THE LA BREA TAR PITS

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Located in the heart of downtown Los Angeles, in the Miracle Mile district and next to the Farmers' Market are the La Brea Tar pits, also sometimes referred to as the Rancho La Brea Tar Pits, The Tar Ranch. If the taxi driver does not know where they are just mention the Page Museum because the Tar Pits are right next to it.

The word 'Brea' means tar in Spanish. If one translates 'The La Brea Tar Pits' into the English language the translation would be 'The The Tar Tar Pits'! (An example of pleonasm.)

For the past 40,000 years asphalt has been oozing and bubbling to the surface from the extensive oil deposits below the surface of the Los Angeles basin.

First discovered by white men in 1769, this cluster of some 100 Tar Pits in the middle of the city, now known as Hancock Park, is home to over three million fossils, most of them in pristine condition. This site is one of the world's most famous locations to study an exceptionally diverse assemblage of extinct Ice Age plants and animals of the Pleistocene epoch.

The Tar Pit fossils are a window into life in southern California from 40,000 to 8,000 years ago.

After the American Civil War the true economic value of the area was realized and in the 1870s the industrial exploration of oil and the mining of asphalt had began.

Observant visitors to the City of Los Angeles may have marvelled at the many 'Nodding Donkeys' pumping oil from within the city boundary and the surrounding urban landscape.

The Los Angeles basin is a coastal, sediment-filled plain, rich in petroleum and is home to the state's largest oil and gas fields. Oil and gas migrate upward from these underground fields to form extensive oil and gas seeps in the area.

The basin is located between the peninsula and transverse ranges in southern California, containing the central part of Los Angeles and parts of the Orange counties. The basin is bounded by the Santa Monica Mountains, the Puente Hills and the Santa Ana Mountains. The Palos Verdes Peninsula marks the outer edge of the basin along the coast.

The sediment in the basin is up to 11 km deep and was formed during the Miocene and Pliocene Epochs of the Tertiary approximately 15 million years ago, whilst the area of Los Angeles and Rancho La Brea lay beneath the surface of the Pacific Ocean. The underlying crustal weakening resulted in the formation of a large bowl within the basin and sediments from the sea and rivers built up in thick layers in such a deep depression on the ocean floor.

The accumulation of micro-organisms and plant remains during this time is believed to be the source of the large deposits of oil in the Los Angeles basin.

The sedimentary character of the basin is the principal reason why it is considered especially susceptible to excessive damage during earthquakes. The basin is often compared by geologists to a 'bowl of jelly' that can shake violently when driven by seismic activity of the San Andreas Fault system.

Its loose rock structure has also led to numerous instances of subsidence as a result of oil extraction, the most spectacular examples being the Baldwin Hill dam collapse in 1963 which claimed several lives and caused considerable damage in the area due to flooding. Baldwin Hills is a district in south-western Los Angeles.

Just as spectacular was the sinking of the Long Beach harbour floor in the San Pedro Bay by several metres. It may be of interest to note that the former cruise liner, the Queen Mary, is now tied up next to Long Beach Harbour.

About 5 million years ago, the crustal stretching subsided and the ocean floor of the basin was forced to the surface. Additional sediments of sand, gravel and clay from the erosion of emerging hills accumulated on top of the much older oil-rich marine deposits during the upswell resulting in the floor of the basin as it exists to-day.

Further erosion from the surrounding hills continued to form new layers of sediments on top of the older ones and over tens of thousands of years produced the cone-shaped asphalt deposits found at the Rancho La Brea Tar Pits.

Although commonly called Tar Pits, the liquids that seep out of the ground at Rancho La Brea are actually comprised of asphalt, not tar. These two names can sometimes lead to confusion. Tar is a commercial by-product made by the distillation of woody materials such as coal or peat while asphalt is a naturally formed substance comprised of hydrocarbon molecules and is the lowest grade of crude oil.

Asphalt seeps like those at Rancho La Brea are rare. The Tar Pits form when crude oil oozes to the surface through conduits and fissures in the Earth's crust. The light fraction of the oil evaporates, leaving behind the heavy tar, or asphalt, sometimes also referred to as bitumen, which accumulates as a sticky, dense, heavy and highly viscous liquid in lakes or pools or oozes out anywhere in small patches on the ground just like thick, black treacle.