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ARTIGO DA SEMANA

NEWS METEORITICA DA SEMANA

Egípcios usaram meteorito que caiu na Terra há 5.000 anos para joias

<http://noticias.ambientebrasil.com.br/clipping/2013/08/21/97348-egipcios-usaram-meteorito-que-caiu-na-terra-ha-5-000-anos-para-joias.html>

Uma descoberta feita por arqueólogos do University College London promete render mais admiração à civilização egípcia, que habitou a Terra entre os anos de 4.500 a.C e 641 d.C.

Nove contas de um colar do Antigo Egito teriam sido feitas com material vindo do espaço, possivelmente, de fragmentos de um meteorito caído na superfície terrestre há mais de 5.000 anos, segundo estudo publicado nesta segunda-feira (19) no Journal of Archaeological Science. Até então, os cientistas acreditavam que as peças encontradas bastante deterioradas em uma escavação no Egito em 1911 seriam de minério de ferro.

O fato de o colar trazer, originalmente, as contas dispostas ao lado de pedras preciosas e ouro indica que os fragmentos espaciais tinham grande valor para os donos das joias e para os artesãos.

O professor Thilo Rehren, que coordenou a pesquisa, aponta que a técnica empregada na elaboração do colar difere totalmente da de outros itens achados no mesmo sítio arqueológico.

"O formato de fina espessura das contas foi obtido através de cuidadosos golpes de martelo e não através de técnicas que, hoje sabemos, eram tradicionais entre esse povo", ressalta ele.

O ferro do meteorito foi repetidamente aquecido e golpeado para confeccionar a joia preciosa, mostrando que os egípcios já eram avançados na arte da ourivesaria.

"Nos empolgou muito, também, analisar a composição das contas, evidenciando um avançado conhecimento dos artesãos no trabalho desse raro material."

Para o novo estudo, os pesquisadores resgataram o material para submetê-lo a análise feita com raio-X e escâner de alta tecnologia, revelando que as contas eram compostas de ferro meteórico, com grande concentração de níquel, cobalto, fósforo e germânio (que é encontrado apenas em pequenas quantidades nos derivados de ferro).

"A grande descoberta da pesquisa foi demonstrar, pela primeira, que há traços de materiais como cobalto e germânio nas contas, e em níveis que só ocorrem em material vindo do espaço, de meteoros rochosos", destaca o professor. O ferro de meteorito é um liga que tem uma composição diferente do ferro terrestre. Além de descobrir que o colar foi elaborado com material vindo do espaço, o estudo também aponta que o trabalho com ferro meteórico deu aos egípcios a base para dominar a técnica do ferro fundido, surgida 2.000 anos mais tarde. Esse conhecimento teria sido crucial para a posterior produção de ferro a partir de minério de ferro, substituindo o uso de cobre e bronze como os principais materiais usados até então. (Fonte: UOL)

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2. Para reforçar regiões com deficit, MEC estuda criar Mais Professores
3. Passe livre estudantil é aprovado em primeira comissão técnica da Câmara
4. MEC divulga segunda chamada do Sisutec
5. Wellington cobra decisão do Supremo sobre partilha dos royalties
6. Especialistas apontam falta de investimento em pesquisas sobre mineração
7. Mercadante afirma na Câmara que MEC trabalha para tornar o ensino médio mais atrativo
8. Comissão aprova criação de programa de ecoeficiência nas escolas
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15. Ministério da Saúde aceita vinda de 4 mil médicos cubanos para o Brasil
16. Perigo em Plutão
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18. Conferência de abertura da reunião anual da FeSBE aborda a análise dos restos mortais da família imperial
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20. Prêmio Péter Murányi 2014 - envio de trabalhos até 30/9
21. Aves "respeitam limite de velocidade" ao voar à margem de estradas, diz estudo
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Edição 4795 - Notícias de C&T - Serviço da SBPC

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2. Congresso mantém vetos de Dilma
3. Aprovada MP que altera regras sobre carreiras do magistério e convênios de fundações
4. MP exige doutorado para ingresso na carreira de professor universitário
5. Programa de inovação reduz exigência para empresa menor
6. Brasil terá primeiro teste clínico com células embrionárias
7. Em um ano, custo do Enem para o governo sobe 29%
8. Professor do CE pega 6 anos por vazar Enem
9. Cientista como profissão e técnicos de nível superior nas universidades federais
10. Conceito Base Zero promete acabar com escassez de água no Semiárido
11. Ciência, Tecnologia e Inovação foram os assuntos do programa "Fala, Secretário", no Acre
12. Estudante gaúcho é premiado em olimpíada internacional de matemática na Europa
13. Hospitais universitários economizam R\$ 480 milhões em compras públicas
14. Unicamp adota o pôquer como disciplina para ensinar negócios
15. Comissão e frente parlamentar discutem desafios da educação básica
16. Aprovação do PNE é fundamental para Conferência Nacional de Educação
17. Reunião anual da FeSBE começa na próxima quarta
18. VII edição do Simpósio de Oncobiologia
19. Aprovado projeto que obriga ensino superior público manter cursos de extensão para idosos
20. Recife sedia encontro entre representantes de instituições de ensino superior de regiões de língua portuguesa
21. Universidade Federal de Santa Catarina abre edital de mestrado em Educação Física
22. Seminário apresentará para sociedade e comunidade científica os resultados das pesquisas
23. 'Com intervenção certa, é possível mudar cérebro'
24. Cotas: Unesp adia para 2018 meta de 50% dos alunos da rede pública
25. Matemáticos defendem didática que atraia alunos
26. Brasil está entre líderes na área da probabilidade, diz pesquisador
27. Ciência Hoje On-line: Um mundo mais quente, árido e violento?

Edição 4794 - Notícias de C&T - Serviço da SBPC

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2. Governo anuncia investimento de R\$ 450 milhões em nanotecnologia
3. Ministério publica norma que agiliza importação de materiais para pesquisa científica
4. Educação se beneficiará de royalties por ao menos 30 anos, diz Dilma

5. Dinheiro dos royalties não será suficiente para cumprir Plano Nacional da Educação, diz especialista
6. Em Brasília, encontro discute qualidade de vida e justiça social
7. Comissão debate demarcações de terras indígenas no Maranhão
8. Cientistas vislumbram manipulação da memória
9. Comissão do Senado discute programa Mais Médicos na quinta-feira
10. Nasa planeja capturar asteroide para estudo
11. Primeiro webcanal de TV brasileiro dedicado à divulgação científica será inaugurado na segunda-feira
12. Centro de estudos debate perspectivas da geração de energia no País
13. Instituto Eldorado busca novas áreas
14. Convocados na primeira chamada do Sisutec têm até hoje para fazer matrícula
15. Unesp amplia para 2018 prazo para ter 50% de alunos da rede pública
16. Unicamp dobra bônus para aluno da rede pública; inscrição começa hoje
17. LinkedIn lança páginas com informações sobre universidades
18. UFC abre mais dois concursos para professor efetivo; 13 vagas em Fortaleza e Sobral
19. Publicação do IBICT/UFRJ abre chamada para artigos sobre as mobilizações no país
20. Fármaco brasileiro mostra bons resultados contra anemia falciforme
21. Melhores empresas para se trabalhar no Rio também inovam
22. Universidades historicamente negras dos EUA buscam acordos acadêmicos no Brasil
23. Videoaulas gratuitas ensinam a fazer de TCC a tese
24. Política de Ciência e Tecnologia é debatida em seminário na Fiocruz
25. Pesquisadores constataam declínio de sete espécies de peixes na Bahia
26. Sob o império do cérebro
27. Revista Ciência Hoje: A onda da autonomia

Edição 4793 - Notícias de C&T - Serviço da SBPC

1. Edição de 16 de agosto do Jornal da Ciência está disponível para download
2. Jornal da Ciência reproduz textos em homenagem à geógrafa Bertha Becker
3. Diretor da Faculdade de Direito da USP renuncia
4. Desacordo entre associações acadêmicas
5. Universidade e meritocracia
6. Pré-sal renderá R\$ 134,9 bi à educação
7. O direito à aprendizagem
8. Aluno terá bolsa de estágio na própria escola
9. Qual é o caminho?
10. Conectadas, escolas rurais resistem no interior de SP
11. Plano de Haddad não ataca problemas, diz professora
12. Universidade Federal do ES abre vagas para professores substitutos
13. Portal vai ajudar professores a ensinar português para estrangeiros
14. Premiados em feiras internacionais, estudantes gaúchos criaram alternativa para transplantes de órgãos
15. Instituições de ensino superior podem ser obrigadas a oferecer cursos para idosos
16. Conselhos escolares conquistam verbas para o ensino e combatem evasão
17. Falta de estrutura dificulta implementação de educação ambiental
18. Revista de história da Unesp convida pesquisadores a contribuir para dossiê
19. Juiz de Fora, em Minas Gerais, sediará o evento científico Talking About Computing and Genomics (TACG)
20. Com apoio da Fapesp, pesquisadores desenvolvem coração artificial implantável nacional
21. Governança da internet é tema de debate na Comissão de Ciência e Tecnologia
22. Instituições de ensino superior podem ser obrigadas a oferecer cursos para idosos
23. MCTI discute parcerias com o Departamento de Energia dos EUA
24. Doutorado de bolsista do CsF pode contribuir na eficiência de aviões não tripulados
25. Artigo de pesquisadores da Fiocruz é publicado na revista 'Infection and Immunity'
26. 13ª Conferência Internacional sobre Comunicação Pública da Ciência e Tecnologia
27. "Patrimônio Cultural: Valores em Risco" é o tema da III Semana Fluminense do Patrimônio
28. Inpa e Musa lançam jogo educativo com conteúdo científico

AMBIENTE BRASIL

Rio de Janeiro é uma das cidades mais expostas a mudanças climáticas

Estudo mapeia municípios mais vulneráveis ao aquecimento global e aponta Rio como o que mais sofrerá nos próximos 30 anos. Mapa pode ajudar na criação de políticas mais eficazes para proteger áreas críticas.

Brasil terá primeiro teste clínico com células embrionárias

O alvo da estratégia é a degeneração macular relacionada à idade, que costuma afetar maiores de 65 anos.

Pesquisadores criam biossensor para detectar pesticida

Princípio básico de sensor biológico para identificar pesticida altamente tóxico em água e alimentos também deu origem a um teste rápido de dengue.

[Aves respeitam limite de velocidade das estradas durante voo, mostra estudo](#)

Os animais medem no ambiente a velocidade geralmente respeitada pelos veículos, como se estivessem fazendo frente à ameaça de um predador. Segundo o cientista Pierre Legagneux, o estudo pode servir para aplicar limites em áreas habitadas para preservar espécies ameaçadas.

[Garimpeiros expulsos voltam a explorar terras indígenas, denunciam yanomamis](#)

Exploração ilegal em busca de ouro assola terra indígena dos yanomamis, que estimam em quase 3 mil os garimpeiros atuando ilegalmente na região. Suspeita é que metal abasteça sobretudo indústria de eletroeletrônicos.

[Baleia jubarte é encontrada morta em praia de Vila Velha/ES](#)

Moradores reclamam do mau cheiro do animal em Nova Ponta da Fruta. Segundo Instituto Orca, retirada do animal será avaliada nesta quinta-feira.

[Índios isolados fazem contato com povoado no Peru](#)

As dezenas de índios foram filmados em junho tentando atravessar o rio Las Piedras, no povoado de Monte Salvado, no sudeste do Peru.

[Zoológico de Londres anuncia pesagem anual de 19 mil animais](#)

Répteis, moluscos, aves e mamíferos, entre outros, vão subir na balança. Objetivo é ver saúde dos bichos e monitorar programas de reprodução.

[Transfusão de sangue de cachorro salva a vida de gato na Nova Zelândia](#)

Trata-se de um caso raríssimo de sucesso de transfusão entre espécies. Gato ingeriu veneno contra ratos; sangue veio de labrador de uma vizinha.

[Jordânia terá reator nuclear de pesquisas com tecnologia coreana](#)

Com capacidade de 5 megawatts, o reator será construído na Universidade de Ciência e Tecnologia da Jordânia.

[Jacaré nasce sem cauda em parque zoológico de João Pessoa/PB](#)

Segundo especialista, anomalia é uma desordem genética. Filhote faz parte de uma ninhada de nove jacarés coroa.

[Cientistas simulam 'viagens' de larvas de corais pelos oceanos](#)

Mapeamento de dispersão de larvas foi feito com ajuda de computador. Pesquisa ajuda a prever como ficarão corais com mudanças climáticas.

[Mais de 850 bombeiros lutam contra incêndios florestais em Portugal](#)

As autoridades portuguesas pediram ajuda à Espanha e à França.

[Cientistas pesquisam 'praga' que produz super fruta](#)

As bagas do espinheiro marítimo têm mais vitamina C do que um kiwi e mais vitamina E do que a soja.

[Japão considera grave vazamento de água radioativa de Fukushima](#)

Água contaminada pode chegar ao Oceano Pacífico. 300 toneladas de água radioativa vazaram da Central Atômica.

[Estudo revela que frutas do cerrado têm mais antioxidantes do que a maçã](#)

Descoberta pode impulsionar a indústria alimentícia e farmacêutica a explorar os benefícios dos frutos.

[Árvore da "independência eterna" do Tadjiquistão durou 5 meses](#)

As sequoias, coníferas oriundas da Califórnia, foram plantadas em março pelo presidente Emomali Rajmon, acompanhado de vários embaixadores, diante do ministério das Relações Exteriores.

[Cientistas afirmam que influência humana no clima é inquestionável](#)

'É muito provável que a influência humana no clima seja responsável por mais da metade do aumento da temperatura da superfície terrestre entre 1951 e 2010', destaca o IPCC em documento.

[Terra entra no vermelho em termos de 'dívida ecológica', segundo ONG](#)

População usou em 8 meses recursos naturais que poderia usar em 1 ano. O chamado 'dia da sobrecarga' aconteceu nesta terça-feira (20).

Ministério lança iniciativa de apoio a pesquisa de nanotecnologia

Estão previstos investimentos de R\$ 440 milhões em dois anos. Programa inclui rede de laboratórios de uso compartilhado.

Verão rigoroso no Japão já matou 120 pessoas em Tóquio

Há um mês e meio as temperaturas superaram facilmente os 30, 35 e até 40 graus Celsius à sombra em grande parte do Sudeste, do centro e do Oeste do arquipélago.

Animais serão colocados para adoção nesta quarta-feira em Cabo Frio/RJ

Serão 120 cães e gatos disponíveis em uma tenda na Praça Porto Rocha. Animais adotados poderão ter acompanhamento gratuito por toda a vida.

Telescópio Kepler identifica novo planeta a 700 anos-luz da Terra

Exoplaneta realiza volta em torno de sua estrela em apenas 8 horas e meia. Superfície é muito quente e pode der 'oceano' de lava, dizem cientistas.

Após o Bóson de Higgs, CERN se prepara para a próxima missão

Há um ano, o colisor de partículas mais potentes do mundo, situado perto de Genebra, fez uma das maiores descobertas científicas da história, ao identificar o que poderia ser o Bóson de Higgs, pedra angular da estrutura fundamental do universo.

Sistema automatizado mede pulso de inundação da Reserva Mamirauá

Com sensores instalados nos pontos de medição, a variação é detectada automaticamente e transmitida em tempo real para o banco de dados, sem nenhuma interferência humana.

Rio: cigarro é o grande vilão do 1º dia de multas por lixo na rua

Até as 17h desta terça-feira, 110 pessoas receberam multas por jogar lixo no chão no centro do Rio de Janeiro, de acordo com a Comlurb.

Novo exoplaneta completa um ano em apenas 8,5 horas, descobre MIT

O Kepler 78b, que está a 700 anos luz de distância, tem um dos menores períodos orbitais já detectados pelos astrônomos.

Escócia discute proteger oceanos

Na consulta, há 33 áreas de proteção marítima sendo propostas, cobrindo várias partes da costa do país.

Búzios/RJ investiga morte de quase 70 animais marinhos

A pesca predatória da sardinha, principal alimento dos pinguins, e a poluição dos mares da região dos Lagos estão entre as principais suspeitas do grupo de biólogos que faz o resgate das espécies Guarda Marítima Ambiental de Búzios.

Egípcios usaram meteorito que caiu na Terra há 5.000 anos para joias

Uma análise feita com escâner de alta tecnologia e raio-X nas contas, descobertas por arqueólogos britânicos na cidade de El-Gerzeh em 1911, revelou que o metal veio de uma rocha espacial.

Acesso à fauna e à flora deve acontecer com responsabilidade

Conselho de Gestão do Patrimônio Genético realiza reunião ordinária em Brasília.

Fukushima registra novo vazamento de água altamente radiativa

Acidente não tem ligação com vazamentos noticiados anteriormente. As 300 toneladas de água que saíram de tanque têm muito mais radiação.

Estudo revela segredo de longevidade dos morcegos

A combinação genética com a hibernação, ritmo lento de reprodução e uma vida discreta em cavernas estão entre os fatores para a longevidade.

Seleção por sexo na avicultura preocupa defensores dos animais

Em raças de galinhas poedeiras, bilhões de pintos machos são mortos após o nascimento por não botarem ovos ou servirem para o corte. Na Alemanha, método de seleção é contestado por contrariar lei de proteção dos animais.

Capacidade de absorção das florestas europeias está perto do limite

Como envelhecimento das árvores, as florestas europeias não conseguem mais absorver o dióxido de carbono como antes. Estudo aponta que saturação pode acontecer já em 2030 se nada for feito para reverter situação.

Indígenas do México operam a própria empresa de telefonia celular

Por 15 pesos, os usuários podem realizar todas as chamadas locais que queiram com uma única condição: não devem falar mais de cinco minutos para que as 11 linhas não fiquem saturadas.

Incêndio destrói parte de parque ecológico em Campo Grande/MS

Chamas foram controladas pelos próprios funcionários da reserva. Alto índice de queimadas preocupa Corpo de Bombeiros.

Artefatos de ferro mais antigos da Terra caíram do céu

As nove pequenas contas foram encontradas em dois sítios funerários, de cerca de 3.200 a.C., em colares confeccionados também com minerais terrestres exóticos, como lápis-lázuli, ágata e ouro.

Amã aprova construção de canal entre Mar Vermelho e Mar Morto

O canal deve levar água do Mar Vermelho ao Mar Morto, ameaçado de seca, e fornecer água dessalinizada ao reino.

Panda Yuan Zai, nascido em Taiwan, abre os olhos pela primeira vez

Filhote que nasceu em 6 de julho é o primeiro panda nascido em Taiwan. Na semana passada, bebê voltou à companhia da mãe após internação.

Tartaruga marinha e pinguins são encontrados mortos em Macaé/RJ

Tartaruga foi encontrada na orla da Praia Campista por moradores. Os pinguins apareceram boiando às margens da Lagoa de Imboassica.

Expressão 'facial' revela como cães diferenciam donos de estranhos

Segundo pesquisa feita com 12 cães de diferentes raças, os animais levantam a "sobrancelha" esquerda em uma primeira demonstração de reconhecimento do dono.

Empresas discutem com governo logística para os eletroeletrônicos

Descarte ambientalmente correto de geladeiras, celulares e outros produtos terá acordo setorial.

Nepal espalha 500 câmeras nas florestas para fazer censo de tigres

A população de tigres no Nepal passou dos 121 felinos em 2009 para 198 registrados nos primeiros meses de 2013, um aumento de 63% em apenas quatro anos, segundo censo do país.

Estiagem prolongada afeta produção de banana no Norte de Minas Gerais

No projeto de irrigação Gorutuba áreas estão sendo abandonadas. Barragem que abastece o projeto está com 28% da capacidade.

Aquário projetado por Niemeyer será construído em Maricá/RJ

Projeto engloba aquário municipal, mirante, central de ensino e anfiteatro. Prefeitura pretende dividir investimento com empresas interessadas.

'Água em pó' é promessa contra a seca

'Chuva Sólida' é um polímero em pó capaz de absorver grandes quantidades de água e libertar líquido aos poucos. Um litro de água pode ser absorvido por apenas 10 gramas do produto, segundo fabricantes.

Macaca 'Chico' deixa ONG em Assis e retorna para família em São Carlos/SP

Animal foi retirado pela Polícia Ambiental no começo da noite desta segunda-feira. Idosa de 71 anos terá dez dias para adequar estrutura e alimentação.

Especialista orienta implantação de censo estatístico em São Félix do Xingu

Voltado para pescadores, projeto discutirá temas como período de defeso, áreas de pesca e dificuldades enfrentadas no município..

Gripe aviária faz mais uma vítima no Camboja, segundo anúncio da OMS

Ele é a 10ª vítima do vírus H5N1 este ano, de acordo com organização. Menino morreu na noite de domingo, após ficar doente no mês passado.

Cidades costeiras correm maior risco de sofrer perdas com inundações

As 136 maiores cidades costeiras do mundo correm um risco de sofrer perdas anuais combinadas de US\$ 1 trilhão com enchentes até 2050 a menos que melhorem drasticamente suas defesas, alertou um estudo.

Operadora de Fukushima diz que 2 funcionários foram contaminados

Dois trabalhadores foram contaminados com radiação nesta segunda-feira. Na semana passada, 10 funcionários tiveram problema semelhante.

Governo lança programa de R\$ 450 milhões para estimular nanotecnologia

O programa prevê ações simultâneas por parte de várias entidades federais, e um de seus objetivos é oferecer infraestrutura de vários laboratórios estatais a empresas. A ideia é permitir que a iniciativa privada possa realizar pesquisa aplicada sem ter de investir pesadamente em equipamentos científicos.

Mudanças climáticas afetam sabor e textura das maçãs, diz estudo

Estudos anteriores tinham demonstrado que o aquecimento global estava fazendo as macieiras florescerem mais cedo e que as colheitas também eram afetadas por mudanças no padrão de chuvas e da temperatura do ar.

Relatório reforçará elo entre mudança do clima e ser humano, diz agência

Reuters teve acesso a trechos do novo relatório do IPCC. Chance de homem causar mudança climática é de 95%, aponta.

Tubarões recebem localizadores com GPS na Flórida/EUA

Iniciativa da Universidade da Flórida envolve estudantes e pesquisadores. Monitoramento dos peixes tem fins científicos.

Equador desiste de impedir exploração de petróleo em área amazônica

Presidente afirma que trabalhos em um dos campos começam nas próximas semanas.

Zoológico chinês que tentou fazer cães aparentarem leões é fechado

Parque em Luohe funcionava ilegalmente, segundo autoridades do país. Local já havia exibido ratos como répteis exóticos e raposa como leopardo.

Novos estudos sugerem uma associação entre Adão e Eva

Estudo revela que o Adão cromossomal-Y viveu na África entre 120 mil e 200 mil anos atrás.

Brasil recolhe 94% das embalagens vazias de agrotóxicos

Segundo o Ministério do Meio Ambiente, o Brasil produz diariamente cerca de 240 mil toneladas de lixo, grande parte depositada de forma inadequada em lixões.

Crocodilo albino é atração em zoológico na República Tcheca

Local é o único da Europa a ter dois animais dessa espécie rara. Animal é visto 'sorrindo' e nadando ao lado de peixe em Protivin.

Terra é ameaçada por 1.400 asteroides, revela mapa da Nasa

As rochas gravitam próximas à órbita da Terra e também às de Vênus, Mercúrio, Marte e Júpiter. Mas, apesar do uso do termo "perigosos", o mapa não deve ser motivo para gerar pânico na Terra.

Pesquisadores desenvolvem coração artificial implantável nacional

Protótipo foi feito na Escola Politécnica da USP e no Instituto Dante Pazzanese e visa a auxiliar pacientes com insuficiência cardíaca que aguardam transplante.

Astronautas russos fazem primeira caminhada espacial de agosto

Os astronautas vão colocar dois cabos de força e um cabo Ethernet do módulo russo Poisk até o segmento americano da plataforma espacial. Eles também deverão fixar na superfície da estação um painel do experimento espacial que estuda como o espaço exterior afeta as características de resistência de alguns materiais selecionados pelos cientistas.

Foguete decola, sobe a mais de 300m e pousa de 'ré'

Teste visa permitir que futuramente foguete vá ao espaço e seja reutilizado. Sistema de precisão foi testado com o veículo Grasshopper da SpaceX.

Governo egípcio pede devolução de peças roubadas de museu em ataque

O ministro de Arqueologia do país, Mohammed Ibrahim, disse que quem entregar as peças roubadas do museu do distrito de Malawi não será julgado, mas recompensado com uma quantia em dinheiro.

Britânicos protestam contra técnica controversa para extrair gás de xisto

Processo chamado 'fracking' envolve bombeamento de água no subsolo. Companhia de energia Cuadrilla Resources suspendeu

atividades.

Milho com quatro 'cabeças' é encontrado em fazenda nos EUA

Espiga foi colhida em fazenda de Hanover, no estado da Pensilvânia. Proprietário não vai comer produto e pensa em inscrevê-lo em concurso.

580 dias: ambientalistas protestam pelo abandono do Costa Concordia

O transatlântico de luxo Costa Concordia, de 290 metros de largura e 70 metros de altura, naufragou no dia 13 de janeiro de 2012, após uma colisão contra rochas próximas à Isola del Giglio, provocando a morte de 32 das 4.229 pessoas que estavam a bordo.

12 / 08 / 2013 Chuvas deixam 20 mortos e 70 mil desabrigados no Sudão

No estado da Al Jazeera, as chuvas puseram abaixo 1.300 casas em 70 cidades e inundaram a estrada oriental que conduz a Cartum.

12 / 08 / 2013 Novo esporte radical aquático pode prejudicar peixes, dizem cientistas

Flyboard utiliza jato de água para fazer movimentos com prancha no ar. Barulho do aparelho e força da sucção podem afetar peixes e corais.

12 / 08 / 2013 Água radioativa de Fukushima ultrapassa muro isolante para o mar

Vazamentos começaram em março de 2011, após terremoto e tsunami. Diariamente 300 toneladas de água contaminada chegam ao mar.

12 / 08 / 2013 Cerca de 500 flamingos são medidos e identificados em reserva espanhola

Adultos e filhotes estão sendo catalogados por voluntários perto de Málaga. Animais vivem em uma das maiores colônias de flamingos da Europa.

12 / 08 / 2013 Moradores deixam ilha na Indonésia após erupção de vulcão

Cerca de 3.000 pessoas foram retiradas da ilha de Palue. Vulcão Rokatenda entrou em erupção na véspera.

12 / 08 / 2013 Animais da megafauna foram cruciais para fertilizar a Amazônia

Durante milhares de anos, os animais gigantes fertilizaram a bacia amazônica ao espalhar nitrogênio, fósforo e outros nutrientes contidos em seus excrementos, antes de desaparecerem abruptamente, privando definitivamente a região deste aporte maciço de adubo.

12 / 08 / 2013 Borboletas 'invadem' Manaus/AM para descansar antes de acasalamento

Segundo pesquisador, borboletas estão em migração para reproduzir. Capital é ponto estratégico na rota da espécie, originária de outros países.

12 / 08 / 2013 Mesmo com proibição, pesca continua em região das Filipinas

Vazamento de óleo em tubulação contaminou águas da baía de Manila. Incidente aconteceu na cidade de Rosário, ao sul de Manila.

12 / 08 / 2013 Carqueiro faz trajeto inédito da China à Europa através do Oceano Ártico

Atalho polar ocorre possivelmente por conta do degelo. Trajeto deve demorar 33 dias.

12 / 08 / 2013 Japão vive onda de calor e tem temperaturas mais altas dos últimos 6 anos

No sábado, os termômetros chegaram a apontar marca a máxima de 40,7 graus nas Prefeituras de Kochi e Yamanashi, no oeste e no centro do país, enquanto em 290 pontos de observação situados por todo o arquipélago superaram os 35 graus.

12 / 08 / 2013 Homens têm mais empatia por cães maltratados que por outros homens

Conclusão é de estudo liderado por especialistas americanos. Mesmo adultos, cachorros são encarados como vulneráveis por humanos.

12 / 08 / 2013 Ventos deslocam microalgas para oeste do Pacífico centro-americano

O deslocamento das microalgas tem a ver com os ventos, a variação da temperatura na água e a mudança das correntes, razão pela qual não se pode estimar os dias ou semanas que permanecerá na região.

12 / 08 / 2013 Fogo consumiu 65% do Parque da Serra de Jaraquá/GO, estima bombeiro

Capitão dos Bombeiros informou que incêndio foi controlado, em Goiás. Fogo em unidade de conservação começou na manhã da última terça (6).

12 / 08 / 2013 [Cativeiro pode abalar psicológico das orcas e criar animais violentos](#)

Alguns cientistas e ativistas defendem ambientes mais naturais, como baías colocadas no próprio mar, bem como o fim da reprodução em cativeiro e do uso de orcas no que os críticos chamam de entretenimento e no que os parques aquáticos chamam de educação.

12 / 08 / 2013 [Ano de 2012 foi um dos dez mais quentes já registrados, diz relatório](#)

Texto da NOAA aponta ainda recorde no degelo do Ártico e no nível do mar. Documento teve participação de 384 cientistas de 52 países diferentes.

13 / 08 / 2013 [Extinções há 12 mil anos podem ter empobrecido solo da Amazônia](#)

Grandes herbívoros, como a preguiça gigante, 'transportavam' nutrientes. Estudo sugere que fim de animais ajudou a reduzir minerais no solo.

13 / 08 / 2013 [Tartarugas encontradas mortas em praias da Guatemala](#)

Conservacionistas e cientistas ambientalistas na Guatemala solicitaram ao governo restringir a pesca de camarões para "estabelecer o impacto desta atividade econômica nas populações de tartarugas marinhas".

13 / 08 / 2013 [Aves e raposas aparecem mortas entre Chile e Argentina](#)

Os animais foram encontrados por pessoas que circulavam pela região de Planta Los Quilos, na cidade de Los Andes, 80 km a noroeste de Santiago, que alertaram a polícia de que as aves voavam a baixa altitude e aparentemente agonizantes.

13 / 08 / 2013 [Com fiscalização, Nepal se torna grande protetor dos tigres](#)

A população de tigres no Nepal passou dos 121 felinos em 2009 para 198 registrados atualmente.

13 / 08 / 2013 [Ancestral de dente-de-sabre tinha mordida mais fraca do que gato](#)

A falta de força do *Thylacosmilus atrox* era compensada, porém, pelos músculos de seu pescoço, responsáveis pela movimentação de seus dentes gigantes.

13 / 08 / 2013 [Número de turistas cai em Pequim, e governo atribui culpa à poluição do ar](#)

Quantidade de visitantes no 1º semestre de 2013 caiu mais de 14%. Níveis de partículas em janeiro superaram o recomendado em 40 vezes.

13 / 08 / 2013 [Desenvolvimento sustentável terá cinco linhas de ação, diz ministra](#)

Inclusão social, erradicação da pobreza e promoção de uma economia verde estarão no documento da ONU.

13 / 08 / 2013 [Calor intenso provoca mais de 700 incêndios em Portugal](#)

A maioria dos incêndios é de pequenas dimensões e coincidem com dias de calor extremo no país.

13 / 08 / 2013 [Morto em fevereiro, maior crocodilo em cativeiro do mundo irá a museu](#)

Carcaça de Lolong, com 6,7 metros, foi mantida congelada nas Filipinas. Parque onde réptil vivia está construindo réplica a partir dos restos mortais.

13 / 08 / 2013 [Botos voltam a rios alemães após programa de despoluição](#)

Na Alemanha de hoje, os rios e lagos são considerados fonte de lazer para banhistas e pescadores e botos voltam ao Elba, antigamente considerado um "lixão". Ecossistemas foram salvos por leis rígidas e limpeza contínua.

13 / 08 / 2013 [Chile descobre assentamento com quase 13 mil anos em deserto](#)

Segundo a pesquisa, o assentamento teria sido construído por um povo "nômade-caçador" na região conhecida como Quebrada Maní 12, 1.870 quilômetros ao norte de Santiago, em uma região de extrema seca no deserto e que não tinha sido muito explorada por arqueólogos.

13 / 08 / 2013 [Chuvas no Sudão afetam cerca de 150 mil pessoas, informa ONU](#)

Nações Unidas não descarta que número de afetados possa aumentar.

13 / 08 / 2013 [Filhote de jaquairica é resgatado em canavial de Lins/SP](#)

Por ser ainda bem pequena, com menos de 20 centímetros e estar em fase de amamentação, a fêmea corre sérios riscos, principalmente quanto ao frio registrado na região.

13 / 08 / 2013 [Estudo vê indícios mais antigos de utensílios de ossos dos neandertais](#)

Fragments de 50 mil anos para polir couro foram encontrados na França. Hominídeos habitaram Europa e Ásia entre 600 mil e 30 mil

anos atrás.

13 / 08 / 2013 Estudo avaliará o impacto ambiental das obras de nova base na Antártica

Empresa terá cinco meses para elaborar o estudo de impacto ambiental. Reconstrução da Estação Comandante Ferraz deve iniciar em 2014.

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EARTH PAGES

Yet another risk of arsenic exposure

Posted on [August 15, 2013](#) by [Steve Drury](#) | [Leave a 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.

Related articles

- [Scientists find new arsenic threat in deep water wells](#) (phys.org)
- [High Levels of Arsenic Found in Groundwater Near Fracking Sites](#)(ecowatch.com)
- [Groundwater Depletion Continues Throughout US](#)(acogblog.wordpress.com)

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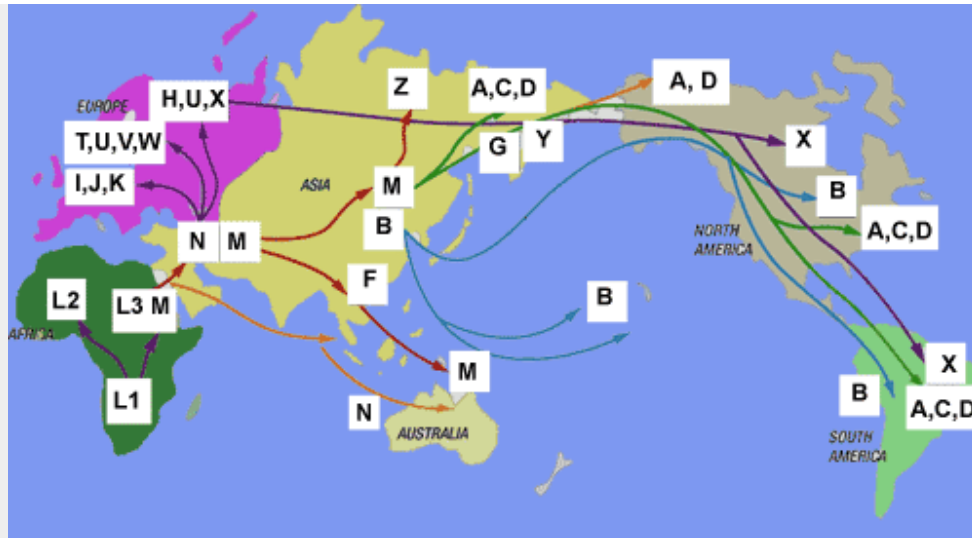
Last common paternal and maternal ancestors closer in time

Posted on [August 10, 2013](#) by [Steve Drury](#) | [Leave a comment](#)

One of the oddities of using human genetic material passed down the male (from Y chromosomes) and female lines (from mitochondria) to assess when fully modern humans originated is that they have hitherto given widely different dates: 50 to 115 ka and 150 to 240 ka respectively. Twice to three-times the age for a putative ancestral 'mother' compared with such a 'father' for humanity raised all kinds of problematic issues for palaeoanthropology, such as a possibly greater 'turnover' of lines of descent among males perhaps due to riskier lifestyles. Y-chromosome data limited speculation on the timing of human colonisation outside of Africa to a maximum of 60 ka, even though there is fossil and archaeological evidence for a much earlier presence in the Levant and India. The difference also questions the validity of molecular-clock approaches to evolutionary matters. Two new studies have lessened the phylogenetic strains.

One examines Y chromosomes in 69 males from nine diverse populations from Africa, Eurasia and Central America (Poznik, G.D. and 10 others 2013. Sequencing Y chromosomes resolves discrepancy in time to common ancestors of males versus females. *Science*, v. **341**, p. 562-565). The US-French team applied sophisticated statistics as well as the elements of a molecular clock approach to both Y-chromosome and mitochondrial DNA, discovering in the process a hitherto unresolved feature in the African part of the male 'tree'. The outcome is a significant revision of both male and female paths of descent: 120 to 156 ka and 99 to 148 ka to the last common ancestor in both lines. The upper limit is somewhat lower than the age of fossil evidence for the earliest anatomically modern humans.

The second study zeros-in on the European story, by examining the Y-chromosome data of 1200 men from Sardinia (Francalacci, P. and 38 others. Low-pass DNA sequencing of 1200 Sardinians reconstructs European Y-chromosome phylogeny. *Science*, v. **341**, p. 565-569) calibrated to some extent by the date when Sardinia was first colonised (7.7 ka). It too revealed new detail that enabled the Italian-US-Spanish team to refine the time when features of Sardinian Y-chromosome DNA would coalesce with those from the rest of the world. In this case the date for a last common paternal ancestor goes back to between 180 to 200 ka, more similar to the old dates for 'African Eve' and the earliest modern human fossils than to either that for male or female lines arrived at by Posnik *et al.* (2013), which are significantly younger.



Map of early migrations of modern humans based on Y chromosome data (credit: Wikipedia)

Equally interesting are the comments on both papers in the Perspectives section of the issue of *science* in which they appear (Cann, R.L. 2013. Y weigh in again on modern humans. *Science*, v. **341**, p. 465-7). Rebecca Cann of the University of Hawaii Manoa considers the two sets of results from Y-chromosomes potentially capable of refining models for the migration times of modern humans out of Africa and their interactions with the archaic populations that they eventually displaced from Europe and central and southern Asia (Neanderthals, Denisovans and *Homo erectus* respectively). She believes that will include signs of earlier excursions that the generally accepted diaspora between roughly 60 and 50 ka seemingly constrained by the previous 50 to 115 ka estimate for the last common paternal ancestor. That would help explain the presence of modern humans in India at the time of the Toba eruption (71 ka).

Related articles

- [New papers on human Y-chromosome phylogeny \(Poznik et al. and Francalacci et al.\)](#) (dienekes.blogspot.com)

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[Assessing submarine great-earthquake statistics fails](#)

Posted on [July 31, 2013](#) by [Steve Drury](#) | [2 Comments](#)

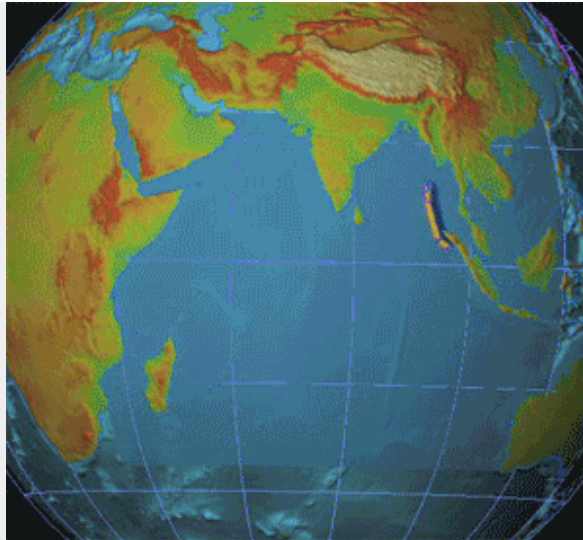
Geologists who study [turbidites](#) assume that the distinctive graded beds from which they are constructed and a range of other textures represent flows of slurry down unstable steep slopes when submarine sediment deposits are displaced. Such [turbidity currents](#) were famously recorded by the severing of 12 transatlantic telecommunication cables off Newfoundland in 1929. This happened soon after an earthquake triggered 100 km hr⁻¹ flows down the continental slope, which swept some 600 km eastwards.



Typical structures in Upper Carboniferous turbidites near Bude, Cornwall, UK (credit: Flickr, Earthwatcher)

Sea beds at destructive margins provide the right conditions for repeated turbidity currents and it is reasonable to suppose that patterns should emerge from the resulting turbidite beds that in some way record the seismic history of the area. British and Indonesian geoscientists set out to test that hypothesis at the now infamous plate margin off Sumatra that hosted the great Aceh Earthquake and

tsunamis of 26 December 2004 to kill 250 thousand people around the rim of the Indian Ocean (Sumner, E.J. *et al.* 2013. Can turbidites be used to reconstruct a paleoearthquake record for the central Sumatra margin? *Geology*, v. **41**, p.763-766).



Animation of Indonesian tsunami of 26 December 2004 (credit: Wikipedia)

Cores through turbidite sequences along a 500 km stretch of the margin formed the basis for this important attempt to test the possibility of recording long-term seismic statistics. To avoid false signals from turbidity currents stirred up by storms, floods and slope failure from rapid sediment build-up 17 sites were cored in deep water away from major terrestrial sediment supplies, which only flows triggered by major earthquakes would be likely to reach. To calibrate core depth to time involved a variety of radiometric and stratigraphic methods

Disappointingly, few of the sites on the submarine slopes recorded turbidites that match events during the 150-year period of seismic records in the area, none being correlatable with the 2004 and 2005 great earthquakes. Indeed very little correlation of distinctive textures from site to site emerged from the study. Some sites on slopes revealed no turbidites at all from the last 150 years, whereas turbidites in others that could be accurately dated occurred when there were no large earthquakes. Only cores from the deep submarine trench consistently preserved near-surface turbidites that might record the 2004 and 2005 great earthquakes.

These are surprising as well as depressing results, but perhaps further coring will discover what kind of bathymetric features might yield useful and consistent seismic records from sediments.

→ **2 Comments**

Posted in [Environmental geology and geohazards](#), [Sedimentology and stratigraphy](#)

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Not-so-light, but essential reading

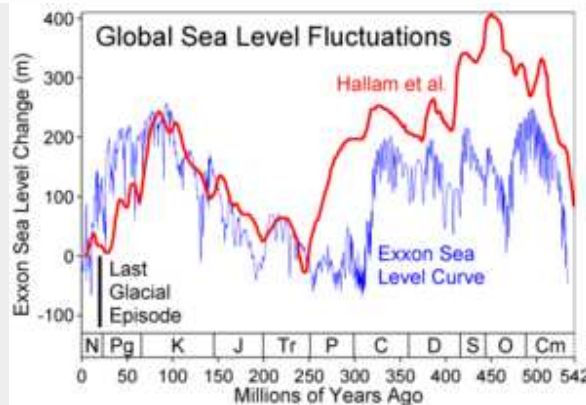
Posted on [July 25, 2013](#) by [Steve Drury](#) | [Leave a comment](#)

In its 125th year the Geological Society of America is publishing invited reviews of central geoscience topics in its Bulletin. They seem potentially useful for both undergraduate students and researchers as accounts of the 'state-of-the-art' and compendia of references. The latest focuses on major controls on past sea-level changes by processes that operate in the solid Earth (Conrad, C.P. 2013. The solid Earth's influence on sea level. *Geological Society of America Bulletin*, v. **125**, p. 1027-1052), a retrospective look at how geoscientists have understood large igneous provinces (Bryan, S. E. & Ferrari, L. 2013. Large igneous provinces and silicic large igneous provinces: Progress in our understanding over the last 25 years. *Geological Society of America Bulletin*, v. **125**, p. 1053-1078) and the perennial

topic of how granites form and end up in intrusions (Brown, M. 2013. Granite: From genesis to emplacement *Geological Society of America Bulletin*, v. **125**, p. 1079-1113).

Sea level change

Conrad covers sea-level changes on the short- (1 to 100 years), medium- (1 to 100 ka) and long term (1 to 100 Ma). The first two mainly result from local deformation of different kinds associated with glacial loading and unloading. These result in changes in the land surface, the sea surface nearby and on thousand year to 100 ka timescales to ups and downs of the sea-bed. Global sea-level changes due to melting of continental glaciers at the present day amount to about half the estimated 2 to 3 mm of rise each year. But increasingly sensitive measures show it is more complex as the rapid shifts of mass involved in melting ice also result in effects on the solid Earth. At present solid mass is being transferred polewards, but at rates that differ in Northern and Southern hemispheres and which are changing with anthropogenic influences on glacial melting. Viscous movement of the solid Earth is so slow that effects from previous glacial-interglacial episodes continue today. As a result rapid elastic movements are tending to produce relative sea-level falls in polar regions of up to 20 mm per year with rising sea level focusing on areas between 30°N and 30°S. The influence of the slower viscous mass transfer has an opposite sense: sea-level rise at high latitudes. Understanding the short- and medium-term controls is vital in predicting issues arising in the near future from natural and anthropogenic change.



Comparison of two sea level reconstructions during the last 500 Ma. (credit: Wikipedia)

Most geologists are concerned in practice with explanations for major sea-level changes in the distant past, which have a great deal to do with changes in the volumes of the ocean basins. If the global sea-floor rises on average water is displaced onto former land to produce transgressions, and subsidence of the sea floor draws water down from the land. Conrad gives a detailed account of what has been going on since the start of the Cretaceous Period, based on the rate of sea-floor spreading, marine volcanism and sedimentation, changes in the area of the ocean basins and the effects of thermally-induced uplift and subsidence of the continents, showing how each contribution acted cumulatively to give the vast transgressions and regressions that affected the late Phanerozoic. On the even longer timescale of opening and closing of oceans and the building and disintegration of supercontinents the entire mantle becomes involved in controls on sea level and a significant amount of water is chemically exchanged with the mantle.

Large igneous provinces



The Web of Science database marks the first appearance in print of “large igneous province” in 1993, so here is a topic that is indeed new, although the single-most important attribute of LIPs, ‘flood basalt’ pops up three decades earlier and the term ‘trap’ that describes their stepped topography is more than a century old. Bryan and Ferrari are therefore charting progress in an exciting new field, yet one that no human – or hominin for that matter – has ever witnessed in action. One develops, on average, every 20 Ma and since they are of geologically short duration long periods pass with little sign of one of the worst things that our planet can do to the biosphere. In the last quarter century it has emerged that they blurt out the products of energy and matter transported as rising plumes from the depths of the mantle; they, but not all, have played roles in mass extinctions; unsuspected reserves of precious metals occur in them; they play some role in the formation of sedimentary basins and maturation of petroleum and it seems other planets have them – a recipe for attention in the early 21st century. Whatever, Bryan and Ferrari provide a mine of geological entertainment.

Granites

In comparison, granites have always been part of the geologist’s canon, a perennial source of controversy and celebrated by major works every decade, or so it seems, with twenty thousand ‘hits’ on Web of Science since 1900 (WoS only goes back that far). Since the resolution of the plutonist-neptunist wrangling over granite’s origin one topic that has been returned to again and again is how and where did the melting to form granitic magma take place? If indeed granites did form by melting and not as a result of ‘granitisation’. Lions of the science worried at these issues up to the mid 20th century: Bowen, Tuttle, Read, Buddington, Barth and many others are largely forgotten actors, except for the credit in such works as that of Michael Brown. Experimental melting under changing pressure and temperature, partial pressures of water, CO₂ and oxygen still go on, using different parent rocks. One long-considered possibility has more or less disappeared: fractional crystallisation from more mafic magma might apply to other silicic plutonic rocks helpfully described as ‘granitic’ or called ‘granitoids’, but granite (*sensu stricto*) has a specific geochemical and mineralogical niche to which Brown largely adheres. For a while in the last 40 years classification got somewhat out of hand, moving from a mineralogical base to one oriented geochemically: what Brown refers to as the period of ‘Alphabet Granites’ with I-, S- A- and other-type granites. Evidence for the dominance of partial melting of pre-existing continental crust has won-out, and branched into the style, conditions and heat-source of melting.



Typical granite tor near Kisumu, Kenya (credit: Wikipedia)

All agree that magmas of granitic composition are extremely sticky. The chemical underpinnings for that and basalt magma's relatively high fluidity were established by physical chemist Bernhardt Patrick John O'Mara Bockris (1923-2013) but barely referred to, even by Michael Brown. Yet that high viscosity has always posed a problem for the coalescence of small percentages of melt into the vast blobs of low density liquid able to rise from the deep crust to the upper crust. Here are four revealing pages and ten more on how substantial granite bodies are able to ascend, signs that the puzzle is steadily being resolved. Partial melting implies changes in the ability of the continental crust to deform when stressed, and this is one of the topics on which Brown closes his discussion, ending, of course, on a 'work in progress' note that has been there since the days of Hutton and Playfair.

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Rope and dope in lake sediments

Posted on [July 24, 2013](#) by [Steve Drury](#) | [Leave a comment](#)

Sediments built up on lake beds are a fruitful source of proxy data for all kinds of time series – mainly climatic and ecological. Pollen, other organic remains, various stable isotopes, and a range of organic geochemical data calibrated to time using magnetostratigraphy, C-14 dating and astronomical 'pacemakers'. Suddenly there is another proxy: [cannabinol](#), the metabolite of tetrahydrocannabinol the principal psychoactive component of marijuana (Lavrieux, M. *et al.* 2013. Sedimentary cannabinol tracks the history of [hempretting](#). *Geology*, v. **41**, p. 751-754). The compound is detectable at the parts per billion level thanks to advances in monitoring the use of drugs, particularly in sports persons – it ends up in the urine of users. So the paper by a team of French Earth scientists has a somewhat irresistible draw, the more so from the opening sentence of its abstract, 'Hemp (*Cannabis* sp.) has been a fundamental plant for the development of human societies'. Indeed it has, for the earliest records date back to the Neolithic in China, perhaps back to 12 ka ago.



Cultivation of hemp for fibre and grain in France. (credit: Wikipedia)

But then all becomes clear: they speak of hemp fibres used in rope and some textiles, and the climatic adaptability of the plant that has ensured its spread from Equator to north of the Arctic Circle and lesser southern latitudes. But there is an element of tongue-in-cheek, or at least so it seemed to me, as the objective of their research is to chart to emergence and rise of [rope making](#) in Central France. Freeing the useful fibres from *Cannabis* stems requires the plant to be soaked and subject to microbial action that breaks down soft tissue, know as retting that is also used in flax and coir production. The resin breaks down to cannabinol, which is therefore a perfect proxy for Hemp retting.

Lac d'Aydat is geologically famous as it formed when a lava flow from one of the puys of the Massif Central blocked a valley and became a dam. It figured in the pioneering volcanological research of English geologist George Julius Poulett Scrope. *Its new place in science*

rests on Lavrieux *et al.*'s chronologically calibrated time series for retting from the lake's muds. Hemp pollen in the section betrays the start of *Cannabis* cultivation in the Auvergne between 500-650 AD, but hemp retting in the lake is marked by a cannabitol spike in the 13th century and increases in pollen. It fell-off sharply in the late 19th century, probably as a result of being outcompeted by more easily processed cotton.

Almost 7 centuries of *Cannabis* processing in central France actually took a toll as cannabitol is toxic to fish and cattle. Despite a 1669 Royal Ordinance against hemp retting in French rivers it continued unchecked in Lac d'Aydat, but more likely than secret retting tucked away in a remote corner of France it stemmed from the ordinance being widely flouted. That it ended with the rise of cotton is not so convincing as hemp is still a staple in rope manufacture, and when the US entered World War II large tracts of land were placed under *Cannabis* to produce naval cordage; the reason why it still grows wild in abundance across many States. There is plenty of evidence, including this, that use of *Cannabis* for cordage came rather late, and plenty in support of its cultivation and wide spread before the Iron Age for 'relaxation'.

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Fracking and earthquakes

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

[Review of Fracking Issues](#) posted on 31 May 2013 briefly commented on a major academic study of the impact of [shale gas](#) exploitation on groundwater. The 12 July 2013 issue of *Science* follows this up with a similar online, extensive treatment of how underground disposal of fracking fluids might influence seismicity in new gas fields (Ellsworth, W.J. 2013. Injection-induced earthquakes. *Science*, v. **341**, p. 142 and doi: 10.1126/science.1225942) plus a separate paper on the same topic (van der Elst, N.J. *et al.* 2013. Enhanced remote earthquake triggering at fluid-injection sites in the Midwestern United States. *Science*, v. **341**, p.164-167).



Major shale gas basins (credit: Wikipedia)

It was alarm caused by two minor earthquakes (<3 local magnitude) that alerted communities on the Fylde peninsula and in the seaside town of Blackpool to worrisome issues connected to Cuadrilla Resources' drilling of exploratory fracking wells. These events were put down to the actual hydraulic fracturing taking place at depth. Such low-magnitude seismic events pose little hazard but nuisance. The two reports in *Science* look at longer-term implications associated with regional shale-gas development. All acknowledge that the fluids used for hydraulic fracturing need careful disposal because of their toxic hazards. The common practice in the 'mature' shale-gas fields in the US is eventually to dispose of the fluids by injecting them into deep aquifers, which [Vidic *et al.*](#) suggested that 'due diligence' in such injection of waste water should ensure limited leakage into shallow domestic groundwater.

The studies, such as that by William Ellsworth, of connection between deep waste-water injection and seismicity are somewhat less reassuring. From 1967 to 2001 the central US experienced a steady rate of earthquakes with magnitudes greater than 3.0, which can be put down to the natural background of seismicity in the stable lithosphere of mid North America. In the last 12 years activity at this energy level increased significantly, notably in areas underlain by targets for shale-gas fracking such as the Marcellus Shale of the north-eastern US. The increase coincides closely with the history of shale-gas development in the US. The largest such event (5.6 local

magnitude) destroyed 14 homes in Oklahoma near to such a waste-injection site. Raising the fluid pressure weakens faults in the vicinity thereby triggering them to fail, even if their tectonic activity ceased millions of years ago: many retain large elastic strains dependent on rock strength.

Apart from the mid-continent New Madrid seismic zone associated with a major fault system parallel to the Mississippi, much of the central US is geologically simple with vast areas of flat-bedded sediments with few large faults. The same cannot be said for British geology which is riven with major faults formed during the Caledonian and Variscan orogenies, some of which in southern Britain were re-activated by tectonics associated with the Alpine events far off in southern Europe. Detailed geological maps show surface-breaking faults everywhere, whereas deep coal mining records and onshore seismic reflection surveys reveal many more at depth. A greater population density living on more 'fragile' geology may expect considerably more risk from industrially induced earthquakes, should Britain's recently announced 'dash' for shale gas materialise to the extent that its sponsors hope for.

Nicholas van der Elst and colleagues' paper indicates further cause for alarm. They demonstrate that large remote earthquakes. In the 10 days following the 11 March 2011 Magnitude 9.0 Sendai earthquake a swarm of low-energy events took place around waste [injection wells](#) in central Texas, to be followed 6 months later by a larger one (4.5 local magnitude). Similar patterns of injection-related seismicity followed other distant great earthquakes between 2010 and 2012. Other major events seem not to have triggered local responses. The authors claim that the pattern of earth movements produced by such global triggering might be an indicator of whether or not fluid injection has brought affected fault systems to a critical state. That may be so, but it seems little comfort to know that one's home, business or community is potentially to be shattered by intrinsically avoidable seismic risk.

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[Africa-Europe exchange of faunas in the Late Miocene](#)

Posted on [July 15, 2013](#) by [Steve Drury](#) | [Leave a comment](#)

The extremely hazardous seaway through the Straits of Gibraltar and the waterless deserts of the Levant presented considerable barriers to natural exchange of animal groups between Africa and Eurasia throughout the period of hominin evolution known from the African Pliocene and Pleistocene record. These barriers were breached by hominins only occasionally. Through most of the Miocene and back to the Mesozoic Era Iberia and what is now Morocco were separated by a wide seaway preventing faunal exchange. That Betic Seaway eventually closed with the tectonic collision of the two sides to form the modern [Betic cordillera](#) in southern Spain towards the end of the Miocene. This left [parts of the Mediterranean to evaporate](#) during what is known as the [Messinian Salinity Crisis](#), which reached completion at 5.59 Ma. Yet this Europe-Africa connection was short-lived, being breached by what is regarded as one of the most dramatic events in Cenozoic history: the [Zanclean Flood](#). At 5.33 Ma the [Atlantic burst through](#) what is now the Straits of Gibraltar to refill the Mediterranean Basin within a period between a few months and two years. The flooding began as a vast system of rapids some 1 km high with an estimated flow a thousand times that of the modern Amazon.



Strait of Gibraltar from space, with Spain on the left and Morocco on the right.) (credit: Wikipedia)

During the existence of the Europe-Africa land bridge it was possible for animals to move between north-west Africa and western Europe. Evidence that such an exchange did take place comes from a number of Late Miocene localities in southern Spain and North Africa. The first recorded migrants into Spain were African gerbils, then evidence mounted for larger animals, including hippos and early camels moving into Europe and a reverse migration of rabbits and mice. One of the Spanish sites (Gibert, L. *et al.* 2013. Evidence for an African-Iberian mammal dispersal during the pre-evaporitic Messinian. *Geology*, v. **41**, p. 691-694) has allowed precise magnetostratigraphic dates to be put on the migrations. The Spanish-US team suggests conditions ripe for migration were in three distinct phases: around 6.3 Ma when hippos managed to swim to Europe; around 6.2 Ma which saw European small mammals making the journey south and camels moving to Europe; in a 300 ka window of opportunity from 5.6 to 5.3 Ma for African mice to make the journey into Europe. Several distinct episodes probably reflect some ups and downs of sea level related to glacial retreats and advances in Antarctica.

One implication of the short-lived Messinian land bridge is that it may have been followed by primates, though evidence has yet to be found. A particularly interesting genus, suggested by some as a possible common ancestor for hominins and chimpanzees, is *Oreopithecus* a bipedal ape recorded from the Miocene of Italy

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Afar: the field lab for continental break-up

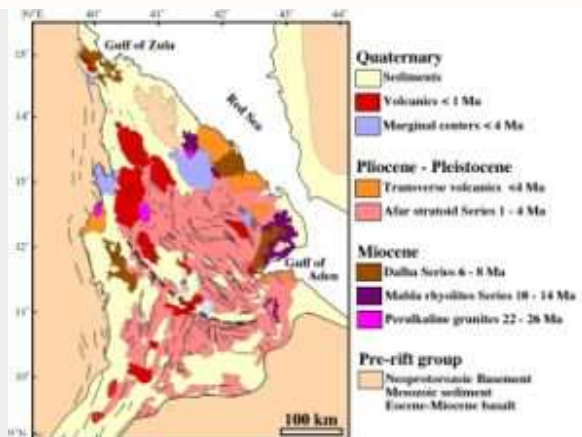
Posted on [July 8, 2013](#) by [Steve Drury](#) | [Leave a comment](#)

The [Afar Depression](#) of Ethiopia and Eritrea is a feature of tectonic serendipity. It is unique in showing on land the extensional processes and related volcanism that presage [sea-floor spreading](#). Indeed it hosts three rift systems and a triple junction between the existing Red Sea and Gulf of Aden spreading centres and the [East African Rift System](#) that shows signs of future spalling of Somalia from Africa. Afar has been a focus of geoscientific attention since the earliest days of plate theory but practical interest has grown rapidly over the last decade or so when the area has become significantly more secure and safe to visit. Two recent studies seem to have overturned one of the most enduring assumptions about what drives this epitome of continental break-up.



Simulated perspective view of the Afar depression from the south (credit: Wikipedia)

From the obvious thermal activity deep below Afar, linked with volcanism and high heat flow, a mantle hot spot and rising plume of deep mantle has been central to ideas on the tectonics of the area. A means of testing this hypothesis is the use of seismic data to assess the ductility and temperature structure of deep mantle through a form of tomography. The closer the spacing of seismic recording stations and the more sensitive the seismometers are the better the resolution of mantle structure. Afar now boasts one of the densest seismometer networks, rivalling the Earthscope USArray. <http://earth-pages.co.uk/2009/11/01/the-march-of-the-seismometers/> and it is paying dividends (Hammond, J.O.S. and 10 others 2013. Mantle upwelling and initiation of rift segmentation beneath the Afar Depression. *Geology*, v. **41**, p.635-638). The study brought together geoscientists from Britain, the US, Ethiopia, Eritrea and Botswana, who used data from 244 seismic stations in the Horn of Africa to probe depths down to 400 km with a resolution of about 50 km. The tomographic images show no clear sign of the kind of narrow plume generally associated with the notion of a 'hot spot'. Instead they pick out shallow (~75 km depth) P- and S-wave low-velocity features that follow the axes of the three active rift systems. The features coalesce at depth; in some respects the opposite of a classic plume that has a narrow 'stem' that swells upwards to form a broad 'head'. If there ever was an Afar Plume it no longer functions. Instead, the rifts and associated lithospheric thinning are associated with a mantle upwelling that is being emplaced passively in the space made available by extensional tectonics. This is closely similar to what goes on beneath active and well-established mid-ocean spreading centres where de-pressuring of the rising mantle results in partial melting and basaltic magmatism along the rift system. Perhaps this is a sign that full sea-floor spreading in Afar is imminent, at least on geological timescales.



Simplified geologic map of the Afar Depression. (credit: Wikipedia after Beyene and Abdelsalam (2005))

For once, mantle geochemists and geophysicists have data that support a common hypothesis (Ferguson, D.J. and 8 others 2013. Melting during late-stage rifting in Afar is hot and deep. *Nature*, v. **499**, p. 70-73). This US-British-Ethiopian team compares the trace element geochemistry of Recent basaltic lavas erupted along the axis of the Afar rift that links with the Red Sea spreading centre with equally young lavas from volcanoes some 20 km from the axis. Both sets of lavas are a great deal more enriched in incompatible trace elements that are generally enriched in melt compare with source than are ocean-floor basalts sampled from the mid-Red Sea rift. Modelling rare-earth element patterns in particular suggests that partial melting is going on at depths where garnet is stable in the

mantle instead of spinel. This suggests that a strong layer, about 85 km down in the upper mantle is beginning to melt – magmas formed by small degrees of partial melting generally contain higher amounts of incompatible trace elements than do the products of more extensive melting. Estimates of the temperature of melting from lavas extruded at the rift axis than off-axis are significantly higher than expected at this depth suggesting that deeper mantle is rising faster than it can lose heat.

The depth of melting tallies with the thermal feature picked out by seismic tomography. The two teams converge on passively induced upwelling of hot asthenosphere while the Afar lithosphere is slowly being extended. The degree of melting beneath Afar is low at present, so that to become like mid-ocean ridge basalts a surge in the fraction of melting is needed. That would happen if the strong mantle layer fails plastically so that more asthenosphere can rise higher by passive means. The geochemists persist in an appeal to an Afar Plume for the 30 Ma old flood basalts that plaster much of the continental crust outside Afar. Those plateau-forming lavas, however, are little different in their trace element geochemistry from off-axis Afar basalts. Yet they are not obviously associated with an earlier episode of lithospheric extension and passive mantle upwelling. Most geologists who have studied the flood basalts would agree that they preceded the onset of rifting but have little idea of the actual processes that went on during that mid-Oligocene volcanic cataclysm.

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Early humans could probably kill at a distance

Posted on [June 30, 2013](#) by [Steve Drury](#) | [3 Comments](#)

It is always refreshing when physical anthropologists perform experiments as well as pondering on bones. It turns out that examining the bio-mechanics of college baseball players can provide useful clues about where in fossil anatomy to look for signs of potential big-game hunters. Anyone who can hurl a baseball, or one of the smaller but much harder red ones preferred by non-Americans, at speeds exceeding 100 kph could in all likelihood bring down a substantial prey animal with a rock and even more so with a spear. At the heart of an important examination of what our forebears might have done to get a meaty meal (Roach, N.T. *et al.* 2013. Elastic energy storage in the shoulder and the evolution of high-speed throwing in *Homo*. *Nature*, v. **498**, p. 483-486) is a US-Indian team's sophisticated study of college baseball players' throwing action using high-speed video, radar and precise timing techniques.



Matt Kata throwing for the Houston Astros (Photo credit: Wikipedia)

It seems that there are several physiological phases in demon ball throwing: rotation of the torso; rotation flexion and extension of the shoulder; flexion and extension of the elbow; and wrist extension. All of these contribute to acceleration of the ball before release. While the thrower steps forward the arm is cocked so that ligaments, tendons and muscles crossing the shoulder become stretched, thereby storing energy. During the acceleration phase the bend in the elbow is snapped straight adding yet more power. Readers should note the difference between this action and that of a bowler in cricket, where the elbow snap is banned on pain of severe penalty and public humiliation of the bowler who 'chucks'. Since a fast bowler also adds energy by running into the crease, this is a humanitarian aspect of the Rules of cricket, although several legal West Indian bowlers of the past 40 years are still remembered with terror by their batsmen contemporaries. No such stricture is placed on the baseball pitcher who has no run-up.

These observations focus attention on the structure of shoulder and elbow, yielding a robust means of predicting how fast throwers with different configurations may have thrown objects. Chimpanzees make poor players of ball games, although they will throw the odd stick, but just for aggressive show. The same goes for the earliest hominins for which we have suitable fossil material: australopithecines may occasionally have eaten carrion but they couldn't throw rocks or spears with enough force to bring down anything and their throwing range would have been pathetic. Not so *Homo erectus*! They were well equipped in the hurling department and could, were they so inclined, have hunted equally as well as modern humans. Interestingly, earlier hominins had some of the physiological necessities of decent throwing, but not all of them. So it seems that the full combination emerged in the evolution of our own genus around 2 Ma ago,

This is in contrast to a view held by some anthropologists, such as Christopher Boehm of the University of Southern California, that big game hunting using projectile weapons emerged only with anatomically modern humans after 250 ka, and most likely only reached its acme 45 ka ago. That assumption, at least by Boehm, is central to notions of how social activities centred on meat sharing may have helped evolve morals, such as altruism and shame (see Boehm, C. 2012. *Moral Origins: The Evolution of Virtue, Altruism and Shame*. Basic Books, New York). That *H. erectus* would have been able to harness sufficient energy to kill at a distance casts doubt on such

assertions. Mere foraging does not require throwing-capable physiology, so how it evolved in early humans with neither the inclination nor bodies to at least begin throwing projectiles at potential prey is something that school might consider.

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[Arctic climate in the run-up to the Great Ice Age](#)

Posted on [June 30, 2013](#) by [Steve Drury](#) | [Leave a comment](#)

Around 3.6 Ma ago a large extraterrestrial projectile slammed into the far north-east of Siberia forming crater 16 km across. The depression soon filled with water to form [Lake El'gygytgyn](#), on whose bed sediments have accumulated up to the present. A major impact close to the supposed start of Northern Hemisphere glacial conditions was a tempting target for coring: possibly two birds with one stone as the lowest sediments would probably be impact debris and boreal lake sediments of this age are as rare as hens' teeth. The sedimentary record of Lake El'gygytgyn has proved to be a climate-change treasure trove (Brigham-Grette, J and 15 others 2013. [Pliocene](#) warmth, polar amplification, and stepped [Pleistocene](#) cooling recorded in NE Arctic Russia. *Science*, v. **340**, p. 1421-1426).



Lake El'gygytgyn impact crater. (credit: Wikipedia)

The team of US, Russian, German and Swedish scientists discovered that the sedimentary record was complete over a depth of 318 m and so promised a high resolution climate record. The striking feature of the sediments is that they show cyclical variation between five different facies, four of which are laminated and so preserve intricate records of varying weathering and sediment delivery to the lake. The sediments also contain pollens and diatom fossils, and yield good magnetic polarity data. The last show up periods of reversed geomagnetic polarity, which provide age calibration independent of relative correlation with marine isotope records.

A host of climate-related proxies, including pollen from diverse tree and shrub genera, variations in silica due to changes in diatom populations and organic carbon content in the cyclically changing sedimentary facies are correlated with global climate records based on marine-sediment stable isotope. These records reveal intricate oscillations between cool mixed forest, cool coniferous forest, taiga and cold deciduous forest, with occasional frigid tundra conditions through the mid- to late Pliocene. Compared with modern conditions NE

Siberia was much warmer and wetter at the start of the record. Around the start of the Pleistocene sudden declines to cooler and drier conditions appear, although until 2.2 Ma ago average summer conditions seem to have been higher than at present, despite evidence from marine proxies of the onset of glacial-interglacial cycles in the Northern Hemisphere.

In detail, Lake El'gygytgyn revealed some surprises including rapid onset of a lengthy cold-dry spell of tundra conditions between 3.31 to 3.28 Ma. The first signs that the lake was perennially frozen appear around 2.6 Ma, well before evidence for the first continental glaciation in North America, presaged by signs around 2.7 Ma that winters consistently became colder than present ones. Overall the lake record presents a picture of a stepped shift in climate in the run-up to the Great Ice Age. Lake El'gygytgyn seems set to become the standard against which other, more patchy records around the Arctic Ocean are matched and correlated. Indeed it is the longest and most detailed record of climate for the Earth's land surface, compared with 120 and 800 ka for the Greenland and Antarctic ice-caps.

Modelling their findings against likely atmospheric CO₂ levels the authors provide grist to the media mill which focuses on how the late Pliocene may be a model for a future warm Earth if emissions are not curtailed, with visions of dense polar forests

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