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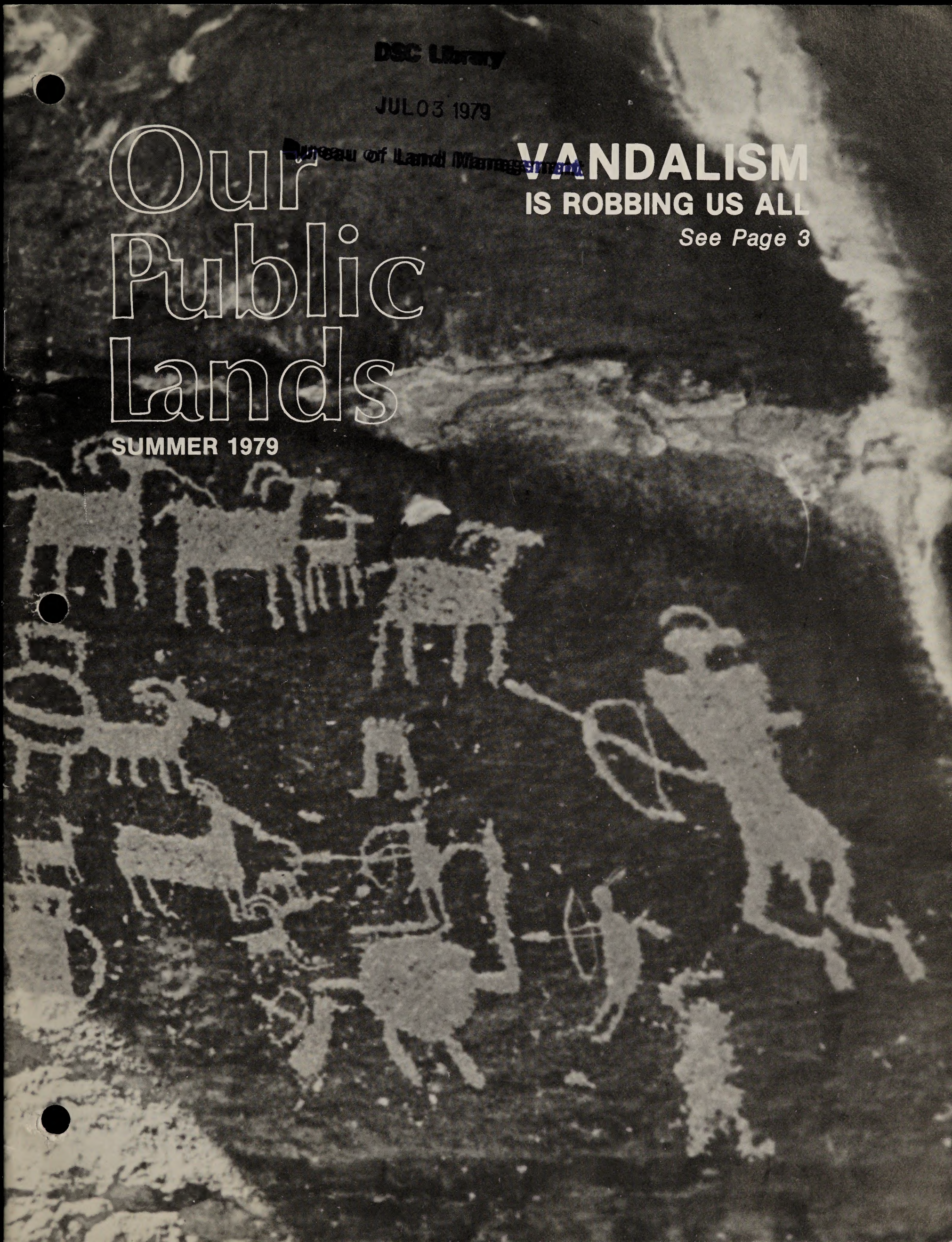
Our Public Lands

SUMMER 1979

Bureau of Land Management

**VANDALISM
IS ROBBING US ALL**

See Page 3



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NO. 3



U.S. DEPARTMENT OF THE
INTERIOR

BUREAU OF LAND MANAGEMENT

As the Nation's principal conservation agency, the Department of the Interior has basic responsibility for water, fish, wildlife, mineral, land, park, and recreational resources, Indian and Territorial affairs are other major concerns of America's "Department of Natural Resources."

The Department works to assure the wisest choice in managing all our resources so each will make its full contribution to a better United States—now and in the future.

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Our Public Lands

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CYNTHIA R. SIMMONS

Ms. Simmons was an archaeologist for the Bureau's Moab District in Utah. Currently she is with the National Park Service stationed in the Big Bend National Park in Texas.

The pleasure of roaming the canyon country of southeast Utah are many—the wildly beautiful scenery, the rocks, the colors, the vistas. All are enhanced by the remains of a past culture, the Anasazi. The lingering spirit of these ancient people combines with the outstanding natural beauty of the area to make the canyon country unique.

Yet, some people are destroying the remains of this ancient culture for profit. We call these people pothunters, looters, grave-robbers, vandals—not very nice names, but fitting of the irreverent destruction they cause. By whatever name, they are all law-breakers.

A site once occupied by the Anasazi may appear as a mound of rubble, a depression, or as scattered shards of pottery. Such sites are common in the southwest. Thanks to the pothunter, sites that have been destroyed—holes gouged into the earth or rubble, human bones unearthed and scattered about, surfaces strewn with fragments of pottery—can also be found in the area.

The Anasazi, a Navajo word meaning “the Ancient Ones,” occupied the Four Corners area from approximately 500 A.D. until about 1300. Previous cultures had been in the area since 10-12 thousand B.C. Through time, the culture had evolved from one of simple forgers, through a semi-agricultural way of life typified by the Basketmaker people to the more settled farming culture of the Pueblo people or Cliff Dwellers.

Around 1300 the Anasazi left the area. The exact reason for their departure is not known, but archaeologists believe that long drought, depletion of wood and other natural resources, raiding by nomadic tribes from the north—any or all of these reasons—may have caused them to leave the area.

VANDALISM IS ROBBING US ALL



In Looting Archaeological Sites, the Vandal Erases Our Only Record of an Ancient Past.



In their haste, commercial pot hunters use bulldozers and other heavy equipment to push aside the debris that marks many archaeological sites. This churning of the layers destroys much of the scientific value of the site.

The Basketmakers excelled in the art of basket weaving, and the Pueblo people developed great skill in pottery making. Artifacts found near the sites also show the transition from one culture to the other. To make their baskets hold water, the Basketmakers learned to line the inside of their baskets with clay. Later they learned to dispense with the basket and make pots of clay alone. Many of the shards bear the impressions of the woven basket on their outer surfaces.

The dry climate of the southwest has preserved examples of these Anasazi crafts in their living, working, storage and burial areas. Often the artifacts are just as the Anasazi left them, covered only by a layer of blowsand, sparse vegetation, or crumbling rock walls.

It is these ancient baskets and pieces of pottery that the pothunters look for. In their search, an archaeological site is plundered, the sequence of an ancient story waiting to be told is destroyed, and artifacts that belong to all are stolen.

When the pothunter digs into an archaeological site to remove artifacts, he not only spoils the

enjoyment of the site for others, but its scientific value as well.

The archaeologist studies an ancient site in order to be able to reconstruct the past. In doing so, he hopes to shed light on the present and gain insight into the future. For a prehistoric culture like the Anasazi, which left no written records, the archaeologist must rely solely on physical evidence found at the site.

To reconstruct the past, the archaeologist carefully records the exact location of each artifact he finds in its relationship to all other things found at the site. It is presumed that the older artifacts and structures will be found in the lower strata of soil, while the more recent will be found in the upper levels. It is further presumed that those artifacts and structures found in the same stratum are approximately the same age and can be grouped together to form a picture of the tools and technologies that were available to the people who occupied the site at a given period of time.

Delicate methods are used to evaluate the evidence, from the dating of tree rings in the wood used in the structures, to an analysis of pollen samples found in

the area of the ruin.

Where the pothunter digs through the ruins, searching only for artifacts, physical evidence is churned up, strewn about and removed. That which does remain no longer tells an accurate story of the past.

To those who come after the pothunter, the sense of discovery, the feeling that the Ancient Ones have just departed, the undisturbed presence, all are destroyed forever.

Ruin sites located on public lands in the United States belong to all. No one person has the right to destroy such a site or remove and keep for himself the artifacts found there.

Ruin sites and artifacts, both prehistoric and historic, found on public land are protected by the American Antiquities Act of 1906 and by other Federal laws. These laws prohibit the removal of artifacts or the disturbance of any ruin site. Those convicted of such a violation can be fined or sentenced to jail. Each state has laws that are similar to the Federal laws. Hence, pothunters are usually in violation of state as well as Federal law.

Because the Anasazi placed offerings of basketry, jewelry, and pottery in the graves of their dead, pothunters are often graverobbers as ancient burial grounds are systematically looted in search of such treasures.

Some people in the southwest feel that pothunting is justified because it keeps artifacts in the area where they are found. They argue that professional archaeologists and institutions study the site and remove valuable artifacts from the area, catalog them, study them, then store them away never to be seen or admired again. They also resent having artifacts taken to distant museums, leaving nothing in the area to tell the story of the past that is so deeply rooted there.

Removal of artifacts from the Four Corners area began in the 1880's after the discovery of the great cliff dwellings at Mesa Verde began to arouse interest in the prehistoric culture that had once inhabited the area. Many early

archaeologists sold artifacts to persons or museums as far away as New York and Pennsylvania. Institutions that sponsored scientific studies of the sites were usually located in the East. The Four Corners area was remote and not developed well enough to support local museums and universities. Few tourists then ventured into the rugged area. Thus over the years many artifacts were sent to places where they could be studied and enjoyed by more people.

Now, this has changed. Tourists from all parts of the world now come to the southwest. But one fact remains constant: to be properly understood, artifacts should be housed and displayed in museums open to the public. A mere collection of pottery or stone tools does not tell the entire story. Proper display and texts accompanying the artifacts are needed to interpret the development of a culture. A pottery bowl on the mantelpiece may keep the artifact in the area, but few will see it, and it does little to piece together the history of the Anasazi.

A genuine concern for keeping artifacts in the area where they are found undoubtedly has certain merit, but one is forced to wonder whether merit or greed motivates most pothunters. According to an official of the Utah Navajo Development Council, that organization recently paid a group of Utah collectors \$45,000 for their collection of Anasazi artifacts. These artifacts will be on display in a museum recently opened by the Utah State Division of Parks and Recreation at the Edge of Cedars State Historical Monument near Blanding. The museum and monument are on the site of an Anasazi Pueblo ruin. The museum will display and interpret its artifacts so that they will help tell the story of Pueblo life and that of the historic Indian and Anglo inhabitants who once lived in the area. Many artifacts from the local area will be properly displayed in the museum.

The Bureau of Land Management manages most of the public land in the vicinity of the Pueblo and plans to donate artifacts now under its custody to the museum.



Robbing of Indian graves in order to obtain artifacts is common over much of the public lands.

The Bureau also has the right to recall any artifact taken from the public lands by a university or an institution. Thus, artifacts under study may be returned to be displayed in the area.

The Bureau of Land Management has recently taken measures to stop vandalism of archaeological sites on public lands. A ranger force patrols the public lands in the San Juan Resource Area near Moab to detect and deter pothunting. With the help of the San Juan County Sheriff's Office there have been eight convictions on charges of archaeological vandalism since the ranger program began in 1974.

The ranger's job is not an easy one. A small permanent staff must cover two million acres. They patrol in four-wheel drive vehicles, on foot, on horseback and by helicopter except over designated primitive areas.

The rangers believe that their presence has helped deter vandalism in certain areas, but there is still much to be done. Ranger Fred Blackburn says, "We're not just dealing with the Sunday digger. We've found sites that have been dug with a front-end loader. A person using equipment like that is after as much as possible in a

short period of time. He's after profit."

The destruction to an archaeological site by heavy equipment is devastating. To stop this great loss, the State of New Mexico recently passed the "Bulldozer Act," to regulate the use of mechanical earthmoving equipment in excavation of archaeological sites, even those on private land.

Fines are stiff—up to \$1,000. But other states, such as Utah, Arizona and Colorado do not have such a law.

Under the federal Antiquities Act of 1906 and under many state laws, the fine for illegal digging in an archaeological site may be less than the value of a single excavated pot. This is changing. House Resolution 1825 calls for fines of \$100,000 and/or five years in prison.

Stronger laws are needed, but more important there is a need for public support of the efforts being made to protect archaeological and historic sites. The temptation for the pothunter is great, because there is a demand for his illegal wares. The number of sites are limited, artifacts constitute a non-renewable resource. They are a part of our culture; they belong to us all.

A Mansion



A Sod House Was Often the First Home of Early Prairie Settlers.

When the would-be settler arrived on his prairie homestead he found the land flat, treeless and constantly caressed by the wind. If he stood in the middle of his homestead, he might easily see the four corners of his land.

As soon as he had walked over his acres, he started to think about building a house. If his land had been acquired under the Homestead Act, a house was required. Under all circumstances, he had to have shelter for himself, his family, and possibly his animals.

In his choice of building material, the settler first thought about wood. The frame house was the most common dwelling east of the Mississippi, and the chances were 9 to 1 that the last house he had lived in had been made of wood.

But finding wood was a problem on the prairie. If there were trees at all they would be confined to narrow strips along the banks of streams. Even if the settler had a stream crossing his property, chances were exceedingly slim that the trees that grew there would be suitable for building.

If he had a cash reserve, he could buy lumber, but it would be freighted in and expensive. Most settlers had to look for cheaper building material.

Man is adaptable, and in the face of necessity, often ingenious. Without wood, stone or brick, most settlers turned to the prairie's most plentiful commodity—sod.

Cut from the surface, sod was a manageable combination of grass, roots and soil, each ingredient supporting the rest. Cut into squares or rectangles, sod could be used to build a wall in much the same way we use brick or stone. Four walls were the beginning of a house—affectionately called a “soddie.”

Once the settler recognized sod as a building material, he started to improve and improvise. With practice, he became proficient in its use just as a mason and carpenter are proficient with brick or wood. As the settlers' confidence grew, their buildings became more ambitious. At least one multistory hotel was built of sod, and served its guests for many years.

As the outer walls went up, openings were left for doors and windows. A minimum of wood was necessary for door and window frames and in the construction of the roof. Some builders capped the sod walls with a tin or shingle roof. Others laid sod over a wooden frame. Sod roofs were decorative in the spring when

they bloomed out in a profusion of prairie flowers of every hue.

On the treeless plain, winters were bitter and the wind relentless. Here the sod house rose to the challenge. It was warm, wind-proof and stable. Even a settler who could afford to build with wood might lay a veneer of sod against his north wall to insulate against the wind and the cold.

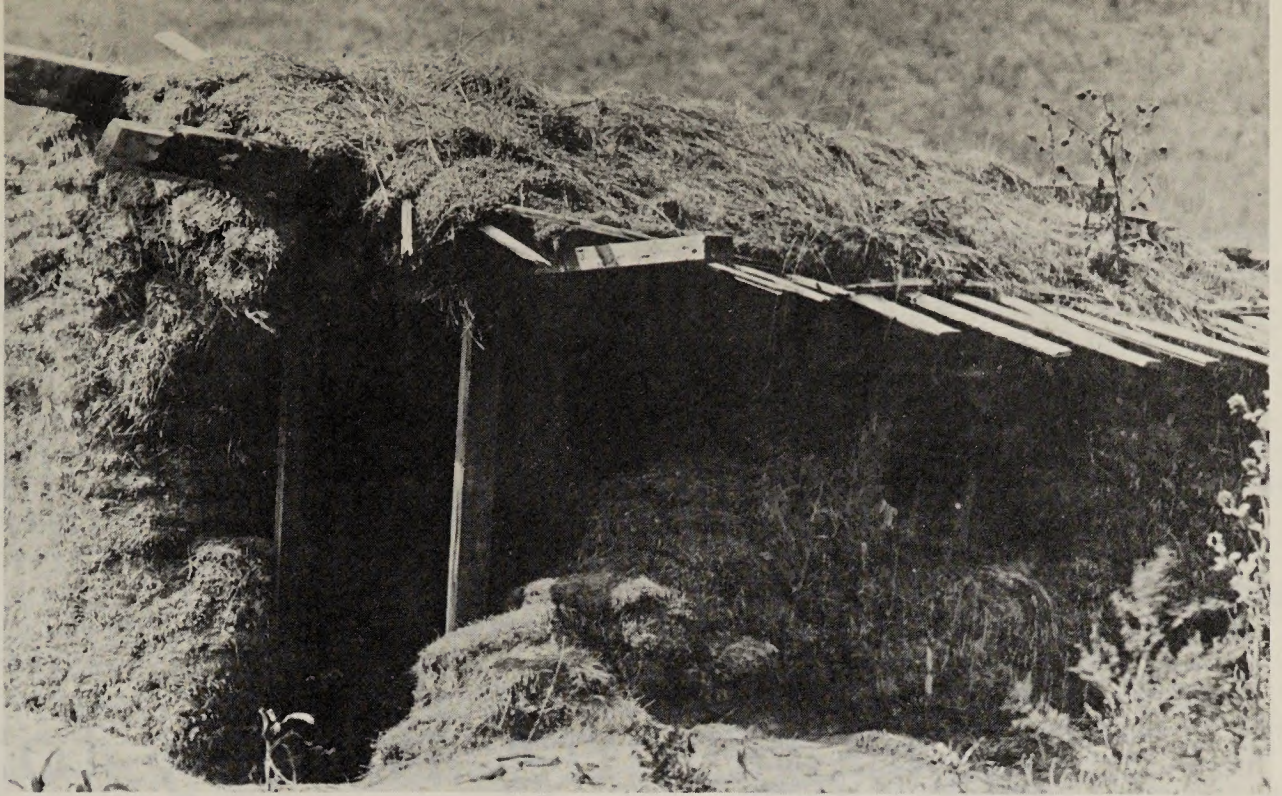
Without trees, there was no wood for fuel. Buffalo chips made a hot fire, but after an initial gleaning that fuel supply was exhausted. For lack of something better, the settler turned to corn and hay to heat his house. Soon the catalogs offered a variety of heaters and kitchen ranges especially designed to burn hay.

Where the topography was right, the first shelter might be part dugout, part soddie. The rear of the building was anchored in the embankment and sod walls were erected for the front of the house. There was a danger here. The literature is filled with accounts of cows that wandered onto a sod roof and fell through into the house.

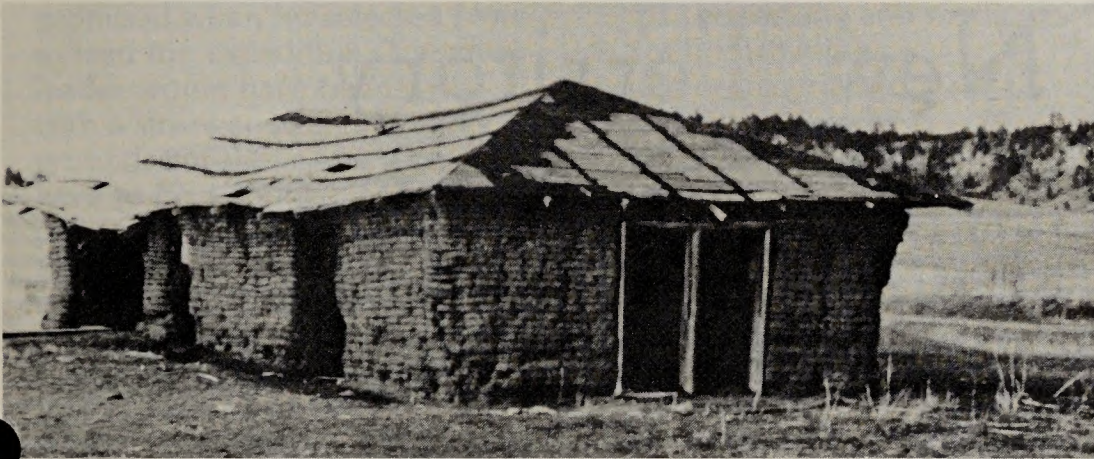
Floor plans for the soddie tended to be simple. Many were single room dwellings. But they were probably as roomy as the house

PAUL HERNDON

Office of Public Affairs



Ruins of sod houses can still be found in the Prairie States. Some (below) stood alone, others (top) were fronts for dugouts. Houses roofed with sod bloomed with a profusion of flowers in the spring.



Cutting sod was the first step in erecting a house. Parallel furrows were plowed about a foot apart. The sod was then scalped from the strip between the furrows and cut into appropriate lengths. Eventually somebody designed a sod plow with a blade to lift the sod.

After the walls of the house were staked out, the pieces of sod were laid end to end. Succeeding layers were overlapped to add strength and stability. Overlapping at the corners tied the ends of the walls together. Although the soddie was intended as temporary shelter, they have proven durable. Across the states of Kansas, Nebraska and the Dakotas a few still stand today.

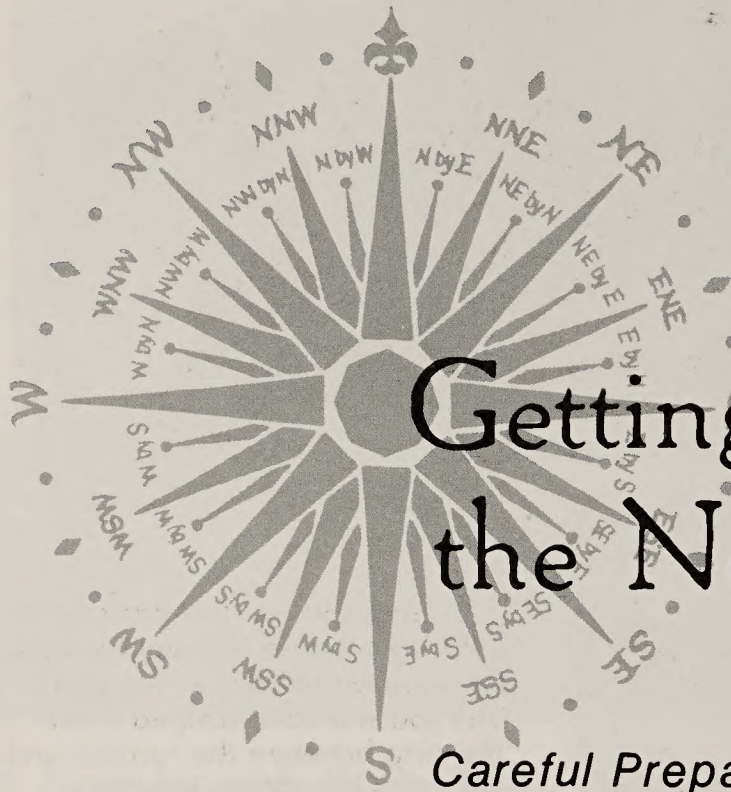
the settler had come from. Additional rooms usually marked the growth of families; the erection of a frame building to replace the soddie testified to the family's prosperity.

When there was prolonged rain or accumulated snow started to

melt, a sod roof had a tendency to leak. Long after the rain stopped or the snow was gone, the inside of the house remained damp and dank, and housewives wept because precious furniture was ruined as water dripped from the rafters.

In this mural commemorating homesteading, the artist John Stewart Curry recognized the role the sod house had in providing shelter for settlers.





Getting Ready to Explore the New Territory

*Careful Preparations Were Made to Launch
Our First Expedition Into the West.*

Even before the United States took possession, it was clear to all that in the Louisiana purchase, Mr. Jefferson had “bought a pig in a poke.” No one knew anything about the land, the people or the resources to be found there, not even where the boundaries were. Obviously someone had to go and find out just what it was that Mr. Jefferson had bought.

In fact, the President had been thinking about sending an expedition to explore the Missouri long before he had any assurance that the River would belong to the United States. He had asked Congress to authorize a scientific expedition as early as 1802. At that time he was negotiating only for the purchase of the City of New Orleans. This has caused some historians to suspect that he intended to take the Territory by force.

However, Mr. Jefferson was a man of insatiable curiosity and it would have been in keeping with his character to propose an expedition for no other reason than to advance human knowledge. Still,

in view of the Nation’s rapid westward expansion, he must have had an intuition that migration would-not—could-not stop at the banks of the Mississippi and surely sensed that one day all the West would belong to the United States.

By the time Congress ratified the treaty of purchase, Jefferson had selected the man he wanted to lead the expedition. His choice was Meriwether Lewis, a neighbor and long time friend.

Lewis was typical of the age. Born in 1774, he had been reared on his father’s plantation—Locust Hill—close enough to Monticello for Jefferson to rig up a mirror so that he could signal whenever he wanted the young Lewis to run an errand.

Lewis’ father, a gentleman planter, had been killed in the Revolution. As soon as he was old enough, the young Lewis assumed responsibility for the plantation, and had studied under the Reverend Mathew Maury, the son of Jefferson’s old teacher, the Reverend James Maury.

As a farmer, he was reasonably successful, but found the life dull

and uninteresting. His education was considered adequate for the times, but not outstanding.

If he was an indifferent farmer and mediocre scholar, he found a career better suited to his taste and talents when he joined the Virginia militia during the Whiskey Rebellion in western Pennsylvania. He saw no action during that campaign, but became a close friend of a more experienced soldier, William Clark.

He liked soldiering so much that he decided to stay in the service, and was sent to serve with Mad Anthony Wayne during the Ohio campaign against the Indians.

On February 23, 1801 the newly elected President wrote to Lewis’ commander asking that Lewis be released from military duty so he could become the President’s private secretary. Lewis didn’t know it then, but he already had been selected to lead the expedition to explore the Missouri and the first party of American citizens to cross the North American continent. As soon as he arrived in Washington he found himself involved in the President’s scheme to explore the

West. Late in 1802 they were planning the expedition in earnest.

On January 18, 1803 Jefferson sent a message to Congress that was a master of camouflage. Tucked away among all the talk about establishing the national presence among the western tribes and breaking the British monopoly on the fur trade was a suggestion that Congress appropriate \$2,500 to finance a small expedition to explore the Missouri River. Congress appropriated the money without a murmur.

Jefferson would have been the first to admit that he had compromised when he selected Lewis to lead the expedition. The ideal leader would have been a man with a stronger scientific background. But the leader would also have to be a young man with physical stamina, woods wisdom, and one who understood the Indians. Such a happy combination was not available.

Therefore, Jefferson picked Lewis hoping that he would be able to cram enough scientific information into his head to offset his lack of formal education. Time would prove the wisdom of that decision.

Among Jefferson's acquaintances were the best scientific minds of the time. Since Philadelphia was the academic center of the Nation, Jefferson sent Lewis there for his pre-trip briefing. He personally wrote long letters to the men he believed could best prepare Lewis for the journey and to the leading instrument makers of the City with detailed specifications for the instruments he thought Lewis would need.

The best available maps were gathered, including one made by Alexander Mackenzie when he had crossed Canada to the Pacific Ocean in 1793. Nicholas King, the man who surveyed the District of Columbia, prepared a blank map that Lewis could use to enter new geographic information gathered along the way.

Late in 1802, Jefferson had told Lewis to start outfitting the expedition. By this time Lewis had been in government long enough to know that any project moves according to its budget. His first

act was to set down an estimate of his expenses on paper. Keeping in mind that Jefferson would ask Congress for \$2,500, his estimates were a model of subtlety if not of practicality. According to Lewis' estimate, he would need:

\$696 to buy presents for the Indians he expected to encounter.
430 for boats and other means of transportation
217 for instruments
81 for powder, shot, guns and other arms
255 for camping equipment
55 for packing and medicine
224 for provisions
55 for materials to make up portable packs
300 to hire guides, hunters and interpreters
100 for expenses incurred in travel from Nashville, Tennessee to the last outpost on the Missouri River. (He eventually chose another route.)

The last item on the estimate was that convenient catch-all "other." By some strange stroke of fortune, Lewis estimated that he would need exactly \$87 for miscellaneous expenses. That, by another strange twist, brought the total to the exact \$2,500 that Jef-

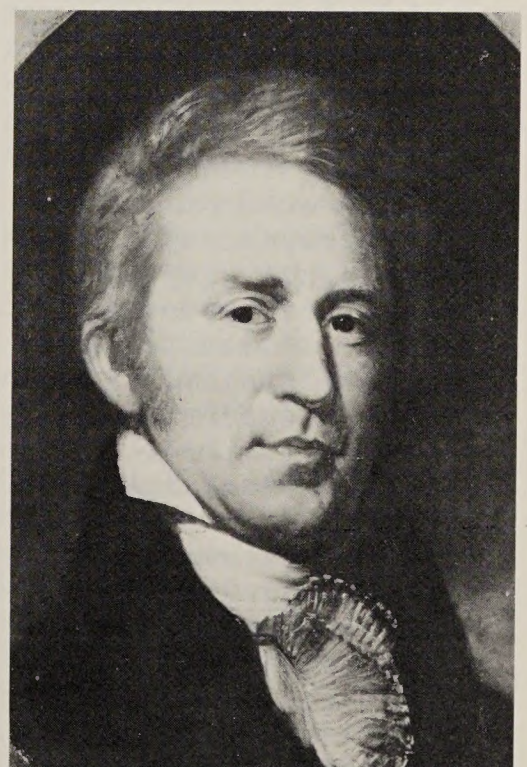
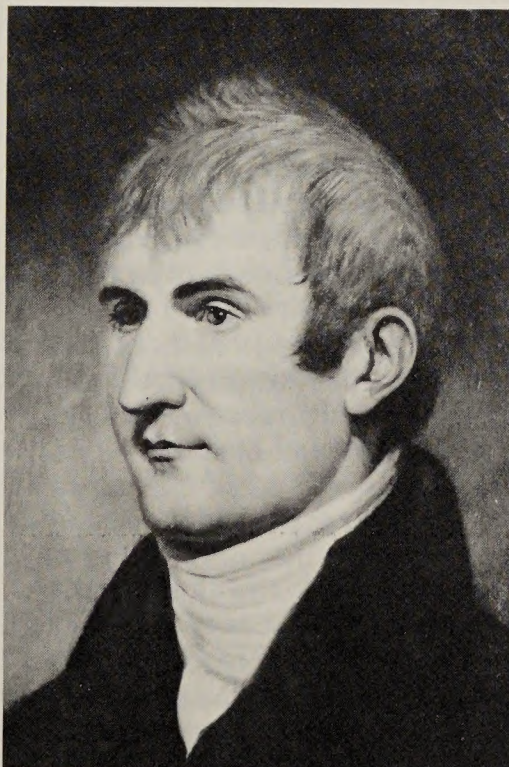
erson would ask from Congress.

Except as an exercise in politics, the budget was nonsense. Supplies would cost \$2,160.40. The cost of the expedition would eventually reach \$38,722.25.

In his instructions to Lewis, Jefferson was explicit. He was to add to the knowledge of the Geography of the West, observe the fauna and flora, gather knowledge about military posts (he found none), and take notes about the climate, soil and other things of interest. Jefferson shared the general curiosity of the times about the Indians. Lewis was to learn all he could about their history, religion, morals, their ideas about property, crime, disease and medicine. He was to find out if there were similarities between their religious practices and the ceremonies of the Jews. (A popular theory of the time held that the Indians were descendants of the lost tribes of Israel.) He was to learn about their attitudes toward suicide, homicide, sex, burial of the dead and food preservation.

Lewis had some ideas of his own about the kind of equipment he would need. He designed a canoe with a collapsible iron frame that would be easy to carry over portages. He had his gun powder packed in lead casks that

Portraits of Meriwether Lewis (left) and William Clark (right) were painted by Charles Wilson Peale.



could, when empty, be melted down and moulded into bullets, and he drew up specifications for the design of his keelboat. He designed a special rifle that was later adopted by the army.

Those who planned the expedition knew that once the party passed St. Louis it would be beyond medical help. Doctor Benjamin Rush, a foremost physician of the day, briefed Lewis on the medical problems he might have to deal with and prepared a memorandum on the rules of health. Rush also helped Lewis design a compact medicine chest with a supply of medicines that would have done credit to an army post.

After completing his briefing and overseeing the collection of equipment and supplies at Harper's Ferry, Lewis returned to Washington on June 17, 1803. News of the signing of the Treaty had then reached the City. Exploration of the newly acquired territory took on new urgency.

Lewis started recruiting men. He wrote a letter to William Clark and asked him to become his partner in command. When Jefferson picked Lewis as his compromise candidate, it is doubtful if he realized how well he had chosen. Nothing shows Lewis' fitness for the task at hand as well as his choice of Clark as his co-Commander.

The joining of Lewis and Clark was one of those happy combinations of history. They effected a near perfect partnership in an age when petty jealousies so often wrecked noble enterprises. The combination worked so well that their names have come down to us as one of those inseparable twosomes, like bread and butter or peaches and cream, and the fact that their arrangement worked at all is a tribute to the high regard both men had for each other and their devotion to their overriding objective.

If Lewis was the mind and brain of the expedition, Clark soon became its flesh and bone. There should be no doubt but that the command belonged to Lewis. The President of the United States had given it to him, and no man re-

WASHINGTON CITY

MONDAY, JULY 4.

OFFICIAL.

The Executive have received official information that a Treaty was signed on the 30th of April, between the Ministers Plenipotentiary and Extraordinary of the United States and the Minister plenipotentiary of the French government, by which the United States have obtained the full right to and sovereignty over New Orleans, and the whole of Louisiana, as Spain possessed the same.

quired him to share it. That he decided to make Clark a full partner, rather than offering him second in command shows his understanding of Clark as well as his own personal shortcomings.

As an organizer, planner, and executive, Lewis had few equals. Yet he was not an outgoing man, and was not the kind of man other men instinctively liked. No man knew this better than Lewis himself.

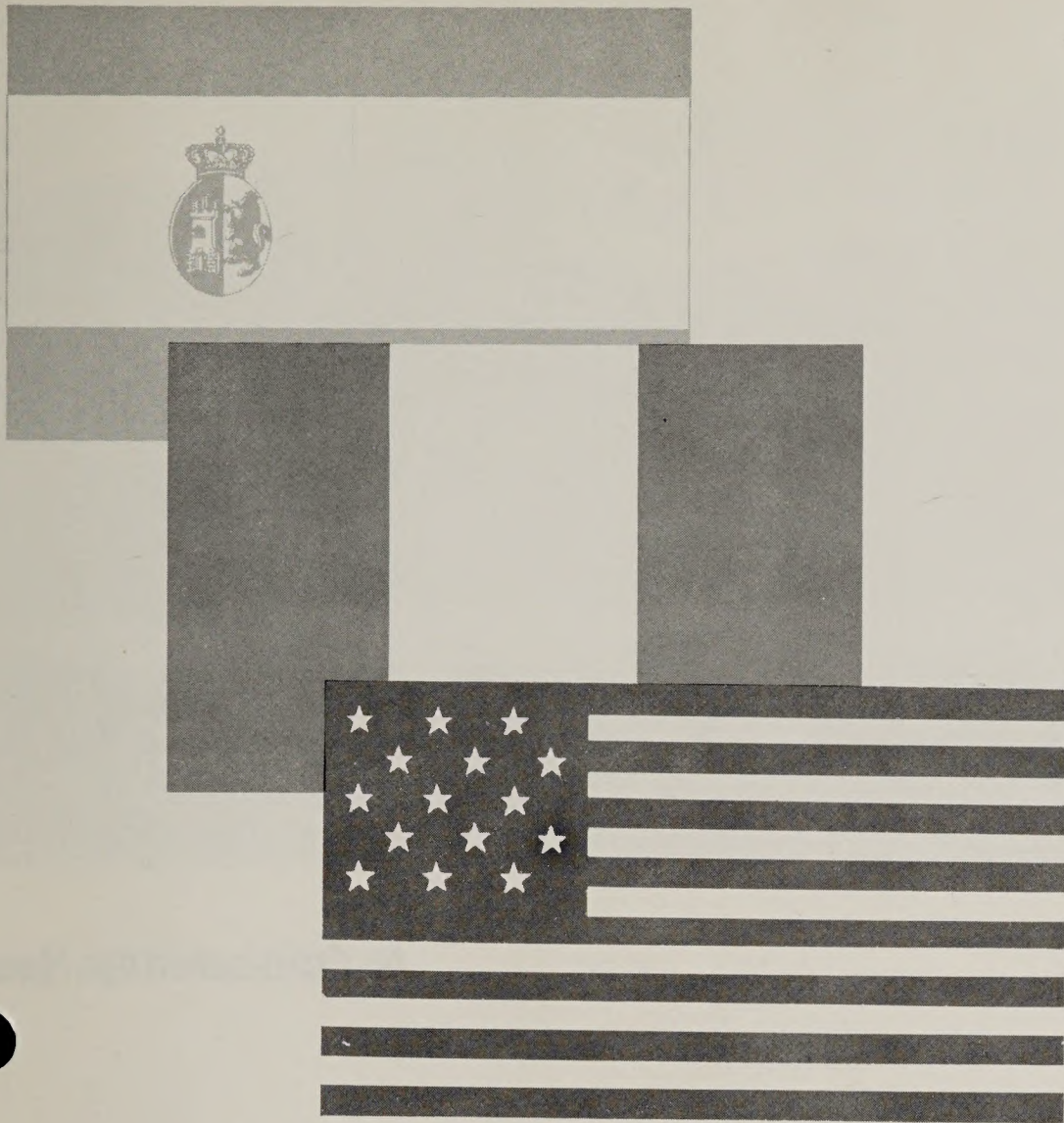
In William Clark, he had chosen a co-Captain who perfectly complemented his own shortcomings. Clark, a redhead like his brother, George Rogers, was a man's man. Throughout the journey it would be Clark that the men turned to and Clark they would instinctively obey.

Lewis left Washington on July 4, 1803. When he reached Pittsburgh, he found that his keelboat was not ready. Like all men who have

important business, he fumed and fretted over the delay. But his mood improved when he received a letter from Clark accepting his offer of a partnership in command.

The keelboat was completed at seven o'clock on the morning of August 31. By ten o'clock, Lewis had the boat loaded and shoved off down the river at eleven. He had seven men aboard, but only three would go with him all the way.

He picked up Clark at Louisville on October 21. Clark had selected seven men. All of these men would make the entire journey. The next stop was at Fort Massac, where Lewis hired a combination scout, hunter and interpreter named George Drouillard. Other stops were made at Kaskaskia and Cahokia where other men were recruited for the crew. The party arrived in St. Louis on December 8, 1803.



As soon as he arrived Lewis presented a letter that explained the nature of his mission to the Governor. Spain's Lieutenant Governor for Upper Louisiana Carlos Delassus was still in charge of the City and happily unaware that Spain had surrendered all claim to the Territory until he read Lewis' letter.

Delassus was a fair and reasonable man, and he immediately took a liking to Lewis. His inclination was to bid the expedition Godspeed, but he was under express orders not to allow any foreigner into Spanish Territory. Until matters cleared up, he could not allow the expedition to proceed. Lewis, who had fretted over delay in Pittsburgh, now proved to be the soul of patience and diplomacy.

To prevent embarrassment to the Governor, he had Clark and

the men camp on American soil across the Mississippi at a site known as Wood River. In the meantime, he took up residence in the town and started to gather every scrap of information about the upper Missouri he could find.

At Wood River, Clark used the time to train and condition the men. They were a tough and independent lot, and like all frontiersmen, they did not accept discipline well. But it was Clark's special talent to make himself the unquestioned leader of just such men. There were a few minor discipline problems, but by Spring the men were starting to work as a team.

In the Spring Delassus received official notice that Spain had surrendered its claim to all of Louisiana. The official ceremony marking the transfer had been held in New Orleans, but it was decided

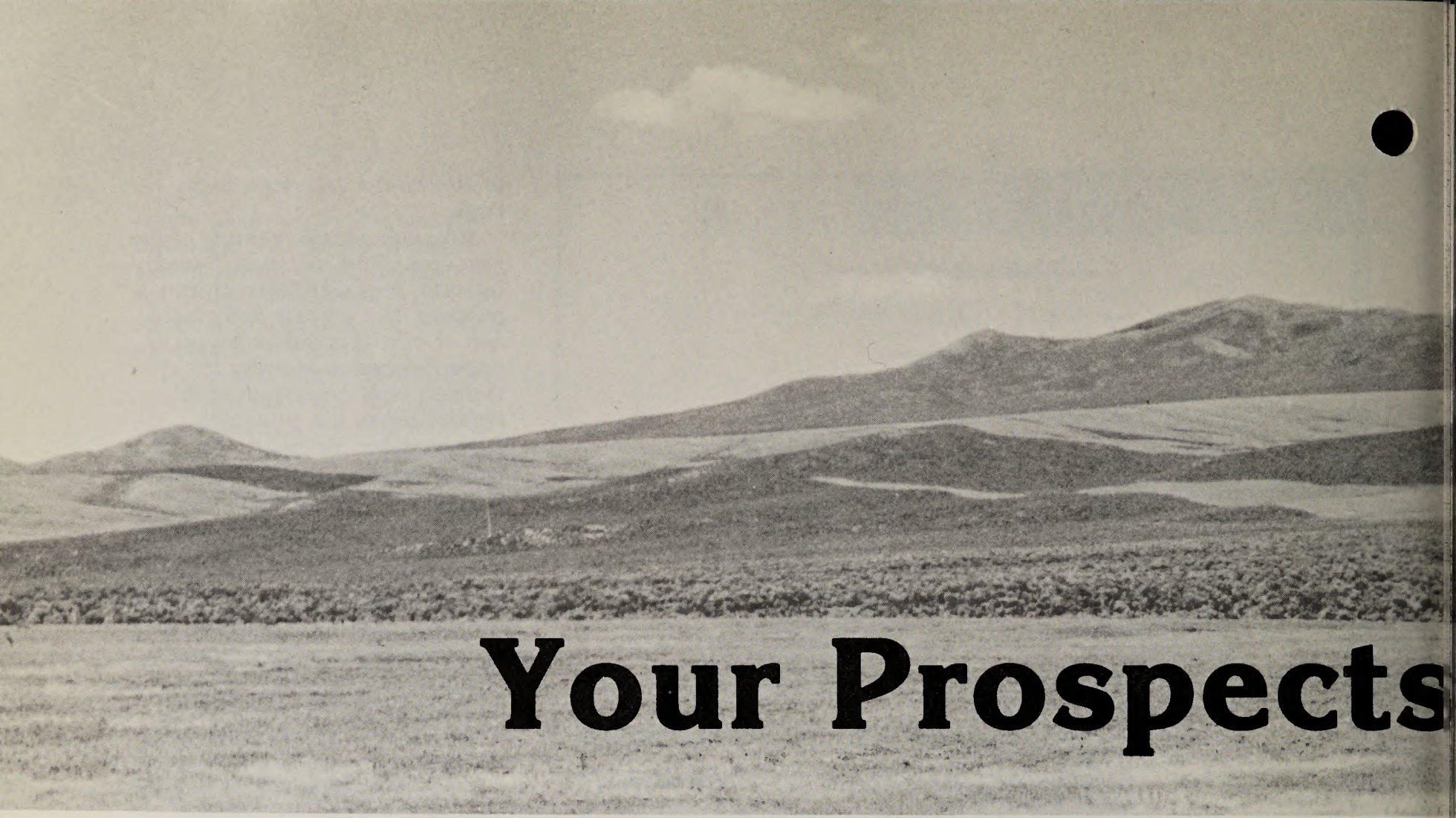
to also hold a ceremony in St. Louis.

Although a great majority of the residents of the city were French by birth, they were then citizens of Spain. Not a single French citizen or official could be found in upper Louisiana. In order for France's brief possession to be symbolized in the ceremony, Captain Amos Stoddard, the commander of the American Army post in Cahokia, was commissioned to accept the transfer from Spain in the name of France. Both Lewis and Stoddard understood the importance of protocol and consulted with local residents about the best way to symbolize French possession. The residents asked that the flag of France be allowed to fly over the city for 24 hours.

On March 9 the residents gathered, and the Spanish flag was lowered and replaced by the tricolor of France. Most of those who witnessed the ceremony had lived for years in the hope, and later with the expectation, that France would one day reclaim Louisiana and restore their citizenship in their mother country. They had accepted Spanish citizenship as an expedience, but almost to a man they had never considered themselves as anything but French. Now the hope and the expectations were gone, and one can only imagine the emotions those Frenchmen felt that afternoon of March 9 as the sun set on the flag they had loved so long and so well. For that short day, they could believe that they were French once more.

The next day Captain Stoddard raised the Stars and Stripes and Louisiana was joined to the United States forevermore.

Lewis continued to be busy, and it was not until May 14 that he sent word for Clark to sail. It was a rainy day, and it was afternoon before Clark maneuvered the boats into the mouth of the Missouri River. Lewis was attending to last minute affairs and did not join the party until the boats reached St. Charles a few miles up river. By then all preparations were complete; the expedition was on its way.



Your Prospects

Is Opportunity Really I

In Idaho

Today real estate is expensive. Families who bought ten years ago have often seen their homes double in value. The increasing values that have characterized housing also apply to land. While the rate of increase has been greater in some areas than in others, it has been dramatic in all areas, even for raw isolated land that is still part of the public domain.

Inflation is one reason for the increase, but experts say that the cost of real estate has increased at a much faster rate than other aspects of the economy, thus hinting at factors that lie deeper than the inflationary spiral. They point out that the amount of land is fixed, while the nation's population continues to grow. In other words, there is a fixed supply and a grow-

ing demand—the result, higher prices.

Characteristically, Americans have always placed a high value on owning land. They are also inveterate bargain hunters. Furthermore, the Federal Government has historically provided land under a variety of land disposal laws. For all of these reasons many still look to the Bureau of Land Management for bargain land.

In 1976 Congress repealed the Homestead Act of 1862. At the same time, it refused to repeal two other laws—the Desert Land Act of 1877 and the Carey Act of 1894. Today these two laws stand as a beacon of hope for thousands of Americans who continue to look to the Federal Government for low-cost land.

Unfortunately the hope is glim-

mering instead of glittering. The purpose of this article is to put your chances of developing a farm under either the Desert Land Act or the Carey Act in a proper perspective.

First, let's look at each of the laws.

When Congress passed the Homestead Act of 1862, its proponents believed that the Nation had a legal vehicle that would ensure the settlement of the vast public domain through the development of family-sized farms.

Actually, the law worked very well up to a point, but Congress soon realized that under a variety of circumstances, the restrictions of the Homestead Act also restricted settlement. Since the mood of the times favored total



In Desert Land

Looking at Your Door?

In Nevada

Idaho's experience in developing desert lands has been watched with interest by a number of western states, but nowhere more closely than in Nevada.

In Nevada the Bureau of Land Management administers more than 48 million acres of public land. With the exception of Alaska, no state has such a high ratio of public to private land. The extent of Federal holdings has been a matter of deep concern for many state residents and getting Federal lands transferred to private ownership has been a major goal of many state and local officials.

Federal ownership of so much of Nevada's land has roots in the State's climate, topography and history.

Most of Nevada lies in the Great

Basin, and its land is either arid or semiarid. Rainfall is less than 15 inches, and most of that falls in the winter. By July, unirrigated lands lie parched under the summer sun. Early travelers found the land harsh and inhospitable, and hastened to a more favorable climate across the Sierra Nevadas in California.

When Nevada became a state in 1864, Congress provided for it to receive two sections out of each township, the same grant made to other public land states. But because this would force the State to accept bad land along with good, state officials petitioned Congress to allow them to select a mere two million acres whenever and wherever they wanted it in place of predetermined sections provided in the Statehood Act.

Because of this decision, the State received only about two-thirds of the land it would have received had it accepted the terms offered under the Nevada Statehood Act. But on balance, since the lands it did choose were better lands, the values were probably favorable to the State.

From the earliest days of settlement, agricultural development was confined to those lands that were susceptible to irrigation. Land beyond the reach of the irrigation ditches was devoted to livestock grazing.

After 1863 settlers flocked into many western states to take up land under the Homestead Act. Most of the would-be settlers continued to bypass Nevada. By 1961 only 704,167 acres of Nevada

In Idaho *(Continued)*

disposal of the public domain, Congress enacted a variety of laws to meet specific situations and to hasten the agricultural development of all public lands.

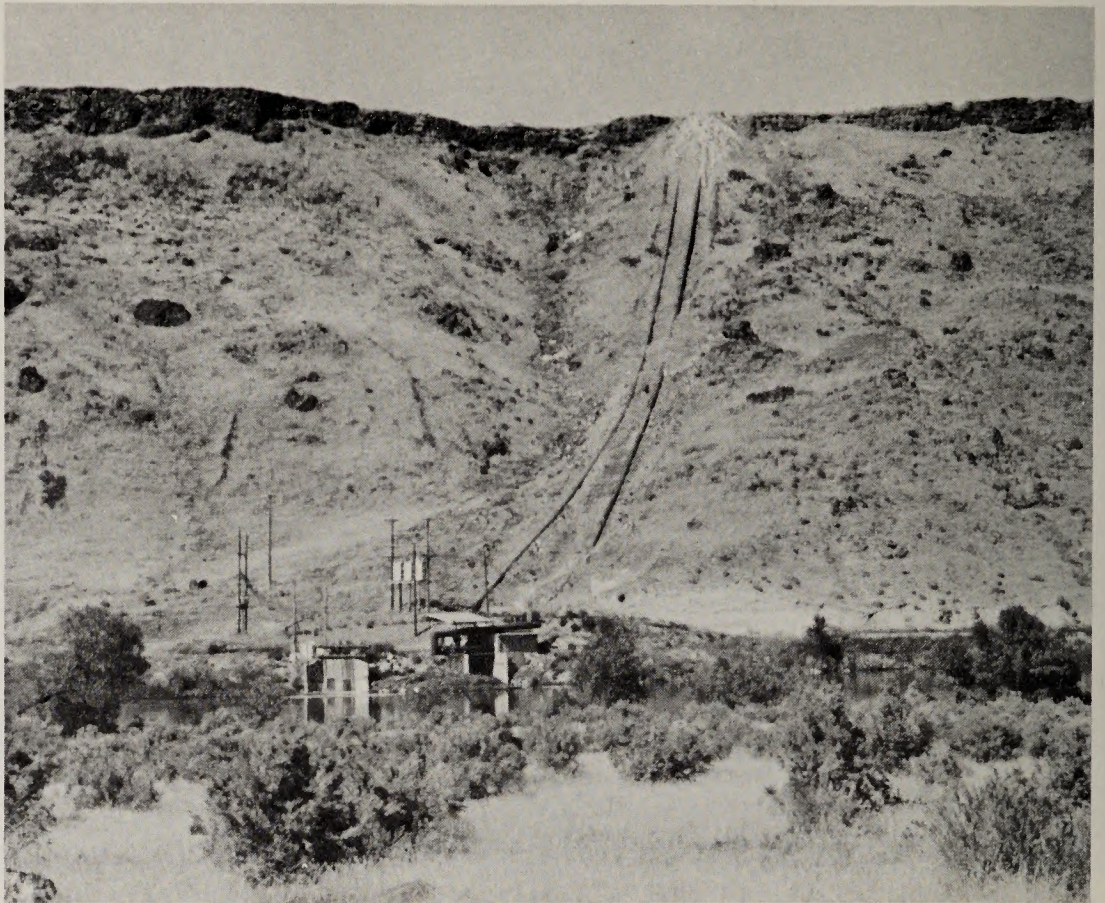
As the line of settlement moved west, the lack of rainfall often proved to be the greatest barrier to successful farming. Where surface or groundwater was available, the settler could overcome this handicap by irrigation. The Desert Land Act and the Carey Act were passed to encourage settlers to bring irrigation to dry desert lands.

Under the Desert Land Act, the applicant could acquire up to 640 acres of arid public land (later reduced to 320 acres) providing he could irrigate it and develop it into a farm.

The Desert Land Act has been called the most popular and most abused of all public land laws. As originally drafted, its vagueness and lack of provisions for government supervision created an ideal climate for fraud. A common evasion of the Congressional intent was for ranchers to have their employees file for 640 acre tracts, then, once the land was patented, the employee would sign over title of his land to the employer. Just as often the settler's claim to have developed a system to irrigate the land was also a farce. In some instances "development" consisted of a dry ditch that would have brought water to the land if water ever learned to run uphill. In other cases land was patented to applicants who had poured a bucket of water on the ground in front of witnesses who were willing to swear that the applicant had "indeed brought water to the land."

In 1891 Congress made an effort to curb fraud and get back to its original intent of providing for the development of family-sized farms by amending the original law with the General Revision Act.

Through this Act Congress reduced the amount of land a single applicant could claim from 640 acres to 320 acres. The applicant



Water is lifted from the Snake River to irrigate desert lands on the plateau by pumping stations like this one.

also had to file a plan of irrigation as a part of his application, show proof that he had enough water to irrigate the entire 320 acres, and that he had spent a minimum of \$1 per acre for each of the three years prior to patent. He also had to have 1/8 of the land (40 acres out of the 320) under irrigation and cultivation before he could receive patent.

With these additional restrictions, the Act worked well as long as there were easily reclaimed lands. But once these had passed into private ownership, other problems arose. When the land was too far from water, or when its topography was too rugged, the cost of irrigation soon soared beyond the financial means of the average settler.

In keeping with the prevailing philosophy of total development, Senator Carey of Wyoming looked for a way to help those settlers who could not afford the cost of irrigating remote or difficult tracts of desert land. Since he did not believe that the U.S. Treasury would be able to provide the necessary funds, he introduced a bill to encourage the individual states to finance irrigation projects.

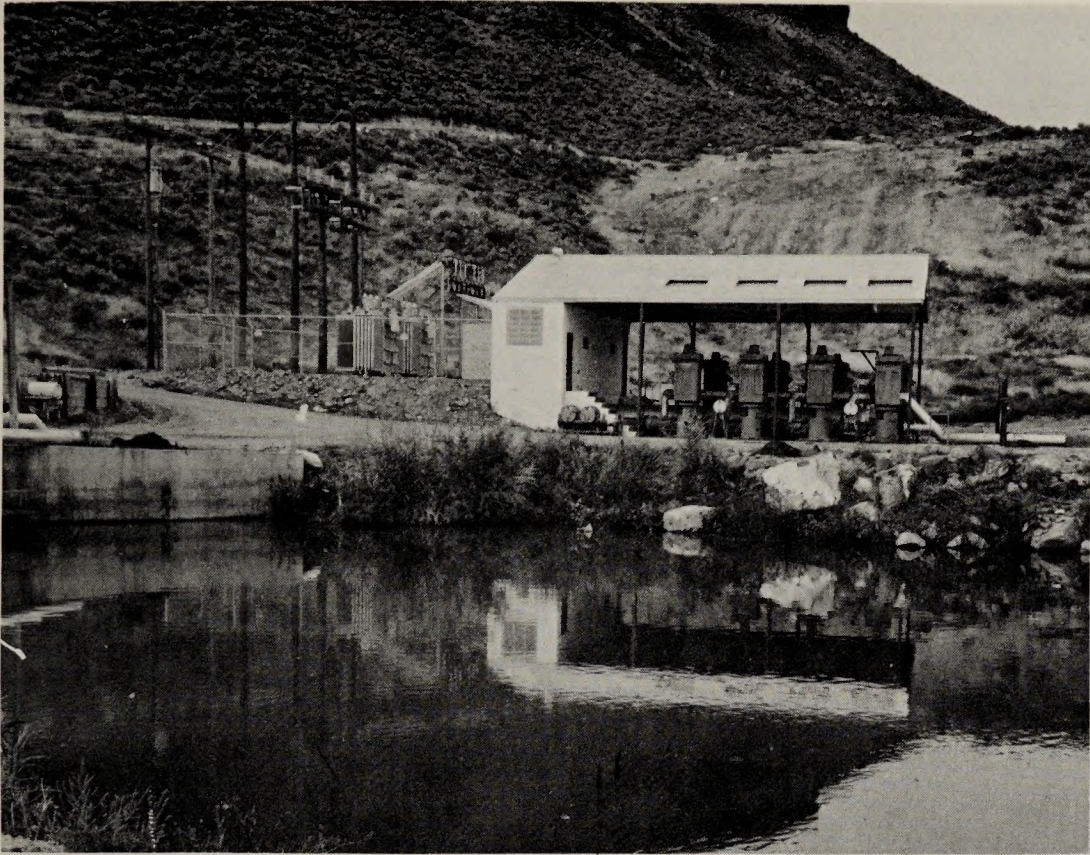
As originally proposed under

the Carey Act, the Federal Government could make up to 1 million acres of public land available to each participating state. The State would, in turn, assume the role of a construction company to divert water and bring it to the land. The state would then sell 160 acre tracts to individual settlers along with enough water to irrigate it.

As soon as the Carey Act was passed 12 states enacted laws accepting the conditions of the Federal grant. They were Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, South Dakota, Utah, Washington and Wyoming.

However, it soon became apparent that State Treasuries were no more able to finance high-cost irrigation than the Federal Treasury had been. Rather than assuming the role of a construction company, most states became program administrators. Physical development and financing were turned over to private promoters.

In actual operations there were three contracts involved in the process of turning public desert into private farms under the Carey Act. The first was between the Federal Government and the State;



Pumping Stations consume a significant amount of electrical energy. Many citizens of the State believe that the amount of electricity consumed by these stations will become a factor in determining future electric rate structures.

the second between the State and the construction company; and the third between the construction company and the settler.

In the first the Federal Government agreed to make certain land available to the state. The state agreed not to use the land for any purpose not compatible with the Carey Act, to bring the land under irrigation, and to make it available to actual settlers for cultivation in parcels no greater than 160 acres.

In the second, the construction company provided proof that it had valid rights to enough water to complete the project. The contract also set out the details of all that had to be done and contained specifications concerning the construction of the irrigation works, how the sale of water to the settler would be handled, and other particulars. The State was assured ultimate control since it was not required to accept the project until all specifications had been met.

The contract between the company and the settlers set out conditions regarding the amount of water that would be delivered to each settler.

Eventually the company would turn the project over to the settlers

who would set up a self-governing body to operate the project.

Since its passage in 1894, the Carey Act has been amended many times. Each amendment was intended to make the Act more workable in the field. A joint resolution approved by Congress on May 25, 1908 granted the State of Idaho an additional one million acres of public land for Carey Act development. A few days later, on May 27, Congress passed legislation making an additional one million acres available to Idaho and Wyoming. Legal experts have since been divided over the intent of Congress. Did Congress intend to confirm by law what it had already made available by Joint Resolution, or was the May 27 action intended to give Idaho still another one million acres for development. The issue is still being debated.

There has been substantial development of desert lands under the Carey Act, but the record remains far from impressive. Out of the 11 states that passed legislation to enable them to accept Carey Act grants, 3 have yet to develop a single acre. The remaining 8 states have successfully de-

(Continued on page 16)

In Nevada *(Continued)*

land had been patented under the Homestead Act. That was the smallest amount of land to be homesteaded for any state west of the Mississippi River, and in all the public land states, only three had less land homesteaded.

Success under the Desert Land and Carey acts has been even less impressive. By 1976, 4,445 applications had been filed for 2,183,224 acres of land under the Desert Land Act. Out of this total, only 333,161 acres have been patented. Since the Carey Act became law, 36,328 acres of public lands in Nevada have been set aside for development under that Act. But patents to individuals have amounted to only 779 acres.

Yet despite the poor success ratio, the Bureau found that it had 1,500 Desert Land applications on hand in 1964. Investigation revealed that the majority of these applications had been filed by land promoters. At the time, the State was making a study of its water resources, and no one knew how much, if any, water was available for agricultural development. In cooperation with State officials, the Secretary of the Interior closed public lands in Nevada to further desert land filings.

In 1976 Nevada officials decided to follow Idaho's example and notified the Bureau that the State intended to develop its remaining Carey Act land.

The revival of interest in the Carey Act in both Idaho and Nevada caught the Bureau by surprise. After a long period of inactivity, the Bureau had dropped regulations that implemented the Carey Act from the Code of Federal Regulations. Proposed new regulations have since been published in the Federal Register and are expected to appear in their final form in the near future.

In April of 1977 the Nevada legislature amended its 1909 Carey Act law to bring it up to date. State regulations to implement this law are now waiting for the adoption of Federal Regulations

(Continued on page 17)

In Idaho *(Continued)*

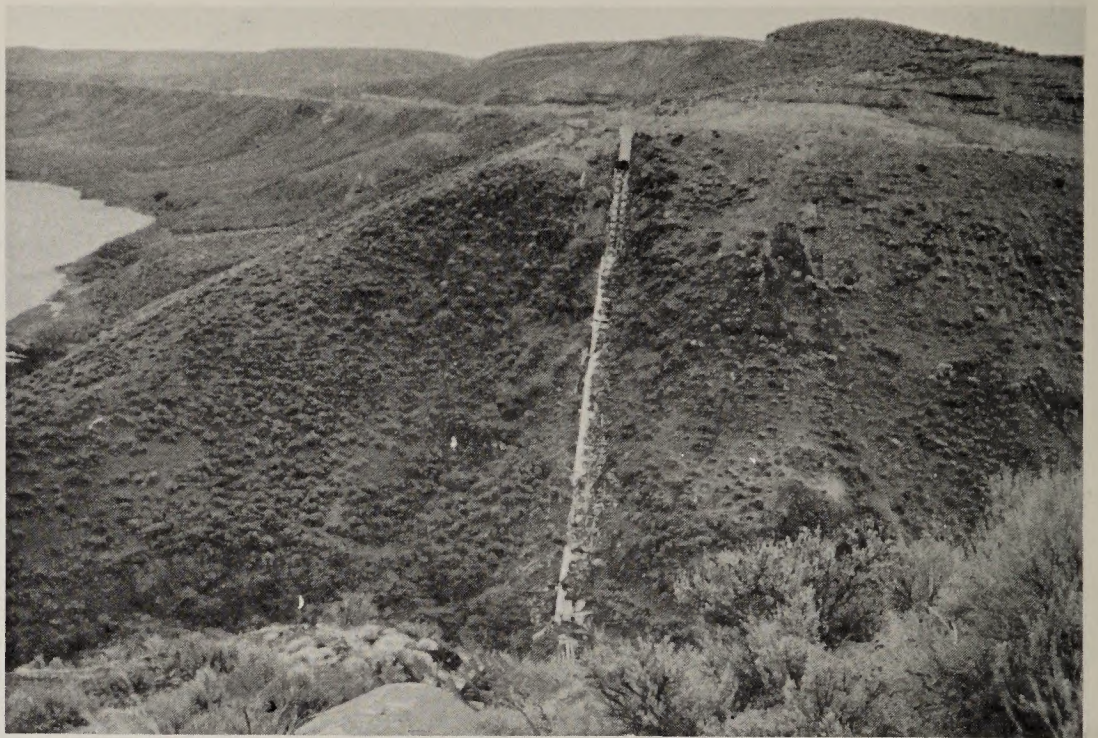
veloped 1,089,654 acres out of the millions of acres granted under the Act or its subsequent amendments.

In many cases the bottleneck has been a lack of water, but there were also a lot of other problems. For one thing, even during the early years the financial aspects of developing Carey Act projects did not prove as attractive to the construction companies as had been expected. The Idaho Conservation League reports that by 1912, 90 percent of the companies operating in that state were in or near bankruptcy. One project involving an anticipated 200,000 acre development and an investment of \$2,000,000 resulted in 40 acres being patented. Of course there were successful projects. The American Falls project resulted in 50 thousand acres out of the 57 thousand that had been set aside being patented. But a study of the records shows that successful projects were the exception rather than the rule.

The success ratio under the Desert Lands Act has been little better, once the easy-to-irrigate lands passed into private ownership. Between 1947 and 1973, 2,376 entries were filed with the Bureau in Idaho. These totaled 585,966 acres. Of the total the Bureau allowed 1,513 entries covering 338,192 to be patented. In Idaho, the success ratio under both acts has been about 39 percent.

After 1930 applications under both the Desert Land and the Carey Act fell off sharply. As land became more difficult and more expensive to irrigate, development under the Carey Act became too risky for the investor, and too expensive for the average settler under the Desert Land Act. Then in the late 1940's there was a revival of interest in desert lands along the Snake River in Idaho.

The Snake River flows in a great arc across southern Idaho. For a large portion of its distance, the river flows at the bottom of a deep canyon. From the bottom of



Some early efforts to bring water to Snake River Plateau lands proved too expensive for profitable farming. An abandoned irrigation facility reminds future developers of the possibility of failure.

the canyon, high, and often sheer, walls rise to a near-level plateau on either side of the river. On the plateau, the land is fertile but arid. With water it can be highly productive; without it, it remains a desert.

From the earliest days of exploration, the relationship between the land on the high plateau and the river in the canyon has been a vexing situation to mankind. Accounts tell us of men who suffered the agonies of thirst while listening to the rushing water in the narrow passages of the canyon below. The inability to bring the water in the river to the land has limited agricultural development of the fertile plateau from the earliest days of settlement.

Then a farmer near Rupert, Idaho, drilled a deep well and successfully irrigated his private land on the Snake River plateau. His success brought a flurry of Desert Land applications into the Bureau's Idaho State Office in the early 40's.

This was followed by another flurry of interest in the early 1960's when improved technology enabled another farmer near Nampa, Idaho, to bring water from the Snake River up to his land by use of a high-lift pump. Together,

these two incidents started what many in Idaho have called the State's "last great land rush."

While improved technology made it possible to irrigate public lands on the Snake River plateau, many other problems remained. Even with the improved technology, the cost of developing an irrigated farm remained high. It was this high cost of development that led to what has been called the Indian Hills Project.

The case involved 12 individuals who had filed for land under the Desert Land Act. All applications were approved and some of the applicants had made final proof before it was learned that a private corporation had financed each development with the understanding that the entrymen would turn control of their land over to the corporation to operate and that such an agreement had existed at the time the applications were filed. Since the Act specifically prohibited this kind of agreement, the Department filed suit to repossess the land. The Department's position was upheld in 1973 by the U.S. Ninth Circuit Court of Appeals and the land was returned to the Federal Government. This involved cancella-



A pivot sprinkler system on a developed Desert Land Entry in southwest Idaho. The pivot turns to make a complete circle. Most pivots can irrigate about 140 acres. Sprinklers are placed along the entire length of the pivot arm.

tion of five patents and seven unpatented claims.

The decision in the Indian Hills case was a setback for the State's hope to bring more public land under cultivation and into private ownership.

In 1973 the State of Idaho notified the Bureau that it would develop the remaining land it was due under the Carey Act.

Although the Carey Act limited applicants to 160 acres of land, it had the advantage of allowing group development of irrigation projects. State officials also believed that family farms of up to 320 acres could be granted through a technicality of the law. This would be accomplished by having husband and wife file separate applications on adjoining tracts of land.

At press time the State's interpretation of this provision of the Carey Act had been upheld by a U.S. District Court and by a Court of Appeals. The U.S. Department of Justice had not reached a decision about an appeal to the U.S. Supreme Court.

This is essentially the situation in Idaho today. As many Americans look for ways to get back to

the farm, their obvious question is: Does the Idaho situation provide an opportunity for me? For most the answer is no.

Within the State of Idaho the question of additional agricultural development is being debated. How much desert land will become available may well depend on the outcome of that debate.

One group that is taking a hard look at the impact that will result from bringing more desert land under cultivation is the Idaho Conservation League. In a 1977 report the League made the following points:

- It is a fact, there has been and is fraud and speculation contrary to the family farm intent of these desert land disposal laws. Given all that, however, more than 2 million acres of public land have been put into private ownership via the Desert Land and Carey Acts. Much of that land is now counted among the most productive farmland in the nation.
- Several interrelated factors have contributed to the survival of the Desert Land and Carey Acts in Idaho long after

In Nevada *(Continued)*

before they appear in final form.

After Nevada announced that it would accept Carey Act applications for specific tracts of public land, it received 1,876 applications covering 1.2 million acres of land. The State then placed a moratorium on further filings.

In 1978 Nevada reversed its position concerning further agricultural development under the Desert Land Act. After its Attorney General had filed suit against the Department of the Interior to have the 1964 restrictions lifted, the Department opened Nevada to desert land filings on December 14, 1978. The opening became effective on January 1.

Unlike other states, public lands in Nevada are open to filings by citizens from other states. Unfortunately, from the applicant's point of view, Nevada has even less water resources than are available to the residents of Idaho. In addition, many of the problems that we listed in the accompanying article that would apply to development in Idaho will also apply in Nevada.

In a recent study conducted for the Bureau by BRI Systems Inc. of Phoenix, Arizona, it was found

(Continued on page 19)



A lack of rainfall is the limiting factor that has prevented the development of much of the public lands. With irrigation, most desert lands prove to be fertile, but without water they are capable of supporting a limited number of livestock.

In Idaho *(Continued)*

they faded away in most of the western states. The proper mix of available public land, climate, surface and groundwater and relatively cheap energy and a traditional ethic of agricultural growth to put them to work. And for the most part, these two acts with deep roots in the past have served Idaho well to date.

- Additional large-scale deep well pumping from the Snake Plain and lesser aquifers would accelerate lowering of water tables and reduce surface flows.
- Flows in the Snake River would be further reduced by additional large-scale high-lift pumping directly from the river.
- Both of the above would substantially reduce the amount of comparatively cheap electricity generated by the Snake River hydroelectric dams now being amortized by ratepayers.
- New deep well and high-lift pumping and sprinkler pressurization would consume large amounts of electricity.
- Reduced hydro production and increased power demand resulting from the new irrigation would create the need for approximately 2,000 megawatts of additional generating capacity by the year 2020.
- These new facilities would likely, even probably, be thermal plants producing far more expensive electricity than Idahoans are accustomed to.
- Under the current average-cost pricing system, the new, far more expensive thermal power would be mixed with cheap hydropower and the average cost passed on to all ratepayers.
- The proposed 1,000 megawatt coal-fired Pioneer plant was projected to raise rates 150 percent.
- Rate hikes of that magnitude would have significant impact on net incomes of existing pump irrigators.
- The projected expansion of irrigated cropland would substantially increase the supply of agricultural products at the marketplace.
- Farm-level prices would decrease unless there were a corresponding increase in demand.
- Future demand for Idaho crops cannot be accurately predicted. Current trends, however, do not support farmer's cherished dream of dramatically expanding domestic and international markets.
- As a result of the above factors, existing irrigators would certainly be faced with much higher energy costs and probably lower farm-level prices.
- Most of the publicly owned desert land earmarked for conversion to private irrigated agriculture is rangeland currently grazed by domestic livestock.
- Elimination of the attendant grazing privileges would have severe impact on many individual ranchers and the important open-range tradi-

tion and lifestyles of southern Idaho.

In support of new development, the State of Idaho has developed a "State Water Plan" designated to "maintain the State's current share of the national and international market." The State plan calls for the irrigation of an additional 790,000 acres of Federal lands by the year 2020.

In anticipation of this, the Bureau of Land Management is now in the process of preparing an Environmental Impact Statement as one step leading to transfer of land to the State and individuals.

The draft of this statement (at the date of this writing the draft of the E.S. is expected to be released for public review in the near future) proposes the transfer of 111,015 acres of Federal land in Elmore, Owyhee, and Twin Falls Counties for agricultural development under the Desert Land and Carey Acts. Transfers would be made at the rate of 22,000 acres a year through 1984.

In the preparation of this Statement, the Bureau does not rule out the possibility of additional transfers at a later date and in other parts of the State. The proposed schedule is designed to provide for an orderly development in keeping with the ability of the State to develop, and the Bureau's ability to process applications. Applications now on hand will take up the amount of land to be offered.

Opportunities offered by the renewed activities in desert land development in Idaho are burdened by a series of "ifs." If you already have an application on file, and if you have sufficient capital to finance the necessary irrigation, there is a chance that your dream of getting land from Uncle Sam may be realized. It will not be cheap land once it is developed. Estimates indicate that it may cost \$100,000 to irrigate 320 acres of land.

Yet some new land in Idaho will be developed for agriculture. For a few well-situated individuals the reward will be worth the effort. But how much land will eventually become available and when are questions that remain unanswered.

In Nevada *(Continued)*

that Nevada has about 23,000 acres of public land that has good to average potential for agricultural development. An additional 29,000 acres has limited potential. Applications now on file under the Desert Land Act and the Carey Act could, if all were allowed, absorb this acreage many times over.

Under the Desert Land Act the applicant can, technically, file for vacant public land provided it has been surveyed, is not reserved for some other use, and is non-mineral in character. However, applications that conflict with other public land laws must be rejected. The Bureau's Nevada State Office has prepared a map indicating those areas in the State where the applicant can reasonably expect his application to be accepted.

The Bureau received 1,747 applications during the first 90 days after the State was opened to Desert Land entry. All of these applications were considered as being simultaneously filed. When there was more than one application for the same tract, a drawing was held to determine which would be considered. Applications filed after the end of the 90 day period (after March 31) would be considered on a first-come-first-served basis.

As in Idaho, there will be some agricultural development of public lands in Nevada, but with the amount of water that is available, that development will be limited.

The economic situation that those who want to develop public lands for agriculture face today is as bad or worse than any faced by earlier developers. In order to open any lands, it will probably be necessary to develop a deep well irrigation system. Nevada's valleys are alluvium deposits and wells will generally provide irrigation for only limited acreage. According to estimates, pumps capable of supplying enough water to irrigate 320 acres will cost about \$175 thousand. The energy to operate these pumps will cost an

estimated \$19 thousand per year. The cost of land preparation and other development expenses will have to be added.

In short, the bottom line of estimates of what it will cost to bring 320 acres of public lands into production may be in the neighborhood of a quarter of a million dollars.

In the meantime, prices farmers are receiving for their crops had not kept pace with the cost of production. Hay, small grains and potatoes make up 96 percent of Nevada's agricultural income. Since 1974 the prices of alfalfa hay, wheat and barley have declined. The price of potatoes increased by 18 percent in 1978, but the 1979 prices have dropped to 1974 levels. Only alfalfa seed has shown a steady increase amounting to a total 39 percent over 1974 levels.

An economic analysis made by Bureau personnel and based on the current cost of existing farms in Nevada and the estimated cost of developing a deep-well irrigation system shows that new desert land farms would probably lose money if low value crops such as alfalfa hay and wheat were raised. The same analysis indicates that high value crops such as potatoes and alfalfa seed might be raised at a profit providing the farmer can get high yields and keep the cost of irrigation down. However, these high value crops are also high cost, high risk crops and have much more restrictive conditions under which they can be grown. Because of these restrictions, they are not adaptable to most Nevada counties.



URANIUM

MINING IN UTAH

MAX ZUPON
Utah State Office



Once the Pursuit of the Rugged Individualist, Uranium Prospecting and Mining Now Requires Sophisticated Techniques and Corporate Enterprise.

Since man split the atom, he has searched for new uses of atomic energy. At first, it was used by the military to power naval vessels and for incredibly destructive weapons, while constructive uses such as generating electricity for power-hungry metropolitan areas were dreams envisioned by the science-fiction writer.

It was not until the 1950's that new uses for atomic energy were seriously explored. Since then, the medical profession has expanded its use of the atom, and for the first time atomic power was considered as an alternative to coal, oil and other fossil fuels. Scientific research into the substance of the atom, and of matter itself, also became important in the late fifties and early sixties.

For the most part, atomic research has evolved around a heavy mineral—uranium, not discovered until 1897. Since its discovery, much of the country's uranium has come from public lands of the Colorado Plateau near Moab, Utah.

People who visit Moab today, find it hard to believe that this was once an agricultural area with orchards and grass for livestock. The discovery of uranium hit the area like a bolt of lightning. The residents were no longer content to tend cattle and orchards, and most joined the influx of prospectors in search of "ore." As the uranium fever gripped the area, the land soon reverted to its natural state.

For the old-time prospector

who has panned for gold, there was something new at the end of his rainbow—a canary-yellow ore that sometimes glistened in bright sunlight. The kind of uranium ore found around Moab was so abundant that it could be located by its color exposed in blanket veins. Today it can be found only through its radioactivity. The old deposits ran as high as 30 percent uranium. Today a deposit that yields as little as $\frac{1}{4}$ of 1 percent uranium is considered commercial grade ore.

Ironically, those early miners considered uranium almost worthless. What they were looking for were two very valuable and rare minerals—vanadium and radium—found associated with uranium. Sometimes uranium ore was pul-

verized and taken with water or food as a home panacea for backaches, colds, infertility and failing eyesight (practices not recommended by doctors today) but

there were few uses for uranium per se.

Vanadium was alloyed with steel to increase its strength. It is still used for this purpose today.

Radium had, and still has, great value. In 1922 it retailed for \$120,000 per gram. (There are 454 grams in one pound.) Radium was used in research and medicine. In those days, radium's discoverer, Madame Marie Curie, was almost a household name, and a few wealthy American businessmen gave her a gram of radium in recognition of her contribution to science.

Both minerals are found with uranium in an ore known as Carnotite. It is Carnotite that was found around Moab. It was named by Madame Curie in honor of A. Carnot, a French inspector general of mines.

Moab was a pretty hectic place between 1905 and 1930. Everyone was staking mining claims, in some places claims were staked on top of claims. A few miners found enough Carnotite to retire for life, but for most it was the usual "gold-rush" story of finding just enough ore to provide a marginal income. The small amount of money that was made was used to buy supplies and equipment so that the miner could continue his search for the mother-lode. It is amazing that these men searched so long and hard for a mineral that was valued only for its by-products.

A few of those early miners are still around today. Howard Balsey is now over 90 years old and is an authority on the history of prospecting and mining in Utah.

Carnotite was first discovered near Moab by Albert M. Rogers, Mr. Balsey tells us. That the field, later patented as the Blue Goose Mine, supposedly was one source of ore for Madame Curie.

Besides prospecting himself, Mr. Balsey grubstaked many miners. In 1915 he grubstaked a cowboy-turned-miner named Charles Snell. Snell claimed to have had dream in which he envisioned a yellow circle of uranium in a block of sandstone. He was sure that he could find it.

"Snell was so sincere that I outfitted him," Balsey said. "Ten days later he returned with news that he had found the yellow circle in the midst of a rich ore deposit."

In those days Moab was en-



An aerial view of typical uranium country.



A new mine shaft near Moab, Utah reaches for uranium deposits deep in the earth.

gulfed in a milieu of optimism that held anything possible. If a man had a dream, others believed in it. Men were willing to take risks because they were convinced that the mother-lode was close.

In the 1930's miners started to contract for the sale of uranium ore with pigment producers. One company that used a lot of ore was the Vitro Chemical Company of Pittsburgh. Vitro made brilliant and long lasting colors from mineral pigments and uranium which were used in ceramics, pottery and in glass.

"Vitro made over 20 shades of red, green, brown and yellow from uranium," Mr. Balsey tells us. The agreements Mr. Balsey made with Vitro really pioneered early sales of uranium ore.

In 1944 the United States was locked in the final struggles of World War II. Military leaders contemplating the invasion of Japan estimated that the loss of life on both sides would be frightful. America's secret weapon was the Atomic bomb. Uranium was the essential ingredient of the bomb.

Until work on the bomb began the demand for uranium in all industries had been low but constant. Late in 1944 the increase in demand was astronomical. In fact some of Mr. Balsey's ore was seized on the way to Vitro and diverted to atomic research facilities. He was later paid for the uranium.

After the bomb was used, the Manhattan Project, created to produce the bomb, evolved into the peacetime Atomic Energy Commission. As late as 1947, the AEC had not established a program for handling uranium ore. In an effort to increase the supply public lands were closed to uranium mining leaving the Federal Government to prospect for new sources of ore. The experiment was largely a failure and the land was then reopened to the public and incentives were offered to those individuals who located ore. That soon produced enough to depress the market.

By 1950 research had found sufficient peacetime uses for atomic energy to create a boom in the uranium fields. The boom drew men from all parts of the nation

and for the first time large corporations became involved in uranium mining. This brought profound changes in the way of finding and producing uranium ore.

Where the old-timers had prospected with pick and burro and looked for color, new miners used aircraft, four-wheeled drive vehicles, Geiger counters and scintillators to find deposits. It was now possible to locate rich deposits hidden far below the surface. With the new methods the rich deposits were soon exhausted.

By 1970 ore whose uranium content was as low as 20/100ths of one percent was considered minable.

This grade of ore does not look like the canary-yellow Carnotite that was mined around Moab in 1900. Old-timers say they would not know how to recognize uranium of such poor quality. This kind of ore is usually buried deep in the earth and is usually a dull gray color rather than the bright yellow the older miners are accustomed to.

Today, mining interests invest large sums to find uranium. Exploratory drilling is a time-consuming and frustrating process.

Scintillator-equipped aircraft are used to locate possible deposits of ore. When the scintillator reading is favorable, the area is pinpointed and a geologist is sent to study the rock outcroppings from the ground. If his reports are favorable, the company sends in drilling equipment to bore test holes.

The first test holes determine if the ore is rich enough to justify more drilling. They also determine how deep and how thick the ore body is. If the deposit is found in rugged country, and it usually is, a single test hole can cost \$20,000 or more. An ore body underlying a few tens of acres will require many test holes to determine the exact size, depth and thickness of the deposit.

Uranium production peaked in Utah in 1958. That year 1,239,767 tons of ore were mined and that produced 9 million pounds of uranium. Production declined after that to between 300 and 400 thousand tons a year. A slow recovery started in 1976 when 858,889 tons were mined. In 1977, 2,457,988

pounds of uranium were produced from 980,508 tons of ore. Production is expected to reach 1 million tons in 1979. If the anticipated power projects become reality, production may reach 1,300,000 tons by 1985—that would be more ore than was mined in the boom year of 1958. According to the Utah Geological and Mineral Survey, the State's uranium reserves amount to 17.9 million short tons.

During the 1950's uranium meant big money and many jobs in Moab. Prospecting and mining on the public lands around the town were regulated only by the Mining Law of 1872. Miners loaded their trucks and headed out in all directions. If they found ore, they used any available means to get it out of the ground.

It's different now. Public concern for the environment has led to new laws and a new emphasis on the role the Bureau plays in the management of the public land. The new Federal Land Policy and Management Act of 1976 charges the Bureau with the responsibility for managing the public lands for all the American people. The law also requires the Bureau to consider remote areas for possible inclusion in the nation's wilderness system. This could lead to some areas of the public lands being closed to mining.

On the other hand, the nation is caught up in the grip of a worldwide energy shortage. Nuclear power may prove to be the most cost-effective alternative to the fossil fuels, providing we can find a way to overcome the environmental and safety problems that have plagued nuclear development.

Much of the uranium mined in Utah comes from land administered by the Bureau. The public and the industry have much at stake.

The industry has been encouraged by President Carter's statement favoring lightwater reactors which use uranium over the breeder reactor. Uranium is now selling for \$42 per pound compared with \$6 to \$8 which was the price in the early 70's. As a result marginal deposits, once considered not worth mining are now being brought into production.

Public Land Sales

Tracts of public land are sold by the State Offices listed on this page. Sales are held only when land use planning indicates that the public interest will be better served by disposal of the tract in question. In light of the time involved in preparing, printing, and distributing this publication, it is impossible to report on all sales far enough in advance to give

most readers an opportunity to participate. However, notices of sale will be published in the Federal Register and in local newspapers serving the community where the land being offered is located. These notices will appear at least 60 days before the sale. Currently, the only States authorized to conduct auction sales are Nevada and Wyoming.

STATE OFFICES U.S. DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT

ALASKA:

555 Cordova Street
Anchorage, AK 99501

ARIZONA:

2400 Valley Bank Center
Phoenix, AZ 85073

CALIFORNIA:

Federal Building, Room E-2841
2800 Cottage Way
Sacramento, CA 95825

COLORADO:

Colorado State Bank Building
1600 Broadway
Denver, CO 80202

STATES EAST OF THE MISSISSIPPI RIVER, PLUS IOWA, MINNESOTA, MISSOURI, ARKANSAS AND LOUISIANA:

Eastern States Office
7981 Eastern Avenue
Silver Spring, MD 20910

IDAHO:

Federal Building, Room 398
550 West Fort Street
P. O. Box 042
Boise, ID 83724

MONTANA, NORTH DAKOTA AND SOUTH DAKOTA:

222 N. 32nd Street
P. O. Box 30157
Billings, MT 59107

NEVADA:

Federal Building, Room 3008
300 Booth Street
Reno, NV 89509

NEW MEXICO, OKLAHOMA AND TEXAS:

U.S. Post Office and Federal Building
P.O. Box 1449
Santa Fe, NM 87501

OREGON AND WASHINGTON:

729 N.E. Oregon Street
P.O. Box 2965
Portland, OR 97208

UTAH:

University Club Building
136 East South Temple
Salt Lake City, UT 84111

WYOMING, KANSAS AND NEBRASKA:

2515 Warren Ave.
P.O. Box 1828
Cheyenne, WY 82001

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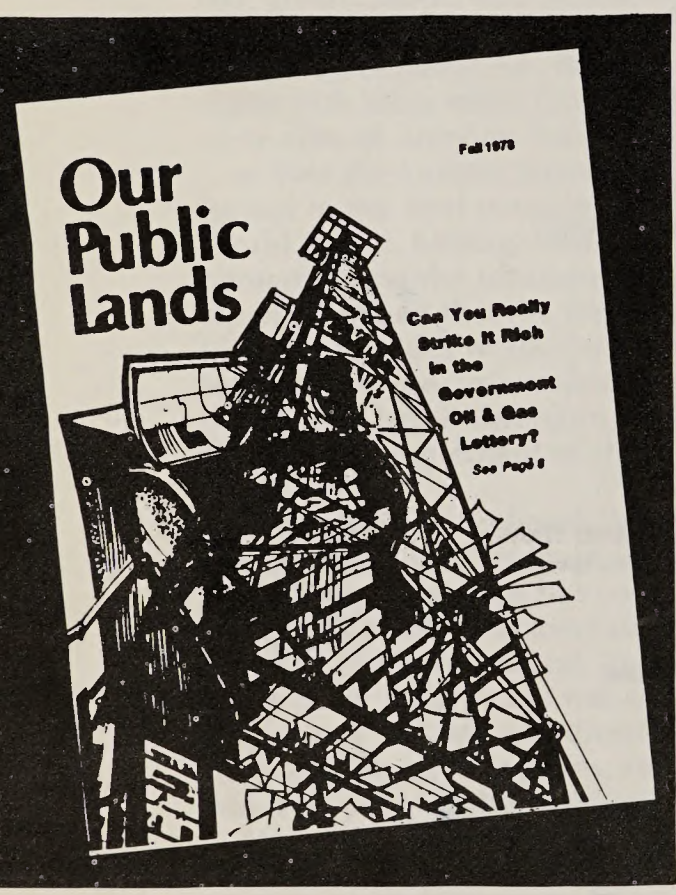
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