recognized. Early references to Lower Silurian faunas in the Great Basin are Lower Silurian in the old European sense, that is, Ordovician.

The rocks in the western facies are predominantly black shale with minor amounts of sandy and calcareous shale and rare interbeds of limestone.

The fauna in the western shale facies is largely pelagic. Locally well preserved graptolites range from Middle to Late Silurian in age. The Upper Silurian shales locally contain eurypterids.

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Tabular Masses of Disordered Breccias in Southern California

Breccias with highly disordered internal structure are widespread in southern California, especially in non-marine parts of the Tertiary and Quaternary sections. Nearly all of them occur as tongue-like or otherwise tabular masses and as erosional remnants of such masses, and they range from a few feet to several miles in maximum exposed dimension. At different localities they have been variously referred to as megabreccias, chaotic breccias, rubble breccias, cyclopean breccias, monolithologic breccias, and as slide, slump, mudflow, debrisflow, or fault breccias.

The most characteristic features of these rocks are the following.

1. The clasts are angular to sub-angular, and pebble-size to cyclopean; most of the very large ones are fractured to severely shattered.

2. The abundance ratios of clasts to matrices are very high; the matrices are themselves predominantly clastic.

3. Sorting is poor to good, and in general can not be attributed to the process of breccia formation per se.

4. Stratification is crudely developed or absent.

5. Many of the breccia masses are essentially monolithologic and commonly intertongue with other monolithologic masses of similar or contrasting lithologic character, or with breccia masses that consist of heterogeneous clasts.

6. The abundance of rock types among the clasts is directly related to the cliff-forming characteristics of the same rocks where they are exposed in place in the same regions.

Most of the breccia masses are underlain and overlain by fanglomerates and other sedimentary rocks with clasts that are lithologically similar to those in the breccia masses but generally more rounded. The masses have sharp lower margins and sharp to gradational upper margins, and most of them butt against or interfinger with various kinds of sedimentary rocks. No lower margins have been traced into major faults; instead most of the masses conform with the structure of the underlying rocks. Nearly all of the breccias occur near zones of major faulting or flank areas of major uplift.

Many of the breccia masses are demonstrably of sedimentary rather than tectonic origin, and most of the others seem best interpreted in this way. They evidently were formed under conditions that permitted rapid mass migration of rock debris, in some areas for distance measured in miles. Debris flows, derived from localized source areas, are thought to account satisfactorily for most occurrences. This specialized type of sedimentation may well have been more widespread in both space and time than has been recognized heretofore.

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Post-Eocene Age for "Markley Gorge" Fill Sacramento Valley, California

In the southern Sacramento Valley there is a buried erosion surface of marked relief, which is usually called the "Markley Gorge." It is a post-Eocene erosional feature, eroded into a sequence of marine strata, which range in age from Late Cretaceous through late Eocene (Markley sand).

The "Markley Gorge" was filled with sediments of diverse lithologic and mineralogic character, distinctly different from earlier strata. In their lower part, these sediments contain an indigenous microfaunal assemblage indicating Oligocene age. Some coarse zones contain detrital shale fragments. Foraminifera of late Eocene age were obtained from one core sample. Apparently they were derived from the shale fragments.

The "Markley Gorge" fill is separated from the Markley formation and older strata by a regional unconformity.

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Santa Cruz Basin Oil Province

The Santa Cruz basin is a highly compressed structural and stratigraphic basin extending from Half Moon Bay, through the Santa Cruz Mountains, and may extend across the San Andreas fault to include the Hollister basin on the southeast. It is bounded on the southwest by the Ben Lomond-Gabilan granitic shelf, and on the northeast, by the Montara granite mass and the Gilroy Franciscan shelf.

The Tertiary rocks of the region are divided into two sequences by an angular unconformity. The