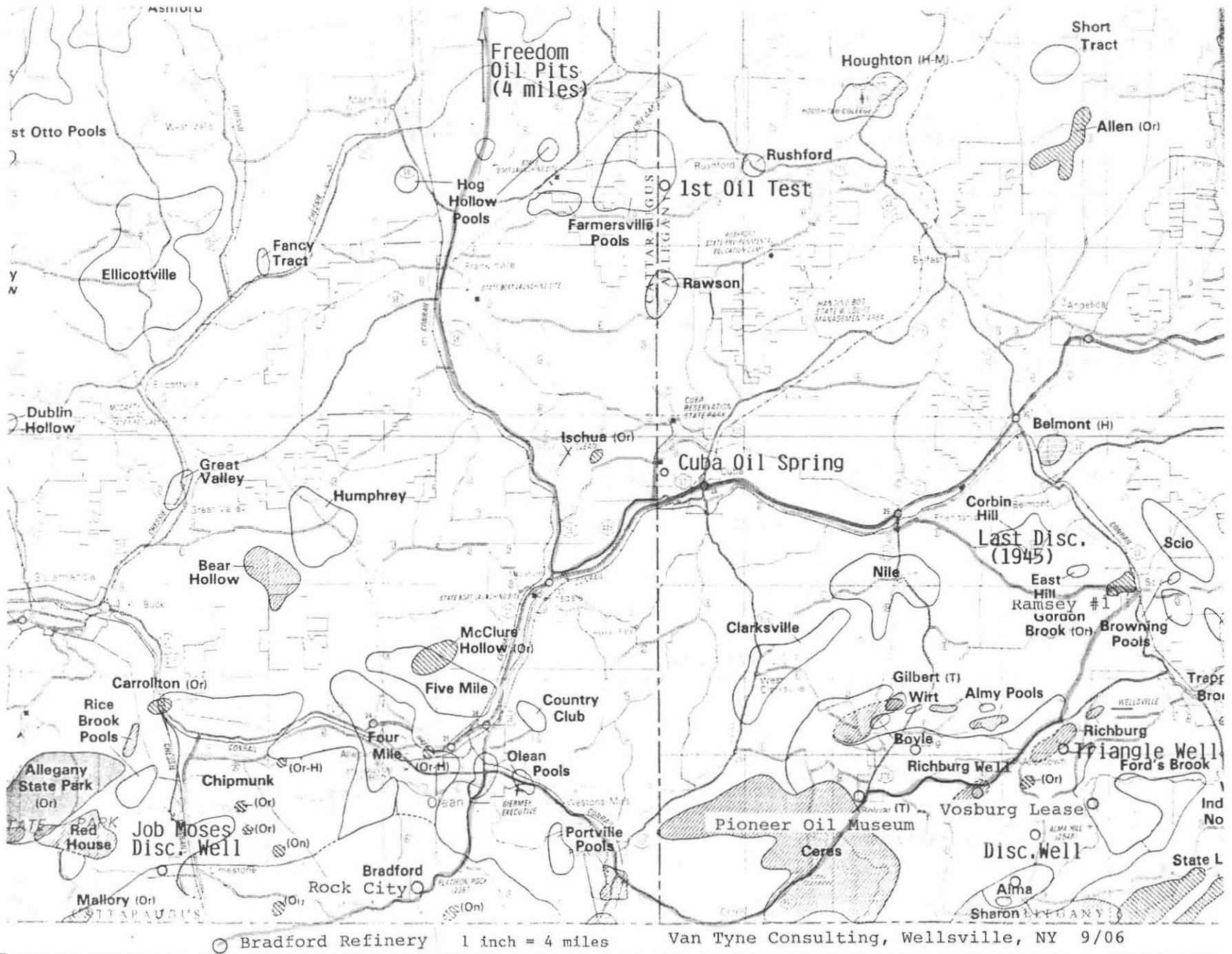


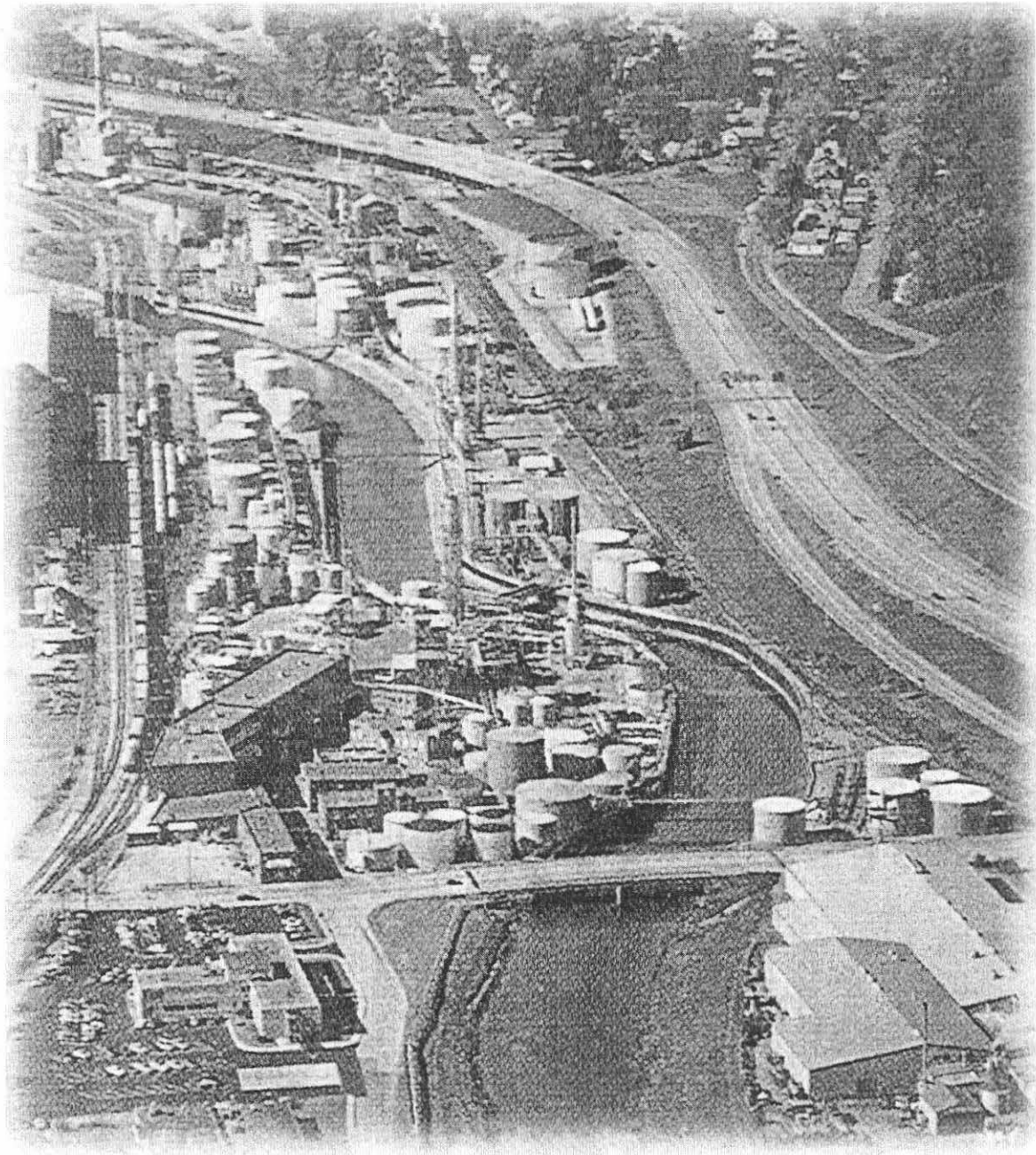
NORTHERN APPALACHIAN BASIN OIL AND GAS: HISTORICAL PERSPECTIVE

Field trip to Bradford, Pennsylvania and various locales in southern Cattaraugus and Allegany Counties, New York.

Held on Saturday, October 7, 2006 in conjunction with the joint annual meetings of the New York State Geological Association and the Eastern Section - American Association of Petroleum Geologists in Buffalo New York.

Arthur M. Van Tyne, Field Trip Leader.



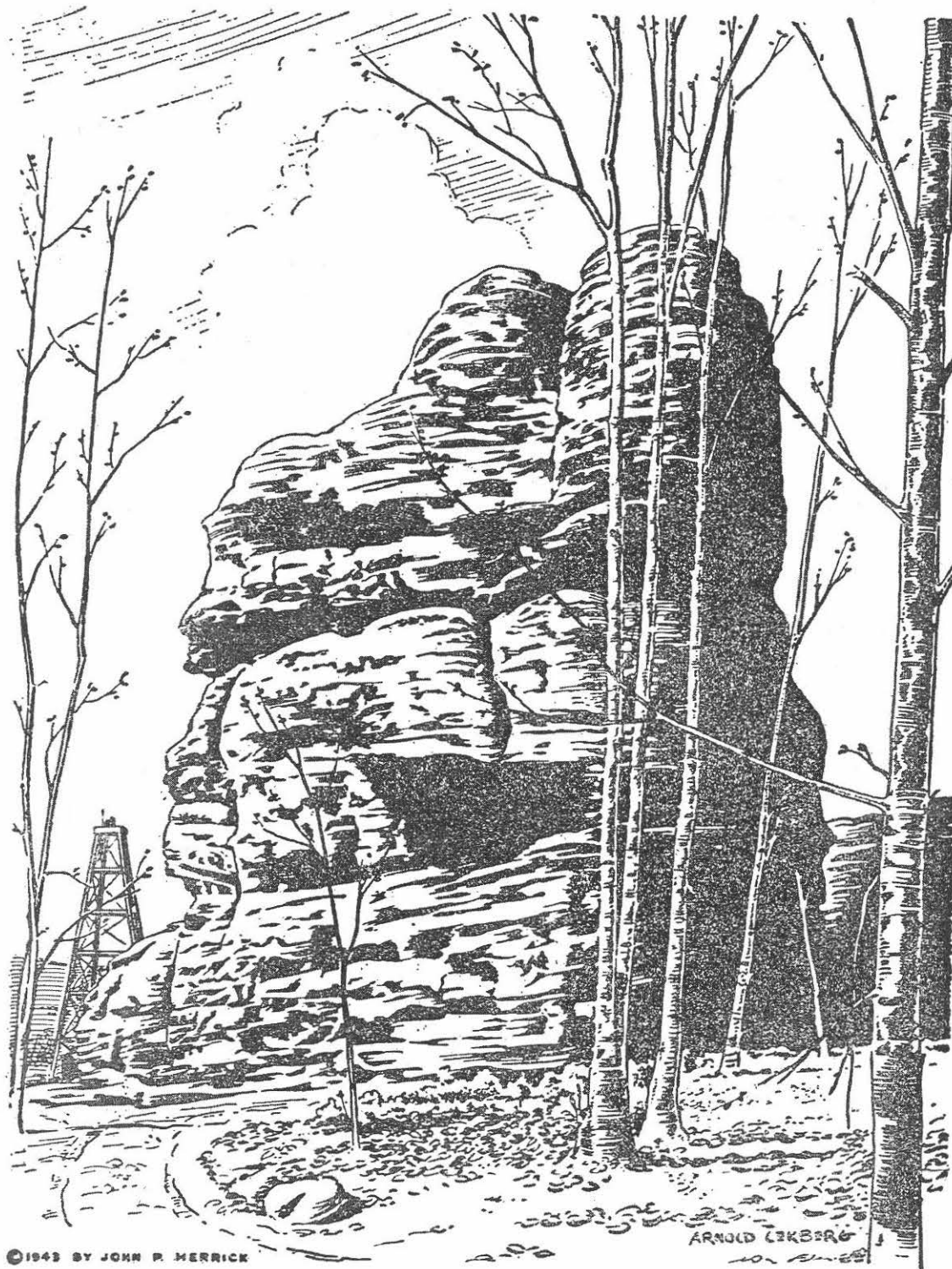


BRAD PENN[®] Refinery **Bradford Pennsylvania**

Stop 1. Our trip will proceed first to Bradford, Pennsylvania where we will visit an oil refinery owned by the American Refining Group. This refinery was started in 1881 and was formerly owned by the Kendall Refining Corp. This summer its 125 anniversary was celebrated by American Refining. It is now said to be, "the oldest continuously operating refinery in the U.S. and the oldest refinery in the world dedicated solely to processing 100 % Pennsylvania Grade crude oil." It is one of only two small refineries still operating in all of central and western Pennsylvania. The Kendall company became famous for its two fingers in the air ad signifying that by the use of Kendall Pennsylvania grade oil you only needed to change the oil in your car motor every 2,000 miles instead of sooner with the use of other motor oils!

Stop 2. After leaving the refinery we will proceed northeastward through Bradford and the Bradford oil field up into a hilly area between Bradford and Olean, New York. Just across the NY-PA State line we will stop at the tiny hamlet of Rock City. This place received its name from the huge rock formations which occur here. These rocks are the Olean conglomerate and sandstones of the Pennsylvanian Pottsville Group. These have been described as fluvial deposits by some researchers. Coming up the hill we passed outcrops of the underlying shales and sandstones of the Mississippian Pocono Group. At this locale the Olean conglomerate has been eroded into a literal "Rock City" and you can now walk down the enlarged joints as "streets" between the rock "buildings". Rock City is actually the technical geologic term for such erosional features. Because of the high purity of the silica in the Olean conglomerate nearby outcrops were quarried extensively during WWII for their silica content. Those pebbles were used in the manufacture of high fidelity radio frequency crystals which were installed in military and aircraft radios.

This rock city has been a Sunday outing site for people from the surrounding area since at least the early 1900s. The current owners, Cindy and Dale Smith, purchased the park from its former long-time owner only a few years ago. They have made a number of improvements to the trail system and have built a new pavilion with tables for picnickers which we may use for our lunch time today.



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ARNOLD LEBERG

Lone Rock Towers High Above Oil Derrick at Rock City

Stop 3. Our next stop will be at the Pioneer Oil Museum in the Village of Bolivar, NY. The museum was started in the 1970s by several local oil producers in an effort to save as much as possible of the artifacts of the early oil industry of this area. Old oil field equipment, data, maps and other information was usually discarded as various operations closed down. The museum has been quite successful in obtaining many gifts of old equipment and records from families and acquaintances of pioneer oilmen.

The building in which the Museum is now located was originally the McEwen Brothers Oilfield Supply Store. It was purposely located here in the heart of the Allegheny oil field. An adjacent addition to the north was recently erected with the help of a New York State grant but the Museum has now outgrown its present site. A larger, and better constructed, building nearby has recently become available and the Museum will be moving to that site as soon as possible. That building, the old Hahn & Schaffner Supply Co. establishment, has been purchased by the New York State Oil Producers Association for the Museum.

Stop 4. After leaving the Pioneer Oil Museum we will proceed eastward on Route 417 to the Vosburg oil lease owned by Plants & Goodwin. Mr. Paul Plants, the owner, is currently the President of the New York State Oil Producers Association and also of the board of the Pioneer Oil Museum.

The lease consists of 95 oil wells and 102 water input wells on a 275 acre tract. It has been operated for more than 60 years. This is a fully developed secondary oil recovery waterflood operation. The last major development took place in 1982 but one new oil well was drilled in the late 1990s. The oil wells are producing from the Richburg sandstone which is quite thick here. The average depth of these wells is 1,300 to 1,400 feet. About 2½ million barrels of oil has been recovered from this lease over a long period of time. We will be walking in about 600 to 700 feet to visit a central power operation with a large eccentric shaped band wheel which pumps several wells with one rotation. This central power is one of only a few still operating in the New York-Pennsylvania oil fields

Stop 5. Gordon Brook Oriskany Gas Field. We are stopping by here briefly only because it is on the way to our last stop. We are looking at the No. 1 Ramsey, the discovery well of the Gordon Brook Gas Field. The well was originally drilled in 1970 by Professional Petroleum Exploration but is now owned by Vandermark Exploration.

Gas Production is from the Oriskany sandstone at a depth of 3,840 feet. The well came in with a flow of 6 to 7 million cubic feet of gas per day. It was still producing gas up to a few years ago but now makes too much salt water when production is attempted. The well has produced about one-half billion cubic feet of gas. Just beyond the well head can be seen the separator where the brine is separated from the gas stream. The brine is then stored in the nearby tank until it can be disposed of properly. This is an example of Oriskany sandstone gas production from a small structure



which is extensively faulted and where the Oriskany is pinching out. Gas has migrated into an offset in the pinchout line and later into the highly broken up sandstone to high areas along the faults. The field itself has produced about five billion cubic feet of gas and still has three producing wells.

Stop 6. Seneca Oil Spring.

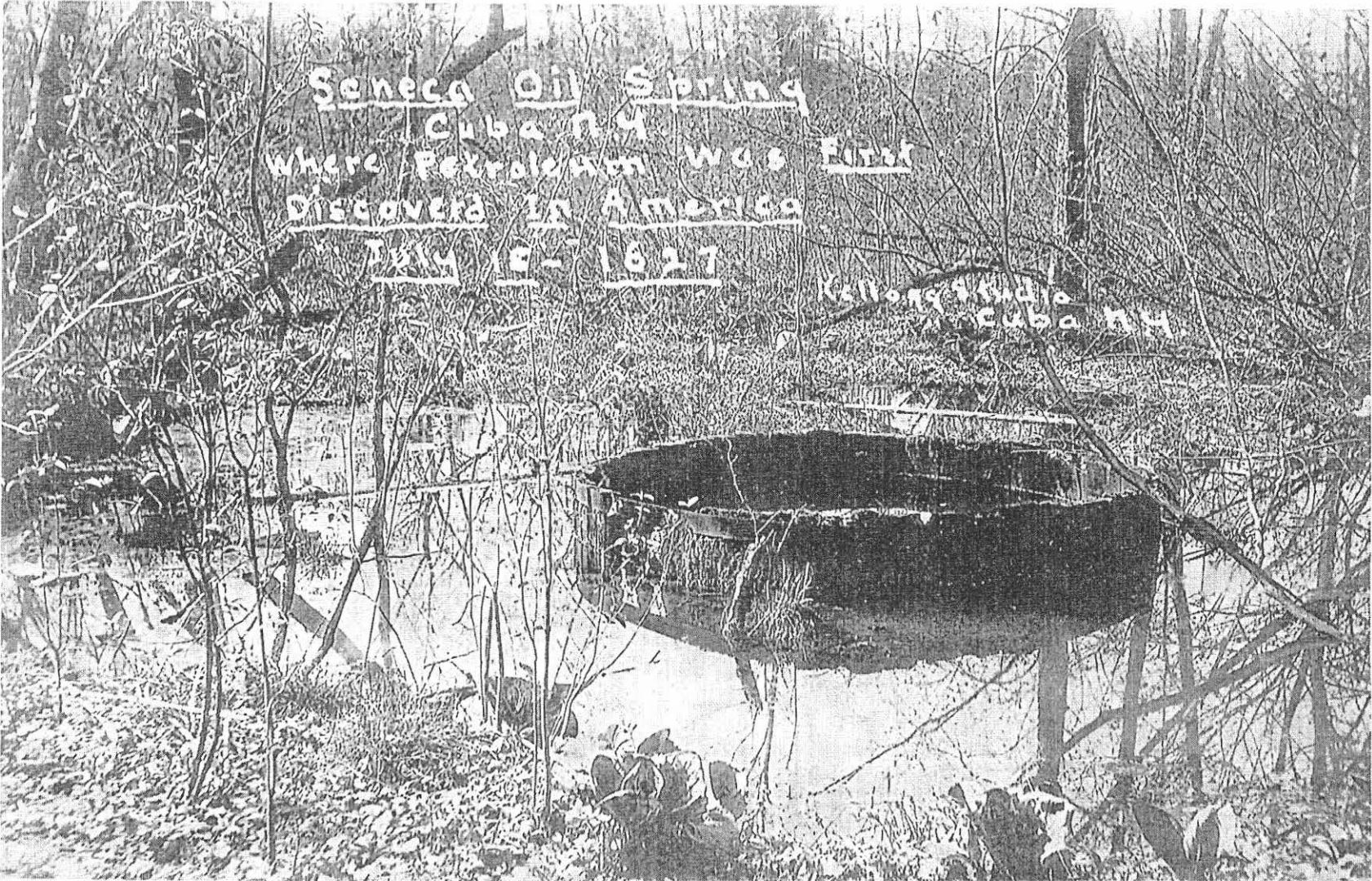
This locale, sometimes known as the Cuba Oil Spring, is located about one and one half miles northwest of the Village of Cuba in central-western Allegany County, NY. This once active oil seep, well known to the local Native Americans, has been reported by many historians of the petroleum industry to have been, in 1627, the site of the first observation by Europeans of petroleum on the North American continent. This was said to have occurred when a Franciscan Recollect Friar, Father Joseph de la Roche Daillon, was taken to see the spring by a group of friendly Native Americans.

Fr. Daillon had been sent to Quebec, Canada by his superiors in France to search for and assist Fr. Nicolas Viel who was working as a missionary to the Hurons. He arrived in Quebec in May of 1625 and soon heard of the death of Fr. Viel in June of 1625. In mid 1626 he journeyed westward to the land of the Hurons. Later, in October of 1626, he journeyed westward again to the land of the Neutrals. While there, on July 18, 1627, Fr. Daillon wrote a letter to a friend in France telling of his experiences with Native Americans. That letter was published in 1636 by Fr. Gabriel Sagard Theodat in his "Histoire du Canada" and became the basis for later interpreters to claim that Fr. Daillon had been taken to see the Cuba Oil Spring.

The Cuba Oil Spring may still be the first place where Europeans saw petroleum in North America but, in the light of further research, we will have to change the date a bit. In a 1962 AAPG Bulletin the late Dr. John Wells, a distinguished Professor of Geology at Cornell University, published a paper in which he disputed the evidence for the Fr. Daillon visit. He quotes the abovementioned Daillon letter as telling of the abundance of vegetables which were available as well as, "some very good oil" (huile). Wells felt that this term refers to an edible oil and believed that Fr. Daillon would have used the word petrole (rock oil) for such an occurrence as the Cuba oil spring because that term had already been applied to oil seeps which had been known in Europe and the middle east for hundreds of years.

He states that the earliest true reference to the Cuba oil spring was made in 1656 by later Jesuit missionaries who described it thusly, "As one approaches nearer to the country of the Cats (Eries) one finds heavy and thick water, which ignites like brandy, and boils up in bubbles of flame when fire is applied to it." This has also been documented in a paper by Thomas, et al given at the Forum on History of Petroleum Geology at the May 1998 AAPG Annual Convention held in Salt Lake City, Utah.

The oil probably came from a subcrop of the Bradford First, and possibly also the underlying Chipmunk sandstone zone under 100 feet or so of valley fill. There is no crude oil visible at the Cuba oil spring now and there has not been any for many years. It



is probable that the drilling of several shallow wells around the spring in the early 1860s depleted whatever was left of oil which had accumulated under the fill.

By the Treaty of Big Tree in 1797 one square mile around the spring was set aside as an Indian Reservation. The large plaque placed on the boulder of Olean conglomerate and dedicated in 1927 reads as follows:

SENECA OIL SPRING

Its history forms the first chapter in the development of the petroleum industry in America, a gigantic world enterprise transforming modern life.

- 1627 - Oil on American continent first recorded in this region by the Franciscan Fr. Joseph de la Roche Daillon.
- 1656 - Spring mentioned by Jesuit Fr. Paul LeJeune.
- 1721 - Visit by Joncaire.
- 1767 - Oil from this spring sent to Sir Wm. Johnson as a cure for his wounds.
- 1797 - Spring permanently reserved by Indians in Treaty of Big Tree.
- 1833 - Description of spring by Prof. Benjamin Silliman of Yale University.

Erected in 1927 by the University of the State of New York and the New York State Oil Producers Association.

Road Log for Field Trip A-3

Parking lot of Adam's Mark Hotel - Buffalo, NY, Saturday, 10/7/06, 8:30 A.M.

Circle around Hotel and take ramp up to Rt. 190, bear left at first intersection (do not go right onto the Skyway), and drive about 6 miles to Exit 53 and Rt. 90.

Go south (bear right) on Rt. 90 and go four miles to the beginning of Rt. 219, Take Rt. 219 south for 23 miles to the Springville Exit. Here, Rt. 219 becomes a two lane road. Drive south on Rt. 219 for about 27 miles to an exit onto Rt. 417 and 219 at Salamanca. Turn left (Eastward) onto Rt. 417 and Rt. 219 and follow the signs for about 3 miles until directed across the River onto Interstate 86. Go east for 6 miles to Bradford Exit on I86. Get off at Bradford Exit and drive south (turn right) on Rt. 219 again for 11 miles to the Refinery in Bradford, PA. Get off at the Kendall St. Exit to go east to the Refinery gates.

Leaving the Refinery go east on Kendall Ave. to Main St., turn left on Main and go $1\frac{1}{2}$ miles to Foster Brook intersection. Turn right onto PA. Rt. 346 and drive for $2\frac{1}{2}$ miles to PA Rt. 646 intersection. Turn left onto PA Rt. 646 and drive for 5 miles, across the NY-PA State line and onto NY Rt. 16, to Rock City, NY.

Leaving Rock City go north on Rt. 16 for 8 miles into Olean, NY and the Main-State St. intersection just past a small park on the right. This is the Rt. 16-Rt. 417 intersection - go right onto Rt. 417 and drive for 20 miles to the Village of Bolivar. The Pioneer Oil Museum will be on your left in the center of the Village next to a gasoline filling station.

Leaving the Pioneer Oil Museum stay on Rt. 417 and drive a short distance to a traffic light where you should turn right and go out of Bolivar past the school. It will be about 5 miles to the Vosburg lease which will be on the right hand side of Rt. 417. You can pull off onto either one of two roads there.

Leaving the Vosburg lease, continue driving east on Rt. 417, through the hamlet of Allentown, for about 3 miles to an intersection with Knight Creek Rd. (County Rt. 9). NOTE: If you miss the intersection you will be driving up a fairly steep, long hill - you can turn around at the top at a Motel and come back down to the missed intersection. Bear left onto Knight Creek Rd. and drive for $5\frac{1}{2}$ miles to an intersection with Back River Rd. just outside of Scio, NY. Turn left there onto County Rt. 31 and go for $\frac{3}{4}$ mile to the Ramsey well on the left.

Leaving the Ramsey well go back onto County Rt. 31, turn left and drive for eight miles to Friendship, NY. Turn left at the intersection with County Rt. 20, just past the P.O. and in the center of the Village. Go through and out of the Village to a major intersection with a blinking light where you will be directed to take a right turn to get onto I 86. Go right for about $\frac{1}{2}$ mile

and after going under the highway turn right onto the westbound entry onto I 86. Drive west for 7 miles on I 86 and get off at the Cuba Exit which will bring you down to intersect with Rt. 305. Turn left here, go under I 86, to the traffic light and turn right onto Rt. 446. Drive for 1 3/4 miles to a road to the north (your right) which has a sign for the Cuba Oil Spring. Turn right and go 1 1/4 miles to the entry road to the Spring - there are marker stone piers here, turn right and go in for a few tenths of a mile to the parking area.

Leaving the Oil Spring, turn left at the entrance and go south to the intersection with Rt. 446 where you turned north previously. Turn right onto Rt. 446 and go 5 1/2 miles to Rt. 16 at Maplehurst. Turn right and take Rt. 16 northward to Yorkshire Corners, a distance of 28 miles. From Yorkshire continue north on Rt. 16 for 14 miles to an intersection with I 400 at South Wales. Take I 400 northwesterly to its blend-in intersection with I 90 a distance of 15 miles. Blend right onto I 90 and drive for about 2 miles to Exit 53. Follow directions to go to Downtown Buffalo at Exit 53 and drive 6 miles to the Church Street Exit and the Hotel.