

Mining Activities in Nebraska

By N. A. BENGTON.

To a majority of people even in the middle west the term Nebraska calls up a mental picture of a smooth, treeless expanse of land devoted to the raising of corn, wheat and alfalfa. Nebraska is great chiefly because of her agricultural and grazing industries. But it may not be out of place to state that she has mineral resources of considerable economic importance. The recently discovered coal mine near Peru has been given prominence in local publications, and we hope further discoveries may be made as a result of vigorous and systematic prospecting. But whatever the future of the coal and gas may be, Nebraska has now a region along the lower Platte river where there is great activity in utilizing the minerals in a commercial way.

To study in the field some of the formations of the lower Platte valley, a party of sixteen young men under direction of Dr. G. E. Condra, professor of economic geology in the university of Nebraska, spent the greater part of their Easter recess on a field trip from Ashland to Cullom. On Wednesday morning, March 27, properly equipped with instruments, collecting bags, camping outfits, and other necessary apparatus, we started out in two groups. One party, under direction of Dr. Condra, went to Ashland to study the exposures of sandstone, limestones, and shales in that vicinity and to get data on the different beds from their eastward. The other party, under direction of the writer, went from Lincoln direct to South Bend and spent Wednesday in studying the strata exposed along the south side of the Platte river from South Bend to Louisville. We also visited the clay pits about two miles southwest of Louisville.

These pits are located on the east side of a small valley, tributary to the Platte, where erosion has removed a great part of the overlying material, called stripping. There are two pits about a quarter of a mile apart. The first is about 300 feet long, the opening faces southwest and has been worked back about 150 feet, and to a depth of 40 to 50 feet. The strippings vary from two feet to fifteen feet in thickness, becoming heavier as the pit is extended into the bank. The clay is light yellow, very firm in position, a little sandy in the upper part of the bed, and underlain by a white sand. The clay bed is about thirteen feet thick. The clay is shipped to Omaha and manufactured into a very high grade of brick. There is also found a layer of about three feet of highly colored red clay which is mined for use in the manufacture of red paint. These pits have been worked for six years, and through the greater part of the year from four to six cars of clay a day are shipped. This property is owned and operated by the Avery Brick company of Omaha, Neb.

After having made a somewhat detailed study of these pits we returned to South Bend, studying along the ravines on the way. At South Bend we joined the Ashland party and, taking advantage of the genial hospitality of Mr. Deming, pitched our tents on the banks of a small stream near his house. At this place we spent two nights.

Thursday the whole party was divided into groups for different specific studies and the day was spent in getting accurate data on the formations exposed along the south bank of the Platte northwest of South Bend. On Friday the same plan of study was carried out along the north side of the river from the state fish hatcheries to Meadow where we crossed over to Louisville. There we camped for the night near the Atwood sand pit. The manager, Mr. Rands, extended every courtesy and during the evening kindly explained the processes of sand dredging. The next day, Saturday, we

worked from Louisville to Cullom, and some of the party went then to Ashland. The evenings were spent in completing and discussing the notes taken during the day and in conferences regarding the industrial possibilities of the district visited.

Among the side trips taken was a visit to the scenic home of the state fish hatcheries. In this region two rock series of very different size are found. The lower and older is called the Pennsylvanian because the same series is also found in the state of Pennsylvania where it is known as the "coal measures." The upper and younger series called the Dakota because of its exposure and type locality in Dakota county, Neb., was not deposited until the Pennsylvanian had long been a land surface which had been eroded into hills and valleys very similar to those now being made. Then came submergence below sea level, and the sands and clays of the Dakota formation were washed in and covered or buried the old topography so that the old hills and valleys were practically obliterated. On the north side of the Platte river, opposite South Bend, one of these old topographies is exposed. At the state fish hatcheries the top of the Pennsylvanian limestone has an elevation of about 1,070 feet, about a mile southwest of the hatcheries, near the north end of Old Clarke bridge, the top of the Pennsylvanian comes to 1,200 feet altitude. East of the old bridge the elevation again becomes less, dropping as low as 1,030 feet in an old broad valley about two miles wide. About one and one-half miles west of Meadow is another Pennsylvanian limestone hill with a maximum elevation of 1,140 feet, which is only 1,050 feet above sea level. From the state fish hatcheries to Meadow, a distance of about six miles, three valleys and two hills, the results of erosion of Pennsylvanian rocks, are exposed. These ancient topographic forms have since been filled and covered by sandstone and clays of the Dakota formation of the cretaceous, and these by still later deposits. At the hatcheries the sandstones predominate and some of the beds are very hard and dark colored. Near Meadow quite an extensive deposit of clay is found. In the Dakota formation of this region there are several irregular beds of clay.

Cedar creek lies in another Pennsylvania valley. About one and one-half miles west of town one side of the old valley is plainly shown. Where the Dakota sands were laid against the Pennsylvania shales and limestones a small modern valley has been eroded. The west bank of this little valley is limestone and shale, the east bank is sandstone. The slope of the limestone side is about 45 degrees and probably marks an old bluff. From this point to about two miles east of Cedar creek sands and gravels predominate and mark what at some time has been a stream channel and flood plain. This old valley, three and one-half miles wide and 120 feet deep and filled with later deposits, is underlain by shales and limestones, which also make up the sides of the valley. Some beds found at the west bank have also been found at the east bank of the valley, and hence the evidence seems conclusive proof of previous continuity.

The relation of the ancient topography of the present is quite marked. Where the Dakota formation fills an old valley and hence is quite thick, the tributary streams have eroded wide valleys and the Platte river also has widened its course. Where the Dakota overlies the old Pennsylvanian hills and hence is shallow, the streams have been cutting into the harder Pennsylvanian beds and have succeeded in carving but narrow gorges, and the Platte has a narrow course. As a result the ancient hills and valleys are not now distinguished by differences in elevation but by different surface relief. The Pennsylvania valleys, though once obliterated, are now marked by smaller undulating hills and valleys, and the Pennsylvania hills are distinguished by a topography of relatively bold relief.

During the week trips were also made to the old quarry opposite South Bend from which most of the stone erected into the state capitol building was taken, to the Green's quarry which has furnished a large output, the old Stout quarry near Louisville, famous in our early state history and which is again to be opened soon by the Murphy Co., the Murphy quarries which alone have furnished Lincoln more than 500 carloads of crushed stone a year, the National Stone Co., the Atwood, and the Cullom quarries. These employ from 35 to 90 men each. The largest, owned by the National Stone Co., was studied carefully and the party feel very grateful to the manager, Mr. Sullivan, for his generous descriptions. This quarry is located on the H. & M. Ry., about two miles northeast of Louisville. The opening faces the north and it has

now been worked out so that a face 750 feet long is exposed, and has been worked back about 150 feet, mining out a solid ledge of limestone 25 feet thick. From this quarry it is estimated that 260,000 tons of stone have been taken, or about 5,200 carloads. Work has been begun to extend the opening about five hundred feet which will give it a frontage of nearly a quarter of a mile. About eight or ten feet of the middle portion of the twenty-five foot ledge is pure enough to be used in sugar refining and hence is known as sugar stone. Most limestone from all these quarries is crushed and used in concrete, in buildings, and in street making. From this district Lincoln receives more than 2,000 carloads of crushed stone annually.

The bluffs along the lower Platte also contain the most extensive gravel pits in Nebraska. Between Cedar Creek and Louisville are two large gravel pits each having a capacity of several carloads a day. Midway between Cedar Creek and Cullom is another large pit. The importance of this product is readily appreciated when we remember its use as a roofing material. The numerous pits in this region, many in operation, some abandoned because of heavy strippings, make the source of the acres of gravel roofs found in Nebraska. The gravel in the beds is mixed with a great deal of sand which is washed out before shipment.

The vicinity of Louisville and Meadow is probably the region of greatest sand mining activity. Five large clam dredges are at work there, one of which operates in conjunction with a sand pump which lifts the sand from the Platte river into a reservoir from which a dredge loads it into cars. The quantity of sand which can be taken from one pit is well illustrated in the case of the Atwood Pit at Louisville, managed by Mr. Rands. This pit is located about one hundred yards south of the channel of the Platte river. The land, useless for farming, leases for about \$100 per acre on account of its sand. The pit was opened five years ago by removing about one foot of the surface strippings. The sand is taken out by a dredge, called a clam on account of the shape. It weighs about 3000 lbs. and operates on a double cable, by means of a draw cable attached to a twenty horse power engine it is lowered into the pit. On account of its weight and shape it sinks into the sand and fills, and automatically closes when drawn up. It is then drawn on the double cable to the side of the pit and against a stripping device which causes it to drop its load of nearly two tons of sand into a waiting car.

When operating at full speed three such loads are hauled in five minutes, or at the rate of a ton per minute. This one dredge loads from eight to fifteen cars per day during ten months each year, regardless of rain or sunshine. That process has gone on at this place for nearly five years and has only excavated a pit about 300 yards long, 100 yards wide, having a maximum depth of 15 feet. The operation described is typical. There are five such dredges at work in that vicinity, at about the same rate, which means an average combined output of thirty-five to seventy cars daily. The upper sands are usually rather fine and are used extensively for engine sand. As dredging is carried to lower depths the sand is coarser and at a depth of seventy-five to eighty feet contains much gravel. All the sand is very angular and is well adapted for use in plasters, cement blocks, street making etc. As the sand is taken out clear water lakes are formed which serve for fish and ice lakes. Thus the value of the land is increased rather than diminished.

When we are tempted to think of Nebraska as a state without mineral wealth let us bear in mind that she has the best of the most important mineral resources in the world, a fertile soil and excellent water. She also has almost innumerable sandpits, a considerable quantity of gravel, numerous quarries, and that she has a district embracing Louisville and Meadow, less than three miles wide and ten miles long, where the boom of the blast is heard on all sides in the evening, and where many trainloads of sand, clay, gravel and stone are mined weekly.

UP-TO-DATE.

Czar Nicholas is a good hand at whist and plays a great deal. Last year he and his intimates used twelve hundred packs of cards, which cost over \$5,000. His cards are made of the finest linen rags, with a water mark of the imperial eagle and crown. The Russians, by the way, are the greatest card players in the world, their yearly expenditure on cards being about \$1,000,000.

King Edward has sanctioned the appointment of Henry Field of Windsor as bombardier to fire royal salutes in the Long Walk, Windsor park, on the birthday anniversaries of the royal family and other special occasions. The office is an ancient one. The ran-

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non which are used in firing the salutes are the bombardier's own property, which he keeps stored at his dwelling house together with powder. This he provides out of the sum paid for firing the salutes of twenty-one guns.

Achilleion, the beautiful palace built for the late Empress Elizabeth of Austria at Corfu, at a cost of \$5,000,000, has been purchased by a Swiss-German syndicate, which will convert it into a hotel and sanatorium.

The palace, which is of pure white marble, was designed by the Italian architect S. Carito. It contains 128 rooms and a chapel, situated in fine grounds planted with 25,000 rare rose trees.

Notice of Petition.

Estate No. 2224 of Margaret Merriman, deceased, in County Court of Lancaster County, Nebraska.

The State of Nebraska. To all persons interested in said estate, take notice that a petition has been filed for the appointment of John J. Ledwith as administrator of said estate, which has been set for hearing herein, on May 3, 1907, at 9 o'clock a. m.

Dated April 3, 1907.

FRANK R. WATERS, County Judge.
By WALTER A. LEESE, Clerk.

Notice.

Notice is hereby given, that the undersigned have formed a corporation, the name of which is Big Four Transfer company; principal place of transacting business is Lincoln, Nebraska; nature of business is drayage, storage and transfer business including buying, selling and dealing in merchandise and real and personal property; the capital stock is \$15,000.00, of which \$3,000.00 is to be issued before commencing business, all stock to be fully paid up before issued; corporation to commence November 25, 1906, and to terminate January 1, 1956; the affairs of the corporation to be managed by a board of directors from whose number shall be elected a president, vice president, secretary and treasurer, the undersigned incorporators to be the first board of directors.

Dated this 4th day of March, 1907.

HARVEY E. PIM,
THEODORE C. SCHMIDT,
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