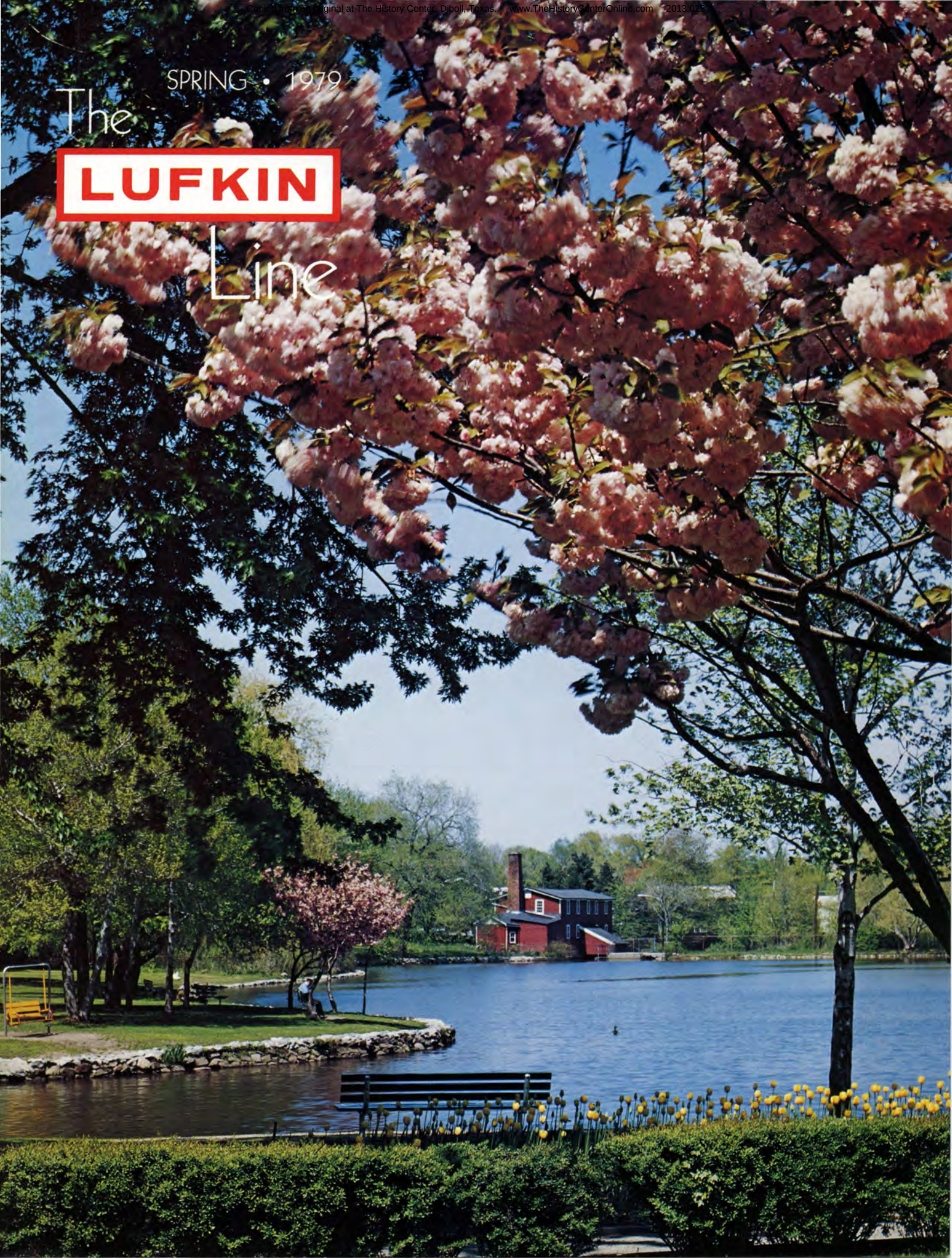
SPRING • 1979

The LUFKIN Line



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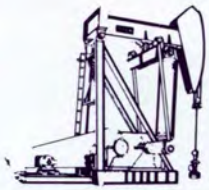

AIR BALANCED

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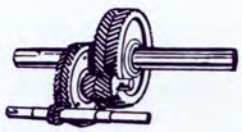
OIL FIELD PUMPING UNITS

MARK II



GEARS FOR INDUSTRY
AND SHIP PROPULSION

Pacific Coast Division

COVER: Transparency by Gene Ahrens
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OPPOSITE: Transparency by Phil Roddey
Bloomington, Illinois

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COLUMBIA: End of the Lewis &

BY KEN BROOKS

". . . we halted a fiew minutes to examine the rapid before we entered it which was our Constant Custom, and at all that was very dangerous put out all who could not Swim to walk around, after passing this rapid we proceeded on passed anoother rapid at 5 miles lower down, above this rapid maney large rocks on each Side at Some distance from Shore, a little below is a bad rapid which is bad crouded with hugh rocks scattered in every Direction which renders the passage very Difficult."

So wrote William Clark in the Lewis & Clark Journals. Time and civilization have altered the character of the river. Seventeen decades of bridges, dams, railroads and shipping have made their marks. Even so, the Columbia, from the John Day bridge to the bar 200 miles below, is an exciting adventure for the modern traveler.

Controlled water levels provide safe boating pleasures, natural resources promote commerce and highways ribbon the Oregon and Washington shorelines. Still, history is everywhere in evidence, prudently preserved as is the incomparable and distinctive Northwest scenery.

Above the John Day bridge, on the Washington side, sit two structures, weirdly incongruous, foreign to the area. The first resembles a 16th century chateau. However imposing at close range, it is dwarfed by its desolate setting.

Pioneer railroad tycoon Samuel Hill built it as a residence, intending to settle the region with European Quaker farmers. The immigrants and Mrs. Hill rejected the rocky, sun-parched area and Hill's dream-empire collapsed.

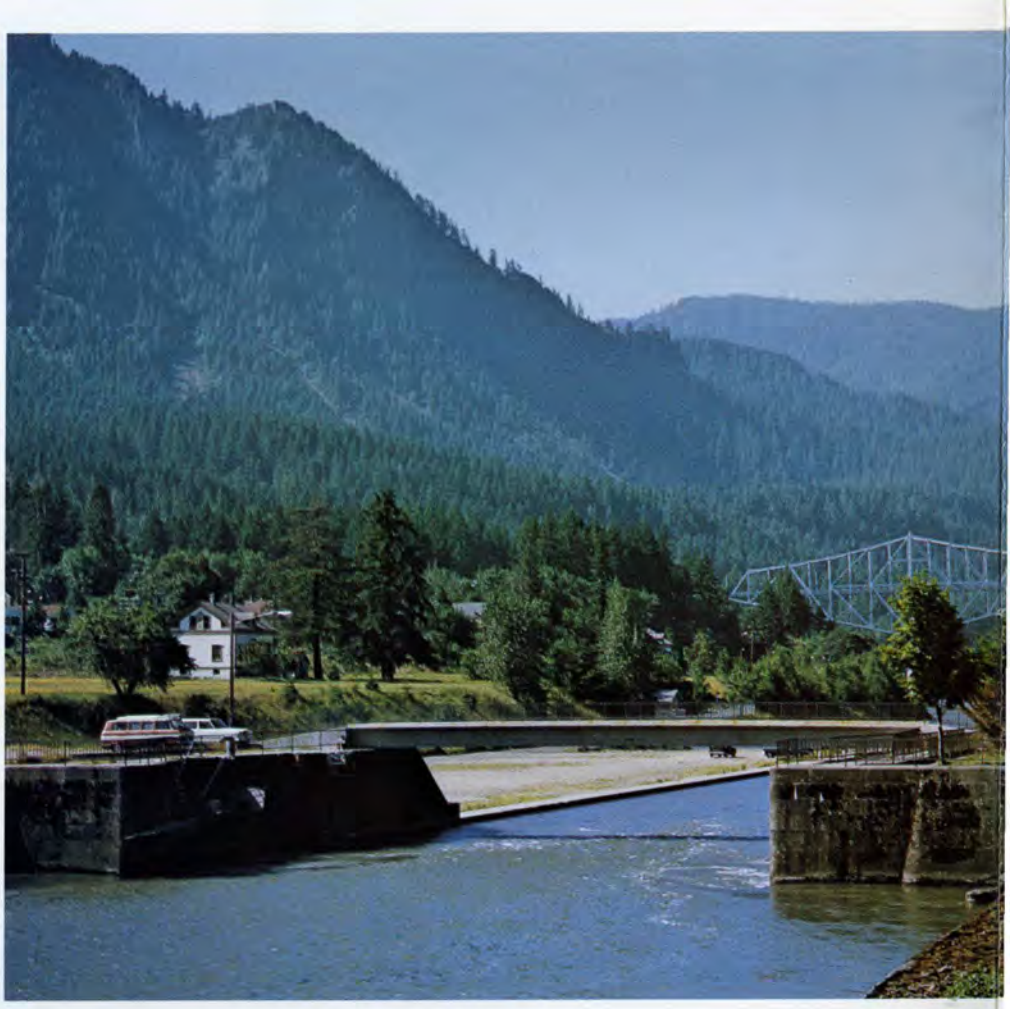
The chateau is now Maryhill Museum, boasting, among its art treasures, royal artifacts from the late Queen Marie of Rumania.

Just down the slope from Maryhill is the second oddity—an eerie replica of England's famous and ancient Stonehenge. Hill admired Stonehenge and had the copy built as a memorial to Washington's military dead.

"on the upper part of this Island we discovered an Indian vau(l)t . . . boards and pieces of canoes leaning on a ridge pole . . . in it I observed great numbers of humane bones of every description . . . on the East End 21 scul bones forming a circle on mats."

That grisly Indian burial island is now under water behind Bonneville Dam, as is Celilo Falls, a traditional Indian fishing site. Replacing them are relatively placid navigable waters accomodating behemoth freight barges shepherded by powerful Columbia River towboats which do not tow at all, but push.

Pleasure boating is everywhere and there are plenty of marinas and public launching ramps for



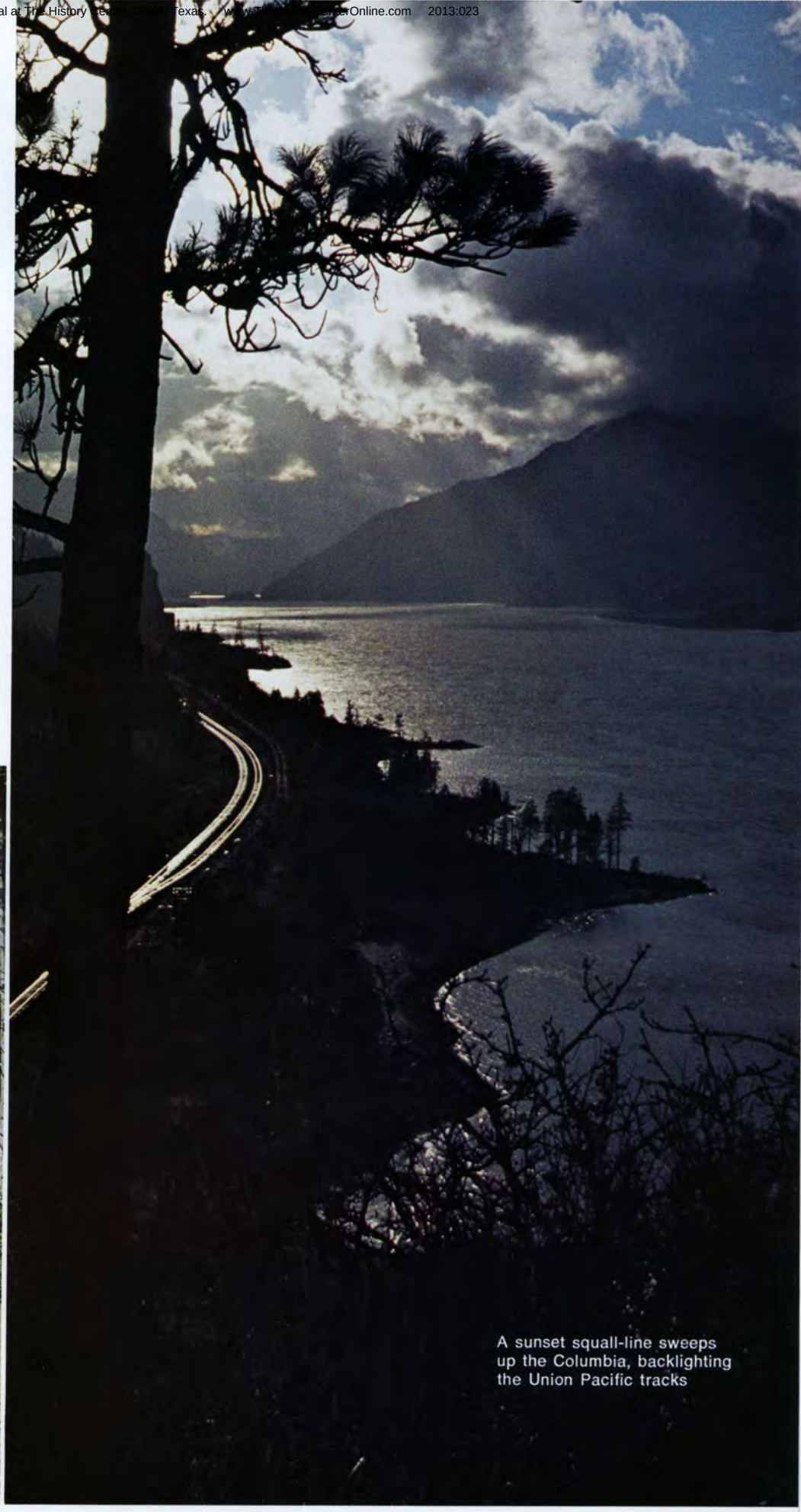
Cascade Locks. Built in the '80s for navigation, the locks are now gone, but the channel remains as a feature of the park

Clark Trail

touring trailer-boaters. Highway monuments give details on historic Indian sites, even those lost to progress.

> "We landed a few minits to Smoke, (on) the lower point of one island opposit which heads in the mouth of Towornehiooks River."

Clark's Towornehiooks (an Indian name) is now the DesChutes River, flowing out of Oregon, famed for its Chinhook salmon. Fishermen headquartered in the Oregon State Park at the mouth spend their days in unforgetable angling and their nights in yarn-swapping. Fish hatcheries on many of Columbia's



A sunset squall-line sweeps up the Columbia, backlighting the Union Pacific tracks

Multnomah Falls is in two stages with a total drop of 620 feet—one of America's most aesthetic falls

COLUMBIA . . . *continued*

tributaries replenish the supply, so progress will not eradicate that timeless tradition.

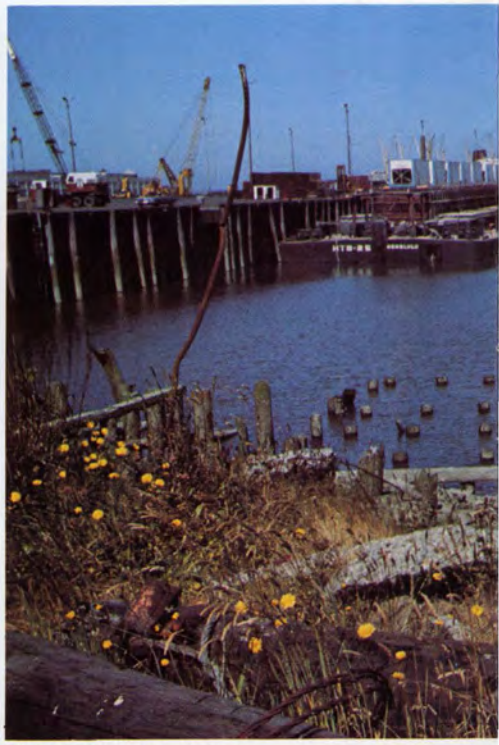
> "Saw 4 Cascades caused by Small Streams falling from the mountains on the Lar(boar)d Side."

Had the Lewis & Clark party been less occupied with navigation, they might have spotted ten gorgous falls in this area, all within a breathtaking 10-mile stretch.

This is the renowned Columbia Gorge, and the falls are star attractions. Visible from I-80 and accessible by trails, they are most easily reached via the scenic loop road. This road is a delightful remnant of the original 1915 Columbia River Highway. Convoluted, but nostalgic, this road climaxes at Vista House, an architectural landmark high above the river.

> "This great Shute or falls is about ½ a mile, with the water of this great river compressed within the space of 150 paces in which there is great numbers of rocks, water passing with great velocity foming and boiling in a most horriable manner."

In the 1880s, the government built Cascade Locks so boats could by-



Waterfront view, Astoria, the first town in Oregon Territory

pass Lewis & Clark's "horriable" falls, creating a Columbia River steamboating era whose legends persist to this day. Bonneville dam, a few miles downriver, submerged the cascades and eliminated the locks, but the rockwork channel and the grounds remain as Cascade Locks Park, a charming picnicking and camping place. Here too, is an opportunity to see Indian salmon seining in traditional style, from scarey platforms slung from the channel's vertical flanks.

> "Passed the upper point of a large Island near the Lard. Side,—walked on shore, about 3 miles, a fine open prairie for about 1 mile, back of which the country rises gradually and wood land appears."

Sauvie Island, masked from Lewis & Clark's view the Willamette River which flows through modern Portland, Oregon. The City of Roses, crowned by symmetrical Mt. Hood, is a metropolis of Western beauty and culture. Its parks, museums and architecture are a must for visitors. On the Washington side is historic Fort Vancouver, where Ulysses S. Grant was once commanding officer.

> "Great joy in camp we are in view of the Ocean, this great Pacific Ocean which we have been so long anxious to See, and the roring made by the waves braking on the rockey Shores may be heard disti(n)ctly."

The waves still break on the shores and in 1907, created a landmark. The four-masted, iron-hulled Peter Iredale, maneuvering to cross the hazardous Columbia bar, broached and grounded on the Oregon side. Her rusting bones remain in the surf, a photogenic magnet for tourists.

There are Washington and Oregon State Parks at the mouth and the entire region is a bonanza of marine sights, sounds and smells. From Washington's Ilwaco and Oregon's history-saturated Astoria, charter boats take enthusiasts over the bar for deep-sea fishing.

The Pacific coast was too spartan for a winter camp, so Lewis & Clark built Fort Clatsop several miles inland;

> ". . . in a thick groth of pine . . . on a rise about 30 feet higher than the high tides leavel."

From Meriwether Lewis's sketches, the National Park Service has constructed a faithful replica, where the original stood. It and the accompanying museum are open to the public.

> "Christmas Wednesday 25th December 1805. At day light this morning we(re) awoke by the discharge of firearm(s) of all our party & a selute, shouts and a song . . ."

In summer, park employees in pioneer garb demonstrate the loading and firing of Lewis & Clark-era weapons, carve dugout canoes and demonstrate other pioneer crafts for visitors.

> "Sunday 23rd March 1806, —the rained seased and it became fair . . . at which time we loaded our canoes & at 1 p.m. left Fort Clatsop on our homeward bound journey. At this place we had wintered and remained from the 7th of Decr. to this day and have lived as well as we had any right to expect . . ."

At this place and at many places along the Columbia, visitors can partake of two worlds. Today's contemporary pleasures and the legendary trials and triumphs of Lewis & Clark. It is a uniquely American experience.

Turn-of-the-century school near Skamokawa, Washington, is now an architectural-heritage community hall

Final Testing Assures QUALITY GEARS

Gear testing at Lufkin Industries is the final quality control procedure to assure the user of minimum delay during plant start-up and also long trouble-free life. Other production devices that assure quality include Schenck balancing machines and gear accuracy checking equipment.

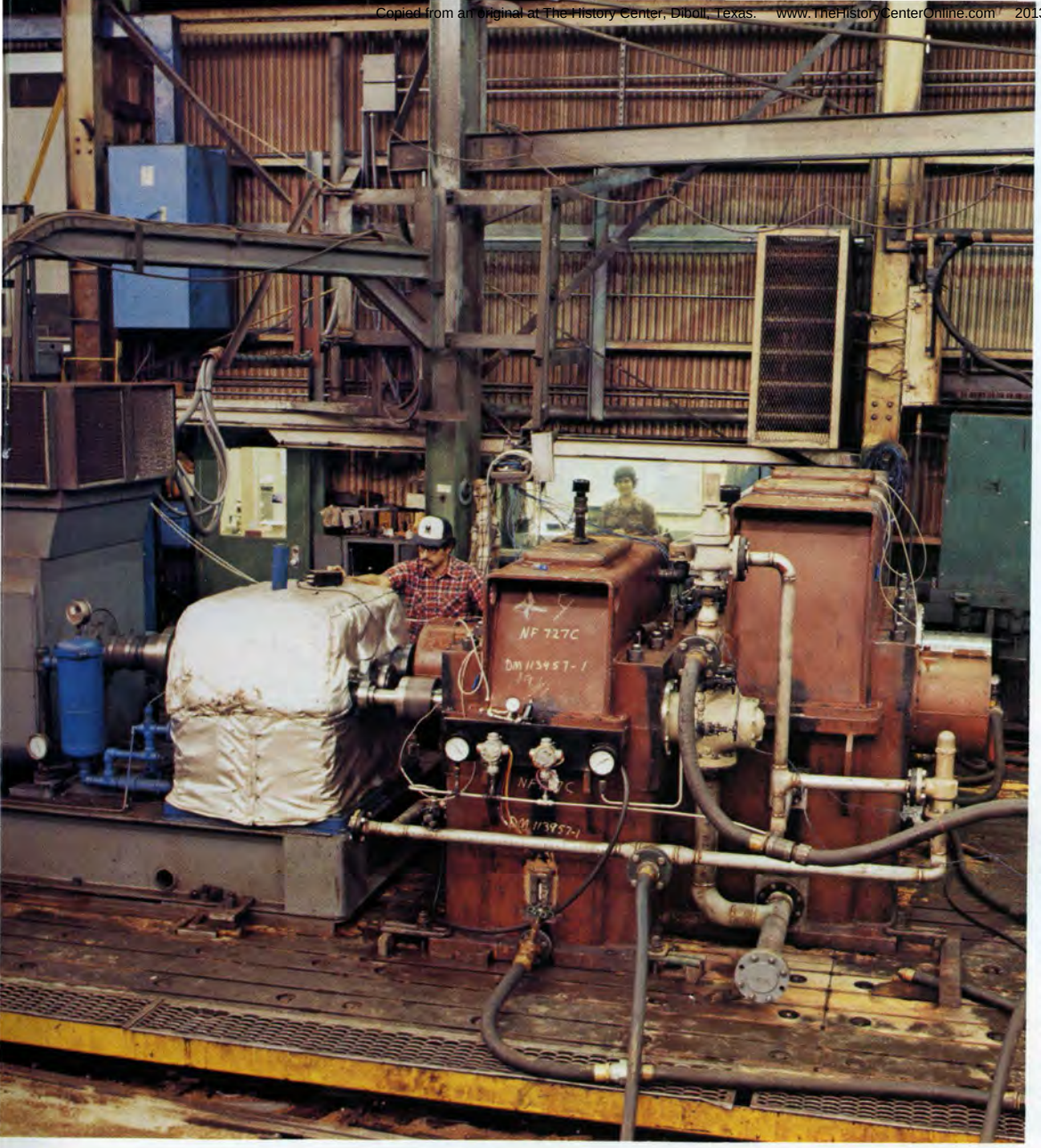
During testing, special emphasis is placed on discovering any gear-related operational problems such as misalignment of gear elements, shaft runout and imbalance or problems with bearings or gear teeth.

Dominating the test stand is an 880 h.p. SCR controlled DC motor. This motor is rated at full horsepower over the speed range of 400 to 1200 r.p.m. and constant torque from 40 to 400 r.p.m.

This motor drives the tested gears through a two-stage gear box with all three shafts extended. The three shafts give a speed range of 40 to 21,500 r.p.m. depending on the shaft being used. Using the variable speed drive arrangement the gear units can be tested throughout the operating speed range and at overspeed.

Besides "no load" spin testing, load tests can be performed using a water brake dynamometer up to 600 h.p., an eddy current dynamometer up to 800 h.p. or by using the locked torque arrangement for high horsepower loading.

The center of the gear testing activity is the instrumentation room. Most test procedures record oil inlet and outlet temperature, oil flow,



(Far Left) Inside the instrumentation room, Service Manager Hugh McWilliams checks records and instruments during a testing operation

Being tested is a LUFKIN Model NF727C reducer which will transmit 5300 h.p. from a steam turbine at 4500 r.p.m. to a reciprocating compressor at 300 r.p.m. for refinery service

bearing temperatures and unfiltered shaft vibration levels at 15-minute intervals.

At one time during testing, housing vibration and sound levels are recorded. Also, frequency spectrum analysis is recorded for shaft vibration and sound level. On high speed units lateral critical speed tests are made for correlation with calculated results.

The unit is disassembled and corrections are made if any abnormalities are found during testing. Modifications required are recorded and the complete test procedure is repeated. Many units are disassembled for inspection and when this is required, the unit is brought up to full speed to make sure reassembly was performed correctly.

Sound level equipment in the instrumentation area includes a B&K portable 2203/1613 precision sound level meter and octave filter set. Also included in a permanently located panel are a General Radio sound and vibration analyzer (with 1/3 and 1/10 octave), a one-inch ceramic microphone and pre-amplifier and a sound level calibrator.

Vibration level equipment includes two types of IRD vibration analyzer/dynamic balancer with non-contact displacement accessory. Within the instrument panel are Spectral Dynamics trim balance analyzers and a Spectral Dynamics Model SD335 Spectrascope II real time analyzer. Also included are various accelerometers, velocity transducers, con-contact pickups and calibration equipment.

In addition to all this, a Hewlett Packard Model 3582A dual channel FFT spectrum analyzer is used, which allows resonant response analysis and location of noise sources, using transfer and correlation function techniques.

The instrumentation room is also equipped with a Tektronix Model 5111 storage oscilloscope for orbit analysis and wave form study along with required calibration equipment.

Various test reports that can be made to customers include housing vibration levels, shaft vibration levels, sound levels, oil flow and bearing temperatures.

The noise data recorded is the only information which must be analyzed to meet government specifications. Other data is analyzed to insure high quality and conformance with customer specifications.

LUFKIN C-640D-365-168,
Chevron USA, Inc., Vickers Lease,
Los Angeles, California

LUFKIN conventional unit with Long Beach,
California in background

LUFKIN Installations

Photos by DAVID FREEZE

LUFKIN C-57D-76-54,
Santa Fe Energy Company, Midway Lease,
Well #88-36, Fellows, California

LUFKIN C-912D-365-168,
Shell Oil Company, Heisen Lease,
Well #33, Mt. Poso, California

LUFKIN M-640D-305-168,
Signal Hill, California

LUFKIN M-346-D-305-120,
Union Oil Company, Torrey Lease,
Well #89, Piru, California

LUFKIN conventional unit,
Huntington Beach, California

LUFKIN M-320D-305-100,
Mobil Oil Company, Padre Lease,
Well #103, Ventura, California

LUFKIN A-912D-427-144,
Hunnicut & Camp Drilling Co.,
Friedrich Lease, Oxnard, California

LUFKIN A-640D-427-144, Atlantic Richfield Co.,
Signal Hill, California

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By the LUFKIN Photographer

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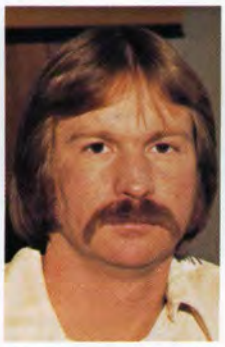

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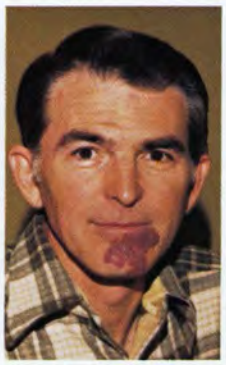

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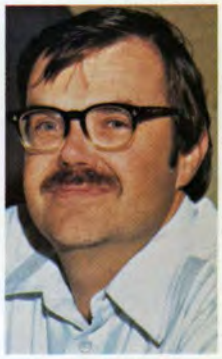

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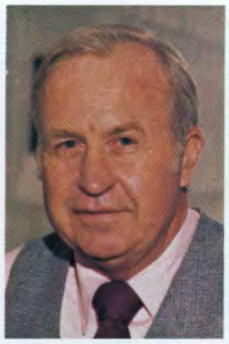

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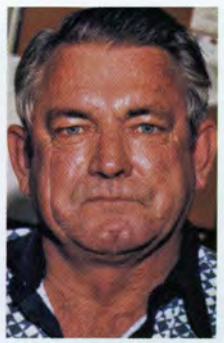

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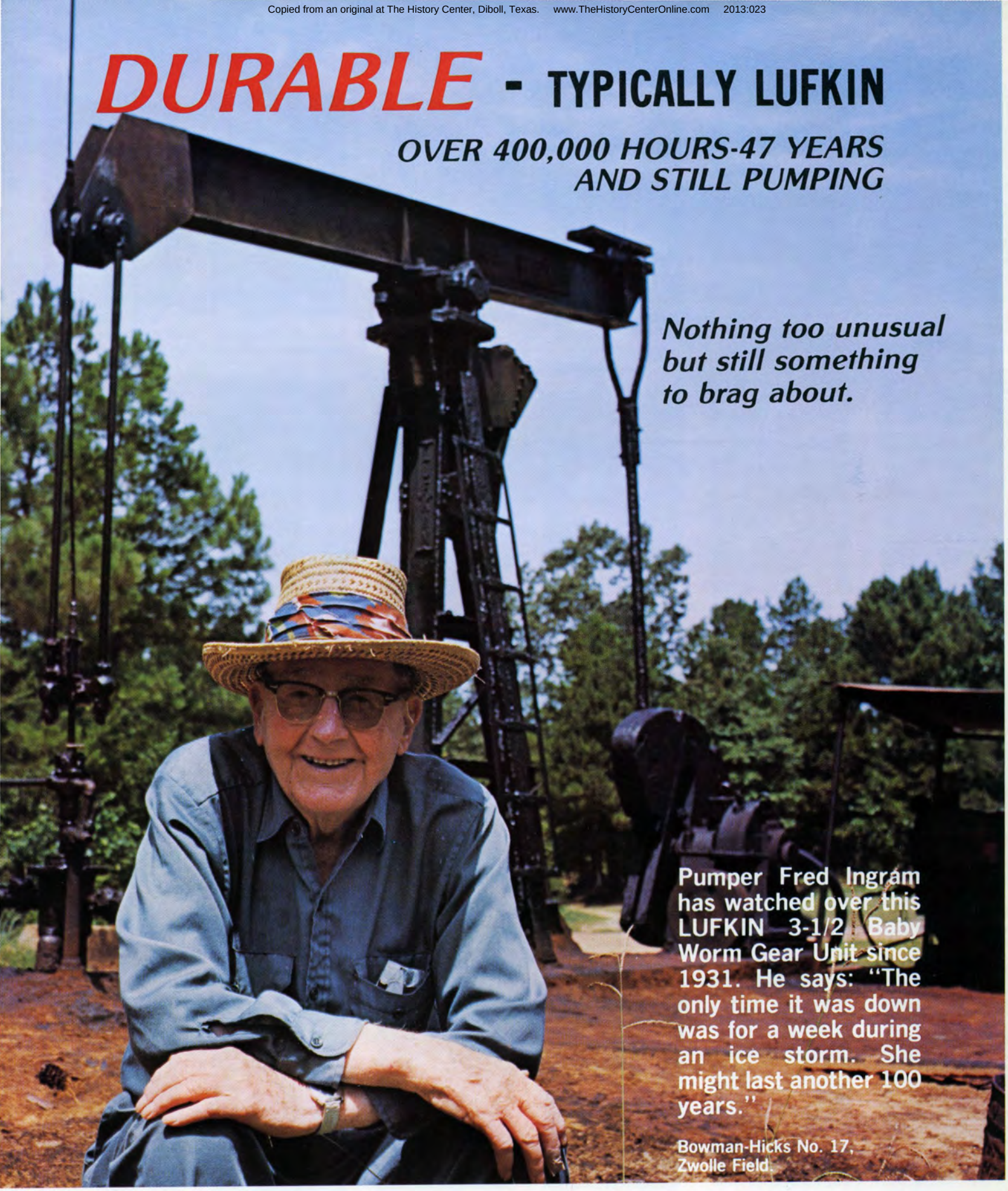
OVER 400,000 HOURS-47 YEARS AND STILL PUMPING



Nothing too unusual but still something to brag about.

Pumper Fred Ingram has watched over this LUFKIN 3-1/2 Baby Worm Gear Unit since 1931. He says: "The only time it was down was for a week during an ice storm. She might last another 100 years."

Bowman-Hicks No. 17, Zwolle Field.

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