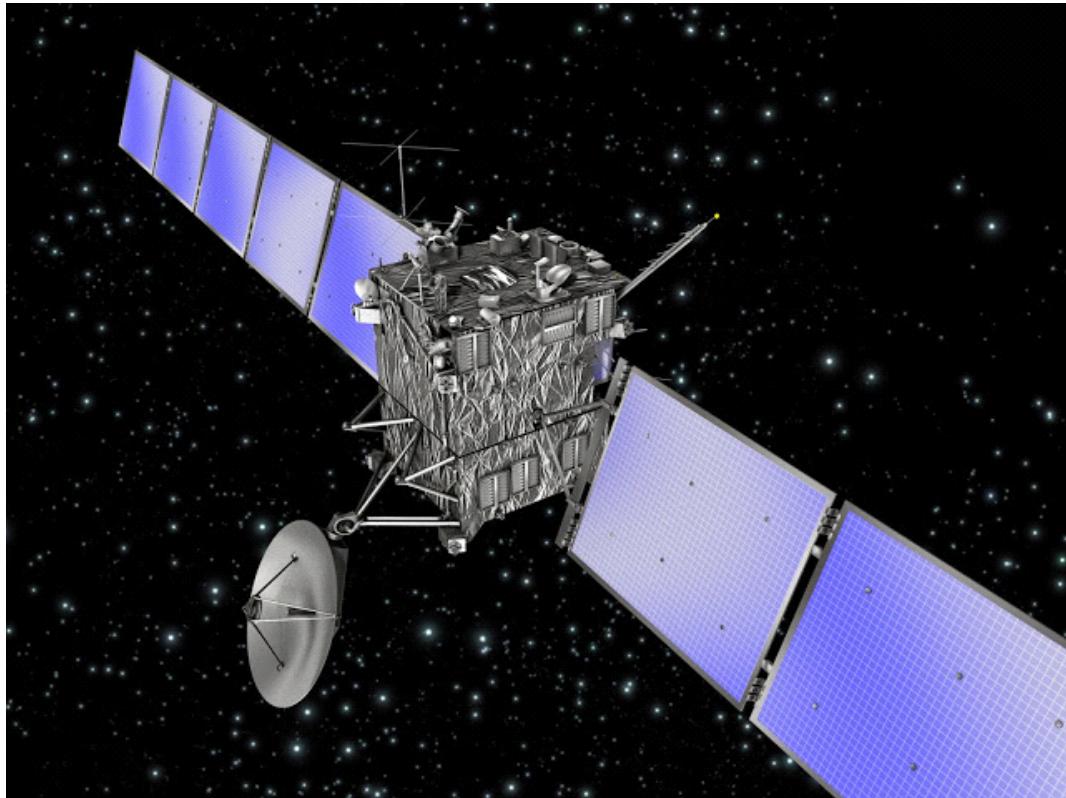
Comets are composed primarily of dust, ice and organic material. A simple model of a comet is created by mixing together dirt, water and dry ice (frozen carbon dioxide), with a generous slug of chocolate sauce to represent the organic component. Thick gloves are needed to handle the dry ice to protect against cold 'burns'.

As water is added to the mixture a rather violent reaction begins as the freezing dry ice meets the much warmer water, and changes directly from a solid into a gas.

That's also what happens in space when the comet moves from the frigid outer Solar System and closer to the Sun. As it warms up, its ices turn into gas, and jets may activate on its surface. Small jets are also seen on the model comet where ice is exposed.

Comets are thought to contain some of the most ancient materials in the Solar System that were left over from when the planets formed some 4.6 billion years ago. These icy bodies may even have delivered water to Earth and charged it with ingredients that helped life take hold on our home planet.

Exploring comets close up with a mission like Rosetta will therefore help us learn more about the early history of our Solar System, while providing the most detailed view of a comet yet.



Artist's impression of the Rosetta Spacecraft. Credit: ESA - C. Carreau

Also on display at the Open Day along the main corridor were ESA science exhibitions showcasing Gaia, BepiColombo and Planck. Gaia will be launched into space at the end of next month to survey a billion stars and map the Milky Way in three dimensions. BepiColombo will be launched to the Solar System's innermost planet, Mercury, in 2016; the engineering model is currently being tested in the cleanrooms at ESTEC.

Cosmology experts were on hand to discuss the latest results from the Planck mission, which earlier this year unveiled the most detailed picture of our infant Universe.

Credit: [ESA](#)

UFO or Meteor? Giant Ball of Fire Hits Waters off Zamboanga, Philippines

<http://www.astrowatch.net/2013/10/ufo-or-meteor-giant-ball-of-fire-hits.html>



Villagers and authorities in the west coast of Zamboanga remain baffled after a big ball of fire streaked from the southern skies at 5 a.m. on Wednesday, hitting the coastal water before exploding and illuminating nearby villages. Senior Inspector Edilberto Alvarez, the police commander of Station 9, confirmed the mysterious phenomenon but could neither offer a clear explanation of the incident at Barangays La Paz and Talisayan. Alvarez said a dull but loud explosion occurred later at the sea water fronting Barangay Talisayan.

"It was confusing because based on my own experience an improvised bomb if exploded would not create such bright and colorful light covering a massive area compared to that one... whatever it was," Alvarez said.

The police official also dismissed the possibility that the ball of fire that exploded was man-made.

Some residents believed it was an UFO, while others said it was a meteor from the outer space.

The police official said investigation conducted from among the residents of Talisayan disclosed that that ball of bright glaring fire streaked from above the skies came from east to west, passing through the airspace of Barangay La Paz toward Talisayan.

The areas were brightened up briefly by the passing mysterious ball of fire that hit the middle of the sea water in front of the NY canning company in Talisayan and exploded.

The police commander said none of the people in the area could also tell who were responsible for such mysterious explosion.

Alvarez they continued to investigate but admitted limitations in going deeper since the area where the ball of fire landed and exploded was in the deep sea.

Credit: philstar.com

Chelyabinsk Meteoriteas as Old as Solar System, Fall Comparable with A-bomb Explosion

<http://www.astrowatch.net/2013/10/chelyabinsk-meteoriteas-as-old-as-solar.html>



The explosion of the Chelyabinsk meteorite in the Earth's atmosphere could be compared with an A-bomb blast, Mikhail Marov, a member of the Russian Academy of Sciences, told journalists at the Academy's Institute of Space Research on Friday. "This event was absolutely unique because we were able to see the scale of consequences caused by the fall of such relatively small bolide," he said. "More than 1,500 people sought medical help after the meteorite shower, a hundred were taken to hospital, mostly with cut wounds caused by broken glass. Eyewitnesses told about a flash brighter than that of the Sun. Air temperatures went up by 20 degrees at an altitude of 12-13 kilometers."

In his words, the explosion of the Chelyabinsk meteorite resembled the Tunguska event. "The Chelyabinsk bolide was classified as an Apollo class asteroid approaching the Earth. Here an analogy with the Tunguska meteorite is seen," he said.

The meteorite was about 4.56 billion years old – as old as the Solar System itself, Marov said.

Mikhail Marov of the Vernadsky Institute of Geochemistry and Analytical Chemistry said scientists had determined the meteorite's age by observing the amount of radioactive isotopes and their decay byproducts, a technique called radiometric dating.

"The age of the Chelyabinsk meteorite – 4.56 billion years – almost coincides with the age of our solar system. This means that we have encountered the so-called 'matter of creation,'" he said. "They [meteorites] hold the history of the processes that took place in the earliest period of the solar system's history."

A 10,000-tonne meteorite with a diameter of about 17 meters entered the Earth atmosphere on February 15, 2013 and broke into numerous fragments, the bulk of which fell down in Russia's Urals Chelyabinsk region. A shock wave that followed the fall of the meteorite broke windows in more than 4,700 houses in Chelyabinsk. Astronomers say the Chelyabinsk meteorite was the biggest celestial object to hit the Earth since the Tunguska event in 1908, when a huge meteorite exploded over Russia's Siberia. This time, meteorite shower was observed in five Russian regions - the Tyumen, Sverdlovsk, Chelyabinsk and Kurgan regions, and in the republic of Bashkortostan.

Eyewitnesses said they had first seen a bright flash in the sky and had heard the sound of explosion. More than 1,500 people, including more than 300 children, sought medical help after the incident, and as many as 69 people, including 13 children, were hospitalized.

Several fragments of the meteorite have already been found. The biggest one measuring 12 centimetres in diameter was lifted from the bottom of Lake Chebarkul. These fragments are now being studied by scientists.

Credit: [ITAR-TASS](#), [RIA Novosti](#)

ÍNDICE DE NOTÍCIAS JORNAL DA CIÊNCIA

Edição 4831

[1. Presidente da SBPC apresenta cartaz da 66ª Reunião Anual a governador do Acre](#)

Com o tema central "Ciência e Tecnologia em uma Amazônia sem Fronteiras", o evento será realizado em 2014, na Universidade Federal do Acre

[2. Escritora canadense Alice Munro fica com Nobel de Literatura](#)

Premiação, no valor de 925 mil euros, foi anunciada pela Academia de Ciências Sueca

[3. Parlamentares alteram tramitação de propostas do marco regulatório da CT&I](#)

As informações são do deputado federal Sibá Machado em entrevista exclusiva à Agência Gestão CT&I

[4. Estudo conclui que Brasil precisa mudar lei de patentes](#)

Produzido pelo Centro de Estudos e Debates Estratégicos da Câmara, o trabalho deverá subsidiar as discussões em torno do projeto

[5. Salário de professor do Rio supera o de São Paulo](#)

Com novo plano, docente carioca irá ganhar R\$ 4.147 por 40 horas semanais; paulistano recebe R\$ 2.600

[6. Instituições vão receber R\\$ 575 milhões para execução de cursos do Pronatec](#)

O Senac receberá R\$ 200 milhões; o Senai, R\$ 350 milhões; e o Senar, R\$ 25 milhões

[7. Boicote de alunos ao Enade faz nota de curso da UFSM despencar](#)

Futuros jornalistas entregaram provas em brancos fazendo com que conceito passasse de 4,96 para 0,29

[8. Educação debate impacto no ensino após fusão de grupos educacionais](#)

O encontro foi proposto pelos deputados Ivan Valente (Psol-SP), Chico Alencar (Psol-RJ) e Jean Wyllys (Psol-RJ)

[9. Congresso quer intervenção do MEC sobre grupo que controla Gama Filho e UniverCidade](#)

Na Comissão de Educação do Senado, parlamentares debatem problemas das instituições mantidas pelo Galileo Educacional

[10. Mais da metade das empresas do Brasil têm metas de redução de emissão de carbono, diz ONG](#)

Relatório CDP Brasil 100, do Programa Mudanças Climáticas 2013, foi divulgado pelo Carbon Disclosure Project (CDP), uma organização internacional

[11. Caos do clima com data marcada: 2047, segundo pesquisa americana](#)

Neste ano, temperatura média do planeta será mais alta do que qualquer outra registrada até 2005

[12. Proposta para Lei de Responsabilidade Educacional é criticada em debate](#)

A comissão especial que analisa a proposta realizou audiência pública nesta quarta-feira

[13. Pesquisadores brasileiros se sentem contemplados com o Prêmio Nobel de Física de 2013](#)

Parceria entre a Cern e a Coppe/UFRJ

[14. Empresa incubada no Senai é finalista do Prêmio Nacional de Empreendedorismo Inovador](#)

V2B Tecnologia é uma das três melhores empresas incubadas do país; resultado será divulgado no dia 17

[15. Especialização em Esportes e Atividades Físicas para Pessoas com Deficiência tem 230 vagas](#)

Universidade Federal de Juiz de Fora oferece curso voltado para professores e profissionais da área

[16. Semana de Ciência e Tecnologia da Unesc socializa conhecimentos das mais diversas áreas](#)

Evento ocorre de 22 a 25 de outubro no campus da universidade catarinense

[17. IAC abre inscrições para a Pós-Graduação em Agricultura Tropical e Subtropical](#)

Instituto de Campinas recebe inscrições até 31 de outubro

[18. Escola de Ciências e Tecnologia da UFRN discute pesquisas na Antártica](#)

olóquio acontece nesta sexta-feira, às 15h50

[19. Universidade Federal de Santa Catarina promove XVI Congresso Brasileiro de Folclore](#)

A programação conta com palestras, oficinas, cursos, exposições, apresentações culturais e turismo cultural

[20. CNPq debate novas perspectivas para a iniciação científica no Brasil](#)

Reunião com pró-reitores de pesquisa aconteceu nos últimos dois dias

[21. Softex e fundação argentina fazem acordo para cooperação em TI](#)

Associação brasileira de software e Ministério da Ciência da Argentina assinaram documento durante a Tecnópolis 2013, em Buenos Aires

[22. Oficina Lúdica abre inscrições para recreação e lazer na UFJF](#)

Com início no dia 15 de outubro, projeto realizará atividades na Faculdade de educação Física

[23. Ciência Hoje On-line: Da química à computação](#)

E o Nobel de Química vai para... Martin Karplus, Michael Levitt e Arieh Warshel, pelo desenvolvimento de metodologias computacionais que possibilitaram compreender melhor reações químicas de alta complexidade

Edição 4827 - Notícias de C&T - Serviço da SBPC

1. Brasileiros são eleitos fellows da World Academy of Sciences
2. Estratégia para democratização e interiorização do ensino superior
3. Senador propõe debate sobre queda de qualidade das universidades brasileiras
4. Brasil é o penúltimo país em pesquisa sobre valorização de professor
5. Cristovam Buarque critica insensibilidade do governo para assuntos da educação
6. Maior número de analfabetos e falta de investimento na Educação são abordados em pronunciamento no Senado
7. Novo marco legal da mineração pode significar retrocesso, aponta consultor
8. CsF: Mercadante afirma que empresas descumprem acordo
9. Programa Ciência sem Fronteiras terá bolsa para mestrado profissional
10. Novos professores com velhas metodologias
11. Ideias brasileiras para um espaço mais útil a todo o mundo
12. Para melhorar a nova Lei do Estágio
13. Brasil precisa investir R\$ 6,7 bilhões para dar fim adequado a resíduos sólidos, diz associação
14. Fundo financiará monitoramento da Amazônia em países da América do Sul
15. Nobel da Paz cobra engajamento do Brasil com lusófonos
16. Inpa promove curso de uma semana de imersão na floresta amazônica para professores da rede pública de ensino
17. Coleção Inventário Florístico Florestal de Santa Catarina será lançado em 15 de outubro
18. Dilemas da educação pública entram em cartaz no teatro
19. Inpe oferece vagas de pós-doutorado em geofísica espacial
20. Pensamento Prospectivo será discutido em encontro na Fiocruz
21. Mais de 300 trabalhos científicos serão apresentados no Simpósio de Pesquisa dos Cafés do Brasil
22. Fisiologia de cana para expandir a produção de bioenergia
23. UFJF sedia Geosudeste 2013: sustentabilidade faz programação que começa dia 28
24. Programa de Pós-Graduação em Filosofia da UFSCar promove minicurso na próxima semana
25. UFSCar recebe inscrições em concurso público para contratação de professor efetivo do Departamento de Engenharia Civil
26. Expedição procura espécies de primatas em risco de extinção na Amazônia
27. Poluentes do diesel atrapalham abelhas a encontrarem flores
28. Estudo prevê "extinção em massa" nos oceanos devido a aquecimento, desoxigenação e acidez
29. Ciência Hoje On-line: Nem mágica, nem dom. Pedra a lapidar
30. Revista Ciência Hoje: Solução nacional

AMBIENTE BRASIL

Países assinam convenção para controlar o uso de mercúrio

Objetivo de acordo é reduzir emissões de mercúrio, tóxicas para a saúde. Mercúrio pode trazer problemas psicológicos, digestivos e respiratórios.

Clima deve ter 'nova normalidade' em meados do século, diz estudo

Média de temperatura no ano deve estar mais elevadas em 2047 do que no ano mais quente entre 1860 e 2005.

Carros movidos a energia solar percorrem 3 mil km na Austrália

Competição que dura uma semana tem percurso do norte ao sul do país. Equipes têm várias paradas obrigatórias e acampam durante a noite.

Índios saterés são responsáveis pela domesticação do guaraná no AM

Dinheiro da venda do guaraná é muito importante no sustento das famílias. Produto beneficiado abastece o país e é exportado para a Itália e a França.

UFSC obtém autorização para utilizar animais em aulas

A ação, movida contra a universidade por uma entidade de defesa dos animais, gerou a determinação de proibição do uso de animais pela Faculdade de Medicina da instituição.

Meteoroide sofreu impactos maiores no espaço antes de explodir na Rússia

Um meteoro explodiu sobre o céu da cidade de Tcheliabinsk no último dia 15 de fevereiro, estilhaçando vidraças, danificando construções e deixando cerca de mil feridos.

Dilma determina que Itamaraty atue para solucionar caso da brasileira presa na Rússia

A brasileira Ana Paula Maciel foi acusada de pirataria após ser presa com mais 29 militantes do Greenpeace durante protesto contra a exploração de petróleo no Ártico.

Biólogos usam Google Street View para combater espécies invasoras

Uma equipe de cientistas da Agência Nacional Francesa para a Pesquisa Agrícola usou a ferramenta online, que fornece imagens em 360 graus de ruas filmadas por carros equipados especialmente, para mensurar a disseminação de um inseto que mata as árvores.

Morre nos Estados Unidos o astronauta Scott Carpenter

Norte-americano foi um dos primeiros homens a voar para o espaço.

Índice de radiação em amostra colhida em Fukushima aumenta

Segundo a empresa, obras de pavimentação provocaram aumento. Nesta semana, seis funcionários tiveram contato com água contaminada.

Mumbai vive boom de prédios verdes

Cidade indiana lidera ranking nacional de construção de baixo impacto ambiental. Prédio residencial mais alto será erguido segundo os padrões sustentáveis.

No AM, água de igarapé fica 'rosa' e moradores denunciam poluição

Coloração foi notada na tarde da quarta-feira (9). População desconfia que material tenha sido despejado na água.

Orangotango ameaçado de extinção morre em 'zoo da morte' na Indonésia

Morte de orangotango-de-bornéu foi a mais recente ocorrência. Local foi apelidado de 'zoo da morte' pela negligência aos animais.

Nova descoberta pode levar à cura de Alzheimer

Testada apenas em camundongos, uma substância química provou, pela primeira vez, ser possível impedir a morte de células do cérebro.

Ibama multa ONG por pesca e controle de tubarões no Recife/PE

Multas foram pela pesca de um tubarão de espécie inofensiva e contra a inserção de tilápias no mar.

Asteróide rico em água sugere existência de exoplanetas habitáveis

Até então nunca havia sido possível detectar água e um corpo rochoso - "dois elementos-chave" para que um planeta seja habitável - fora do nosso sistema solar.

Marinha quer lançar, ainda este mês, edital para construir estação antártica

Projeto executivo foi entregue nesta 5ª; veja em vídeo como deve ficar. Estação Comandante Ferraz custará R\$ 110 milhões e fica pronta em 2015.

MG testa uso de documentos eletrônicos por redução de papel

Projeto-piloto será composto por funcionalidades de processos de aquisições do governo mineiro.

Mudanças climáticas radicais estão prestes a ocorrer, sugere estudo

Cientistas estimaram que planeta experimentará clima extremo em 2047. Região dos trópicos será a primeira a sentir efeito intenso de mudança.

Ministério da Pesca lança edital para licitar 112 hectares de áreas aquícolas

A maior parte das áreas aquícolas está demarcada em reservatórios de usinas hidrelétricas, onde será criado peixe da espécie tilápia.

Acidente nuclear de Fukushima não afetou esperma de touros da região

Hipótese inicial do estudo era que radiação teria afetado testículos. Pesquisa pretende compreender impacto do acidente na reprodução.

Brasil e 140 países assinam acordo para eliminação gradual do mercúrio

Medida estabelecerá protocolos com o objetivo de reduzir os riscos na utilização de um dos elementos mais tóxicos para a natureza.

Planeta é encontrado flutuando sem estrela no espaço

O exoplaneta gasoso, denominado PSO J318.5-22, está a 'apenas' 80 anos-luz da Terra e tem uma massa seis vezes superior à de Júpiter. O planeta, que se formou 12 milhões de anos atrás, é considerado um recém-nascido entre seus pares.

Pesquisa relaciona ruído de aviões a risco maior de derrame e doenças cardíacas

Estudo indicou que moradores de áreas com ruído mais alto no entorno de Heathrow tinham risco até 20% maior para doenças.

Zoo abriga demônios-da-tasmânia para projeto de conservação

A espécie é importante porque come carcaças de outros animais - e, dessa forma, limpam o meio ambiente e impedem a transmissão de doenças.

Cientistas pesquisam passado para ajudar na preservação da Mata Atlântica

No período pré-Colombiano, a Mata Atlântica brasileira tinha cerca de 3 mil quilômetros de extensão e formava uma cadeia de florestas contida entre o Oceano Atlântico e as áreas mais secas e mais elevadas no território.

Mais da metade das empresas do Brasil têm metas de redução de emissão de carbono, diz ONG

O número, embora ainda seja baixo se comparado ao de diversos outros países, representa um avanço para o Brasil considerando o ano anterior, pois, em 2012, 40% das empresas informaram ter metas de redução de emissão.

Seis trabalhadores de Fukushima são contaminados por radioatividade

Água contaminada atingiu área onde grupo estava. Sete toneladas de material radioativo vazaram nesta quarta-feira.

Frango provoca surto de infecção por salmonela nos Estados Unidos

Pelo menos 278 pessoas adoeceram por terem comido frango infectado. Surto atingiu pessoas de 18 estados, segundo autoridades americanas.

Países asiáticos aprovam sistema para rastrear poluição atmosférica

Indonésia, Malásia e Cingapura realizaram uma breve cúpula trilateral em Bandar Seri Begawan para reafirmar seu propósito de lutar de forma conjunta contra a poluição criada pelos incêndios florestais que acontecem todos os anos na ilha de Sumatra, na Indonésia.

Cientistas descobrem por que crianças têm facilidade de aprender mais de uma língua

Cérebro tem 'janela' para aprendizado de idiomas entre 2 e 4 anos, quando influências exteriores têm maior impacto na linguagem.

Pesquisadores brasileiros se sentem contemplados com o Prêmio Nobel de Física de 2013

Pesquisadores brasileiros integram a Organização Europeia de Pesquisa Nuclear (Cern). Peter Higgs e François Englert receberam o Nobel pelo desenvolvimento de pesquisas sobre a teoria que explica como as partículas adquirem massa.

Quênia e Tanzânia farão censo de elefantes e mamíferos de grande porte

Objetivo é ter controle sobre a vida selvagem da região. Projeto é parceria entre os dois países e organizações ambientais.

Manejo de água no país é crítico, afirmam pesquisadores

A gestão de recursos hídricos no Brasil representa um problema crítico, devido à falta de mecanismos, tecnologias e, sobretudo, de recursos humanos suficientes para gerir de forma adequada as bacias hidrográficas do país.

Trio leva Nobel de Química de 2013 por modelos de sistemas complexos

Karplus, Levitt e Warshel criaram as bases de modelos de computador. Graças a eles, tornou-se possível prever processos químicos elaborados.

Marca destrutiva de El Niño em Galápagos mobiliza cientistas

Situado a 1 mil km da costa, o arquipélago de Galápagos sofre todo ano com a chegada do El Niño, caracterizado pelo aumento das temperaturas no Oceano Pacífico, fortes chuvas e enfraquecimento dos ventos.

Mesmo sem emitir CO₂, mundo levará 20 anos para frear aquecimento, diz IPCC

Relatório do IPCC diz que planeta já esquentou cerca de 0,8°C desde o começo do século 20. As temperaturas têm aumentado mais lentamente nos últimos 15 anos apesar do aumento nas emissões de gases do efeito estufa, mas há uma retomada da tendência de aquecimento que provavelmente vai causar ainda mais ondas de calor, secas, enchentes e elevamento do nível do mar. A previsão é de aumento de quase 5°C até 2100.

Secretário-geral da ONU diz que é preciso enfrentar desperdício de água

Ao discursar na abertura da Cúpula da Água em Budapeste, Ban Ki-Moon disse que quase a metade da população mundial pode enfrentar escassez de água em 2030, quando a demanda poderá superar a oferta em 40%.

Primeira vacina contra malária pode entrar no mercado a partir de 2014

Produto foi capaz de reduzir a incidência de malária em crianças na África. Farmacêutica pretende pedir registro do produto no ano que vem.

Robôs têm equilíbrio 'humano' e até galopam

Empresa financiada pelo Pentágono desenvolve equipamentos com movimentos surpreendentes que podem ter impacto futuro no setor de defesa.

Justiça rejeita pedido de libertação de médica do Greenpeace na Rússia

Ekaterina Zaspa permanecerá em prisão provisória até 24 de novembro. Ela faz parte do grupo de 30 ativistas presos na Rússia, que inclui brasileira.

Arqueólogos belgas encontram peças de ouro pré-incas no lago Titicaca

Em apenas dois meses de exploração foram encontrados 31 fragmentos de ouro laminado do em povoados às margens do lago.

Fiscalização do trânsito passa a incluir cerco aos veículos poluidores

Resolução do Conama estabelece limites de emissões de gases.

Marsupiais australianos morrem por estresse logo após cópula, diz estudo

Mortes ocorrem por esforço extremo para garantir qualidade de esperma. Machos copulam por até 14 horas seguidas com grande número de fêmeas.

Nasa sofre boicote após se recusar a receber cientistas chineses

Astrofísicos americanos decidiram boicotar uma importante conferência de astronomia da Nasa, em novembro, para protestar contra sua decisão de impedir a participação de pesquisadores chineses, justificado por razões de segurança nacional.

Parlamento europeu aprova novas regras para derivados de tabaco

Cigarro eletrônico não poderá ser vendido em farmácia como remédio. Regras ainda serão submetidas a representantes dos 28 países da UE.

Cães processam emoções de forma similar a seres humanos, mostra estudo

Cachorros e humanos têm estrutura e funcionamento bastante parecidos do núcleo caudado, localizada no centro do cérebro e fundamental em processos de memorização e aprendizado.

Política de Resíduos Sólidos será debatida por 1.352 delegados no DF

MMA prepara etapa nacional da 4ª Conferência Nacional do Meio Ambiente que acontecerá de 24 a 27 de outubro.

François Englert e Peter Higgs ganham Nobel de Física de 2013

Prêmio foi oferecido por teoria sobre como partículas adquirem massa. Previsões sobre 'partícula de Deus' se confirmaram em experimentos.

Águas-vivas têm mecanismo de propulsão otimizado, diz estudo

Medusas têm sistema único de recaptação de energia durante o nado. Estratégia melhora os 'custos energéticos' do nado em 48%, diz estudo.

Sonda lunar na Nasa lançada em setembro atinge a órbita da Lua

Sonda irá ajustar sua órbita para que fique a 250 km da superfície lunar. Instrumento da Nasa vai estudar gases que envolvem a Lua.

Brasil já polui como país rico; frota de veículos explica resultado

No Brasil, a maior causa da emissão de dióxido de carbono é a queima de combustível, que é explicada principalmente pelo aumento muito significativo da frota de veículos nos últimos anos.

Instituto suíço lança projeto bilionário para simular cérebro humano

Projeto apoiado pela União Europeia reúne cientistas de 135 instituições. Objetivo é que cérebro artificial simule reações a drogas e tratamentos.

Até 2050, 680 milhões serão expostos a ciclones e furacões, diz ONU

Ban Ki-moon defendeu o planejamento como essencial, já que desde o começo do novo milênio, os desastres naturais geraram perdas econômicas de US\$ 1,3 trilhão ou mais de R\$ 2,8 trilhões.

Ganhadores do Nobel detalharam comunicação química entre células

Os pesquisadores James Rothman, Randy Schekman e Thomas Südhof descobriram que células diferentes têm processos similares.

Expedição registra diversidade de parque de Moçambique

Os resultados desta pesquisa, feita no primeiro semestre deste ano, começaram a ser divulgados agora: os cadernos de campo registram 182 aves, 54 mamíferos, 47 répteis, 33 espécies de rãs, mais de 100 variedades de formigas e 320 tipos de plantas.

Consultora climática de Obama vai renunciar, dizem fontes

Heather Zichal assessorou o presidente Barack Obama desde que ele era candidato ao cargo, em 2008, e ajudou a moldar as atuais políticas dos EUA para o combate às emissões de gases do efeito estufa.

Robô europeu é testado no Atacama para simular condições de Marte

Experiência com 'Bridget' deve levar 5 dias e ser controlada do Reino Unido. Meta é criar tecnologia e acumular conhecimento sobre operação de sonda.

Polícia Federal prende cinco suspeitos de tráfico internacional de fósseis

Entre os detidos está um alemão que era mantenedor de museus de paleontologia nos Estados Unidos e na China.

Ativistas estão em condições desumanas na prisão, diz advogado

Segundo defensor, alguns ativistas não tiveram acesso a água potável. Outros passam fome porque não conseguem comer a comida da prisão.

Astronautas treinam em cavernas da Itália como preparação para o espaço

Seis 'cavonautas' passaram seis dias isolados em ambiente escuro e frio. Grupo aprendeu a conduzir pesquisas e a sobreviver de forma colaborativa.

Governo e indústria procuram medidas de apoio à economia verde

A ideia é promover a troca de informações entre os envolvidos no processo industrial do país.

Navios da Marinha partem para a Antártica em missão científica

A missão inclui a manutenção dos abrigos localizados nas ilhas da região e o apoio a projetos nas áreas de oceanografia, hidrografia, biologia, geologia, antropologia e meteorologia.

Construção de usinas térmicas é estratégia energética a longo prazo, diz ministério

"O sistema hidrotérmico brasileiro vai evoluir no sentido de nós completarmos o aproveitamento das usinas hidrelétricas", disse o secretário de Planejamento e Desenvolvimento Energético do Ministério de Minas e Energia, Altino Ventura.

Tartaruga-verde deficiente ganha novo lar em cassino de Las Vegas/EUA

Animal com problema pulmonar terá abrigo em aquário dentro de cassino. 'OD' fez o percurso de Flórida até Las Vegas em Avião da FedEx.

Mecânico do Greenpeace diz que 'Arctic Sunrise' corre risco de afundar

Preso, holandês pede para continuar fazendo manutenção do navio. Se geradores falharem, sistema de alerta pode deixar de funcionar.

Falha humana paralisa sistema de resfriamento em Fukushima

Bomba que injeta água em um dos reatores afetados por acidente parou. Por engano, funcionários interromperam alimentação elétrica da bomba.

Cidade japonesa famosa por morte de golfinhos quer ter parque marinho

Taiji planeja espaço onde pessoas possam nadar com golfinhos e baleias. Documentário 'The Cove', sobre matança de animais, levou Oscar de 2010.

Nasce filhote de leão branco, ameaçado de extinção

O leão branco está em perigo: restaram menos de 10 exemplares do animal na natureza.

Carcaça de lula-gigante com 9m é encontrada em praia na Espanha

O corpo do animal foi enviado ao museu marítimo de Cantabria, onde foi limpo e congelado enquanto se aguarda um acordo entre cientistas e o governo para decidir o que será feito com o bicho colossal.

Impacto das mudanças climáticas na saúde da população preocupa governo

Espera-se que as mudanças no clima tenham impactos indiretos, devido à mudança na qualidade da água, do ar e dos alimentos.

Operação no Amazonas apreende quase 1,1 tonelada de pescado

Fiscalização ocorreu neste domingo (6), em Manacapuru. Foram recolhidos ainda 190 ovos de quelônios e 644 kg de carne de caça.

Poluição modifica cheiro das flores e confunde abelhas, mostra estudo

A poluição emitida por motores a diesel confunde o olfato das abelhas e de outros insetos polinizadores ao modificar a química de elementos voláteis e perfumados liberados pelas flores, comprova estudo britânico.

Agência da ONU firma acordo para limitar CO2 na aviação a partir de 2020

Oaci quer manter sistema que limita emissões de gases de efeito estufa. Boa notícia é que acordo abrange China e Índia, segundo fonte diplomática.

Melhoria na condição de vida reduz mortes por doenças cardiovasculares

Uma pesquisa de médicos da Universidade Federal Fluminense apontou que melhorias das condições socioeconômicas da população reduziram o índice de mortalidade por doenças cardiovasculares, principalmente nos casos de acidente vascular cerebral, em pelo menos três Estados do Brasil: Rio de Janeiro, São Paulo e Rio Grande do Sul.

Fabricantes terão que diminuir ruídos de liquidificadores, aspiradores e secadores

O objetivo do projeto é combater o barulho emitido pelos eletrodomésticos do país.

Nicolelis diz que exoesqueleto será testado no Brasil até novembro

Neurocientista desenvolve equipamento que pode fazer paraplégico andar. Dez voluntários participarão do experimento, que será feito na AACD.

Sumiço de jiboia rara de US\$ 1 milhão mobiliza PF e Ibama

Americano teria comprado cobra de pele branca da diretora de um zoológico de Niterói. A PF fez buscas, mas o animal está desaparecido.

Poluição e nevoeiro causam cancelamentos de voos na China

Ao menos 13 voos foram cancelados e outros 29 desviados neste domingo. Informações são das agências de notícias estatais.

Mostra de Cinema Ambiental leva cinema temático para 17 cidades paulistas

A 2ª Mostra Ecofalte de Cinema Ambiental aborda sete temas: água, cidades, contaminação, economia, globalização, mobilização e povos e lugares.

Banco genético mostra influência do Peru no cultivo de palmito no Brasil

Palmeiras foram plantadas em meados da década de 80. Coleta de 200 variedades foi feita no Peru, Colômbia, Equador e Brasil.

Brasil deve mudar matriz energética, alertam especialistas

"É necessário um olhar estratégico para soluções de tecnologia limpa, e nisso o Brasil está ficando para trás", disse Carlos Rittl, da WWF-Brasil.

Nepal quer substituir piras por crematório ecologicamente correto

A Unesco demonstrou preocupação pela ausência de um estudo detalhado sobre o impacto do novo crematório no templo, sobretudo por causa da chaminé de 30 metros que deverá ser instalada.

Pesquisadores traçam mapa da dispersão da pupunha nas Américas

Primeiros exemplares podem ter surgido no sudoeste da grande floresta. Índios aguarunas estão entre os pioneiros do domínio da pupunha.

Químico da Unesp de Araraquara pretende fazer estudo inédito na Nasa

Gustavo Costa atuará na agência espacial norte-americana em novembro. Pesquisa vai abordar atmosfera dos planetas fora do Sistema Solar.

Fechado acordo para limitar emissões de CO2 a partir de 2020

A Assembleia Geral da Organização da Aviação Civil Internacional vai manter, antes da data de sua próxima Assembleia Geral do outono de 2016 (hemisfério norte), um sistema de limitação das emissões de gases de efeito estufa com vistas a entrada em vigor em 2020.

Coalas podem desaparecer com aquecimento da Austrália, diz estudo

Marsupial é símbolo do país e depende de árvores densas para se abrigar. Pesquisa de 3 anos rastreou 40 coalas por satélite em Nova Gales do Sul.

Recifes e animais marinhos comem lixo 'reciclado' das esponjas

Como algumas pesquisas já haviam mostrado que os micro-organismos ajudavam a alimentar os corais, mesmo não sendo em quantidade suficiente para todo o ecossistema, o cientista Jasper de Goeij decidiu fazer experimentos com as esponjas no seu laboratório instalado na ilha caribenha de Curaçao.

Mesmo com paralisação do governo, Nasa mantém nova missão a Marte

A sonda Maven tem de ser lançada até 17 de dezembro deste ano. Se janela for perdida, próxima chance será só em 2016.

Holanda vai iniciar ação jurídica para libertar ativistas detidos na Rússia

Governo anunciou que tentará arbitragem baseada nas regras da ONU. Grupo do Greenpeace, incluindo brasileira, foi denunciado por pirataria.

Células-tronco são utilizadas para cirurgia inédita na Paraíba

Paciente de 58 anos apresentava sintomas comuns a pessoas com 90. Previsão de recuperação é de cerca de oito meses.

Equipe acha estátua de Ramsés 2º com mais de 3.000 anos no Egito

O templo se encontra na colina de Bubastis, que, segundo Ibrahim, é uma das jazidas mais antigas do país, já que nele se descobriram artefatos que se remontam à dinastia IV.

Especialista aponta sustentabilidade como solução para capitalismo

Empresas precisam aprender a lidar com escassez, diz consultor. Comunidades do Pará lucram com economia verde.

Cientistas da Coreia do Sul criam material eficiente para capturar CO2

Membrana feita de grafeno evita que gás seja emitido à atmosfera. Estudo foi publicado na revista 'Science'.

Equador autoriza exploração de petróleo em reserva natural da Amazônia

Maiores campos de petróleo do país devem ser explorados. Decisão é anunciada após fracasso da proposta de abrir mão da exploração em troca de recursos internacionais.

Primeiro microssatélite brasileiro para fins militares será desenvolvido no RS

Equipamento fará sensoriamento remoto para as forças armadas. Projeto será construído no estado e lançado ao espaço em 2015.

Agricultor cuida de mais de 500 animais abandonados em Fukushima

Keigo Sakamoto cuidava de deficientes mentais antes do tsunami em 2011. Após acidente na usina ele recolheu centenas de animais na área afetada.

Expedição no Suriname descobre 60 novas espécies de animais, diz ONG

Um dos novos bichos é uma perereca do gênero "Hypsiboas" que foi apelidada de "perereca de cacau" devido à coloração de chocolate. Os aros existentes nas extremidades das patas ajudam o animal a subir árvores, dizem os biólogos da organização Stuart V.

Índios recorrem ao STF para cobrar garantia de direitos constitucionais

Segundo o documento protocolado pelos índios, a demora na análise dos processos tem agravado a "notória situação de conflitos e violência, a insegurança jurídica e social e a criminalização dos nossos povos, comunidades e lideranças".

Jornalista emplaca estudo falso em publicações de acesso aberto

Artigo publicado na 'Science' denuncia falta de rigor de revistas. 157 veículos caíram em 'pegadinha' e aceitaram reproduzir texto com erros.

Homem é preso por extração ilegal de madeira no interior do Pará

Um trator e uma motosserra foram apreendidos. Madeira apreendida será doada para fins humanitários.

30 / 09 / 2013 O Sol que não rugiu: cientistas tentam compreender baixa atividade solar

Aguardada máxima solar se mostrou com explosões fracas; especialista acreditam que pior ainda está porvir.

30 / 09 / 2013 Incêndio atinge vegetação de ilha no Canal do Linguado/SC

Segundo bombeiros, área queimada equivale a três campos de futebol. Chamas foram controladas após 3,5 horas de trabalho.

30 / 09 / 2013 Brasil e Reino Unido avançam em pesquisas conjuntas sobre clima

Pesquisadores centram seus estudos sobre a Amazônia e em como a região pode impactar o planeta.

30 / 09 / 2013 Bióloga brasileira ficará presa por dois meses na Rússia

determina que Ana Paula Maciel ficará detida no país com outros ativistas do Greenpeace até o fim das investigações de pirataria.

30 / 09 / 2013 Polícia ambiental em MS apreende equipamentos de pesca proibidos

Foram encontrados 500m de rede e espinhel com cem anzóis. Peixes que haviam ficado presos no equipamento foram soltos.

30 / 09 / 2013 Cargueiro privado se acopla à Estação Espacial Internacional

A Orbital Science se transforma assim na segunda companhia privada que completa uma missão de transporte de carga à ISS, depois da empresa californiana SpaceX, que há um ano envia provisões com sua cápsula Dragon.

30 / 09 / 2013 200 pessoas são retiradas de Área de Proteção Permanente, em Manaus/AM

Segundo Batalhão Ambiental, invasores haviam montado barracos no local. Três homens foram detidos suspeitos de liderarem o grupo na invasão.

30 / 09 / 2013 Macaco muriqui é definido como símbolo do 'Caminhos da Serra'

O macaco passa a ser símbolo da Região Turística Caminhos da Serra. A espécie está com risco de extinção e representará 11 cidades da serra.

30 / 09 / 2013 Biólogo explica sobre cuidados com escorpiões após caso de Natividade/TO

Professora denunciou infestação no setor Aeroporto II. Segundo o biólogo os animais estão presentes em todas as regiões.

30 / 09 / 2013 Grupo da USP mapeia diversidade de algas no Estado de São Paulo

Com auxílio de ferramentas moleculares, pesquisadores identificaram cerca de dez novas espécies.

30 / 09 / 2013 Primeira etapa da vacinação contra aftosa no Pará atinge a meta

Vacinação do primeiro semestre de 2013 ultrapassou a marca de 98%. Pará mantém status de estado 100% livre de febre aftosa com vacinação.

30 / 09 / 2013 Terremoto de 4,8 graus sacode três regiões do centro do Chile

Terremoto deste domingo (29) não causou vítimas ou danos consideráveis.

30 / 09 / 2013 Produtores se preparam para vacinar contra aftosa na fronteira em MS

Falta de doses nas revendas atrapalha início da vacinação. Secretaria afirma que período oficial começa em novembro.

30 / 09 / 2013 Brasil mantém viva polêmica sobre primeiros humanos da América

Embora a teoria mais difundida e aceita diga que o primeiro ser humano chegou a América há 14 mil anos pelo estreito de Bering, outros estudos afirmam que o Homo sapiens já habitava a cerca de 36 mil anos antes no território que hoje é o Brasil.

30 / 09 / 2013 Exportação de milho cresce no Brasil

Maior parte da safra sai de Mato Grosso, estado que mais produziu o grão. Até agora, 12 milhões de toneladas de milho já foram exportadas.

30 / 09 / 2013 Laboratório da UFMG usa DNA para investigar origem de povos indígenas

'O trabalho é uma aplicação da ciência a serviço da história', diz biólogo. Projeto internacional estuda material genético dos Uros, no Peru.

30 / 09 / 2013 Aquecimento segue mesmo com 'hiato' de 15 anos, diz relatório

Os oceanos, que dominam a absorção de energia na Terra, e as geleiras, continuam a se aquecer. Não houve hiato nos mares, que, segundo o novo relatório do IPCC, absorveram mais de 90% da energia extra que a mudança climática aprisionou no planeta entre 1971

e 2010.

01 / 10 / 2013 Foguete lançado na Califórnia vai estudar tempestades espaciais

Foguete SpaceX Falcon 9 leva instrumentos para estudo da atmosfera. Efeito de tempestades espaciais em navegação por GPS será estudado.

01 / 10 / 2013 Laboratório de Produtos Florestais abre exposição comemorativa de seus 40 anos

O laboratório tem quase 300 espécies estudadas da Amazônia e uma xiloteca (coleção de madeiras) com mais de mil espécies.

01 / 10 / 2013 Greenpeace recorre de decisão que mantém ativistas presos na Rússia

Documentação apresentada nesta segunda-feira (30) vale para 22 detidos. ONG dará entrada nos próximos dias em recurso para outros oito do grupo.

01 / 10 / 2013 Bactéria da Ásia ameaça laranjas da Flórida/EUA

Doença, que afeta sobretudo as laranjas, pode permanecer latente por cinco anos antes de se manifestar, quando é tarde demais para agir.

01 / 10 / 2013 Estudo encontra ligação entre casamento feliz e boa saúde

Levantamento de 20 anos encontrou relação direta, embora não tenha descoberto como exatamente uma coisa influencia a outra.

01 / 10 / 2013 Rússia retoma com êxito lançamento de foguetes Proton

A Rússia realizou o lançamento bem sucedido de um foguete Proton-M, quase três meses depois de suspender estes lançamentos pela exposição de um deles que desprendeu na atmosfera combustível altamente tóxico.

01 / 10 / 2013 Cientistas da Nasa fazem testes em espaçonave que orbitará Marte

Nave que será lançada em novembro estudará o planeta Marte. Testes garantem que sistema de comunicação funciona adequadamente.

01 / 10 / 2013 Terra teve níveis de oxigênio bem menores do que os atuais, mostra estudo

Para os pesquisadores, isso sugere que a oxigenação de nossa atmosfera, desencadeada há 2,3 bilhões de anos, teria dado início a uma série de alterações geoquímicas que, ao longo de 400 milhões de anos, resultaram em altos níveis de oxigênio seguidos de agudo declínio.

01 / 10 / 2013 Imenso herbário virtual leva flora brasileira para a internet

Acervo on-line é composto de 420 mil fotografias de plantas nacionais. Pesquisadores de todo o mundo podem editar banco de dados.

01 / 10 / 2013 Nativos da Ilha de Páscoa trocavam frutos do mar por dieta à base de ratos

Para determinar do que os primeiros habitantes da Ilha de Páscoa se alimentavam, os pesquisadores analisaram vestígios de nitrogênio e isótopo de carbono contidos nas arcadas dentárias de 41 cadáveres coletados em escavações previamente feitas no local.

01 / 10 / 2013 Fukushima reativa unidade de descontaminação de água radioativa

Unidade havia sido bloqueada por um pedaço de borracha após ativação. Equipamento pretende eliminar elementos radioativos da água.

01 / 10 / 2013 Egito expõe tesouros roubados durante revolução de 2011

Intitulada "Destrução e restauração", a exposição conta com 29 objetos, incluindo 11 que haviam sido roubados em 28 de janeiro de 2011 do Museu Egípcio do Cairo, perto da Praça Tahrir, quando manifestantes exigindo a renúncia de Hosni Mubarak invadiram o prédio.

01 / 10 / 2013 Cratera em Mato Grosso pode ser prova da maior extinção em massa no planeta

Há 250 milhões de anos, queda de meteorito pode ter levado à extinção de 83% das espécies. Se a teoria for comprovada, o Brasil estaria, pela primeira vez, no centro dos grandes eventos geológicos mundiais.

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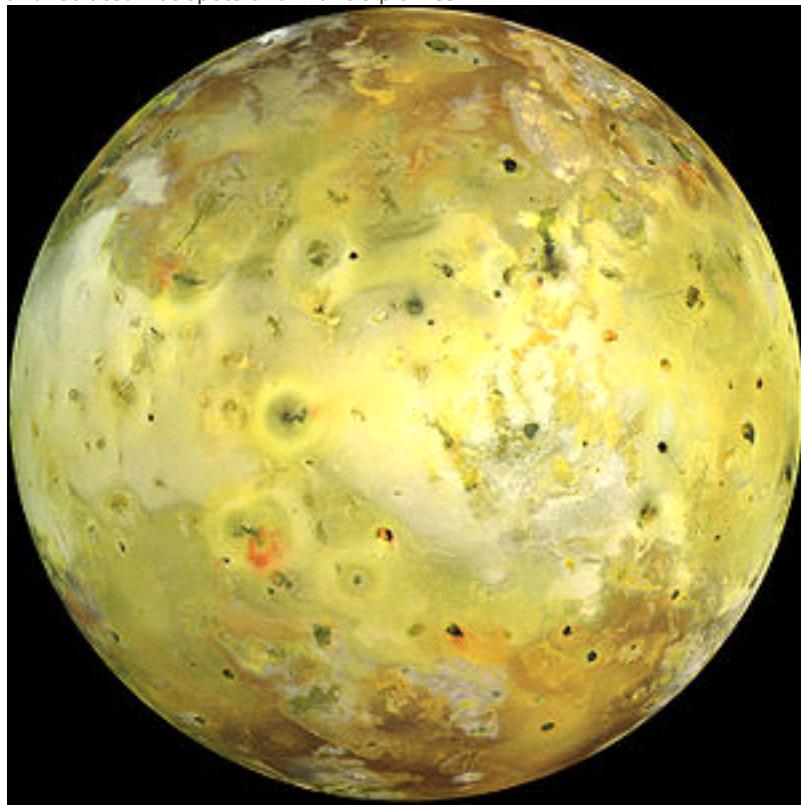
EARTH PAGES

Tectonics of the early Earth

Posted on [October 8, 2013](#) by [Steve Drury](#) | [Leave a comment](#)

Tectonics on any rocky planet is an expression of the way heat is transferred from its deep interior to the surface to be lost by radiation to outer space. Radiative heat loss is vastly more efficient than either conduction or convection since the power emitted by a body is proportion to the fourth power of its absolute temperature. Unless it is superheated from outside by its star, a planet cannot stay molten at its surface for long because cooling by radiation releases all of the heat that makes its way to the surface. Any football supporter who has rushed to get a microwaved pie at half time will have learned this quickly: a cool crust can hide a damagingly hot centre.

Thermal power is delivered to a planet's surface by convection deep down and conduction nearer the surface because rocks, both solid and molten, are almost opaque to radiation. The vigour of the outward flow of heat might seem to be related mainly to the amount of internal heat but it is also governed by limits imposed by temperature on the form of convection. Of the Inner Planets only Earth shows surface signs of deep convection in the form of plate tectonics driven mainly by the pull exerted by steep subduction of cool, dense slabs of old oceanic lithosphere. Only Jupiter's moon [Io](#) shows comparable surface signs of inner dynamics, but in the form of immense volcanoes rather than lateral movements of slabs. Io has about 40 times the surface heat flow of Earth, thanks largely to huge tidal forces imposed by Jupiter. So it seems that a different mode of convection is needed to shift the tidal heat production; similar in many ways to Earth's relatively puny and isolated hot spots and mantle plumes.



An analogy for the early Earth, Jupiter's moon Io is speckled with large active volcanoes; signs of vigorous internal heat transport but not of plate tectonics. Its colour is dominated by various forms of sulfur rather than mafic igneous rocks. (credit: Wikipedia)

Shortly after Earth's accretion it would have contained far more heat than now: gravitational energy of accretion itself; greater tidal heating from a close Moon and up to five times more from internal radioactive decay. The time at which plate tectonics can be deduced from evidence in ancient rocks has been disputed since the 1970s, but now an approach inspired by Io's behaviour approaches the issue

from the opposite direction: what might have been the mode of Earth's heat transport shortly after accretion (Moore, W.B. & Webb, A.A.G. 2013. Heat-pipe Earth. *Nature*, v. **501**, p. 501-505). The two American geophysicists modelled Rayleigh-Bénard convection – multicelled convection akin to that of the 'heat pipes' inside Io – for a range of possible thermal conditions in the Hadean. The modelled planet, dominated by volcanic centres turned out to have some surprising properties.

The sheer efficiency of heat-pipe dominated heat transfer and radiative heat loss results in development of a thick cold lithosphere between the pipes, that advects surface material downwards. Decreasing the heat sources results in a 'flip' to convection very like plate tectonics. In itself, this notion of sudden shift from Rayleigh-Bénard convection to plate tectonics is not new – several Archaean specialists, including me, debated this in the late 1970s – but the convincing modelling is. The authors also assemble a plausible list of evidence for it from the Archaean geological record: the presence in pre- 3.2 Ga greenstone belts of abundant ultramafic lavas marking high fractions of mantle melting; the dome-trough structure of granite-greenstone terrains; granitic magmas formed by melting of wet mafic rocks at around 45 km depth, extending back to second-hand evidence from Hadean zircons preserved in much younger rocks. They dwell on the oldest sizeable terranes in West Greenland (the Itsaq gneiss complex), South Africa and Western Australia (Barberton and the Pilbara) as a plausible and tangible products of 'heat-pipe' tectonics. They suggest that the transition to plate-tectonic dominance was around 3.2 Ga, yet 'heat pipes' remain to the present in the form of plumes so nicely defined in the preceding item *Mantle structures beneath the central Pacific*.

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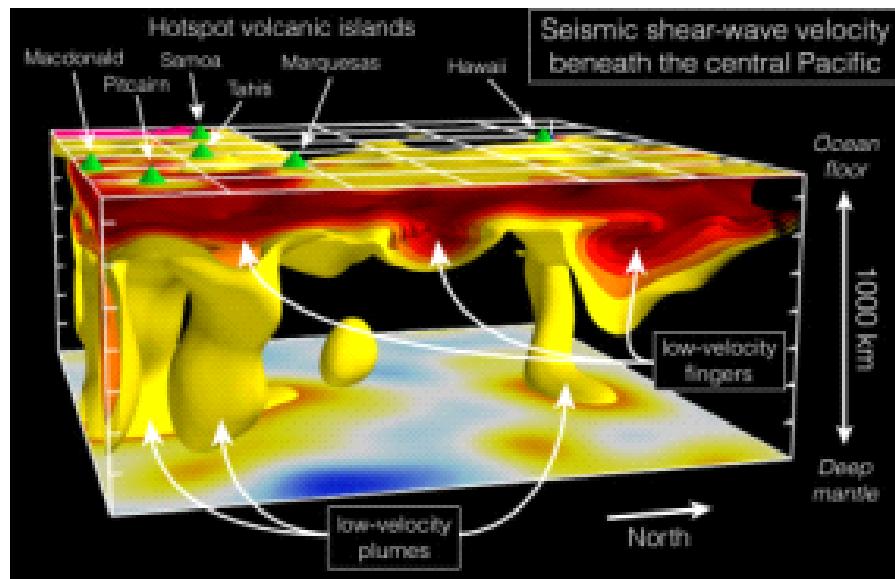
Mantle structures beneath the central Pacific

Posted on September 26, 2013 by Steve Drury | [Leave a comment](#)

Since it first figured in Earth Pages 13 years ago [seismic tomography](#) has advanced steadily as regards the detail that can be shown and the level of confidence in its accuracy: in the early days some geoscientists considered the results to be verging on the imaginary. There were indeed deficiencies, one being that a [mantle plume](#) which everyone believed to be present beneath Hawaii didn't show up on the first tomographic section through the central Pacific. Plumes are one of the forms likely to be taken by mantle heat convection, and many now believe that some of them emerge from great depths in the mantle, perhaps at its interface with the outer core.

The improvements in imaging deep structure stem mainly from increasingly sophisticated software and faster computers, the data being fed in being historic seismograph records from around the globe. The approach seeks out deviations in the speed of seismic waves from the mean at different depths beneath the Earth's surface. Decreases suggest lower strength and therefore hotter rocks while abnormally high speeds signify strong, cool parts of the mantle. The hotter mantle rock is the lower its density and the more likely it is to be rising, and vice versa.

Using state-of-the-art tomography to probe beneath the central Pacific is a natural strategy as the region contains a greater concentration of hot-spot related volcanic island chains than anywhere else and that is the focus of a US-French group of collaborators (French, S. et al. 2013. Waveform tomography reveals channelled flow at the base of the oceanic lithosphere. *Science Express*, doi 10.1126/science.1241514). The authors first note the appearance on 2-D global maps for a depth of 250 km of elongate zones of low shear-strength mantle that approximately parallel the known directions of local absolute plate movement. The most clear of these occur beneath the Pacific hemisphere, strongly suggesting some kind of channelling of hot material by convection away from the East Pacific Rise.



Seismic tomographic model of the mantle beneath the central Pacific. Yellow to red colours represent increasingly low shear strength.
(credit: Global Seismology Group / Berkeley Seismological Laboratory)

Visually it is the three-dimensional models of the Pacific hot-spot ‘swarm’ that grab attention. These show the low velocity zone of the asthenosphere at depths of around 50 to 100 km, as predicted but with odd convolutions. Down to 1000 km is a zone of complexity with limb-like lobes of warm, low-strength mantle concentrated beneath the main island chains. That beneath the Hawaiian hot spot definitely has a plume-like shape but one curiously bent at depth, turning to the NW as it emerges from even deeper mantle then taking a knee-like bend to the east. Those beneath the hot spots of the west Pacific are more irregular but almost vertical. Just what kind of process the peculiarities represent in detail is not known, but it is almost certainly a reflection of complex forms taken by convection in a highly viscous medium.

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[Pushing back DNA sequencing: a Spanish cave bear](#)

Posted on September 25, 2013 by Steve Drury | [Leave a comment](#)

At the time, only 3 years ago, publication of the first full [Neanderthal genome](#) seemed miraculous. Yet the apparent magic proved repeatable, including for an obscure but distinct group of extinct humans – the [Denisovans](#) – known only from their DNA in a single pinkie bone. These advances astonished the world by showing that anatomically modern humans were capable of interbreeding with both groups; and did so that many people now living outside of Africa carry the genetic evidence. But the samples analysed for DNA were little more than 40 thousand years old. Older fossils of extinct animals have given up their genetic features, such as the wooly mammoth and a horse about 700 ka old, but only from samples frozen into permafrost at high northern latitudes.

The degradation of DNA over time seemed destined to limit palaeo-genetics, even when slowed down by natural freezing. The degradation breaks down any surviving genetic material into shorter and shorter fragments of the DNA molecule, ultimately to its atoms being recombined in new molecules of totally unrelated compounds through the chemical processes of fossilisation. Reassembling the fragments correctly becomes increasingly difficult the smaller they are. Few outside of a highly skilled specialists were optimistic of breaking the 100 ka barrier, even using frozen fossils. Unsurprisingly, having had such dramatic successes, the specialists continue to ride their luck and their ingenuity.



Excavations at Gran Dolina, in Atapuerca, Spain. (Photo credit: Wikipedia)

The cave complex of the [Atapuerca Mountains](#) in northern Spain, whose sediments range in age from almost a million years ago to recent times, contain rich accumulations of human remains, including the pre-Neanderthal *Homo heidelbergensis* and *H. antecessor* dating back to more than 800 ka. If ever there was a magnet for archaeo-geneticists Atapuerca is definitely one. Moreover, physical anthropologists seem never to stop disputing their interpretations. Jesse Dabney of the now famous [Max Planck Institute for Evolutionary Anthropology](#) in Leipzig, Germany, and co-workers from Britain, New Zealand, Spain and Australia are now beginning to report results. The first are from a cave bear (probably *Ursos deningeri*) known to be older than 300 ka (Dabney, J. and 10 others 2013. Complete mitochondrial genome sequence of a Middle Pleistocene cave bear reconstructed from ultrashort DNA fragments in one of its foreleg bones. *Proceedings of the National Academy of Sciences*, v.**110**, doi/10.1073/pnas.1314445110). The bear's mitochondrial DNA was pieced together from fragments as small as 50 base pairs, and shows its ancestry to bears (*U. spelaeus*) from the later Pleistocene that became extinct at about 28 ka.



Reconstruction of a European cave bear (*Ursus spelaeus*) (credit: Wikipedia)

It may be only a matter of time before human DNA emerges from the rich Atapuerca fossil hoard; indeed the authors strongly hint that

they are working on that now.

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- [It's Barely There – 300,000 Year Old DNA \(genedork.wordpress.com\)](#)

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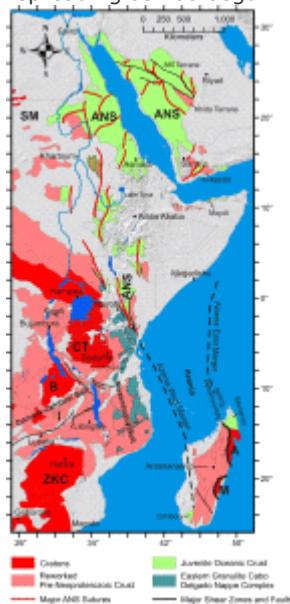
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[The East African Orogen: Neoproterozoic tectonics on display](#)

Posted on [September 19, 2013](#) by Steve Drury | [Leave a comment](#)

Over a period of about 300 Ma the fragmentation of a supercontinent, [Rodinia](#), drove a round of sea-floor spreading and continental drift that culminated in reassembly of the older continental pieces and entirely new crust in a new supercontinent, Gondwana. The largest source of evidence for this remarkable tectonic turnaround is a belt stretching N-S for over 3000 km from southern Israel through East Africa to Mozambique. At its widest the belt exposes [Neoproterozoic](#) rocks and structures for some 1700 km E-W from west of the Nile in northern Sudan almost to Riyadh in Saudi Arabia. This [Arabian-Nubian Shield](#) tapers southwards to thin out completely in northern Tanzania between far older cratons and in a state of high-grade metamorphism.

This East African Orogen has long been considered the best exposed bowels of former mountain building that there are: results of continent-continent collision and the bulldozing together of many oceanic arcs and remnants of oceanic lithosphere that once separated the cratons. This was much more complex than a case of head-on tectonics, the northward-swelling Arabian-Nubian Shield showing all the signs of being like a gigantic 'pip' squeezed out northwards from two cratonic jaws during the last stages of what is often called the [Pan African Orogeny](#). Interestingly, the line of the orogen is roughly followed by East Africa's other giant feature, the Rift Valley; actually two of them following Pan African terranes. A continental scale anisotropy has been reactivated and subject to extensional tectonics, and maybe in future a new round of sea-floor spreading as has begun in the Red Sea, some half a billion years after it formed.



Simplified geological map of the East African Orogen courtesy of the authors of Fritz et al 2013

Now there is an opportunity for anyone to download and read a digest of East African orogenic processes compiled by researchers from several countries along the belt and their colleagues from North America, Europe and Australia who have been privileged to work in this vast area (Fritz, H and 13 others 2013. [Orogen styles in the East African orogen: A review of the Neoproterozoic to Cambrian tectonic evolution. Journal of African Earth Sciences, v. 86, p. 65-106](#) Click on the link, scroll to the Open Access article to download the 12 Mb PDF version). The authors present superb simplified geological maps of each major part of the orogen, a vast array of references and

well-written accounts of its sector-by-sector tectonic and metamorphic evolution, variations in style and broad tectonic setting.

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Explosive erosion in the Himalaya

Posted on [September 17, 2013](#) by Steve Drury | [Leave a comment](#)

As the Yalung-Tsangpo River on the northern flank of the Himalaya approaches a bend it rotates its flow by almost 180 degrees to become the Brahmaputra it enters one of the world's largest canyons. Over the 200 km length of the [Tsangpo Gorge](#) the river descends two kilometres between peaks that tower 7 km above sea level. Since the area is rising tectonically and as a result of the unloading that attends erosion, for the Tsangpo to have maintained its eastward flow it has been suggested that an average erosion rate of 3 to 5 km per million years was maintained continuously over the last 3 to 5 Ma. However, new information from the sediments downstream of the gorge suggests that much of the gorge's depth was cut during a series of sudden episodes (Lang, K.A. et al. 2013. Erosion of the Tsangpo Gorge by megafloods, Eastern Himalaya. *Geology*, v. 41, p. 1003-1006).



The Yarlung Tsangpo River watershed which drains the north slope of the Himalayas. (credit: Wikipedia)

It has become clear from a series of mountainside terraces that during the Pleistocene glaciers and debris from them often blocked the narrow valleys through which the river flowed along the northern flank of the Himalaya. Each blockage would have impounded enormous lakes upstream of the Tsangpo Gorge, containing up to 800 km³ of water. Failure of the natural dams would have unleashed equally spectacular floods. The researchers from the University of Washington in Seattle examined the valley downstream of the gorge, to find unconsolidated sediments as much as 150 m above the present channel. They have similar grain size distributions to flood deposits laid down some 30 m above the channel by a flood unleashed in 2000 by the failure of a temporary dam caused by a landslide. The difference is that the higher level deposits are densely vegetated and have well-developed soils: they are almost certainly relics of far larger floods in the distant past from the lakes betrayed by the terraces above the Tsangpo Gorge.

By measuring the age of zircons found in the megaflood deposits using the U/Pb methods the team have been able to show that the sediments were derived mainly from 500 Ma crystalline basement in the Tsangpo Gorge itself rather than from the younger terranes in

Tibet. There are four such deposits at separate elevations above the modern river below the gorge. Like the 2000 AD flood deposit, each terrace is capped by landslide debris suggesting that flooding and associated erosion destabilised the steep slopes so characteristic of the region. Because the valleys are so narrow (<200 m at the bottom), each flood would have been extremely deep, flows being of the order of a million cubic metres per second. The huge power would have been capable of moving blocks up to 18 m across with 1 m boulders being carried in suspension. It has been estimated that each of the floods would have been capable of removing material that would otherwise have taken up to 4000 years to erode at present rates of flow.

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- [Massive Himalayan gorge partly carved by Lake Erie-sized floods\(arsTechnica.com\)](#)

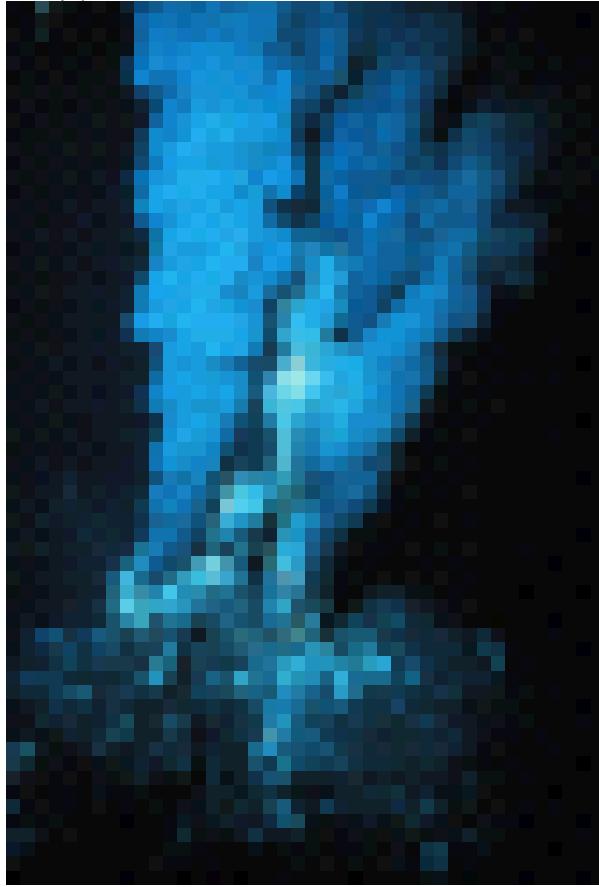
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[Electricity from 'black smokers'](#)

Posted on [September 13, 2013](#) by Steve Drury | 1 Comment



Hydrothermal vent at the mid-Atlantic Ridge (credit: Wikipedia)

Occasionally, journals not usually associated with mainstream geosciences publish something startling, but easily missed. *Nature* of 12 September 2013 alerted me to just such an oddity. It seems that the chemistry of sea-floor [hydrothermal vents](#) potentially can generate electrical power (Yamamoto, M. et al. 2013. Generation of electricity and illumination by an environmental fuel cell in deep-sea hydrothermal vents. *Angewandte Chemie*, online DOI: 10.1002/ange.201302704).

The team from the Japan Agency for Marine-Earth Science and Technology, the Riken Centre for Sustainable Resource Science and the University of Tokyo used a submersible ROV to suspend a fuel cell based on a platinum cathode and iridium anode in hydrothermal vents that emerge from the Okinawa Trough off southern Japan at a depth of over 1 km. It recorded a tiny, but significant power generation of a few milliwatts.

The fluids issuing from the vents are at over 300°C while seawater is around 4°C, creating a very high thermal gradient. More importantly, the fluid-seawater interface is also a boundary between geochemically very different conditions. The fluids are highly acidic (pH 4.8) compared with the slight alkalinity of seawater, and contain high concentrations of hydrogen and hydrogen sulfide but undetectable oxygen (sea water is slightly oxygenated).

The fuel cell was designed so that iridium in the anode speeds up the oxidation of H₂S at the geochemical interface which yields the electrons necessary in electrical currents. The experiment neatly signified its success by lighting up three light-emitting diodes. Does this herald entirely new means of renewable power generation? Perhaps, if the fuel cell is scaled-up enormously. Yet, the very basis of oxidation and reduction is expressed by the mnemonic OILRIG (Oxidation Is Loss Reduction Is Gain – of electrons) and any potential redox reaction in nature has potential, even plants can be electricity producers. In fact all fuel cells exploit oxidation reactions of one kind or another.

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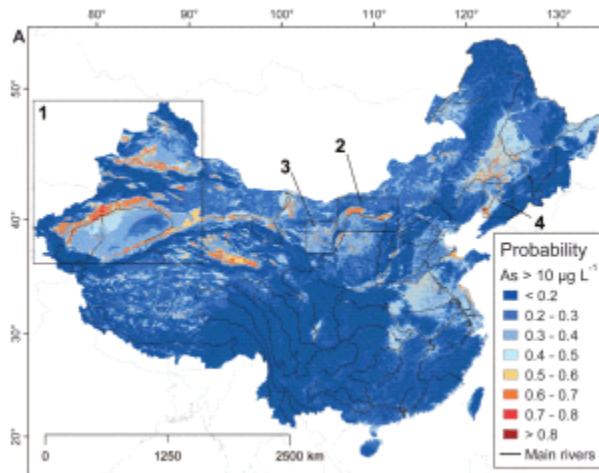
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Estimating arsenic risks in China

Posted on [September 4, 2013](#) by [Steve Drury](#) | [2 Comments](#)

Two weeks after Earth pages featured [arsenic in groundwater below the Mekong Delta](#) another important paper has emerged about modelling risk of arsenic contamination throughout the People's Republic of China (Rodriguez-Lado, L. et al. 2013. Groundwater arsenic contamination throughout China. *Science*, v.**341**, p. 866-868). Scientists based in the Swiss Federal Institute of Aquatic Science and technology and the China Medical University follow up the results of geochemical testing of groundwater from almost 450 thousand wells in 12% of China's counties; part of a nationwide aim to test millions of wells. That is a programme likely to last for decades, and their work seeks to develop a predictive model that might better focus such an enormous effort and help in other large regions where well sampling is not so advanced.

As well as the well-known release of arsenic-containing ions through the dissolution of iron oxy-hydroxides in aquifers that exhibit reducing conditions, aridity that causes surface evaporation can create alkaline conditions in groundwater that also desorbs arsenic from similar minerals. The early results from China suggested 16 environmental factors available in digital map form, mainly geological, topographic and hydrogeochemical, that possibly encourage contamination; a clear indication of the sheer complexity of the problem. Using GIS techniques these possible proxies were narrowed down to 8 that show significant correlation with arsenic levels above the WHO suggested maximum tolerable concentration of 10 micrograms per litre (10 parts per billion by volume). Geology (Holocene sediments are most likely sources), the texture of soils and their salinity, the potential wetness of soils predicted from topography and the density of surface streams carrying arsenic correlate positively with high well-water contamination, whereas slope, distance from streams and gravity (a measure of depth of sedimentary basins) show a negative correlation. These parameters form the basis for the predictive model and more than 2500 new arsenic measurements were used to validate the results of the analysis.



Estimated probability of arsenic in Chinese groundwater above the WHO acceptable maximum concentration (Credit: Rodriguez-Lado, et al. 2013)

The results graphically highlight possible high risk areas, mainly in the northern Chinese provinces that are partly confirmed by the validation. Using estimated variations in population density across the country the team discovered that as many as 19.6 million people may be affected by consumption of arsenic contaminated water. In fact if groundwater is used for irrigation, arsenic may also be ingested with locally grown food. It seems that the vast majority of Chinese people live outside the areas of risk, so that mitigating risk is likely to be more manageable than it is in Bangladesh and West Bengal.

As well as being an important input to environmental health management in the PRC the approach is appropriate for other large areas where direct water monitoring is less organised, such as Mongolia, Kazakhstan and Kyrgyzstan in central Asia, and in the arid regions of South America.

Related articles

- [New risk model sheds light on arsenic risk in China's groundwater](#)(phys.org)
- [New predictive method pinpoints arsenic hotspots](#) (terradaily.com)
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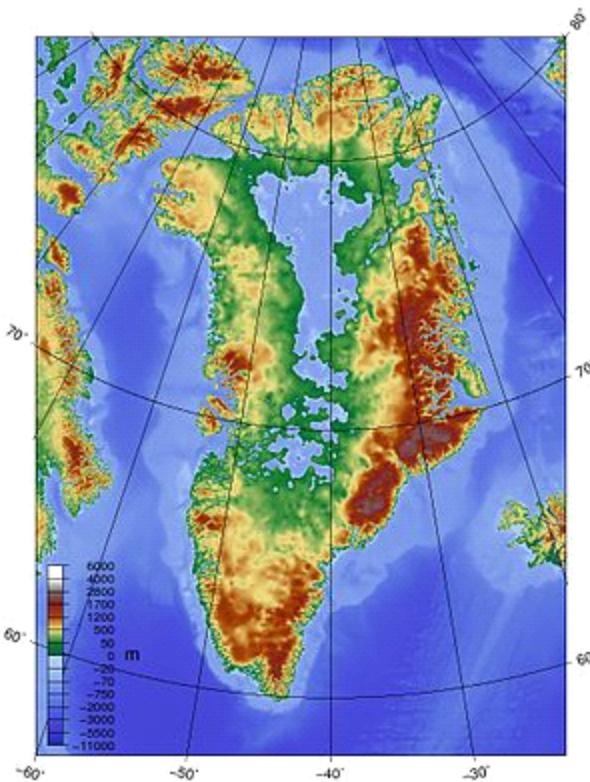
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[The Grand Greenland Canyon](#)

Posted on [September 3, 2013](#) by [Steve Drury](#) | [Leave a comment](#)

One of the properties of radar is that it can pass through hundreds of metres of ice to be scattered by the bedrock beneath and return to the surface with sufficient remaining power to allow measurement of ice depth from the time between transmission of a pulse and that when the scattered energy returns to the antenna. Liquid water simply absorbs the radar energy preventing any return from the subsurface. As far as rocks and soils are concerned, any water in them and the structure of minerals from which they are composed limit penetration and energy return to at most only a few metres. While radar images that result from scattering by the Earth's solid surface are highly informative about landforms and variations in the surface's small-scale texture, outside of seismic reflection profiling, only [ice-penetrating radar \(IPR\)](#) approaches the 'holy grail' of mapping what lies beneath the surface in 3-D. Unlike seismic surveys it can be achieved from aircraft and is far cheaper to conduct.



Greenland's topography without the ice sheet. (Photo credit: Wikipedia)

It was IPR that revealed the scattering of large lakes at the base of the Antarctic ice cap, but a survey of Greenland has revealed something even more astonishing: major drainage systems. These include a vast canyon that meanders beneath the thickest part of the ice towards the island's north coast (Bamber, J.L. et al. 2013. Palaeofluvial mega-canyon beneath the central Greenland ice sheet. *Science*, v. **341**, p. 997-999). At 750 km long and a maximum depth of 800 m it is comparable with active canyon systems along the Colorado and Nile rivers in the western US and Ethiopia respectively. A less-well publicised feature is ancient leaf-shaped system of buried valleys further south that emerges in a great embayment on West Greenland's coast near Uummannaq, which may be the catchment of another former river system. In fact much of the data that revealed what appears to be pre-glacial topography dates back to the 1970s, though most was acquired since 2000. The coverage by flight lines varies a great deal, and as more flights are conducted, yet more detail will emerge.

The British, Canadian and Italian discoverers consider that glacial meltwater sinking to the base of the ice cap continues to follow the canyon, perhaps lubricating ice movement. The flatter topography beneath the Antarctic ice cap is not so easy to drain, which probably accounts for the many sub-glacial lakes there whereas none of any significance have been detected in Greenland. The earliest time when Greenland became ice-bound was about 5 Ma ago, so that is the minimum age for the river erosion that carved the canyon

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New approach to the Milankovitch mystery

Posted on [August 23, 2013](#) by [Steve Drury](#) | [1 Comment](#)



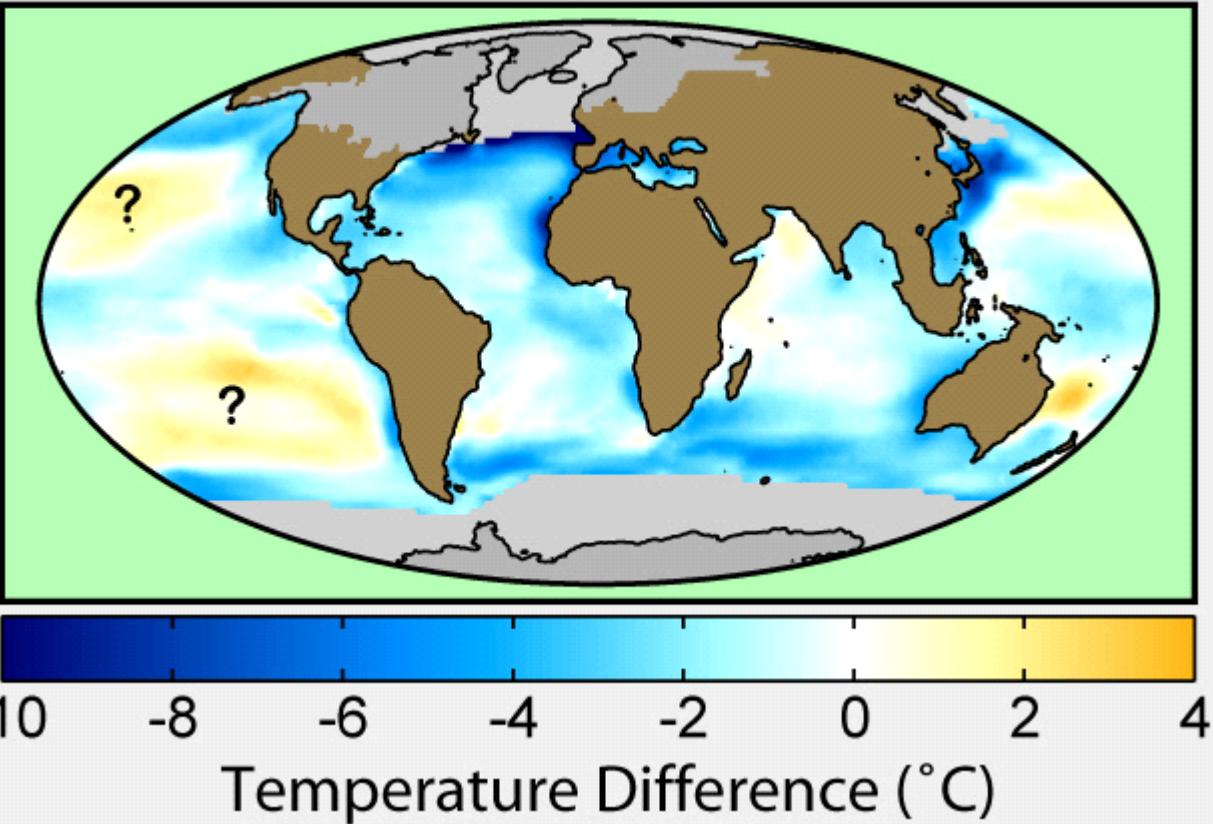
Melting pond on the Greenland ice sheet (credit: Photo by Leif Taurer)

Milutin Milankovitch's astronomical theory to account for glacial – interglacial cycles is based on 3 gravitational influences on the Earth that change the way it spins and orbits the Sun. Each is cyclic but with different periods: the angle of axial tilt every 41 ka; precession of its rotation axis on a 23 ka pacing; the change in shape of the orbit around the Sun over 100 ka. Each subtly affects the amount of solar energy, their influences combining to produce a seemingly complex, but predictable variation through time of solar heating for any point on the Earth's surface. Milankovitch's work was triumphantly confirmed when analysis of oxygen-isotope time series from sea-floor sediments revealed precisely these periods in the record of continental ice cover. Specifically, astronomical pacing of midsummer insolation at 65°N matches the real climatic pattern through time.

Yet the periods between glacial maxima have not stayed constant over the last 2 Ma or so ([Figure showing Phanerozoic climate changes](#)). About 0.8 to 1 Ma ago a sequence with roughly 41 ka spacing was replaced by another about every 100 ka, i.e. both overall climate periods matched one of the astronomical forcings. What is a puzzle is that the current periodicity seems to follow the very weakest influence in energy terms; that from orbital eccentricity. The energy shifts from changes in orbit shape are, in fact, far too weak to drive the accumulation and eventual melting of ice sheets on land. Climatologists have suggested a variety of processes that might be paced by eccentricity but which act to amplify is climatic 'signal'. None have been especially convincing.

In an attempt to resolve the mystery Ayako Abe-Ouchi of the University of Tokyo and Japanese, US and Swiss colleagues linked a climate model driven by Milankovitch insolation and variations in CO₂ recorded in an Antarctic ice core with a model of how land-ice forms and interacts with the underlying lithosphere (Abe-Ouchi, A. *et al.* 2013. Insolation-driven 100,000-year glacial cycles and hysteresis of ice-sheet volume. *Nature*, v. **500**, p. 190-193).

CLIMAP: The Last Glacial Maximum



Map of ice sheets, sea temperature changes, and changes in the outline of coastal regions during the last glacial maximum. (credit: Wikipedia)

Their key discovery is that the ice-sheets that repeatedly formed on the Canadian Shield and extended further south than Chicago had such a huge mass that they changed the shape of the land surface beneath them so much it had an effect on climate as a whole. The reason for this is that glacial loading forces the lithosphere down by displacing the more ductile asthenosphere sideways. But when melting begins rebound of the rock surface lags a long time behind the shrinking ice volume – well displayed today in Britain and Scandinavia by continued rise of the land to form raised beaches. In the case of the North American ice sheet, what had become an enormous ice bulge at glacial maxima developed into a huge basin up to 1 km deep as the ice began to melt. Simply by virtue of its low elevation this sub-continental basin would have warmed up more and more rapidly as the ice-surface fell because of this ‘isostatic’ lag.

Another feature to emerge from the model was the interaction between the 100 ka eccentricity ‘signal’ and that of precession at 23 ka. For long periods that kept summer temperature low enough for snow to pile up and become glacial ice, but on a roughly 100 ka time scale both acted together to increase summer temperatures at high northern latitudes. Melting that instantaneously removed some ice load each summer brought into play the sluggish isostatic response that helped even more warming the following year. As well as convincingly accounting for the 100 ka mystery, the model explains the far more rapid deglaciations in that mode than in the preceding 41 ka cycles, which were almost symmetrical compared with the more recent slow accumulation of continental ice sheets over ~90 ka followed by almost complete melting in a mere 10 ka.

If true, the model seems to imply that before 800 ka the positions, thicknesses and extents of continental ice sheets were different from those in later times. Or perhaps it reflects a steady increase in the overall volume of ice being produced over northern North America, or that glacial erosion thinned the crust until changing isostatic influences could ‘trip’ sufficient additional warming.

Related articles

- [Why an Ice Age Occurs Every 100,000 Years: Climate and Feedback Effects Explained \(thedailysheep.com\)](#)
- [The Milankovitch Cycles \(muchadoaboutclimate.wordpress.com\)](#)
- Kerr, R.A. 2013. How to make a Great Ice Age, Again and again and again. *Science*, v. **341**, p. 599.
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Yet another risk of arsenic exposure

Posted on [August 15, 2013](#) by [Steve Drury](#) | [1 Comment](#)

The most widely feared risk of poisoning through natural causes, which grossly disfigures and kills through a range of cancers, is from chronic exposure to arsenic in drinking water. Tragically, the risk is highest from what has traditionally been considered safest source, groundwater. That was the gruesome lesson of a massive transfer in Bangladesh from drinking surface water containing organic pathogens to reliance on well waters. The greatest mass poisoning in history was eventually traced to shallow aquifers in the Ganges-Brahmaputra plains that were rich in organic matter. Their reducing chemistry broke down iron hydroxide coatings on sedimentary grains. Since these minerals are among the most accommodating adsorbers of ions from the environment, including a variety of arsenic-bearing ions, their dissolution releases potential poisons from otherwise safe storage. In Bangladesh and neighbouring West Bengal in India it was found that deeper aquifers have oxidising chemistry and so the iron minerals not only hold ionic pollutants fast by adsorption but help to extract them from groundwater. Deep wells together with various kinds of treatment of shallow groundwater, some using the very iron minerals whose breakdown caused the pollution, are helping to mitigate the perilous situation for people of South Asia.



Skin lesions (keratoses) from arsenic poisoning in Bangladesh (Photo credit: waterdotorg)

Much the same kind of arsenic pollution has subsequently been revealed in groundwaters of lowland Vietnam and Cambodia. Yet the turn there to deep groundwater has revealed a new twist. That too is yielding increasingly high arsenic concentrations, but for a different reason (Erband, L.E. et al. 2013. Release of arsenic to deep groundwater in the [Mekong Delta](#), Vietnam, linked to pumping-induced [land subsidence](#). *Proceedings of the National Academy of Science*, doi/10.1073/pnas.1300503110). Scientists from Stanford University,

California analysed waters from around 900 wells in the Lower Mekong Delta and found several tracts with arsenic contents well above levels deemed safe by the WHO. Some, as could be anticipated from South Asian studies, were from shallow wells along the present course of the Mekong. However, in the delta area to the southwest of Ho Chi Minh City (formerly Saigon) is a large cluster from wells 150 to 450 m deep, totally unlike the situation in other areas of thick Pliocene to Recent river sedimentation.

Comparing the distribution of affected wells with precise estimates of the subsidence rates of the land surface from orbital interferometric radar surveys shows a close correlation of arsenic contamination with rates of subsidence. This suggests that groundwater pumping from deep aquifers is causing compaction at depth, in much the same way as in the environs of Venice. But is this somehow drawing in arsenic polluted water from higher levels? It seems not. So the pollution seems most likely to be an effect of pumping itself. The authors suggest that most of the subsidence is due to compaction of clay-rich sediments rather than the sandy aquifers, well known by engineers to resist compression. They explain the increasing arsenic concentrations by the introduction into the aquifers of water expelled from the clays, either containing arsenic ions in solution or carrying organic compounds that create the reducing conditions to break down iron hydroxide grain coatings and release ions adsorbed on their surfaces.

This presents another grim prospect for South Asian people forced to make the choice between drinking polluted surface water and enteric disease and increasingly exploited deep groundwaters that seem to be safe as well as in very high volumes. Let's hope that arsenic monitoring can be maintained in the Ganges-Brahmaputra plains in the long term.