

# **INFORME GEOBRASIL**

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## ?? DICAS DA SEMANA

### SIGEP - NOVA PROPOSTA

A SIGEP objetiva o cadastro de sítios geológicos e paleobiológicos do Brasil a serem preservados e a sua publicação na forma de artigos científicos que incluem recomendações de preservação desses sítios.

A partir dessa base de dados (ver sítios já publicados: <http://www.unb.br/ig/sigep/sitios.htm>), disponibilizada em livros e na Internet, em português e em inglês, serão selecionados sítios a serem propostos à UNESCO como Patrimônio da Humanidade.

Propostas de sítios brasileiros e de sua descrição sistematizada, com vistas a compor base de dados global (Global Indicative List of Geological Sites - GILGES), vem sendo submetidas, através de formulário padronizado (<http://www.unb.br/ig/sigep/formulario.htm>), por geocientistas que trabalharam nas áreas dos sítios.

Tais propostas são disponibilizadas na Internet para conhecimento e avaliação, não só por parte dos membros da comissão SIGEP mas, também, da comunidade geocientífica em geral. Comentários a favor e contra, sugestões e críticas pertinentes, juntamente com as réplicas e trélicas, são veiculadas também na mesma página da proposta.

(Ver propostas em estudo <http://www.unb.br/ig/sigep/propostas/> e propostas já aprovadas: <http://www.unb.br/ig/sigep/quadro.htm>)

É com satisfação que informamos o recebimento de mais uma proposta de sítio com compromisso de sua descrição (clique abaixo):

TANQUES DO RIO CARNAÚBA – ACARI - RN

Aguardamos seus comentários, a favor e contra, sugestões e críticas que embasarão a aprovação ou não dessas propostas.

Saudações

Manfredo Winge

Representante da SBG

P/corpo editorial

## ?? CONGRESSOS E SIMPÓSIOS

### NOVO PRAZO PARA ENVIO DE TRABALHOS: GEONORDESTE 2006 - III SIMPÓSIO REGIONAL DE GEOPROCESSAMENTO E SENSORIAMENTO REMOTO

27 de agosto de 2006 - CHAMADA PARA TRABALHOS

Embrapa Tabuleiros Costeiros e Rede Sergipe de Geotecnologias

Aracaju / SE - Brasil

Outubro 25-27, 2006

<http://www.cpatc.embrapa.br/srgsr/>

## ?? ÍNDICE DE NOTÍCIAS

### ?? AMBIENTE BRASIL

Sete estados dos EUA estabelecem limites de emissão de GEE

Nova York, Nova Jérsey e mais cinco estados do nordeste Norte Americano estabeleceram uma meta para reduzir as emissões de dióxido de carbono em 10% num período de 10 anos, ajudando a reduzir o aquecimento global.

Secas na Amazônia serão mais freqüentes, dizem pesquisadores

Segundo pesquisadores, a seca recorde de 2005 não foi um evento extremo isolado e sim uma

amostra do que o futuro reserva para o clima da região.

Itaipu aumenta a produção de energia para socorrer a região Sul

O aumento acontece para compensar a queda na produção das hidroelétricas que abastecem a região. A falta de chuva baixou o nível dos rios e reservatórios de todo o Sul.

Risco de rodízio mais severo ainda existe, diz Sanepar

A chuva que caiu desde quarta-feira (16) na Grande Curitiba (PR) foi insignificante para o sistema de abastecimento de água.

Ibama trata jaguatirica com acupuntura

O filhote é uma fêmea encontrada há dois meses por técnicos do Ibama perdida nas ruas do centro de Manaus (AM). O animal estava bastante debilitado, desnutrido e sem nenhuma sensibilidade nas patas traseiras.

Baleias assassinas também sabem fazer as pazes

Um novo estudo sugere que, como os seres humanos, as baleias também fazem as pazes - no caso delas, nadando lado a lado.

China volta a sacrificar cães em massa para combater a raiva

A China viveu neste verão três epidemias de raiva, basicamente em zonas rurais. A doença causou 19 mortes e obrigou o sacrifício em massa de cachorros.

Portugal registra redução de incêndios florestais em 2006

Cerca de 50 mil hectares de florestas já foram queimados este ano em Portugal, um terço da média de bosques destruídos no mesmo período nos últimos cinco anos.

Governo aumenta valor de compra de produção de agricultura familiar

O governo aumentou valor-limite para a compra de R\$ 2,5 mil para R\$ 3,5 mil anuais. Com a possibilidade de vender mais, os agricultores também poderão ampliar a produção.

Curitiba/PR discute IR ecológico

Líderes de organizações ambientais e empresários paranaenses debaterão, na próxima segunda (21) e terça-feira (22), o Projeto de Lei que cria um estímulo fiscal para projetos ambientais.

Rede Brasileira de Agendas 21 define estrutura de trabalho

A Rede Brasileira de Agendas 21 terá um colegiado nacional, com mandato de um ano, representado por processos de Agenda 21 de todas as regiões do país, para deliberar sobre suas atividades, projetos, plano e grupos de trabalho.

Projeto Quelônios da Amazônia é realizando no entorno do Parna do Araguaia

O objetivo básico é promover o manejo e a proteção dos principais quelônios encontrados na Amazônia Brasileira.

Vazamento de óleo no Líbano mobiliza comunidade internacional

O governo libanês pediu ajuda material, como navios de limpeza, bombas e produtos solventes ou absorventes, e vários Estados-membros da União Européia já responderam ao pedido.

ESA pede observação mundial do impacto de sonda na Lua

A sonda, lançada anos atrás para testar um sistema de propulsão de íons, realizou diversas observações da superfície lunar.

Quilombolas de Marambaia/RJ levaram "balde de água gelada", diz moradora

A anulação do relatório que delimitava a área de ocupação das 160 famílias remanescentes de quilombolas na Ilha de Marambaia decepcionou a Vânia Guerra, presidente da Associação Quilombola da Marambaia (RJ).

Todas as formas de tabagismo fazem mal ao coração

Os fumantes correm um risco três vezes maior de sofrer um infarto do miocárdio em relação a pessoas que nunca fumaram.

Menina de 9 anos morre de gripe aviária na Indonésia

Garota é a 45ª vítima mortal do vírus no país que registrou o maior número de mortes pela gripe aviária.

Gripe aviária reapareceu na Ásia devido a novos tipos do vírus

Segundo a FAO, os últimos focos de gripe aviária no sudeste asiático foram causados por novos tipos isolados do vírus que aparecem junto a outros já conhecidos.

Depois de quase três décadas, índios Krahô-Kanela terão direito à reserva no Tocantins

Os presidentes do Incra, Rolf Hackbart, e da Funai, Mércio Pereira Gomes, assinaram uma

portaria, nesta quinta-feira (17), que autoriza a obtenção de dois imóveis rurais para a constituição da reserva indígena no Tocantins.

Mudança climática esculpiu os Alpes, diz pesquisa

Após 3 milhões de anos de tempo quente e úmido, o clima voltou a esfriar e geleiras se formaram nos Alpes. Mas isso está mudando de novo, por conta do aquecimento global.

Canadá planeja 'Clean Air Pact' como alternativa a Kyoto

O Primeiro Ministro do Canadá, Stephen Harper, declarou que o Canadá não atingirá a sua meta de Kyoto para a redução das emissões de gases do efeito estufa em 6% abaixo do nível de 1990.

Projeto mexicano é exemplo para mercado de carbono

O projeto utiliza um modelo de desenvolvimento sustentável para produzir e vender 'reduções' de carbono há mais de dez anos.

Escassez de água é problema global, diz WWF

Segundo um relatório do WWF, mudanças climáticas, perda de áreas alagadas, infra-estruturas inadequadas e mau gerenciamento dos recursos transformaram a questão em "problema verdadeiramente global".

EUA abrirão mais áreas de exploração de petróleo no Alasca

Ambientalistas criticam a decisão, tomada mesmo depois de se revelar o risco de vazamento em um campo já explorado na região.

MMA promove encontro sobre Programa Nacional de Capacitação de Gestores

O objetivo do encontro, que acontece de 23 a 25 de agosto, é fazer um balanço do primeiro ano de atividades do programa e definir estratégias para a organização da Rede Nacional de Capacitação em Gestão Ambiental.

Petrobras anuncia aumento da oferta de diesel menos poluente no país

A Petrobras aumenta, a partir deste mês, o número de regiões do país beneficiadas com a comercialização do diesel 500, produto menos poluente, que chega a ter teor de enxofre até 75% menor do que o diesel normal.

Gene do cérebro é o mais diferente entre homem e macaco

Segundo um estudo, publicado na edição desta quinta-feira (17) da revista Nature, uma região do DNA ligada à formação do cérebro é a que mais mudou desde que a linhagem humana se separou da do chimpanzé.

STF suspende sentença contra o Projeto de Integração das Bacias do São Francisco

A Associação Mineira de Defesa do Ambiente queria anular o edital do Ibama que trata do Projeto, alegando ser uma obra de grande impacto socioambiental e que o processo de licenciamento dificultou o direito do povo mineiro à informação.

SC edita portaria com regras de trânsito de aves

Aortaria faz parte da adaptação ao plano de prevenção da gripe aviária e controle da doença de Newcastle, e proíbe a entrada de aves de descarte procedentes de outros Estados para abate em Santa Catarina, exceto aquelas destinadas a estabelecimentos com fiscalização federal.

Secretaria volta a proibir queima de cana em SP

A Secretaria do Meio Ambiente do Estado de São Paulo alega baixa umidade e alta temperatura para proibir a queima. Se o produtor descumprir a determinação, será advertido e, se reincidente, poderá ser autuado e multado.

Greenpeace denuncia uso de baía filipina como área de despejo

Segundo nota do Greenpeace, o problema "afeta diretamente a saúde e o sustento dos 10 milhões de pessoas que vivem na região.

Decisão judicial permite divulgação de informações sobre males causados por pneus usados

O MMA e o Ibama pretendem com a divulgação de cartilhas informar ao público sobre a importante questão de pneus e como a importação de pneus usados poderá prejudicar o ecossistema de nosso país.

Decreto autoriza a redução da Reserva Legal em sub-zona do ZEE de Rondônia

O decreto presidencial, publicado no Diário Oficial da União desta quarta-feira (16), adotou a recomendação feita pelo Conama para que a reserva legal, ao longo da BR-364, seja reduzida em até 50% da área da propriedade rural.

Fóssil revela baleia caçadora de tubarões

De acordo com o cientista Erich Fitzgerald, que estudou um fóssil de 25 milhões de anos, a baleia Janjucetus era uma caçadora implacável.

Grana transgênica escapa do laboratório nos EUA

Segundo o jornal The New York Times, um tipo de grama geneticamente modificada, ainda não aprovado para uso, foi encontrado em terreno selvagem. A grama foi criada para uso em campos de golfe, e é resistente ao herbicida glifosato.

Bombeiros controlam incêndio em parque de Goiás

O fogo começou no sábado (12) e destruiu cerca de 45% do Parque Estadual da Serra de Caldas Novas (GO).

Pesquisa abre caminho para remédio contra gripe aviária

Cientistas mapeiam em detalhes a neuraminidase - o "N" do H5N1 - que é a proteína que permite ao vírus espalhar-se pelas células do corpo.

Gripe aviária faz China sacrificar mais de 210 mil aves

O foco da doença foi encontrado na província de Hunan no dia 4 de agosto. Este é 38º foco de gripe aviária informado pela China desde outubro.

Guerra no Líbano gera maior crise ambiental em 7 anos

O derramamento de petróleo já poluiu mais de 140km da costa libanesa e se espalha no norte, em águas da Síria.

Primeiro plano de proteção do mar Cáspio entra em vigor

Os cinco países assinaram esta Convenção em novembro de 2003, seguindo passos dados no passado pelos Estados banhados pelos mares Mediterrâneo e Báltico.

EUA usam golfinhos em treinamento militar

Leões-marinhas também estão em batalhão especial da Marinha; entidades de proteção animal se revoltam.

Projeto que tira sal da água dobra alcance

Investimento de R\$ 6 mi do BNDES deve expandir recuperação de água salgada para 10 Estados, priorizando regiões secas de baixo IDH.

Médicos polemizam sobre o poder da soja na saúde

Parecer da Sociedade Brasileira de Endocrinologia e Metabologia afirma que o efeito da soja sobre os calores da menopausa é praticamente nulo e ela também não age sobre outros sintomas do climatério.

Pequim faz censo canino para evitar epidemia de raiva

As autoridades da capital chinesa, Pequim, vão fazer uma contagem da população de cachorros na cidade.

Incêndio da Serra da Boa Esperança (PR) já dura uma semana

Até a sexta-feira, o fogo já havia consumido 30 hectares da mata.

ONG dedicada aos sapos disponibiliza na internet um guia completo de anfíbios de SC

Trabalho traz fotos em alta resolução, arquivos de som dos coaxares e vídeos, muitos vídeos, com as espécies coaxando.

Petrobras e YPF decidem estender negociações sobre o preço do gás por mais 60 dias

A próxima reunião entre as empresas está marcada para 14 de setembro, na Bolívia.

Professor cria pescada num porão de Nova York

Os tanques poderiam ser instalados "em vários lugares, de armazéns a arranha-céus", diz Martin Schreiber

Tailândia tem 46 possíveis novos casos de gripe aviária

A Organização Mundial da Saúde já confirmou 236 casos de gripe aviária no mundo todo. Deste total, 138 foram fatais.

Ciência acessível

Os pesquisadores do Experimento de Grande Escala da Biosfera-Atmosfera na Amazônia acabam de entrar no caminho da divulgação científica.

Edital de apoio a projetos da Fundação O Boticário recebe propostas até 31 de agosto

Os recursos para os projetos aprovados serão liberados a partir de janeiro. A organização prioriza

parte deles a três biomas específicos: Cerrado, Mata Atlântica e Pantanal.  
México registra tremor de 5,1 graus na costa oeste  
Sem causar danos, foi percebido apenas em alguns edifícios mais altos da capital mexicana.  
Tremor de 5,9 graus na escala Richter atinge a Nova Zelândia  
O movimento foi sentido também na cidade de Christchurch e na parte sul da Ilha do Norte.  
Rússia suspende restrições à carne de Mato Grosso  
A liberação do comércio entre Mato Grosso e Rússia abre precedente para a normalização do mercado com outros estados embargados.  
Encontro discute sustentabilidade e mercado de créditos de carbono no Brasil  
Empresas do Interior de São Paulo apostam em fontes alternativas de energia e já se tornam um dos principais mercados para investidores estrangeiros.

## ?? JORNAL DA CIÊNCIA

### Edição 3082 - Notícias de C&T - Serviço da SBPC

- 1 - Reunião ordinária da CTNBio "limpa" pauta com 92 itens
- 2 - Leitor comenta artigo "Direito de veto paralisa CTNBio", de Fernando Reinach
- 3 - Reunião da Comunidade Sul-Americana de Nações (Casa) sobre Ciência, Tecnologia e Inovação, no Rio, na semana que vem
- 4 - Sociedade brasileira está consciente da importância da inovação para desenvolvimento nacional, diz ministro
- 5 - FAP-DF poderá ter recursos assegurados em 2007
- 6 - Regulamentação do Fundeb será discutida por secretários de Educação e MEC
- 7 - Fenômeno de aproximação de Marte com a Terra é negado
- 8 - Política de iniciação científica é avaliada no CNPq
- 9 - Secas na Amazônia serão mais frequentes, dizem pesquisadores do Inpe
- 10 - Criticado por ONGs, governo revê artigo da lei de florestas
- 11 - Escassez de água vai se agravar
- 12 - Pesquisa acha gene-chave para a evolução do cérebro
- 13 - Gripe do frango tem calcanhar-de-aquiles
- 14 - A beleza do sorriso, artigo de Suzana Herculano-Houzel
- 15 - UFRJ exhibe mamífero "pós-dinossauros"
- 16 - SP suspende avaliação de escolas
- 17 - Ceará: inovação em parceria, artigo de Hélio Barros
- 18 - Aqüicultura: SC terá Centro de Diagnóstico e Estudos de Patologias de Organismos Aquáticos
- 19 - Pesquisa mostra o potencial da energia solar para residências brasileiras
- 20 - Rio sedia maior encontro de saúde pública da América Latina
- 21 - Previ e BBI serão parceiros da Finep na seleção e análise de fundos de capital de risco
- 22 - Ampliação do Laboratório Nacional de Astrofísica inclui o Brasil no mercado internacional de instrumentação astronômica
- 23 - Lançamento da revista Estudos Avançados, nº 57
- 24 - Associação Nacional de Pós-Graduação e Pesquisa em Educação (Anped) promove sua 29ª Reunião Anual, em Caxambu, MG, de 15 a 18 de outubro
- 25 - Lançamento do livro "Nanotecnologia, Sociedade e Meio Ambiente"
- 26 - Lançado o livro "À luz das estrelas – Ciência através da Astronomia", de Lilia Irmeli Arany-Prado
- 27 - Bolsa Pew para Pós-Doutorado nos EUA
- 28 - Pós-graduação em Biodiversidade Vegetal e Meio Ambiente do Instituto de Botânica de SP
- 29 - Inovatec 2006 - Feira de Negócios em Inovação Tecnológica entre Empresas, Centros de Pesquisa e Universidades
- 30 - Inscrições para a Reunião Anual de Usuários do LNLS
- 31 - Unicamp lança 3ª turma do curso de Especialização em Gestão Estratégica da Inovação

Tecnológica na cidade de SP

32 - VI Semana de Engenharia de Produção Sul-Americana (Seprosul)

33 - Universidade Federal de Ouro Preto (Ufop) seleciona professor visitante

### **Edição 3081 - Notícias de C&T - Serviço da SBPC**

1 - Fernando Haddad anuncia R\$ 300 milhões para expansão da educação superior em 2007

2 - Deputada federal e candidata ao senado, Jandira Feghalli debate C&T e Ensino Superior

3 - Finep recebe parlamentares da CPI dos Sanguessugas nesta quarta, às 16h

4 - Conselho de Reitores tem nova diretoria

5 - Federação internacional escolhe a Fiocruz como a melhor instituição do mundo em saúde pública

6 - CNPq começa seleção de projetos sobre doenças negligenciadas

7 - Fundação de Apoio ao Desenvolvimento do Ensino e C&T de Mato Grosso do Sul (Fundect) lança edital para Primeiros Projetos

8 - Abertas as inscrições para a Semana de Ciência, Tecnologia e Cultura da UFRN – Cientec 2006

9 - No ar o portal de cooperação científica entre países árabes e América Latina

10 - Aula inaugural de Pós-Graduação em Museologia e Patrimônio da UniRio/Mast

11 - Conselho barra cotas na federal do Espírito Santo

12 - Estudo do Ipea aponta que empresas inovadoras geram mais empregos e remuneram melhor do que a média

13 - Aids: Prevenção é nova prioridade

14 - Conferência Mundial de Aids: Apesar de promissoras, vacinas estão longe de se tornar uma realidade

15 - Conferência Mundial de Aids: Pesquisador brasileiro aponta nova forma recombinante do HIV no Rio Grande do Sul

16 - Sistema Solar pode ficar com 12 planetas

17 - Nasa não consegue achar vídeos de viagens para a Lua

18 - Experimento sobre Big Bang ganha prêmio

19 - Sistema solar pode ser comum em Órion

20 - Aumenta registro de infecções por rotavírus

21 - Direito de veto paralisa CTNBio, artigo de Fernando Reinach

22 - Abertas as inscrições para a primeira fase da III Olimpíada Brasileira de Biologia

23 - O inimigo público número um, artigo de Nora Bär

24 - Comissão Coordenadora do Plano Estratégico Nacional de Áreas Protegidas (PNAP) ainda não saiu do papel

25 - Cursos brasileiros de Engenharia de Materiais avaliados pelo Enade, artigo de José Roberto G. da Silva

26 - O conteúdo, senhores, o conteúdo!, artigo de Renato Gianuca

27 - Universidade Federal de Ouro Preto (Ufop) lança revista ArteFilosofia

28 - X Congresso Brasileiro de Nutrologia promoverá Simpósios de Nutrologia Geriátrica

29 - Cursos de extensão do Instituto de Física Teórica da Unesp

### **Edição 3080 - Notícias de C&T - Serviço da SBPC**

1 - Academia Brasileira de Ciências divulga resultado do programa "Bolsa Auxílio L'Oreal Brasil para Mulheres na Ciência"

2 - Encontro discute ações voltadas às engenharias no Brasil

3 - CNPq lança edital para cursos de curta duração em Biotecnologia

4 - Inpi testa sistema de registro on-line

5 - Capes apóia programas com a Espanha

6 - Melhores alunos do Enade não acertaram nem metade da prova

7 - Leitora comenta editorial "As lições do Enade", de "O Estado de SP"

- 8 - Educação integral: muitos modelos possíveis, artigo de Antonio Matias
- 9 - Ministérios da Educação e da Cultura instituem o Plano Nacional do Livro e Leitura
- 10 - Moysés Nussenzeig profere palestra "A Física da Vida", nesta quinta-feira, às 17:30h, no Fórum de Ciência e Cultura da UFRJ, no Rio
- 11 - Fundação de Amparo à Pesquisa do Amazonas (Fapeam) prorroga prazo de entrega das propostas para o edital de Comunicação Científica
- 12 - A independência energética, artigo de José Goldemberg
- 13 - Cerrado pode desaparecer por completo em apenas 30 anos
- 14 - Prefeitura de Pequim proíbe lançamento ao espaço exterior de cinzas mortuárias e levanta questões jurídicas pouco habituais
- 15 - Aquecimento de 3 graus vai mudar configuração global
- 16 - Hubble fotografa estrelas bebês e jovens juntas
- 17 - Conferência decide se Plutão merece receber título de planeta
- 18 - Navio japonês perfura 5,8 km debaixo do mar
- 19 - Prevenção e tratamento de Aids precisam andar juntos
- 20 - Farmacologia: Droga com anticorpos causou reação imune
- 21 - Esperma congelado pode ajudar a reviver mamutes
- 22 - Aluna da Escola Municipal Cecília Meireles vence o 1º Prêmio Jovem Empreendedor, da Universidade Federal de Juiz de Fora
- 23 - EUA deporta cientistas iranianos com visto vigente
- 24 - Ópera sobre a vida de Oswaldo Cruz
- 25 - Teatro e Ciência em SP
- 26 - Gás: Submarino e natural
- 27 - Abertas as inscrições para a participação no VI Simpósio Internacional de Telecomunicações
- 28 - Seleção para mestrado e doutorado
- 29 - 13º. Congresso Internacional de Imunologia
- 30 - Universidade Federal de Mato Grosso oferece mestrado em Ciências Florestais e Ambientais

### **Edição 3079 - Notícias de C&T - Serviço da SBPC**

- 1 - Conselho Consultivo da Finep considera ilegal o contingenciamento dos fundos setoriais
- 2 - Novo chefe da Unidade do Inpe de Santa Maria será anunciado em breve
- 3 - Cientistas latino-americanas buscam mais espaços
- 4 - Criada Câmara Executiva para implementação do Fórum do SBTVD-T
- 5 - Lula designa ministro da C&T para solucionar problema salarial da carreira de C&T
- 6 - Julgamento e resultado de projetos do CNPq será todo informatizado
- 7 - Por votos, políticos propõem 86 novas universidades federais
- 8 - UFRJ não consegue pagar manutenção básica
- 9 - MEC homologa obrigatoriedade do ensino de filosofia e sociologia
- 10 - As lições do Enade, editorial do "O Estado de SP"
- 11 - Faculdade Tancredo Neves se prepara para fechar as portas
- 12 - Colóquio analisa educação superior no Brasil e nos EUA
- 13 - Tecnologia: Conferência discute educação a distância
- 14 - Universidade Estadual do Norte Fluminense Darcy Ribeiro (Uenf) completa 13 anos
- 15 - Cabral, Crivella, Frossard e Paes faltam ao debate da Uerj
- 16 - Representações do Brasil no exterior refletem ênfase na relação sul-sul
- 17 - "Ciência e Cultura" com dossiê sobre a Amazônia, já está circulando
- 18 - Petrobras assina acordo com empresas portuguesas para estudos em águas profundas da costa de Portugal
- 19 - Astrônomos estão reunidos na capital da República Tcheca, Praga, na esperança de definir exatamente o que é um planeta
- 20 - Cientistas do MIT lançam nova teoria sobre deformações da Lua
- 21 - A nova sopa cósmica, artigo de Marcelo Gleiser
- 22 - Câncer do cão, artigo de Marcelo Leite



- 23 - Aids: Novas drogas pressionam gastos do governo
- 24 - Aids: Laboratório cria nova classe de medicamento
- 25 - Brasileiros ganham prêmio com dispositivo para cegos
- 26 - Aquecimento global acelera degelo no Norte
- 27 - Americanos rejeitam teoria da evolução
- 28 - "Primas" de caranguejeira têm 110 milhões de anos
- 29 - Peixe comedor de detrito regula ciclo de carbono
- 30 - Tecnociência pura
- 31 - Ameaça ambiental em alto-mar, artigo de Sylvia Earle
- 32 - A ciência também veio para confundir
- 33 - Pressionado, cientista publica texto inconclusivo
- 34 - A Teoria Gaia e a Gestalt, artigo de Luis Lira
- 35 - Seminário internacional discutirá efeitos de campos eletromagnéticos
- 36 - Grupo "cria" agressividade em laboratório
- 37 - Estudo acha nova causa para deficiência no DNA
- 38 - Cientistas brasileiros descobrem novo mecanismo contra obesidade
- 39 - Gripe aviária: Na Tailândia, 46 pessoas estão em observação
- 40 - Inpa apresenta a história dos bagres da Amazônia
- 41 - Nova tecnologia auxilia diagnóstico do câncer de pele
- 42 - Concurso com 31 vagas de professores efetivos para o Cefet-PI
- 43 - Vaga para professor do Programa de Pós-Graduação em Administração da Unisul

## ?? COMCIÊNCIA

- Patrimônio arqueológico do Brasil pede socorro

Dos 13 mil sítios arqueológicos catalogados pelo Iphan, apenas 920 estão no único parque brasileiro tombado por seu patrimônio arqueológico. Entre os principais entraves está a falta de políticas para a criação de parques arqueológicos e o reconhecimento de parques por seu valor ambiental e não arqueológico.

<http://www.comciencia.br/comciencia/?section=3-icia=183>

- Mídia e legislação garantem sucesso dos genéricos

No Brasil, os medicamentos genéricos conseguiram conquistar altos índices de venda em pouco tempo, porque houve contínua adequação à legislação, quando necessária, além do apoio da mídia. Esta é uma das conclusões de um artigo que analisa o processo da implantação da política de genéricos no país de 1999 a 2002.

<http://www.comciencia.br/comciencia/?section=3-icia=182>

- Casa de madeira é alternativa para moradia social e preservação ambiental

No Brasil, o déficit habitacional para a população de baixa renda é estimado em 6,6 milhões de moradias. A ampliação do uso da madeira de reflorestamento apresenta-se como uma alternativa para produção de moradias de interesse social que reduz os custos com as obras da construção civil.

<http://www.comciencia.br/comciencia/?section=3-icia=180>

## ?? SOCIEDADE BRASILEIRA DE ESPELEOLOGIA

É com satisfação que disponibilizamos mais um número do boletim eletrônico SBE Notícias (edição nº 23 - 12/08/2006)

Esta edição traz as seguintes matérias:

- SBE realiza a III Expedição Tocantins;
- "SBE de Portas Abertas" tem como tema: Fungos;

- Encontrada figura da mitologia pérsia em caverna no Afeganistão;
- Laboratório de Los Alamos cria rádio subterrâneo com tecnologia digital;
- Humanidade pode ter 5% de DNA Neandertal;
- SBE participa de feira de esportes e turismo de aventura;
- Uso sustentável do palmito Juçara.

O boletim é editado em formato PDF e pode ser baixado clicando no link:

[http://www.sbe.com.br/sbenoticias/SBENoticias\\_023.pdf](http://www.sbe.com.br/sbenoticias/SBENoticias_023.pdf)

As edições anteriores do boletim também estão disponíveis aos interessados no site:

<http://www.sbe.com.br/sbenoticias.asp>

Colabore enviando notícias, críticas, sugestões, fotos, etc.

## ?? MUNDOGEO

GNSS e Serviços de Localização

Robôs usam tecnologia de navegação por satélite para se locomover na água

Novos equipamentos para agricultura de precisão rastreiam os sinais GNSS

Conferências internacionais consolidam o GEOBrasil como referência mundial do setor

GIS e Imagens de Satélite

Satélites Grace, da NASA, mostram diminuição do volume de gelo na Groenlândia

Software cria mundo virtual em 3D a partir de fotografias digitais

Imagens de satélites mostram derramamento de óleo no Líbano

Agrimensura, Cartografia e Cadastro

Congresso Brasileiro de Georreferenciamento e Geoprocessamento

Lançada nova versão do CD LEGEO - Legislação e Georreferenciamento

Resolução nº 1.010 do CONFEA: prazo para sugestões termina dia 15 de agosto

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#### **Planets are round. Will that do? p724**

Astronomers attempt to break deadlock over definition.

Jenny Hogan

10.1038/442724a

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#### **AIDS meeting urged to rethink prevention strategy p724**

Researchers seek new ways to fight disease.

Erika Check

10.1038/442724b

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#### **Homing in on the genes for humanity p725**

What makes us different from chimps?

Kerri Smith

10.1038/442725a

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## Sidelines p726

10.1038/442726a

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## Guilty, but no jail sentence for Russian scientist p726

Human-rights groups condemn conviction.

Quirin Schiermeier

10.1038/442726b

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## The outlook for Amazonia is dry p726

Drought of 2005 is a taste of things to come.

Jim Giles

10.1038/442726c

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## Florida lures research institutes east p729

Sunshine state appeals to Californian expertise.

Rex Dalton

10.1038/442729a

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## The methane mystery p730

The claim that living plants emit the greenhouse gas methane has shaken up atmospheric scientists. Quirin Schiermeier talks to the experts trying to make sense of the measurements.

10.1038/442730a

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## Business

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### More fizz at Pfizer? p734

Young blood is taking the helm at the world's biggest drug firm. Colin Macilwain assesses whether this is likely to revive its share price.

10.1038/442734a

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## News Features

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### Cancer: New fronts in an old war p735

10.1038/442735a

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### **Cancer: Caught in time p736**

The detection of cancer at an early stage in its development can be life-saving. With research efforts under way to find better methods to detect minuscule tumours, Laura Spinney finds out how near some of these cancer 'biomarkers' are to the clinic.

10.1038/442736a

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### **Cancer: Off by a whisker p739**

Much of what we know about cancer comes from studying mice, and potential therapies are tested in the animals. But the differences between the species can scupper the best laid plans of researchers and drug companies, reports Carina Dennis.

10.1038/442739a

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### **Cancer: The root of the problem p742**

Is targeting cancer stem cells a way to finish tumours off once and for all — or just the latest in a long line of false dawns? Alison Abbott looks at a debate that's generating both heat and light.

10.1038/442742a

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### **Conservation requires multiple approaches p744**

Kamaljit S. Bawa

10.1038/442744a

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### **Researchers should ensure that their actions are lawful p744**

Peter Cohen

10.1038/442744b

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### **Wiki and other ways to share learning online p744**

Stephen Caddick

10.1038/442744c

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### **It's easier to patent plants than to publish research p744**

U. C. Lavanaia

10.1038/442744d

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## Books and Arts

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### Defining moments p745

What are the major principles that controlled the origin of life?

David Penny reviews *Singularities: Landmarks on the Pathways of Life* by Christian de Duve

10.1038/442745a

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### Secret giants p746

Jon Agar reviews *Colossus: The Secrets of Bletchley Park's Codebreaking Computers* edited by B. Jack Copeland

10.1038/442746a

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### Exhibition: Discovering the invisible p747

10.1038/442747a

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### Small science, big challenge p747

Julia A. Moore reviews *Nanotechnology: New Promises, New Dangers* by Toby Shelley

10.1038/442747b

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## News and Views

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### Quantum physics: A spin solo p749

Quantum computers could solve problems insurmountable to conventional computers. The missing ingredient for quantum computing with electron spins is now available — the rotation of a single spin.

Guido Burkard

10.1038/442749a

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### Genomics: Predictable packaging p750

Nuclear factors must access specific sites within genomic DNA to function, yet the DNA is bundled up into many nucleosomes. Is the DNA sequence sufficiently informative to predict where each nucleosome will be?

Timothy J. Richmond

10.1038/442750a

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### **50 & 100 years ago p751**

10.1038/442751a

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### **Solid-state physics: Resistance is futile p752**

With the right combination of microwave radiation and magnetic field, two-dimensional electron systems conduct electricity with zero resistance. But is this zero really zero, or is it negative resistance in disguise?

Adam C. Durst

10.1038/442752a

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### **Astronomy: Young spirals get older p753**

These days, galaxies come in very different shapes and sizes. Cutting-edge technologies allow a detailed peek at how things looked in the Universe's early days, 'the same, but different' is the tentative message.

Robert C. Kennicutt, Jr

10.1038/442753a

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### **Cancer biology: A game of subversion p754**

Just as stem cells are crucial for tissue development and regeneration, cancer stem cells underlie tumour formation and maintenance. But do cancer stem cells invariably arise from normal stem cells?

Emmanuelle Passegue

10.1038/442754a

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### **Obituary: George W. Wetherill (1925-2006) p756**

Geochemist, planetary scientist and astrobiologist.

Alan P. Boss

10.1038/442756a

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### **Silent spread of H5N1 in vaccinated poultry p757**

A chink in the protection of a caged flock can dramatically increase the chances of a flu outbreak.

Nicholas J. Savill, Suzanne G. St Rose, Matthew J. Keeling and Mark E. J. Woolhouse

10.1038/442757a

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### Cell biology: Nondisjunction, aneuploidy and tetraploidy pE9

Beth A. A. Weaver, Alain D. Silk and Don W. Cleveland

10.1038/nature05139

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### Cell biology: Nondisjunction, aneuploidy and tetraploidy (Reply) pE10

Qinghua Shi and Randall W. King

10.1038/nature05140

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### Multiferroic and magnetoelectric materials p759

W. Eerenstein, N. D. Mathur and J. F. Scott

10.1038/nature05023

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### Driven coherent oscillations of a single electron spin in a quantum dot p766

F. H. L. Koppens *et al.*

10.1038/nature05065

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### A genomic code for nucleosome positioning p772

A combined computational and experimental approach is used to determine the DNA sequence preferences of nucleosomes and predict genome-wide nucleosome organization. The yeast genome encodes an intrinsic nucleosome organization, which can explain about 50% of in vivo nucleosome positions.

Eran Segal *et al.*

10.1038/nature04979

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### **PML inhibits HIF-1 $\alpha$ translation and neoangiogenesis through repression of mTOR p779**

The tumour suppressor gene PML is shown to normally restrain angiogenesis, both in tumours and under ischaemic conditions. This involves a new pathway in which during hypoxia, PML regulates mTOR and the transcription factor HIF-1 $\alpha$

Rosa Bernardi *et al.*

10.1038/nature05029

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## **Letters**

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### **The rapid formation of a large rotating disk galaxy three billion years after the Big Bang p786**

Observations of a luminous star-forming galaxy when the Universe was only 20% of its current age reveal high gas surface densities, large star formation rate and moderately young stellar ages, suggesting rapid assembly, fragmentation and conversion to stars of an initially very gas-rich protodisk.

R. Genzel *et al.*

10.1038/nature05052

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### **No signature of clear CO<sub>2</sub> ice from the 'cryptic' regions in Mars' south seasonal polar cap p790**

The low albedo region of the seasonal polar ice caps of Mars could result from absorption by the underlying surface. But the deep and broad CO<sub>2</sub> absorption bands that are expected in the near infrared from a thick transparent slab of CO<sub>2</sub> ice are not observed.

Yves Langevin *et al.*

10.1038/nature05012

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### **CO<sub>2</sub> jets formed by sublimation beneath translucent slab ice in Mars' seasonal south polar ice cap p793**

Infrared and visible observations show that features on the martian south polar cap remain at CO<sub>2</sub> ice temperatures well into summer, and must be granular materials that have been brought up to the surface of the ice.

Hugh H. Kieffer, Philip R. Christensen and Timothy N. Titus

10.1038/nature04945

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### **Spontaneous skyrmion ground states in magnetic metals p797**

New theoretical work shows that skyrmions can form stable ground states in various types of magnetic metals and may be observed directly with modern magnetic microscopy techniques. Moreover, it predicts that spontaneous skyrmion ground states exist generally in a large number of materials.

U. K. Roszler, A. N. Bogdanov and C. Pfleiderer

10.1038/nature05056

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### **Resonant slow fault slip in subduction zones forced by climatic load stress p802**

Anthony R. Lowry

10.1038/nature05055

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### **Archaea predominate among ammonia-oxidizing prokaryotes in soils p806**

Nitrification, the microbial conversion of ammonia to nitrate, is a key process in the global nitrogen cycle. This reaction is predominately carried out by archaeal and not bacterial ammonia oxidizer, as the archaeal ammonia oxidizers are more abundant in soils than their well-known bacterial counterparts.

S. Leininger *et al.*

10.1038/nature04983

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### **Hierarchy and adaptivity in segmenting visual scenes p810**

Computer algorithms have not been successful at finding coherent regions in noisy visual images under natural viewing conditions. A new approach can now determine all salient regions of an image and build them into a hierarchical structure faster and more accurately than previous approaches.

Eitan Sharon *et al.*

10.1038/nature04977

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### **Phosphorylation of WAVE1 regulates actin polymerization and dendritic spine morphology p814**

Yong Kim *et al.*

10.1038/nature04976

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### **Transformation from committed progenitor to leukaemia stem cell initiated by MLL–AF9 p818**

Oncogenic transformation of committed blood progenitor cells can produce

leukaemic stem cells with the ability to self-renew through critical changes in gene \_expression.

Andrei V. Krivtsov *et al.*

10.1038/nature04980

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### **Notch signalling regulates stem cell numbers in vitro and in vivo p823**

The Notch receptor plays a pivotal role in a pathway that controls the survival of embryonic, fetal and adult stem cells, as it activates the phosphatidylinositol-3-OH kinase/Akt signalling pathway and identifies a key serine on STAT3.

Andreas Androutsellis-Theotokis *et al.*

10.1038/nature04940

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### **Protein flexibility acclimatizes photosynthetic energy conversion to the ambient temperature p827**

Examination of the photosystem II reaction centre shows that changes in locally flexible domains allow enzyme adaptation to ambient temperature. Mutations in the packing motif of mesophiles that increase the residue bulkiness and reduce the size of cavities to promote thermophilic behaviour. Similar mechanisms may occur in other systems, including globular proteins that require acclimation to significantly different habitats.

Oksana Shlyk-Kerner *et al.*

10.1038/nature04947

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### **Structure of the catalytic domain of the hepatitis C virus NS2-3 protease p831**

Ivo C. Lorenz, Joseph Marcotrigiano, Thomas G. Dentzer and Charles M. Rice

10.1038/nature04975

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### **DNA overwinds when stretched p836**

Physical intuition predicts that DNA should unwind under tension as it is pulled towards a denatured structure, but this is not the case. Pulling of a single DNA molecule first leads to overwinding, which causes it to lengthen, not shorten. These results can be explained by a coupling between stretch and twist, such that the DNA inner radius changes under tension.

Jeff Gore *et al.*

10.1038/nature04974

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## Corrigendum: Structure of the Sec13/31 COPII coat cage p840

Scott M. Stagg *et al.*

10.1038/nature05141

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### Prospects p841

UK graduate students and postdocs are not getting stipend top-ups, despite available funds.

Paul Smaglik

10.1038/nj7104-841a

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### Japan's other research hub p842

Science is cut-throat by nature, but how should young scientists handle working on competitive projects — or worse, getting scooped? Kendall Powell investigates how to release the pressure valve.

Kendall Powell

10.1038/nj7104-842a

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### My grandfather's river p846

A stream of memories.

Brenda Cooper

10.1038/442846a

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16 August 2006

ARTICLES

### Crystal structures of a multidrug transporter reveal a functionally rotating mechanism

Satoshi Murakami *et al.*

doi: 10.1038/nature05076

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**An RNA gene expressed during cortical development evolved rapidly in**

## humans

Katherine S. Pollard et al.

doi: 10.1038/nature05113

[Abstracts](#) | [Full Text](#) | [PDF](#) | [Supplementary information](#)

## The structure of H5N1 avian influenza neuraminidase suggests new opportunities for drug design

Rupert J. Russell et al.

doi: 10.1038/nature05114

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## NEWS AND VIEWS

### Structural biology: Antiviral drugs fit for a purpose

Ming Luo

doi: 10.1038/nature05003

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### Evolutionary biology: Human brain gene wins genome race

Chris P. Ponting and Gerton Lunter

doi: 10.1038/nature05154

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13 August 2006

## ARTICLE

### Editing-defective tRNA synthetase causes protein misfolding and neurodegeneration

Jeong Woong Lee et al.

doi: 10.1038/nature05096

[Abstracts](#) | [Full Text](#) | [PDF](#) | [Supplementary information](#)

## LETTERS

### The tumour suppressor Hippo acts with the NDR kinases in dendritic tiling and maintenance

Kazuo Emoto et al.

doi: 10.1038/nature05090

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### Highly ordered arrangement of single neurons in orientation pinwheels

Kenichi Ohki et al.

doi: 10.1038/nature05019

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### Autophosphorylation at serine 1987 is dispensable for murine Atm activation in vivo

Manuela Pellegrini et al.

doi: 10.1038/nature05112

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### **NMDA-receptor-mediated, cell-specific integration of new neurons in adult dentate gyrus**

Ayumu Tashiro et al.

doi: 10.1038/nature05028

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### **Molecular biology: Sticky end in protein synthesis**

Hervé Roy and Michael Ibba

doi: 10.1038/nature05002

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## **?? SCIENCE**

Emeleus, C.H. and Bell, B.R., with contributions from Stephenson, D. *British Regional Geology: the Palaeogene Volcanic Districts of Scotland (Fourth edition)*.: British Geological Survey, Nottingham. 2005. ISBN: 0-85272-519-1. Price {pound}18.

J. G. MacDonald

*Mineralogical Magazine*. 2006; 70(3): p. 342-a-343-a

<http://minmag.geoscienceworld.org/cgi/content/full/70/3/342-a?ct=ct>

Moon, C.J., Whateley, M.K.G. and Evans, A.M. (Editors). *Introduction to Mineral Exploration*, 2nd edition, 2006.: Blackwell Publishing, Oxford. ISBN 1 405113 17 0. Price {pound}34.99, paperback. 481 pp.

P.W. Scott

*Mineralogical Magazine*. 2006; 70(3): p. 342

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REDOX PROPERTIES OF STRUCTURAL Fe IN FERRUGINOUS SMECTITE. A DISCUSSION OF THE STANDARD POTENTIAL AND ITS ENVIRONMENTAL IMPLICATIONS

Fabienne Favre, Joseph W. Stucki, and Pascal Boivin

*Clays and Clay Minerals*. 2006; 54(4): p. 466-472

<http://ccm.geoscienceworld.org/cgi/content/abstract/54/4/466?ct=ct>

Contributions of Slab Fluid, Mantle Wedge and Crust to the Origin of Quaternary Lavas in the NE Japan Arc

JUN-ICHI KIMURA and TAKEYOSHI YOSHIDA

*J. Petrology*. published 17 August 2006, 10.1093/petrology/egl041

<http://petrology.oxfordjournals.org/cgi/content/abstract/egl041v1?ct=ct>

Widespread arc-related melting in the mantle section of the northern Oman ophiolite as inferred from detrital chromian spinels

S. Arai, K. Kadoshima, and T. Morishita

*Journal of the Geological Society*. 2006; 163(5): p. 869-879

<http://jgs.geoscienceworld.org/cgi/content/abstract/163/5/869?ct=ct>

Stable isotope transfer in open and closed system across chemically contrasted boundaries: metacarbonate-granitoid contacts in the Querigut magmatic complex (Eastern Pyrenees, France)

Cyril Durand, Philippe Boulvais, Didier Marquer, and Michel Rossy

Journal of the Geological Society. 2006; 163(5): p. 827-836  
<http://jgs.geoscienceworld.org/cgi/content/abstract/163/5/827?ct=ct>

PREPARATION OF POROUS CARBONS FROM HALLOYSITE-SUCROSE MIXTURES

Ai-ping Wang, Feiyu Kang, Zheng-Hong Huang, and Zhancheng Guo  
Clays and Clay Minerals. 2006; 54(4): p. 485-490  
<http://ccm.geoscienceworld.org/cgi/content/abstract/54/4/485?ct=ct>

U-Pb age constraints on Variscan magmatism and Ni-Cu-PGE metallogeny in the Ossa-Morena Zone (SW Iberia)

I. Romeo, R. Lunar, R. Capote, C. Quesada, G.R. Dunning, R. Pina, and L. Ortega  
Journal of the Geological Society. 2006; 163(5): p. 837-846  
<http://jgs.geoscienceworld.org/cgi/content/abstract/163/5/837?ct=ct>

The extension of the western limb, Bushveld Complex (South Africa), at Cullinan Diamond Mine  
R. G. Cawthorn and N. McKenna

Mineralogical Magazine. 2006; 70(3): p. 241-256  
<http://minmag.geoscienceworld.org/cgi/content/abstract/70/3/241?ct=ct>

Severity and timing of Cenozoic exhumation in the southwestern Barents Sea

Andrew J. Cavanagh, R. Di Primio, M. Scheck-Wenderoth, and B. Horsfield  
Journal of the Geological Society. 2006; 163(5): p. 761-774  
<http://jgs.geoscienceworld.org/cgi/content/abstract/163/5/761?ct=ct>

CALORIMETRIC DETERMINATION OF THE ENTHALPIES OF FORMATION OF HYDROTALCITE-LIKE SOLIDS AND THEIR USE IN THE GEOCHEMICAL MODELING OF METALS IN NATURAL WATERS

Rama kumar Allada, Edward Peltier, Alexandra Navrotsky, William H. Casey, C. Annette Johnson, Hillary Thompson Berbeco, and Donald L. Sparks  
Clays and Clay Minerals. 2006; 54(4): p. 409-417  
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## ?? EARTH PAGES

### Common grouses

#### Anonymous referees

Anyone who submits their first paper to a journal soon becomes aware of the "peer review" process: probably the single greatest contributor to academic suspicion and anxiety. Of course, these "peers" fall into two categories: the "esteemed colleague" (helpful); the "witless wonder" (negative, and prone to crushing your paper). Write a book, a play or an operatic score, and your critics in the media have a name. You could even find out where they keep their pet rabbit. They are accountable. Yet, editors of journals claim to have a "duty of confidentiality" towards those referees who opt for anonymity: guess which category most often does. At one time or another, most academics asked for critiques by learned journals only to recommend rejection have succumbed to "taking the veil". Equally, there are few researchers who have not suffered a similar fate to one they may have meted out themselves. Learning by experience is not necessarily a strong point among scientists. A typical case came to my notice recently, but the identity of one faceless and repugnant referee eventually became clear. I know him well. He too had suffered acute stress from a grossly delayed manuscript and the vicious comment of an anonymous referee some years back, yet saw fit to indulge his own spleen when offered a place in the shade: goodness only knows why, but in this case I have my suspicions.

The whole scientific community grows increasingly uneasy about anonymous peer-review, and the abuse that it sometimes makes possible. Examples are deliberate delays by unnamed referees engaged in similar research or related commercial activity, plagiarism, incompetence and the self-indulgence of gratuitously destructive and belittling comment. It is the near-universal policy of referee anonymity that allows these unwholesome practices to fester and grow. Most journals give their referees the option of coming out of the closet, or remaining smugly behind its door. Some assume anonymity, so that a referee has to ask explicitly for their name to be revealed. Anonymous referees are simply moral cowards, along with editors of the journals that give them a cloak. What do they fear? Are direct questions about their comments cause for timidity?

Referee malpractice can be removed completely by editors refusing to allow referees to skulk behind anonymity. Now, in the UK at least, it seems possible to challenge this unwholesome editorial prerogative, because of the Freedom of Information Act 2000 (2002 Scotland), which came into force on 1 Jan 2005, and the Data Protection Act 1998. Resorting to the Acts ought not to be necessary as regards the activities of scholarly journals, yet editors continue to defend the more faceless of their referees. No doubt there would be a temporary shortage of referees should compulsory "outing" become the norm, but it would remove those who do engage in malpractice. The most important result would be an increase in objectively constructive comment, which softens the blow of a rejection slip by showing a way forward to authors. Peer-review should work both ways, and should be seen to be honest.

## Anthropology and geoarchaeology

Out of Africa and back again?

Humans left Africa with a meagre tool kits at a remarkably early date, possibly around 1.9 Ma from finds of primitive stone tools in Pakistan and Central China, and certainly before 1.7 Ma in the case of the now celebrated human remains at Dmanisi in Georgia and in Java. Around 1.7 Ma sites with evidence for human occupation extend from southern to north-western Africa and over 2/3 of the width of southern Eurasia. Despite the increased chances of preservation in later times, such a wide-ranging expansion seems not to have recurred until the fully modern human diaspora from Africa that began around 70 to 100 ka. Fossil evidence suggests that descendants of these earliest known migrants thrived until as recently as 20 ka in south-east Asia, and perhaps longer, if tiny *Homo floresiensis* prove to be other than symptomatic of congenital dwarfism. They represent a puzzle, and absence of evidence has deterred palaeoanthropologists from sticking out their necks, until a recent review of possibilities (Dennell, R. & Roebroeks, W. 2005. An Asian perspective on early human dispersal from Africa. *Nature*, v. 438, p. 1099-1104).

For a long time all human remains dated between 1 and 1.9 Ma were ascribed to *H. erectus*, whose type specimen hails from Java, not Africa. Anatomical re-evaluation of specimens from Africa, notably the famous, 1.6 Ma old Turkana Boy from Kenya, shows that they are sufficiently different from Eugène Dubois's Javan *H. erectus* type specimen to warrant a different species name – 'African Man' or *H. ergaster*. The Dmanisi humans have close affinities, but are older. Therein lies one puzzle: apart from the very much more primitive (and very rare) *H. habilis* of east Africa, there is no obvious African candidate as an ancestor for *H. ergaster* there. Dennell and Roebroeks speculate that they migrated back to Africa after evolving there from some unknown earlier species. Another puzzle centres on the tools carried by the early migrants from Africa.

Simple chopper and rough flake tools first appear in north-east Ethiopia at 2.6 Ma, but with no clear sign of who made them. The first discovery of the earliest known tool kit was at Olduvai Gorge in Tanzania – hence their name, Oldowan. They are associated with remains of the earliest known human species *H. habilis*, but date only to 1.8 Ma. Since Oldowan tool use is now known to have extended over a huge range of Africa and Eurasia at that time, the original emigrants must have carried the culture with them sometime after its first appearance in Ethiopia at 2.6 Ma. The emblematic artefact of '*H. erectus*' is the beautiful pear-shaped biface axe, yet it first

appeared at 1.5 Ma in Africa, and did not make an appearance outside the continent until about 700 ka and never made it to east Asia until carried there by fully modern humans: it was an African invention. Oddly, these highly crafted tools are often found with little sign of wear, and indeed opinion about what they were for is divided.

The great problem in palaeoanthropology is absence of fossils, which is hardly surprising. Dennell and Roebroeks comment that most Late Pliocene to Early Pleistocene terrestrial faunas are nearly always of large, robust animals, and even they are uncommon. The ravages of erosion and transportation also make it difficult to date finds of stone tools, as they may have been mixed with younger dateable materials. With confidence, they rely on the old adage (not well liked by the Popperian school of scientific methodology) that, 'Absence of evidence is not evidence of absence', and also that the earliest evidence for a new migrant is bound to be younger than its first presence. They look to the palaeoecological record of the period, which suggests a vast extent of open savannah covering much of Africa and southern Asia in the period when the climatic effects of glacial-interglacial cycles had not gripped low latitudes to create the desert barriers of later Pleistocene times. For species adapted to savannah life there was little to prevent their very wide migration, indeed simple diffusion would have moved them across the entire savannah range. Once thought to be confined to the East African Rift, australopithecines have turned up as far afield as modern Chad, 2500 km away, and as long ago as 3.5 Ma. If such diminutive creatures with no tools could diffuse so far, then what might have been the geographic limitation to the earliest tool users? Moreover, diffusion has no direction in the area that presents its possibility: movement could have been back and forth. An intriguing point made by Dennell and Roebroeks is that climatic instability first appeared around 2.6 Ma in Central China, so any emigrants moving north would have been subject to greater evolutionary-selective pressures for longer. *Homo ergaster* might have evolved in Asia and returned to Africa in the face of worsening conditions. This approach raises as many plausible hypotheses as a stick can be poked at, and should re-vitalise palaeoanthropological research outside Africa as a means of testing them.

See also: Kohn, M. 2006. Made in Savannahstan. *New Scientist*, v. 191 (1 July 2006 issue), p. 34-39.

## Climate change and palaeoclimatology

Pliocene climate and a lesson for the near future?

While most geoscientists use the products of processes that operate today to judge environments of the past, climatologists do the reverse: the past is the key to the present. While the climate record of the last 2.5 Ma is a key to understanding and perhaps even predicting rapid climate shifts during glacial-interglacial periods uncontaminated by human influences, such is the extent to which greenhouse emissions have affected the current climate that we have little idea what the outcomes may be. The possibility of greenhouse warming has become higher than in any previous interglacial epoch. To get even an inkling of what that might set in motion requires looking back to warmer times than the Late Pliocene and Pleistocene, at around 3 to 5 Ma. In the Early Pliocene it is very likely that CO<sub>2</sub> in the atmosphere was no more than nowadays. Because the Earth's geography was little different from the way it is now and the Milankovich forcing was the same too, modelling Early Pliocene climate might seem to result in similar patterns, but it doesn't (Fedorov, A.V. et al. 2006. The Pliocene paradox (mechanisms for a permanent El Niño). *Science*, v. 312, p. 1485-1489). Sea level was some 25 metres higher than it is at present and mean global temperature was an extra 3 °C, and sea-surface temperatures (from the oxygen isotopes in planktonic foraminifera) were high as well. Despite much the same forcing factors as today, the Pliocene lacked large high-latitude ice caps in Arctic regions. Milankovich-related fluctuations were damped down compared with those of the Pleistocene. Both modelling and geological evidence from the Early Pliocene suggests that Earth's climate was dominated by a perpetual El Niño in the tropical oceans, because of an inability of cold water to upwell periodically along the western tropical margins of Africa and South America. Quite probably such conditions had persisted for the previous 50 Ma, despite gradual overall cooling.

Fedorov and colleagues point to very different Early Pliocene climates in several regions: Mild winters in central and north-eastern North America; droughts in Indonesia and torrential rains in western North and South America. Overall, it was a much more humid world, and since water vapour is a powerful greenhouse gas warmth and humidity were sustained despite no higher CO<sub>2</sub> levels than now. At about 3 Ma, ocean surface waters began to cool, with signs that the alternations associated with El Niño and La Niña in the eastern Pacific began. An explanation for this is the gradual build up of very cold water deep in the ocean as a result of winds from continents cooling ocean surface water at high latitudes and causing it to sink. Without periodic upwellings, warm surface waters and cold deep waters could not mix, so inevitably the interface became shallower. At some critical depth, this thermocline could break surface, transforming both climate patterns and those of ocean currents, eventually to end up as the present tropical climate cyclicity which is connected with other climate features of the Great Ice Age.

Fedorov et al speculate that only a small descent of the ocean thermocline – a matter of a few tens of metres – could re-establish Pliocene conditions. That might occur because of continued anthropogenic warming, and the 'flip' might be as quick as a few decades to centuries.

### **Environmental geology and geohazards**

Evidence for strain build up along faults in southern California

In the centenary year of the 1906 San Francisco earthquake a lot of attention has been paid to the northern part of the infamous San Andreas Fault. That avoids the fact the its southerly extension to the south-east of Los Angeles has not ruptured in a devastating way for at least 250 years. Faults break after protracted build-up of elastic strain. Such strains are detectable using data from spaceborne radar systems. These have been available since 1992 from the European Space Agency ERS-1 and ERS-2 satellites. A sequence of data sets provides information about the annual rate of deformation (Fialko Y. 2006. Interseismic strain accumulation and the earthquake potential on the southern San Andreas fault system. *Nature*, v. 441, p. 968-971). Fialko shows that the parallel San Andreas and San Jacinto faults near the Salton Sea are building up strain at about 3 cm per year, so that about 7 to 10 metres will have accumulated since the last major earthquake in that part of the system. This exceeds the largest known seismic movement on the system, thereby suggesting that Los Angeles is likely to experience a 'big one' shortly.

Supervolcanoes

Outside of a major meteorite impact, the greatest danger posed by geological processes is a monster volcanic eruption. As well as the close-by effects of massive debris avalanches and ash falls, explosive eruptions blast sulphur gases into the stratosphere where they reside for a long time as sulphuric acid aerosols. Clouds of these tiny particles reflect a proportion of solar radiation back into space and so cause global cooling. The eruptions of Pinatubo and Krakatau in recent historic times did just that, as have several others with more devastating global effects such as famine. Yet these are tiny compared with eruptions known from the recent geological past that are marked by ash deposits over vast areas. About 71 ka ago, Toba in Indonesia blasted out a 30 by 100 km caldera and its ash extends across much of south Asia and surrounding ocean floors. Genetic evidence from human Y-chromosomes suggests a massive decline in human numbers at the time, to create an evolutionary bottleneck. This near-extinction may have been connected in some way to eruption of the Toba supervolcano. Such events are a more likely risk than impacts, and a recent review of research into them highlights those that are well-known (Bindeman, I.N. 2006. The secrets of supervolcanoes. *Scientific American*, v. 294 (June 2006 issue), p. 26-33). The western USA has two potential threats: calderas in Yellowstone National Park and Long Valley. Between 760 and 640 ka both exploded to blanket the whole southern USA and northern Mexico with around 1000 cubic kilometres of ash. Bindeman's own research sheds light on the details of magma evolution during such eruptions using isotopic signals in zircons contained within ash deposits.

## Geobiology, palaeontology, and evolution

Near-pristine traces of life before Earth's surface became oxidising

Only around 2.2 Ga did the atmosphere contain sufficient oxygen to oxidise iron(II) to iron(III) and leave its trace in red soils and terrestrial sedimentary rocks. That opened the way for the emergence and evolution of the Eucaryan domain of organisms, most of which depend on oxygen. For their predecessors, the prokaryote Bacteria and Archaea, oxygen would have been intensely toxic, especially for those which used anoxygenic forms of metabolism. Almost certainly oxygen was released for more than a billion years before the Great Oxidation Event, by blue-green bacteria, only to be mopped up by oxidation of abundant iron(II) ions dissolved in sea water. Getting an idea of the diversity of pre-2.2 Ga life is possible by examining the organic chemicals produced when they decayed under anoxic conditions, i.e. from oil and kerogen. Unfortunately, the great age of their host rocks has resulted in many Precambrian sediments having been heated and metamorphosed, so that different biomarkers break down into less distinctive compounds. There are, however, sediments that may have remained more or less unaffected, and one sequence in the Canadian Shield has yielded astonishing results (Dutkiewicz, A. et al . 2006. Biomarkers from Huronian oil-bearing inclusions: An uncontaminated record of life before the Great Oxidation Event. *Geology* , v. 34 , p. 437-440).

The sediments are conglomerates rich in uranium, having been deposited under reducing conditions that helps precipitate uranium from solution, and have been mined extensively in the Elliot Lake area of Ontario. Oil seems to have entered fluid inclusions in quartz that cemented the conglomerates, shortly after the conglomerates were deposited at about 2.45 Ga. The oil contains a host of complex organic compounds that have never been degraded by heating. Some can be linked to blue-green bacteria, which undoubtedly created oxygen continuously. That they gave rise locally to favourable conditions for oxygen-using organisms is clear from other biomarkers. Those are steranes that are derived by breakdown of sterols, which in turn are only known to be created by the enzymes exclusive to Eucaryan metabolism. Steranes have been found in even older sediments, but they were back shales that could easily have been contaminated by much younger organic materials seeping through the host rock. Oil in fluid inclusion within diagenetic minerals is far less likely to have been contaminated, so the Elliot Lake samples define a minimum age for the emergence of the Eucarya far earlier than the appearance of actual microfossils that show the distinctive cell nucleus that defines the domain Eukarya.

Precambrian bonanza for palaeoembryologists

Signs of relatedness among groups of organisms often show up well during their early growth as embryos, so their fossils in very old rocks are of great use in establishing when different groups emerged (see Ancient baby penis worm hits the news in EPN February 2004 issue). A deposit containing possible embryos of deuterostomes (see Age range of early fossil treasure trove , in EPN March 2005 issue), in which the first orifice to emerge during embryonic development is the anus, is of considerable interest. Nowadays, the group contains animals with mirror symmetry (bilaterians), including the vertebrates. First reports of fossil embryos from the 580 Ma old Doushantuo Formation of southern China in 2004 drew fire from palaeontologists who preferred to believe that the smooth almost spherical objects, like the fictitious life forms in a supposedly Martian meteorite, were probably oolith-like mineral growths. Undeterred, their finders have extracted yet more from the exposures (Chen, J-Y. and 12 others 2006. Phosphatized polar lobe-forming embryos from the Precambrian of southwest China . *Science* , v. 312 , p. 1644-1646). They demonstrate clearly that the objects do show lobes in an early stage of development that break the embryos initial symmetry so that different kinds of tissue can develop to form adults. The find matches well with evidence from the genes of modern bilaterians that the basic branching of the Animal Kingdom occurred well before the Cambrian Explosion of shelly fossils. Since more or less all modern phyla are represented by Cambrian fossils, that is not surprising.

## Pocket sauropods

The largest animals to roam the land were vegetarian dinosaurs of the sauropod group. The biggest reached a length of more than 30 metres, and were commensurately tall. These giants permeate our perception of Mesozoic life on the continents, along with their monster predators. Now, children made nervous by such titanic creatures (and I was definitely one of them) can be reassured that there were ones that were not so crushingly big (Sander, P.M. et al . 2006. Bone histology indicates insular dwarfism in a new Late Jurassic sauropod dinosaur. *Nature* , v. 441 , p. 739-741). A near-complete skeleton of a sauropod that was only 6 metres long turned up in Lower Saxony in Germany, along with other remains suggesting individuals as small as 1.7 m. *Europasaurus* was first thought to be a juvenile of a much larger species, but Sander et al . developed means of microscopic bone analysis that clearly show fully mature bone growth. In the Late Jurassic central Germany was covered by sea, except for a number of large islands. The most likely explanation for such a tiny species is that it adapted to island life in much the same way as other, more recent mammals did, such as pigmy elephants and hippos on many islands in the Mediterranean and the Indonesian archipelago.

## Geomorphology

### Hydrogen isotopes test uplift hypotheses

When Cenozoic mountain belts and high plateaux began to rise and be eroded has become a disputed topic about most of them, such as the Himalaya and Tibetan Plateau, the North American Western Cordillera, the Andes and the Ethiopian Plateau. A host of techniques have been used, including plant-leaf stomatal indices, the bubbles in lavas, cosmogenic isotopes and various stratigraphic approaches. For the Tibetan Plateau (see *When did Tibet rise?* and *Tibetan uplift: looking a gift horse in the mouth* in the March and May 2006 issues of EPN ) opinion is polarised: as soon as India collided with Asia, around 40-50 Ma ago, due to crustal thickening; as a result of a slab of lithosphere delaminating from the region as recently as the Late Miocene (8-10 Ma), when the crust rose gravitationally. There is support for both hypotheses. Much the same divergence of opinion applies to the Sierra Nevada of the Western USA, which may have been a major feature throughout the Cenozoic, or subject to delamination in the Pliocene (3 to 5 Ma ago). In its case, a new way of estimating topographic elevation in the past may resolve the disputation (Mulch, A. et al . 2006. Hydrogen isotopes in Eocene river gravels and paleoelevation of the Sierra Nevada . *Science* , v. 313 , p. 87-89).

The Stanford University group led by Andreas Mulch have focused on the way in which the proportion of deuterium ( $^2\text{H}$ ) in rainwater changes as clouds rise over high areas. This is known quite precisely from modern hydrological studies. Of course, you cannot find ancient rainwater ponded in the place where it once fell, but that rain does find its way into clay minerals during weathering. The western flank of the Sierra Nevada is mantled by extensive Eocene gravels deposited by rivers that drained the area now occupied by the mountains. Handily, those gravels were the main target for the 1849 California Gold Rush and subsequent alluvial gold mining, so they have been well exposed by the prospectors throughout the Sierra Nevada . At high elevations they are preserved in river terraces, so it is possible to trace roughly the ancient drainage courses and sample a range of modern elevations. The hydrogen isotope data from kaolinite in cobbles of weathered granitic rocks are extremely interesting. They show that the Eocene rainwater that entered kaolinite molecules at different modern heights had fallen at a very similar range some 50 Ma ago. There seems little doubt that the Sierra Nevada had risen more than 2 km before the Eocene.

## Planetary, extraterrestrial geology, and meteoritics

### Accretion and core formation reviewed

Painstaking work on meteorites and their re-evaluation has only a small, non-specialist readership, but now and again developments in the science and its bearing on how the Solar System and its planets formed need a review. The latest of these (Wood, B.J. et al . 2006. Accretion of the Earth and segregation of its core. *Nature* , v. 441 , p. 825-833) doesn't deviate much from generally accepted ideas, except in detail. For a long while it has seemed inescapable that gravitational potential energy accumulated from accretion of mass, together with energy released by decaying short-lived isotopes formed by a supernova near the dust cloud that gave birth to the Solar System would have led to hot protoplanets. So core formation by segregation of dense immiscible metal and sulphide melts was likely to have been sooner rather than later – such melts form at lower temperatures than do those made of silicates.

The daughter isotope ( $^{182}\text{W}$ ) of one short-lived isotope ( $^{182}\text{Hf}$ ) is especially revealing in both meteorites and the Earth. Hafnium favours entry into silicates while tungsten has an affinity for metallic iron; they are siderophile. So, when metallic melts form in a silicate body the Hf/W ratio increases in the silicates. If that segregation occurs before most  $^{182}\text{Hf}$  has decayed – within about 45 Ma – then the silicate part will express an excess of  $^{182}\text{W}$  while metals have a deficiency. In the case of metallic meteorites,  $^{182}\text{W}$  is so low as to indicate segregation of the metal from silicate within less than 5 Ma of the ultimate origin of the Solar System. Inevitably, Earth would have incorporated some of these early-formed metallic parts during its accretion. Tungsten isotopes from terrestrial rocks, however, suggest that core formation lasted about ten times longer, and imply that this early metal re-mixed with silicate in the mantle during accretion, and formation of the core was a secondary product of heating of the growing planet. The mantle has an excess of siderophile elements, which poses a problem. There are three possibilities: core formation was never completed, some of these elements remaining locked in silicate; it took place while overall chemical conditions changed from reducing to oxidizing, so that the most siderophile ended up in the core during the reduced phase then less siderophile elements progressively favoured silicate entry as conditions became oxidising; as the Earth grew the pressure under which segregation of core materials increased. The third scenario invokes a deep 'ocean' of magma through which droplets of metal fell, equilibrating with silicate melt and then forming a pond on the 'ocean' floor, ultimately to descend as large masses.

Wood et al . examine these three scenarios in the light of recent data and planetary modelling, suggesting that the second was the most likely by a process of 'self-oxidation' as its size increased, perhaps linked with the formation of perovskite in the deep mantle once a limiting radius had been achieved. Such a heterogeneous accretion and core segregation would explain the disparity between estimates of the timing of the core from tungsten and lead isotopes (~12 and ~28 Ma respectively) They also revisit the oddly low density of the liquid outer core – about 8% less than expected of an iron-nickel alloy, ascribing it to a mixture of the low-atomic weight elements, silicon, sulphur, carbon and hydrogen, with an unknown proportion of oxygen.

## Tectonics

### Detection of rifting due to dyke emplacement

The Afar Depression of NE Africa is a zone of complex continental rifting and nascent formation of new ocean floor that has been developing since the Late Oligocene, where the Red Sea, Gulf of Aden and Ethiopian rifts meet. Averaged out, the extension is at around 16 mm per year. In September and October 2005 small seismic events spread along about 60 km of a discrete segment of the Afar rifting system. Analysis of the vicinity of these earthquakes, using satellite-radar interferometry revealed an astonishing 8 m of extension in little more than a week (Wright, T.J. et al . 2006. Magma-maintained rift segmentation at continental rupture in the 2005 Afar dyking episode. *Nature* , v. 442 , p. 291-294). This could not be accounted for by extensional faulting alone, indeed that would only add up to less than 10% of the motion. It seems likely that sideways injection of around 2.5 km<sup>3</sup> of magma was responsible, forming a dyke extending from 2 to 9 km deep. Surface volcanism was barely noticeable, the event being represented by a small

puff of felsic ash from a minor volcano while the dyke itself is twice the volume of the 1980 eruption of Mount St Helens.