(2) altering brown goethite and amorphous ferric oxide in mud to hematite pigment in mudstone; and (3) oxidizing inherited magnetite to specular hematite, and altering iron-bearing silicates which supplied some of the hematitic pigment.

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FLUORESCENT TRACER STUDY OF EOLIAN SAND TRANSPORT[1]

Ten pounds of eolian sand were dyed fluorescent red and released on the crest of a large shadow dune at Windy Point, San Gorgonio Pass, California. The dune surface was sampled by pressing 3×3-in. Vaseline-coated cards onto the sands at predetermined stations downwind of the tracer point source. Westerly winds blew at 15–25 m.p.h. during the test.

Sample cards were examined under ultraviolet light and the number of fluorescent grains per square inch determined for elapsed times of 3, 20, and 60 min. after tracer release. Isopleths of equal tracer concentration at the three elapsed times all delineated lobate patterns presumably in response to variable wind "streamlines" over the dune.

At 2.5 hrs. after tracer release a lag deposit of very coarse fluorescent grains remained at the point source. The lag grains formed ripples with lengths three times those of the natural ripples. This suggests that ripple length is governed primarily by grain diameter and wind velocity.

Analysis of tracer distribution revealed that fluorescent sand entered and left the sample grid at a constant rate. A decay curve of tracer loss from the point source indicated extinction of the point source occurred 157 min. after release. Difference between decay value and per cent of the total tracer on the dune at any moment was equivalent to per cent of tracer loss from the sample grid at any moment. Knowing the distance of grain movement, this relationship yielded an average tracer grain velocity of 30.36 in./min. Time-lapse motion pictures established that creep velocity, assumed to be equivalent to ripple velocity, was 0.153 in./min., indicating that grains in saltation were traveling roughly 198 times faster than grains in creep. This magnitude of difference between creep and saltation velocity is physically inconsistent with Bagnold's classic division of eolian sand load.

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GEOLOGY AND PALEONTOLOGY OF A PORTION OF MANIX BASIN DEPOSITS, SAN BERNARDINO COUNTY, CALIFORNIA

Late Pleistocene fluviatile and lacustrine deposits in the Manix Lake basin occupy about 250 sq. mi. of the Mojave Desert including Coyote Lake and Troy Lake. The sediments have been exposed by recent downcutting of the Mojave River along part of the margin of the basin.

The lowest sediments are conglomerates that lie unconformably on metamorphic and volcanic basement rocks of the Cady Mountains. These alluvial-fan deposits dip gently to the northwest and interdigitate with lacustrine clays and silts in the center of the basin. About 70 ft. of fossiliferous lacustrine clays, silts, and sands lie horizontally above the conglomerates and older lake sediments. The uppermost sediments are alluvial arkosic sands and conglomerates that overlie the youngest lake beds, and are about 15 ft. thick.

Originally Manix Lake was restricted to the central portion of its basin and flanked by alluvial fans. As the basin was filled, lake sediments lapped on and covered over portions of the alluvial slopes. A wedge of fluviatile arkosic sand in the eastern part of the basin within the later lake beds may indicate a temporary retreat of the lake. A continuous sequence of lake beds near the center of the basin shows that one permanent lake was present until an outlet through Afton Canyon developed.

Fossil remains of fresh water gastropods, pelecypods, fish, tortoise, and water birds represent members of lake and lake-shore communities. Grassland and riparian communities are indicated by the following mammal genera: *Canis, Felis, Equus, Camelops, Tanupolama, Ovis, Bison, Mammuthus,* and *Nothrotherium* (not previously reported). A preliminary examination of the fauna reveals a Rancholabrean North American mammal age.

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SINCLAIR DINOSEIS

The *Dinoseis* seismic system, developed during the past 2 years by Sinclair Research, Inc., is described. This system uses a unique seismic pulse generator activated by a confined explosion. The pulse generator and recording equipment are shown in field operation movies. A comparison is made between *Dinoseis* and conventional seismic records in Texas and Oklahoma.

F. S. KRAMER AND M. L. SWAN, United Geophysical Corporation, Pasadena, California

HIGH-SPEED DIGITAL CORRELATOR FOR GEOPHYSICAL APPLICATION

Many of the processes used in the interpretation of geological and geophysical data basically involve the correlation or cross-comparison of related sets of well logs, seismograms, and other graphical data.

Commonly the correlation is done by visual inspection. Two sets of graphical data are viewed side-by-side, and displaced relative to each other until a maximum degree of correspondence is observed.

However, with the ever-increasing volume of accumulated geological information, there is a growing trend toward the automatic processing of data. The digital correlator described is a special-purpose computer specifically designed to perform correlation operations at speeds sufficiently high to permit "on-line" or real-time processing of geophysical field data.

The paper describes the basic correlation process and, schematically, how the process is carried out in the correlator, and includes pictures and description of the correlator itself.

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STRATIGRAPHIC EVIDENCE FOR LAS VEGAS VALLEY SHEAR ZONE

Longwell (1960) has postulated about 25 mi. of right-lateral displacement along a major shear zone in Las Vegas Valley, extending from Frenchman Mountain northwest past Mercury, Nevada. Because of their areal distribution, several Paleozoic stratigraphic units in

[1] This project was supported in part by Office of Naval Research Contract Nonr 228(17).