worked and possibly downwarped Pleistocene shoreline deposits exposed onshore farther south.

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FOUNDERING OF CONTINENTS AND ITS RELATION TO ISOSTASY, CRUSTAL THINNING, AND MANTLE DENSITY CHANGES

Current theories on geosynclinal subsidence and on the disappearance of ancient land masses postulate crustal thinning by subcrustal processes. This idea was a necessary implication of the two premises popular a decade ago, namely: (1) surface elevation is related to crustal thickness according to Airy's model of isostatic compensation; (2) either the crust as defined by the Mohorovicic discontinuity is comparable with the crust envisioned by Airy, who separated a solid crust from a fluid substratum, or there is no significant regional difference in mantle density, and there has been none during the past. Recent geophysical investigations have indicated that isostatic adjustment could result not only from changes in crustal thickness, but also from variation in upper mantle density. This new discovery permits the postulate that thinning of continental crust can be related to removal of surficial sialic material by supracrustal processes, such as erosion, gravity sliding, and overthrusting from elevated regions which owed their surface elevation to an abnormally low mantle density. Subsequent increase in mantle density because of variations in mantle temperature leads to isostatic subsidence of regions of thin crust. Such a combination of crustal thinning by supracrustal processes and isostatic subsidence related to mantle density changes could explain adequately (1) the disappearance of ancient land, (2) the formation of a new geosyncline at the site of an ancient land, and (3) the estimated chemical composition of the earth's crust. The efficacy of supracrustal processes to remove large quantities of sialic materials has been discussed. It is not necessary to postulate subcrustal processes which either must assume lateral transfer of vast quantities of crustal material or that the Mohorovicic discontinuity is a phase change boundary. An isostatic model relating surface elevation, crustal thickness, and mantle density variation during an orogenic cycle is presented.

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LOWER CRETACEOUS ALGAE FROM SOUTH TEXAS

Appreciable numbers of algae occur in the Lower Cretaceous limestones of reef and near reef facies. They include red algae belonging to the families Solenoporaceae, Permocalculus, and Corallinaceae, and numerous green algae of the family Dasycladaceae. The flora is quite similar to the Lower Cretaceous flora of the Mediterranean region, with identical or closely related species. A number of the genera are recorded for the first time in the western hemisphere.

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THE GILBERT-TYPE DELTA

The pioneer work on deltaic sedimentation was done by G. K. Gilbert, and published in 1885, and in 1890. The deltas which he so carefully described were built into Pleistocene Lake Bonneville by rivers and creeks entering the lake from the rugged Wasatch Mountains to the east.

The classic concept of the delta, as described by Gilbert, with distinctive topset, foreset, and bottomset beds, was incorporated into virtually all introductory textbooks in geology as a "typical delta". It has persisted until the present time, in spite of the publication of many papers on such complex deltas as the Mississippi and others quite different from Gilbert's classic, simple delta. The term "Gilbert-type Delta" was introduced by Bates in 1953, who characterized it as a product of homopycnal flow into lakes.

The present paper describes and illustrates some typical Lake Bonneville deltas as "Gilbert-types". The deposits are characterized by:

1. Essentially homopycnal flow by mountain streams of steep gradient into deep water immediately offshore.
2. Occasional turbidity flows (mud-rock flows); hyperpycnal.
3. Coarse gravels dominant in foreset beds.
4. Fine sands and silts in bottomset beds, prograded locally to receding lake levels.

Some of the deltas of Lake Bonneville are true counterparts of alluvial fans.

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REGIONAL ENVIRONMENTAL STUDY OF THE NUGGET AND NAVAJO SANDSTONES

The late Triassic (?) and early Jurassic Nugget and Navajo Sandstones are compositionally and texturally extremely homogeneous, mature, feldspathic quartz arenites extending over vast areas in the western United States. They have long been considered as "classic" eolian sandstones, deposited within great interior, sub-tropical deserts.

Trough-shaped "festoon" cross-bedding predominates and most tabular-planar and irregular sets are modifications of this basic style. Large scale simple, non-erosional, wedge-shaped sets are subordinate and are restricted stratigraphically to the middle part of the Navajo Sandstone. Ripple-marked, wavy-bedded horizons, plane bedded to massive units, and interbedded shale seams associated with horizontal truncation planes are common, particularly in the Nugget Sandstone. Very thin dolomitic carbonate lenses are found in the Navajo. While the sparse fossil evidence is indicative of terrestrial, but not necessarily extremely arid, conditions, these latter characteristics, as well as widespread contortion of inclined laminae, are apparently the result of subaqueous processes.

Sediment volume, grain composition, and textural maturity indicate a predominantly sedimentary provenance. No areal compositional or textural trends are discernible but south- and southeasterly-directed paleocurrents suggest a source along the western margin of the Canadian Shield. Textural parameters derived from recent sediments fail to clearly identify Nugget and Navajo depositional environments.

The weight of all evidence indicates, however, that both formations consist of a complex of shallow-marine, littoral, and coastal dune deposits laid within, and in advance of, an east- and southward-transgressing sea. Although temporary regressive oscillations may have at times exposed large areas of marine sand to the action of the wind, the majority of Nugget and Navajo cross-bedding is aqueous in origin. Preserved eolian structures are remnants of transverse coastal dune belts rather than vast interior dune fields, and paleocurrent directions thus reflect both marine current and coastal on-