I R M
Institute for Rock Magnetism

UNIVERSITY OF MINNESOTA — *Minneapolis, Minnesota*

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Paleomagnetic Data Available On-line

Bill Harbert
University of Pittsburgh

During the recent IUGG meeting in Vienna, I suggested that it would be useful to put paleomagnetically important information at a computer archive site where anyone could gain access to it at any time. The goal in setting up a paleomagnetic archive site was to increase the ease with which paleomagnetists could gain access to on-line databases and computer program source code. The current situation, with some exceptions, is poor. Most researchers are working alone, or are sending floppy disks or magnetic tape to colleagues by mail. Using the File Transfer Protocol (FTP), a central archive site for paleomagnetic information that can be reached at any time, and from which files can be very rapidly downloaded at no charge, has been established at FTP site 130.49.3.1 (earth.eps.pitt.edu) at the University of Pittsburgh.

Following up on discussions held in Vienna, Michael McElhinny kindly made available an ASCII listing of "The Global Paleomagnetic Database" developed by Jo Lock and Michael McElhinny for this archive. [See the abstract of their article under the "Other" heading at the end of the Current Abstracts section; or see their note in the GP Section News in *Eos*, *72*, no. 51, p. 579, December 17, 1991; or write them at Gondwana Consultants, 112 Sealand Road, Fishing Point, NSW 2283, Australia.] At the FTP site I have incorporated (1) this data set, (2) selected UNIX paleomagnetic program FORTRAN source code, and (3) a paleomagnetist address list for workers in the United States and Canada. The database currently contains a total of 4.48 megabytes of information.

The site can be reached from any computer on Internet using the file transfer program "ftp," available on all host computers attached to Internet. There is no charge for data stored in the archive. To connect to the archive site, complete the

Database...*cont. on page 7*

Reports from the Visiting Fellows

Each issue of the *IRM Newsletter* will contain short summaries of the work done by Visiting Fellows at the ***IRM***. Although six Visiting Fellows have now come, and nine more are scheduled for this spring and summer, only one Visiting Fellow has been here since the last issue of the *IRM Newsletter*: In October, Dr. **Eiichi Kikawa**, from Texas A&M University and from the Geological Survey of Japan, was able to learn quite a bit from his unique oceanic gabbros, despite all the obstacles thrown in his path by

VF's...*cont. on page 2*

In this issue...

VF's...*cont. from page 1*

the cantankerous VSM-sample-holder gods. He has contributed the following summary of his work done here at the ***IRM***:

Magnetic Properties of Oceanic Gabbros and the Origin of their NRM

Eiichi Kikawa, Texas A&M University, and the Geological Survey of Japan

Because of sampling difficulty, early magnetic studies for the oceanic intrusive layers were conducted on unoriented dredged and ophiolite samples and on intermittent DSDP cores. ODP Leg 118, however, provided a total of 500.7 m of continuous, vertical oceanic gabbroic section. *Kikawa and Pariso (1991)* showed that (1) many of the Leg 118 gabbros, whose magnetic carriers are mainly Fe-Ti oxides, have strong and unstable secondary magnetic remanence components that were probably acquired during drilling; (2) stable inclinations, which are probably in-situ magnetization, indicate a single polarity; and (3) an average intensity value calculated for the stable magnetic components of individual samples is an unexpectedly high 1.6 A/m—sufficient to contribute to the marine magnetic anomalies.

Rock magnetic experiments such as high field hysteresis loops and thermomagnetic analyses were performed at the IRM to provide more information on magnetic minerals contained in Leg 118 gabbros. Preliminary results show a good agreement with that predicted from magnetic behavior observed during step-wise AF and thermal demagnetization; the main magnetic carriers are single- to coarse-grained magnetite. Both IRM (at 1500 mT) and TRM (at 600°C and 0.2 mT) acquisition experiments, and their step-wise AF demagnetization, were also performed for selected samples. The results are now being analyzed. We are going to be discussing the science in detail at the 1992 AGU Spring Meeting to be held at Montréal, Canada.

Finally, I would like to mention that my 3-week stay was productive because of the helpful cooperation of everyone at the ***IRM***.

Ref.: Kikawa, E., and J. Pariso, Init. *Repts. DSDP, 118*, in press, 1991. [See abstract on p. 6 of the *IRM Newsletter*, vol. 1, no. 1, Spring 1991.]

RAC to Back New Tack

A meeting of the ***IRM*** Research and Advisory Committee (RAC) was convened on 11 December 1991 during the AGU meeting in San Francisco. On the agenda were the focus for the ***IRM*** for the coming year, just what a Visiting Fellow is to be anyway, and (of course!) when the RAC should meet next.

As the focus of research to be encouraged at the ***IRM*** this year, the RAC suggested that the connection between the fundamentals of rock magnetism and paleomagnetic observations needs attention. Of greatest importance is the reliability of magnetic recording in a geological setting. For example, the remagnetization of crystalline and sedimentary rock can be caused by crystal growth or by alteration of preexisting crystals as a result of fluid flow or of changing thermodynamic conditions. Perhaps "magnetic petrology" covers the idea. Despite its bad press in the past, remagnetization can be turned to advantage, with implications for and applications in hydrology, geochemistry, paleoclimate studies, and so on. Further work needs to be done in this important area.

The status of the Visiting Fellowship program at the ***IRM*** was also considered. Because of past ambiguity, it was decided to have two classes of Visiting Fellows: Regular and Student. Regular Fellowships will go to established researchers who, as before, submit outstanding proposals outlining the project they wish to pursue here. Student Fellowships will go to graduate students who may or may not have so clear a picture of their work—indeed, some may not even have any experience with rock magnetism at all. The ***IRM*** wants to support both the Big Names and the Fresh Faces. Either way, proposals are due according to the following schedule: by May 31, 1992 (decisions July 1) for stays during September 1, 1992 to February 28, 1993, and by November 30, 1992 (decisions January 1, 1993) for stays during March 1, 1993 to August 31, 1993. Call the ***IRM*** for more information.

And finally, because the busy social season here in the Twin Cities has already been graced by such ethereal events as the Special Olympics, the World Series, and the Super Bowl, we could think of no more fitting a finale than to hold the next RAC meeting in Minneapolis....

Current Abstracts

A list of current research articles dealing with various topics in the physics and chemistry of rock magnetism is a regular feature of the *IRM Newsletter*. Articles published in familiar geological journals will be included, but special emphasis is given to current articles from physics, chemistry, and materials science journals. Most abstracts are culled from *INSPEC* (© Institution of Electrical Engineers), *Geophysical Abstracts in Press* (© American Geophysical Union), and the authors themselves, after which they are edited for the *IRM Newsletter*. An extensive reference list of articles primarily about rock magnetism, the physics and chemistry of magnetism, and some paleomagnetism is continually updated at the ***IRM***. This list, with more than 1400 references, is available free of charge. As always, your contributions both to the Abstracts section of the *IRM Newsletter* and to the reference list are welcome.

Anisotropy

Jackson, M. J.
Anisotropy of magnetic remanence: A brief review of mineralogical sources, physical origins, and geological applications, and comparison with susceptibility anisotropy, *Pure Appl. Geophys., 136*, 1-28, 1991.

The differences between susceptibility and remanence, and between their respective anisotropies, are discussed. Because susceptibility anisotropy is generally weaker, is a measure of all (often less anisotropic) minerals, and is prone to other problems, remanence anisotropy provides a better quantitative estimate of the distribution of particle orientations in a rock sample.

Jackson, M. J., and L. Tauxe
Anisotropy of magnetic susceptibility and remanence: Developments in the characterization of tectonic, sedimentary, and igneous fabric, *Rev. Geophys., 29, suppl. (IUGG Report)*, 371-376, 1991.

Advances in the analysis and geological applications of anisotropy of magnetic susceptibility (AMS) and anisotropy of magnetic remanence (AMR) are reviewed, focussing on the contributions of researchers in the USA.

Johns, M., and M. J. Jackson
Compositional control of anisotropy of remanent and induced magnetization in synthetic samples, *Geophys. Res. Lett., 18*, 1293-1296, 1991.

Anisotropy of remanent and induced magnetization was found to be compositionally controlled in synthetic samples of varying proportions of chlorite (a platey paramagnet), manganese oxide (an isotropic paramagnet), and magnetite (an anisotropic ferrimagnet). Anisotropy of anhysteretic susceptibility (AAS) and anisotropy of magnetic low-field susceptibility (AMS) are studied.

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Anomalies

Acton, G. D., and R. G. Gordon
A 65 Ma palaeomagnetic pole for the Pacific plate from the skewness of magnetic anomalies 27r-31, *Geophys. J. Int., 106*, 407-420, 1991.

A paleomagnetic pole for the Pacific plate is computed using new skewness data from magnetic anomalies. The pole from skewness data differs from the poles from all other types of data by no more than 4.2°, suggesting that skewness data can be used to estimate Pacific paleomagnetic poles in the absence of other data.

Bina, M., *et al.*
Transformation of pyrrhotite to magnetite by heating: A potential source of magnetic anomalies, *C. R. Acad. Sci. (Paris), Sér II, 313*, 487-494, 1991.

A thermomagnetic study of iron-sulfide-bearing rock from the Montagne Noire shows a transformation from pyrrhotite to magnetite at 400˚C. Because the geological context implies that such an increase of temperature has been possible, such a transformation could account for the magnetic anomalies at the site.

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Chemistry

Mitra, S., T. Pal, and T. Pal
Variation in Mössbauer hyperfine parameters with Al-substitution in iron oxide and hydroxide phases, *Indian J. Pure Appl. Phys., 29*, 313-325, 1991.

Because Al^{3+} substitutes for Fe^{3+} in iron oxides and hydroxides in sedimentary environments, the dependence of Mössbauer parameters on aluminum substitution in hematite and goethite is studied.

Nikumbh, A. K., P. L. Sayanekar, and M. G. Chaskar
Magnetic and electrical properties of γ-Fe_2O_3 prepared from ferrous malonate dihydrate, *J. Magn. Magn. Mater., 97*, 119-125, 1991.

A study of single-domain acicular γ-Fe_20_3 was made by measuring direct current electrical conductivity, the Seebeck coefficient, x-ray diffraction patterns, initial magnetization, magnetic hysteresis, Mössbauer spectra, and SEM images. The results suggest that γ-Fe_20_3 can adsorb oxygen and water from the atmosphere to form a skin of hydrogen ferrite.

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Remember...

Current Abstracts

Dynamo

Larson, R. L.
Geological consequences of superplumes, *Geology*, *19*, 963-966, 1991.

Superplumes are suggested as the cause of long periods of constant magnetic polarity. The superplumes originated just above the core-mantle boundary, significantly increased convection in the outer core, and stopped the magnetic field reversal process for 41 Ma in the Cretaceous and for 75 Ma in Pennsylvanian-Permian time.

Pal, P. C.
The correlation of long-term trends in the palaeointensity and reversal frequency variations, *J. Geomagn. Geoelectr., 43*, 409-428, 1991.

The fact that paleofields are stronger during fixed polarity superchrons than during the periods of frequent reversals can be ascribed to greater helicity fluctuations associated with the core's greater convective vigor. The implications of the kinematic geodynamo theory for long-term variations observed in the paleomagnetic record are also examined.

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Environmental Magnetism

An, Z.-S., *et al.*
Magnetic susceptibility evidence of monsoon variation on the loess plateau of central China during the last 130,000 years, *J. Quat. Res., 36*, 29-36, 1991.

The magnetic susceptibility of loess and paleosols in central China represents a proxy climate index closely related to past precipitation, vegetation, and summer monsoon intensity. Time series of magnetic susceptibility document the history of summer monsoon variation during the last 130,000 years, and correlate closely with the oxygen isotope record in deep-sea sediments.

King, J. W., and J. E. T. Channell
Sedimentary magnetism, environmental magnetism, and magnetostratigraphy, *Rev. Geophys., 29, suppl. (IUGG Report)*, 358-370, 1991.

The recent development of both automated pass-through cryogenic magnetometers for measuring remanence directions, and equipment for the rapid measurement of mineral magnetic properties (*e.g.*, χ, ARM, and IRM) makes it possible to conduct cost-effective non-destructive magnetic studies on large numbers of samples.

Yamazaki, T., I. Katsura, and K. Marumo
Origin of stable remanent magnetization of siliceous sediments in the central equatorial Pacific, *Earth Planet. Sci. Lett., 105*, 81-93, 1991.

In contrast with the unstable remanence of unfossiliferous red 'pelagic clay' which accumulates in the middle latitudes of the Pacific, siliceous sediments distributed in the central equatorial Pacific have a stable remanent magnetization regardless of age or depth. TEM observations revealed that most of the magnetic extracts from the siliceous sediments are identical in size and shape to bacterial magnetosomes, with a mean diameter of 0.05 μm.

Zheng, H.-B., *et al.*
The magnetic properties of particle-sized samples from the Luochuan loess section: Evidence for pedogenesis, *Phys. Earth Planet. Inter., 68*, 250-258, 1991.

Measurements of magnetic susceptibility and laboratory remanences on loess and paleosol samples show that the sub-micron clay fraction of the paleosol is greatly enriched in fine-grained (<0.03 μm) ferrimagnetic minerals, and thus confirm the importance of secondary pedogenic components in the magnetic record from loess-paleosol sequences.

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Models

Banks, P. O., W. D. Stuan, and S.-W. Liu
Piezomagnetic fields of screw dislocation fault models, *J. Geophys. Res., 97B*, in press, 1992.

An analytical solution is obtained for the piezomagnetic field generated by a screw dislocation and its image. Because the symmetry of piezomagnetization around a screw dislocation inhibits regions of intense piezomagnetism near the dislocation from contributing to the external field, the field is predicted to be below current detection levels.

Bochnicek, J., P. Hejda, and V. Kropacek
Effect of cooling of igneous rocks on changes of the paleointensity in contact rocks, *J. Geomagn. Geoelectr., 43*, 389-393, 1991.

TRM is generated at igneous/sedimentary rock contacts, and provides information about the paleointensity of the magnetic field at the time the igneous rock was formed. Using a plane model of the intrusion, the process of cooling inside and outside a lava slab of varying thickness is studied by numerical methods.

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Paleointensity

Radhakrishnamurty, C., S. D. Likhite, and R. W. Sahasrabudhe
Domain states of magnetic grains in basalts and palaeointensity techniques, *J. Geomagn. Geoelectr., 43*, 351-355, 1991.

A prior knowledge of the domain states and composition of the magnetic grains in basalts could be helpful in planning paleointensity investigations. The behavior of basalt samples containing different types of magnetic grains on heating and cooling is presented, and the feasibility of estimating paleointensity from such samples is discussed.

Tanaka, H., and M. Kono
Preliminary results and reliability of palaeointensity studies on historical and ^{14}C dated Hawaiian lavas, *J. Geomagn. Geoelectr., 43*, 375-388, 1991.

Paleointensity determinations, using Coe's (1967) version of the Thellier method, for seven Hawaiian flows are used to illustrate some of the problems in paleointensity determinations. It is shown that the linearity of NRM-TRM is not an adequate criterion for acceptance, but that it is very powerful when combined with the PTRM test.

Walton, D.
A new technique for determining palaeomagnetic intensities, *J. Geomagn. Geoelectr., 43*, 333-339, 1991.

A technique has been developed which largely eliminates the errors resulting from mineral alteration during heating. It has been used to measure the intensity of the Earth's magnetic field from eight sites in the Eastern Mediterranean. The results are such that one may do limited archaeomagnetic dating with a precision of between one and about two hundred years between 900 BC and AD 400.

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Paleomagnetism

Clement, B. M., and C. G. Constable
Polarity transitions, excursions, and paleosecular variation of the Earth's magnetic field, *Rev. Geophys., 29, suppl. (IUGG Report)*, 433-442, 1991.

Paleomagnetic records of secular variation, excursions, and polarity transitions, which provide important constraints on understanding the process generating the geomagnetic field, are reviewed. Although each type of field behavior has traditionally been considered independently, the characteristic time scales of these features overlap.

Geissman, J. W., and R. G. Gordon
Paleomagnetism reference poles, apparent polar wander paths, paleomagnetic Euler pole analysis, and true polar wander, *Rev. Geophys., 29, suppl. (IUGG Report)*, 384-394, 1991.

The prior quadrennial report concluded that Phanerozoic and Precambrian cratonic reference poles and APW paths are less accurate than was assumed in the late 1970's and early 1980's. Although this statement remains true, this review looks at new paleomagnetic reference poles, re-interpretations of older data, new approaches to the analysis of APW paths, and true polar wander.

Smith, B., A. Bonneville, and R. Hamzaoui
Flow duration of a dike constrained by palaeomagnetic data, *Geophys. J. Int., 106*, 621-634, 1991.

An apparent paleotemperature profile and two corrected profiles were deduced from the thermal demagnetization of sandstones intruded by basaltic dikes. Good fits between the experimental data and a conductive thermal model are obtained for a flow duration of one to five days.

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Physics

Babkin, E. V., K. P. Koval, and V. G. Pyn'ko
Magnetic properties of the ferrimagnetic iron oxide γ-Fe_2O_3, *Sov. Phys. JETP, 73*, 321-325, 1991.

The temperature dependence of magnetization and of magnetic anisotropy constants were measured. For films of γ-Fe_20_3, the effect of the onset of magnetic anisotropy induced by film growth was observed. It is shown that the onset of anisotropy is due to the ordering of the cation vacancies during the film growth.

Kvardakov, V. V., *et al.*
Study of Morin transition in nearly perfect crystals of hematite by diffraction and topography, *Physica B, 168*, 242-250, 1991.

The spin-reorienting magnetic Morin transition is investigated in nearly perfect platey crystals of hematite by combining neutron diffraction, neutron and synchrotron radiation topography, and magnetization measurements. The experiments indicate that the interfaces which separate the weakly ferromagnetic and the antiferromagnetic phases are parallel to the main surfaces of the crystals.

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Remanences

Dinares-Turell, J., and E. McClelland
A cautionary tale for palaeomagnetists: A spurious apparent component remanence due to overlap of blocking-temperature spectra of two components, *Geophys. Res. Lett., 18*, 1297-1300, 1991.

Thermal demagnetization of some red-limestones yields an apparently single-component remanence. However, when two IRM components are imparted to a sample, at right angles to each other with each affecting grains of different coercivities, thermal demagnetization of the composite IRM does not isolate the components but alternating field demagnetization does, illustrating the superiority of the latter treatment in this case.

...send in your abstracts for the next issue...

Current Abstracts

Elmore, R. D., and C. McCabe
The occurrence and origin of remagnetization in the sedimentary rocks of North America, *Rev. Geophys., 29, suppl. (IUGG Report)*, 377-383, 1991.

The mechanisms that have caused secondary magnetizations in the sedimentary rocks of North America are reviewed. Considerable progress has been made, particularly in understanding the role of fluids, but much remains to be learned about remagnetization mechanisms.

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Rock Magnetism

Heider, F., D. J. Dunlop, and H. C. Soffel
Low-temperature and AF demagnetization of saturation remanence and thermoremanence in magnetite grains, *J. Geophys. Res., 97B*, in press, 1992.

Low-temperature demagnetization (LTD) was performed on magnetites having grain sizes between 0.037 μm and 5 mm. We demonstrate that the method of preparation of magnetites, irregularities in the crystals, and increase or decrease of the state of internal stress by quenching or annealing all have a direct effect on the amount of magnetic memory. In some cases, the Lowrie and Fuller (1971) test must be reinterpreted.

Moskowitz, B. M., and T. S. Moon
Experimental and theoretical fine particle magnetism, *Rev. Geophys., 29, suppl. (IUGG Report)*, 349-357, 1991.

Highlights and accomplishments in rock magnetism research published by US authors are reviewed. While advances in rock magnetism continue to make an impact on paleomagnetic research in many significant areas, theoretical and experimental rock magnetism is now a robust geophysical discipline with its own intrinsic interest.

Nord, G. L., Jr., and C. A. Lawson
Magnetic properties of ilmenite$_{70}$-hematite$_{30}$: Effect of transformation-induced twin boundaries, *J. Geophys. Res., 97B*, in press, 1992.

Twin domains and boundaries arising from the order-disorder transition (T_{cr}~1025°C) in ilmenite$_{70}$-hematite$_{30}$ have little effect on intrinsic magnetic properties (T_{Curie} and J_s) but a large effect on extrinsic properties (IRM, TRM, and AF and thermal demagnetization). Twin boundaries also serve as domain boundaries in two-domain grains, and contribute to wall-pinning in larger ones.

Xu, S., and R. T. Merrill
Stress, grain size, and magnetic stability of magnetite, *J. Geophys. Res., 97B*, in press, 1992.

Thermal variations in H_c are shown to be linearly proportional to λ/M_s from the Verwey transition to the Néel temperature for various samples of magnetite, indicating that the temperature stability of bulk coercivity in these samples is stress controlled. We suggest a mechanism in which internal stress associated with dislocations in these samples not only causes domain wall pinning but also determines the anisotropy of domain walls.

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Special Issues

IUGG Report—Contributions in Geomagnetism and Paleomagnetism, Shea, M. A., ed., *Rev. Geophys., 29, suppl.*, 1991. [Includes titles below not abstracted above.]

Bloxham, J., and P. H. Roberts
The geomagnetic main field and the geodynamo, 428-432.

Hagstrum, J. T., and W. P. Harbert
Paleomagnetism and microplate tectonics, 395-404.

Kodama, K. P.
Overview of geomagnetism and paleomagnetism, 1987-1990, 343-348.

Wannamaker, P. E., and G. W. Hohmann
Electromagnetic induction studies, 405-415.

Magnetic Anomalies on Land and Sea, Wasilewski, P., and P. Hood, eds., *Tectonophysics, 192*, no. 1/2, 1991.

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Other

Kono, M., *et al.*
An automatic spinner magnetometer with thermal demagnetization equipment, *J. Geomagn. Geoelectr., 43*, 429-443, 1991.

The authors have developed a fully automated spinner magnetometer which can measure remanence as well as perform thermal demagnetization of paleomagnetic samples. Rotation and translation of the sample, measurement of the magnetic field by a ring-core fluxgate sensor, heating and cooling of the electric furnace, and switching on and off of the solenoid magnetic field are all controlled by a personal computer.

Lock, J., and M. W. McElhinny
The Global Paleomagnetic Database: Design, installation, and use with ORACLE, *Surv. Geophys.*, *12*, 317-506, 1991.

The Global Paleomagnetic Database has been developed using the ORACLE Relational Database Management System. All published data up to the end of 1988 are included in the database, with updates to occur every four years. The paper outlines the structure of the database and provides details for installing and maintaining both the ORACLE software and the Global Database on a Personal Computer under MS-DOS. Examples of querying the database using SQL (Structured Query Language) are given.

[Note: For questions concerning the database, the authors may be reached at Gondwana Consultants, 112 Sealand Road, Fishing Point, NSW 2283, Australia. See also the lead article in this issue by W. Harbert.]

Tauxe, L., and Y. Gallet
A jackknife for magnetostratigraphy, *Geophys. Res. Lett.*, *18*, 1783-1786, 1991.

The reliability of a magnetostratigraphic section is evaluated using a jackknife resampling scheme. The authors define a parameter, *J*, which quantifies the dependence of a magnetostratigraphic record on the distribution of sampling sites. Based on simulated magnetostratigraphic sections, *J* was found to be an indicator of the approximate percentage of polarity zones present in the original reference sections that were recovered in the sampled section.

Database...*cont. from page 1*

commands highlighted in bold in the box below, where the <return> and <tab> symbols mean you have pressed the "return" and "tab" keys, respectively.

After receiving the "ftp>" prompt users can move about the directory tree and download any files. For help, type **? <return>** to list available commands. Some useful ftp commands include **ls**, (list files), **cd directoryname** (change directory to directoryname), **ascii** (put ftp into ascii mode, when downloading ascii files), **binary** (put ftp into binary mode, when downloading compressed or tar files), **get filename** (get the file named filename and put it in my directory), **cd..** (go down one directory level), **quit** (quit ftp). Files that users feel should be at the archive set can be copied to the directory "incoming," or sent to Bill Harbert at the University of Pittsburgh, to be placed into directories for general access.

Currently downloadable files are available in the following directories:

pub; all.files, a listing of all files in the archive.

McE_Abase; compressed and uncompressed versions of Jo Lock and Michael McElhinny's Global Paleomagnetic Database.

paleomagnetists; address database of all (?) paleomagnetists in the U.S. and Canada.

unix; tar file of useful paleomagnetic programs.

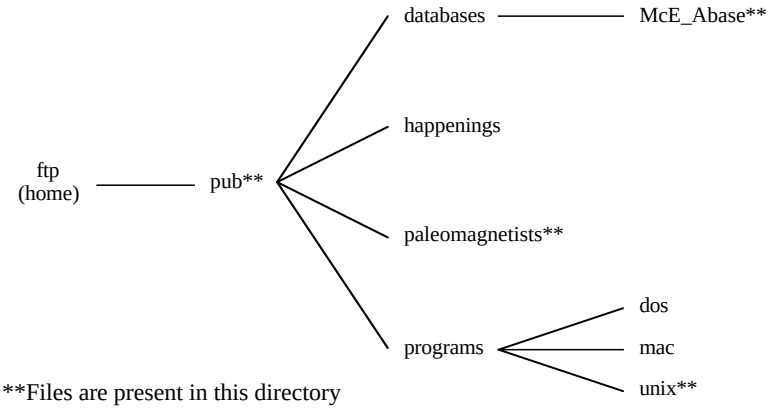
Any comments or suggestions about this site can be sent via e-mail to harbert@unix.cis.pitt.edu (on Internet), or HARBERT@PITTVMS (on BITNET).

[Note: A slightly longer version of this article will appear shortly in *Eos*.]

Paleomagnetic Archive Directory Structure

earth.eps.pitt.edu 130.49.3.1

myprompt% **ftp 130.49.3.1 <return>**
Connected to 130.49.3.1
220 earth FTP server (SunOS 4.1) ready.
Name(130.49.3.1:your name will appear here): **anonymous <return>**
331 Guest login ok, send indent as password.
Password: **<tab> <return>**
230 Guest login ok, access restrictions apply.
ftp>



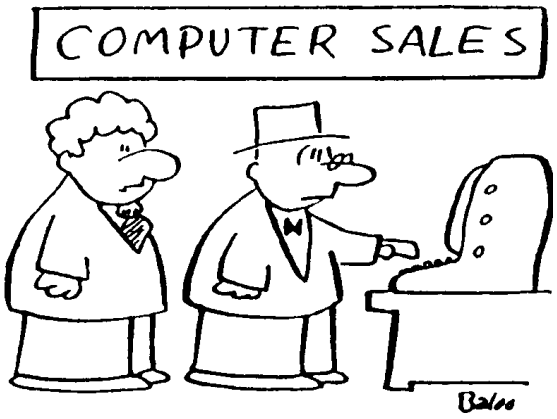
**Files are present in this directory

More Equipment Available

Two new equipment systems have recently arrived or gone on-line at the ***IRM***: a Magneto-Optic Kerr Effect (MOKE) system for imaging magnetic domains, and a Mössbauer Spectrometer system for investigating the mineralogy of iron-bearing species such as magnetite, maghemite, or hematite.

The various components of the MOKE system are arriving now, and should be fully operational within the next few months. At its core lies a Leitz Orthoplan microscope, modified to allow observation of the Kerr effect in small magnetic grains. A video film recorder coupled with a frame-grabber, image-manipulating software, and a control computer complete the system. New sample-preparation facilities (a rock saw and specimen polishers) are also being garnered.

The Mössbauer system donated to the ***IRM*** by 3M Corporation last year has been upgraded and assembled to provide limited Mössbauer capability. The room-temperature and zero-external-field portion is now operational (well, OK, it will be as soon as we leap the bureaucratic hurdles required to obtain the radioactive ^{57}Co source). The other low-temperature and high-field assembly must await the repair of the liquid helium dewar (in progress).



"Careful, sir—they can sense fear."

Asilomar II Planned for Fall

A conference to be held at the Asilomar Center on the Monterey Peninsula of California is being planned for a fall weekend in September or October, 1992. Two dozen responses to our trial balloon inquiring about interest in such a conference have been returned. Possible topics suggested include paleoclimatic magnetic signatures, anisotropy of magnetic remanence, chemical remagnetization processes, magnetism of fine particles, reconciliation among paleomagnetism and other dating techniques, integration of paleomagnetic practises with rock magnetic theory and experiment, biogenic sources of magnetism, and interdisciplinary overlaps. The format would probably be one of short talks interspersed with plenty of discussion time. If you have any suggestions for this conference, please write to Subir Banerjee at the address given at the end of this newsletter.

The ***Institute for Rock Magnetism*** is dedicated to providing state-of-the-art facilities and technical expertise free of charge to any interested researcher who applies to become a Visiting Fellow. Proposals are accepted semi-annually in spring and fall for work to be done during the following half year. Shorter, less formal visits are arranged on an individual basis through the laboratory manager.

The ***IRM*** is funded by the **W. M. Keck Foundation**, the **National Science Foundation**, and the UNIVERSITY OF MINNESOTA.

The *IRM Newsletter* is published three times a year by the staff of the ***IRM***. If you or someone you know would like to be on [or off] our mailing list, if you have something you would like to contribute (*e.g.*, titles plus abstracts of papers in press), or if you have any suggestions to improve the newsletter, please notify the editor:

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