ABSTRACTS – SHREVEPORT MEETING, MARCH 26-29, 2003 – Mary Barrett, Chairperson

This paper reports the history of the Czarist government's project to explore the Caspian Sea at Baku, then reports the unique factors that motivated and made possible the petroleum exploration of the sea at Summerland and the operation, ownership and history of its sea wells.

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CALIFORNIA INDIANS, ARTISANS OF OIL

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"...at a distance of two leagues from this mission [San Luis Obispo] there are as many as eight springs of bitumen or thick black resin that the natives call chapopote*; it is used chiefly by them for caulking their small watercraft and tarring the vases and pitchers the women make for holding water."* Pedro Fages, 1775

Natural oil seeps, like those Pedro Fages found with his soldiers in 1775, have been active in California for thousands of years. Most seeps are in the southern half of the state—either along the Pacific coastal areas, both onshore and offshore, or in the vast, central San Joaquin Valley.

Any historical study of the petroleum industry in California must begin with the oil-related activities of California Indians living around the seeps. Fages and other early explorers—from the 1500s on—recorded how California Indians refined and used asphaltum and heavy oils from the seeps. Documentation has continued through the years, and today many references and objects show us how California Indians—including the Yokuts, Achomawi, Maidu, and Chumash—used asphaltum and heavy oils for symbolic, decorative, and practical purposes.

As elsewhere in the world, some of these objects evolved into *folk art*, becoming articles that not only satisfied the daily practical needs of those who produced and used them but also reflected the aesthetic values of the creators themselves, the artisans of oil. In fact, the astounding variety of Indian uses of petroleum resembles our own.

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CANOE PITCH TO CORNERSTONE OF CANADIAN OIL PRODUCTION: THE ATHABASCA OIL SANDS, ALBERTA, CANADA

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At some 868 billion barrels of bitumen in place, the Athabasca oil sand deposit is the world's second largest known crude oil resource. There is a tremendous difference between a resource in place and economic production. Bridging that gap took many decades and numerous failed attempts before the first trickle of economic production was achieved. This is that story.

Bitumen is heavier than water and is more viscous than molasses. The oil sands are saturated with water and bitumen trapped in the pore spaces. The sands are exposed along the banks of the Athabasca River in northeastern Alberta. The native Indians who traveled the Athabasca river highways knew of this enormous deposit. It was, however, a local curiosity with practical applications limited to a pitch for caulking canoes and the like. The first recorded mention of the bitumen deposits was in 1719 when a Cree Indian brought a sample to a fur trading post on the shores of Hudson Bay.

Early explorers observed free bitumen in pools at the bottom of the river channel as well as the saturated outcroppings. Entrepreneurs tried to drill wells through the bitumen to the pools of oil thought to lie below. Natural gas was discovered but no free oil. Attention then turned to experiments trying to separate the bitumen from the sand. Pilot plants were opened through the 1920s-1940s.

The first commercial oil sands mining operation commenced in 1967. Current production is approximately 485,000 bbls per day of synthetic crude oil.

AUSTRIA – A SCENIC COUNTRY, BUT ALSO AN OIL PROVINCE?

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Some two and a half thousand hand dug pits were the source of an annual oil production of 5,000 tons in the early 1860s. New and advanced drilling technologies and diversified use as well as increased demand for oil pushed the Austro-Hungarian Monarchy from a minor oil player in the middle of the 19th to the third largest oil producer in the world in the early 20th century, just surpassed by the United States and Russia. Almost all of this oil – with a peak production rate of some 2 million tons in 1909 – came from Galicia – an area that belongs now to southern Poland and the western Ukraine. Within its political limits of today Austria is a relative newcomer with respect to a professional exploration for and production of hydrocarbons.

A systematic exploration of the Vienna Basin, Austria's most important oil province and home of Central Europe's first giant oil field (Matzen, discovered in 1949), started in the 1920s and was based upon surface geological investigations as well as on gravimetric and other

(geo)physical measurements conducted by Austrian geologists on behalf of two companies – the Eurogasco and the Vacuum Oil Company. In 1930 these and the activities of other companies resulted in the first proof of oil. In 1935 the newly founded RAG (a joint venture of the Vacuum Oil Company and Shell) was granted exploration rights across most of the Vienna Basin. Already their second well discovered a thirty million barrels oil field which has been producing oil since 1937. The Vienna Basin with numerous reservoirs in several tectonic floors in depths between 500 and 8000 meters has been explored and exploited successfully until today.

Some 200 km west of Vienna, the Molasse Basin – the northern foredeep of the Alps – provides the second hydrocarbon province in Austria. Here, already in 1900 major parts of the city of Wels were lightened by natural gas. This was discovered by accident in 1892 when a newly drilled water well in the backyard of a nursery started to eject water and gas. The discovery of heavy oil at the northern edge of the Molasse Basin in 1906 was more a local attraction than the starting signal for a rising golden age. It took almost fifty more years to see the first economic oil flow from the Tertiary in the Molasse Basin. Thermal oil and biogenic gas are (more or less) restricted to individual stratigraphic horizons. Originally overlooked or just registered as a useless byproduct, in the early sixties gas became an interesting and more and more important exploration and production target. Meanwhile, natural gas is the dominating and highly profitable hydrocarbon product from the Molasse Basin with an annual production of some 200 BFC or 12% of the domestic consumption.

During the history, Austria as a mountainous country used to be rich in mineral resources. But today, the oil and gas production remains as the only profitable "mining"-branch and is looking forward to some more prosperous years.

OIL COMPANIES AND UNINTENDED CONSEQUENCES

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During World War II, the bulk of the oil fueling the Allied war effort came from the United States, seriously lowering domestic reserves. To improve exploration effectiveness, some twenty US oil companies responded by starting exploration research. They staffed their labs with top new geology PhDs from universities across the country. This became a pre-NSF post-doctorate experience for many, as fifty or more geologists left the labs for university teaching, and continued their research started in the labs.

Oil companies commonly get blamed for actions, mainly environmental, that result in negative publicity. Some actions have unintended consequences with positive results. Exploration research may—or may not—have been of great benefit to the companies. The unintended consequence was a significant boost to soft-rock geology. Only published research had an impact on the science. Fields of soft-rock geology that got jump-started include: Recent clastics and carbonates, clay mineralogy, carbonate petrography, organic geochemistry, stratigraphy, paleoecology, palynology, rock mechanics and structural geology. Several of these were aided by pioneering advances in computer applications.

This project is limited to the "Golden Age", the third of a century from 1947 to 1980 when budgets were unlimited, researchers chose their own projects, and could publish some results with little hindrance. Published research tells the obvious story. More interesting is the "story behind the story"—those human interest aspects not usually revealed in scientific journals. Personal anecdotes from participants provide the materials for this work-in-progress.

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AMERICA'S FIRST SUCCESSFUL RAILWAY TANK CAR, 1865

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The first practical railway tank cars in America went into service in 1865 following a successful run in late summer from a terminal at Miller Farm on Oil Creek, Pennsylvania, to New York. Amos Densmore, an oil producer, and his brother James Densmore of the Densmore Brothers, an oil buying and shipping firm at Miller Farm, are credited as the inventors, and their names appear on the letters patent. They obtained the use of a flat car from the Atlantic and Great Western Railroad and mounted two round wooden tanks on it, each one over the trucks. The tight tanks were built of pine planks and held 40 to 45 barrels of crude oil each. James Densmore saw to the building and procurement of the tank cars. A partner, Watson & Company, bought oil for shipment and handled loading. Oil was shipped by the Densmore, Watson & Company to Clint Roudebush & Company in New York City on a steady basis. Other shippers followed the design and a vast bulk commerce of crude oil and refined products resulted from this invention.

The Densmore two tank design was patented tardily on April 10, 1866. Many of those cars were already on the tracks before that date as well as similar cars built by others. Patents for protection purposes were also obtained on June 26, 1866, for designs having a single tank, three tanks and square tanks, but the cars with two wooden tanks remained the most common. The patents stated that light riveted sheet