THE PHYSICAL CHEMISTRY OF STONE PRESERVATION

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Human intervention to slow down or arrest stone decay is primarily concerned with monuments and historic structures, and with time scales of the order of centuries. Measures that can appropriately be taken must be based upon a thorough understanding of the physical and chemical properties of the stone involved, as well as of the mechanisms of the several decay phenomena at work.

Two approaches have traditionally been employed in this field: (1) isolation (generally only partial) of the stone from the aggressive factors attacking it; or (2) introduction of impregnants to coat, consolidate, and harden it. A recent, new approach consists in chemically modifying certain types of stone so that they cease to be vulnerable to specific agents of decay.

The physical chemical principles underlying these approaches will be discussed, and their effectiveness, in the present state of the art, will be critically assessed.

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UTILIZATION OF GEOTHERMAL ENERGY

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Geothermal energy is a natural heat source which can be utilized in a variety of ways. Optimum utilization depends on the characteristic of the source, i.e. temperature, pressure, liquid or vapor dominated, chemical composition etc. Present uses are for the production of electrical power. This paper discusses other applications such as space heating, production of process steam, air conditioning and desalting along with power production.

Where the geothermal energy is to be used in a flash process to produce power, trade offs in selecting the flash separator temperature must be made. These trade offs should consider the economic objectives of both the producer and the user. For low temperature sources, below 350°F, it can be shown that the greatest revenues will be produced where space heating applications are possible. Such applications will require long range industrial planning as well as conventional geothermal exploration programs.

Projected revenues from a typical source are given for seven different end uses. The range of revenues vary by a factor of 5 - 7 depending on the specific application.

U-PB AGES OF THE SPAVINAW AND TISHOMINGO GRANITES, OKLAHOMA

Lewis, R. D., Department of Geology, University of Kansas, Lawrence, Kansas 66045; Bickford, M. E., Department of Geology, University of Kansas, Lawrence, Kansas 66045

Exposures of Precambrian basement rocks in Oklahoma include the Spavinaw Granite in the northeastern part of the state and the Tishomingo Granite in the Arbuckle Mountains region. U-Pb ages of suites of cogenetic zircons from both rocks are about 1400 m.y. Previously reported mineral ages from these granite bodies are about 1350 m.y. and a Rb-Sr isochron derived from whole-rock samples from the northeastern Oklahoma basement

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The zircon ages repo...
...are somewhat older than p...
...significantly younger tha...
...St. Francois Mountains of ...
...to the Spavinaw Granite a...
...although basement rocks o...
...are petrographically simil...
...record a complex history ...

...DATING MEXICAN ARCHAEOLOG...
...GEOMAGNETIC FIELD EXCURSIO...
...Liddicoat, Joseph C., ...
...Studies, University ...
...Lambert, P.W., Instit...
...Mexico, D.F., Mexico*
...The University of Tex...
...A possible geomagnetic fie...
...Malco at the Tlapacoya, M...
...of the center of Mexico Ci...
...dating upper Quaternary se...
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...excursion is recorded. Whe...
...this geomagnetic field excu...
...version at other sites in t...
...Mexico.

*Present address: U.S. ... Colorado 80225

...PHOLOGY OF THE CAMPECHE ...
...Lindsay, John F., Shiple...
...Laboratory, University ...
...Strand, Galveston, Tex...
...A bathymetric survey was ca...
...the Campeche Escarpment in ...
...made following the discovery ...
...canyons transecting the sca...
...13 embayments were observed...
...categories. The first is a la...
...trending shoreward for more t...
...depressions with less than 1...
...depth of 1600 m, or about 20...
...plain. The second valley ty...
...sometimes within the larger