and the lower Lodo, Media Aqua Creek) are known to be of Paleocene age. However, the bulk of both the foraminiferal and nannoplanktonic assemblages collected from several geographically distinct areas throughout the Coast Ranges represent the Penutian (West Coast lower Eocene) and/or Ulatisian (West Coast middle Eocene) Stages.

Moreover, the foraminiferal faunal change which characterizes the Penutian-Ulatisian boundary, as well as the nannoplanktonic faunal change found to correlate widely with this foraminiferal change on the West Coast, occur within or close to the Poppin Shale of the Santa Barbara Coast and several of its Coast Range correlatives.

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THE SURF-BREAK: KEY TO PALEOGEOGRAPHY?

The most important element in paleogeography, and perhaps the most difficult to locate, is the shoreline. Specific indicators are rare, faint, or easily destroyed. Nevertheless, we require a "key" which will permit us, tentatively at least, to identify ancient coasts.

River sands placed on modern beaches are modified in a systematic way. The distribution below a critical diameter is filtered to provide a new, distinctive, size curve. The result is an inflection so located in many samples that it does not appreciably affect the standard deviation. The inflection, or "break," which results from surf action may not be an absolute indicator, but it appears to be fairly good. This has been verified observationally (studying near-shore sands) and experimentally (placing fluvial sands in the breakers).

Under wave action, the "surf-break" starts in the "fines" and moves into the coarser sizes. The rate at which it moves is a measure of wave energy level; hence its position depends on both wave energy and duration-of-working. The "surf break" should be common in sands worked by low to moderate energy waves; along coasts having moderate to high energy breakers, the inflection may be missing due to an absence of material coarse enough to record it.

Shorelines of interior seas, such as ancient seaways, are generally marked by low to moderate wave energy levels. Hence the "surf break" may be a widely useful, although not foolproof, device.

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THE USE AND DETECTION OF FLUORESCENT SAND TRACERS

Two recent developments, fluorescent tracers and a fluorescent particle counter, hold promise as practical means to the quantitative evaluation of littoral drift and sediment transport in rivers. Unlike radioactive material, luminophores present no health hazard or storage problems, offer a wider range of applicability, can be recovered in samples, and are more economical to use. The fluorescent tracers have been employed in studies of such specific problems of sediment migration as beach erosion, inlet stability, dune processes, and artificial beach nourishment.

Fluorescent dyes and thermosetting plastics have been combined to coat sand in a process designed to produce the tracer material, so that the physical properties of tracers and the sediments are nearly identical. Of the several materials and techniques tested, urea-formaldehyde resin, fluorescing organic dyes, and a catalytic procedure imparted the best chemical and physical characteristics to the tracer grains.

The application of tracers to sand transport studies became practical only with the invention of the fluorescent particle counter. This instrument provides a rapid and accurate method of frequency determination of tracer particles in sand samples, and therefore affords a much needed statistical treatment of sediment transport. The particle counter has been built on the principles of optics, electronics, and threshold decision logic, to differentiate simultaneously for four tracers, the fluorescent colors of which have been established through spectrophotometric measurements. Tracers in samples with concentrations varying from 10^{-7} to 10^{-2} are counted, tabulated, and recorded at the rate of 20,000 particles/second.

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ORIGIN OF PISOLITES

The Permian pisolites of the Guadalupe Mountains of southern New Mexico and west Texas have been widely accepted as being a by-product of algal activity in the shallow lagoonal area behind the platform margin of the Delaware Basin. If this interpretation were correct, one would expect to find smooth pisolite laminations formed by the algae and not the crenulate laminations seen in some of the pisolites. One would also expect to see developed stratification, and interlayering with stromatolites and other algal deposits. Evidence of pisolites being formed by algae somewhere in the world today would be anticipated.

Evidence shows that such conditions are not applicable to the Guadalupe Mountain pisolites. The field relationships suggest that the pisolites developed in porous and permeable calcarenites by a weathering-soils process. The area behind the platform margin was periodically subaerially exposed. The climate was arid with occasional wet periods. The downward migrating surface waters leached calcium carbonate from the upper layers and concentrated it in the lower layers as films or laminae about nuclei. These dense concentrations are the pisolites; they compare very favorably with caliche deposits in the area.

The environment can be completely misinterpreted if the pisolites are thought to have formed in a shallow sea when they actually formed in the soil of an arid climate.

Knowledge concerning the factors which produced the pisolites in the Guadalupe Mountains should be applicable in studies of pisolites elsewhere.

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GEOLOGY, GEOPHYSICS, AND THEIR COMMON GROUND

During the past ten to fifteen years many subjects for papers and topics for symposiums have hinged about pleas for closer cooperation between geologists and geophysicists. The popularity of the subject reflects the increased effort required to find new oil reserves and suggests the possibility that one group of professionals suspects the other of not doing all they can to make the job easier. This polite but definite pointing of the finger is a natural and human reaction to the necessity of facing an unexpected and unpleasant situation.

Any altercation between a geologist and a geophysicist can literally and figuratively be described as a family fuss—for a family we are. We feed from the same trough, we are subject to the same management, and we have exactly the same objectives, i.e., the discovery of more oil at less cost. In certain areas, we use the same tools and speak exactly the same language, but from the