

1931

Potash in New Mexico: Its Possible Significance

John D. Clark

Follow this and additional works at: <https://digitalrepository.unm.edu/nmq>

Recommended Citation

Clark, John D.. "Potash in New Mexico: Its Possible Significance." *New Mexico Quarterly* 1, 1 (1931).
<https://digitalrepository.unm.edu/nmq/vol1/iss1/7>

This Contents is brought to you for free and open access by the University of New Mexico Press at UNM Digital Repository. It has been accepted for inclusion in *New Mexico Quarterly* by an authorized editor of UNM Digital Repository. For more information, please contact disc@unm.edu.

Potash in New Mexico: It's Possible Significance

By JOHN D. CLARK

ONLY a few years ago, relatively speaking, the newspapers told us that potash was noted in the material removed from some of the wells being drilled for oil in southeastern New Mexico. Following this, we learned, if we read only the newspapers, that Congress had provided funds for core drilling so that we might have more information concerning this potash. If we have continued to follow the news, we have learned that the cores obtained showed the presence of potash in commercially attractive quantities, and that at the present time a mine shaft is being sunk down to the beds which were revealed by the core drill.

In general, this publicly disseminated information has received little attention, though many know of the importance of potash to agriculture. The full significance of an abundant source of potash in America, and particularly in New Mexico, has been so little realized, that an article of this kind needs no apology for its appearance in a New Mexico publication.

Potash is absolutely essential to the growing of crops. It is one of the great trinity: nitrogen, phosphorus, potash. Though occurring in all virgin soil, it is readily removed by crops; and, its salts being soluble, they are somewhat easily lost. That our forefathers used wood ashes on their farms indicated how soon agricultural land needs potash after being cultivated. Pliny (A. D. 23-79) wrote, "The use of ash is viewed so favorably by farmers that they actually prefer it to manure furnished by their cattle." R. W. Thatcher, in "Crops and the Soil," (a chapter of Chamberlain's "Chemistry in Agriculture,") writes: "Potassium is undoubtedly the third great essential for plant growth.

The general tone and vigor of the plant are largely dependent upon an ample supply of potassium. The popular expression that 'potash makes starches and sugars' is a fairly accurate statement of its function in plant tissues. While the element itself is not a constituent of any carbohydrate compound, it is in some unknown way connected with their manufacture in plant cells. The production of sugar, or starch, in such root crops as beets, potatoes, etc., diminishes with decreased supplies of available potassium in the soil. Potash-hungry plants do not exhibit any characteristic external change in form or color, but their vigor is much reduced, and they have been found to be more susceptible to injury by disease than are well-nourished normal plants."

Up to 1914, Germany and Alsace produced nearly all of the world's supply of potash. The supply being under German government control, the price was a monopolistic one. The dependence of the United States on German potash was brought forcibly and unpleasantly to our attention when the World War broke out. The price of potassium salts rose 1000 per cent in a short time. When the United States entered the war, Ostwald, an eminent German chemist, said, "America went into the war like a man with a rope round his neck which is in his enemy's hands, and is pretty tightly drawn. With its tremendous deposits, Germany has a world monopoly in potash, a point of immense value which cannot be reckoned too highly when once this war is going to be settled. It is in Germany's power to dictate which of the nations shall have plenty of food and which shall starve."

With war-time haste we proceeded to extract potassium salts from Nebraska brines and the saline waters of Searles Lake, California; to heat and leach the alunite rock of Utah; to save cement and blast furnace dusts; to utilize molasses distillery wastes and beet sugar refinery wastes; to utilize the potash bearing kelp of southern California,

and even to burn hard wood solely to secure the potash in the ashes. Price was a secondary consideration; 128 producers sprang up. We succeeded in producing about one-fifth our normal requirements. Following the declaration of peace, the American producers ceased operating, one at a time, until at the present time the American Potash and Chemical Corporation at Searles Lake, is the only survivor. It is producing twelve per cent of our requirements, and is meeting French and German prices.

Quite aside from the fact that our natural resources constitute a national safeguard, if we are to appraise properly the meaning of large beds of potash salts in New Mexico (and West Texas) we should begin by looking at two things: the first, our present income; and the second, the need of employment and of income for our coming generations.

Concerning our present income, statistics vary. The production of wealth in New Mexico by the 423,317 inhabitants shown in the 1930 census, according to the *Statesman's Year Book* is slightly lower than figures quoted by the Albuquerque Chamber of Commerce, as far as agricultural products are concerned, and higher for mineral production, excepting oil. The School of Mines has excellent recent estimates of our income from minerals. It is probably not far inaccurate to say that the annual production of wealth in New Mexico is about as follows, as far as we know:

Farm Crops -----	\$40,000,000
Cattle -----	25,000,000
Sheep -----	4,000,000
Wool -----	4,500,000
Timber -----	2,600,000
Gold, Silver, Lead, Copper and Zinc -----	25,000,000
Coal -----	8,300,000
Petroleum and Products -----	2,500,000
Other Mineral Products -----	2,000,000

Manufactured Products	20,000,000
Federal Expenditures	5,000,000
Recreation Seekers	16,000,000
Health Seekers	
Transportation Through State	
Other Income	

The reader may fill in the intangibles as he wishes. The absolute accuracy of the figures is not important. If, however, the total figure, obtained as you will, is divided by 423,317, the per capita annual wealth of New Mexico can be seen to be *low*.

According to the report of the Committee on Recent Economic Changes of President Hoover's Conference on Unemployment, the 1928 national income was 89 billion dollars, or \$745 per capita. The sources from which this came are not given for that year, but for 1926 they were in percentages: agriculture, 10; mines, quarries, etc., 3; manufacturing, 21; construction, 4; transportation and public utilities, 8; commercial and savings banks, 1; merchandising, 15; governments, 8; unclassified industries and occupations, 20, and miscellaneous income, 10.

Commenting on distribution of national income, the report says: "We have seen that the United States as a whole has been enjoying an era of great prosperity, but that this prosperity has been far from evenly distributed among the various industries and occupations, and territorial specialization suggests that different parts of the country have fared very differently. In fact, most of the country has been less prosperous than the region which contains most of the population, and receives most of the income. Over forty per cent of the population, and nearly fifty per cent of the income, are concentrated in the eight Middle Atlantic and East North Central States, which comprise only about one-ninth of the total area. On the other hand, the South Central and Mountain States, which include nearly half the area of the country, received less than one-fifth of the national income in 1919. Income is more highly concentrated

than population. Only 3.2 per cent of the national income was received in the mountain area of Montana, Idaho, Wyoming, Utah, Colorado, New Mexico, Arizona and Nevada. Agriculture, a considerable proportion of which is animal husbandry, accounted for 30 per cent of the income of the Mountain region in 1919, and manufacturing pay rolls less than 9 per cent. The per capita income index drops to 92 in 1926 (100 in 1919)." During this period, population in the Mountain area increased 10 per cent.

We may now pause and examine the character of the population that is getting more numerous at a time when per capita income is diminishing. At the outset, it is obvious that the population is better educated than formerly. Public schools are open to every non-Indian child, and government schools are available to a very high percentage of Indians. Each year sees a greater enrollment in our high schools, and each graduation from them results in a larger enrollment in our colleges. Our people have become educated to higher and higher standards of living, in which fact we should rejoice, but we should not shut our eyes to the ominous fact that high grade employment is, each year, harder and harder to find. Already the migration to other states of the highest type of intellectual young men trained in New Mexico colleges, presumably for service in New Mexico, yet who leave us to bear our burdens and to conduct our affairs with the help of those not their mental equals, is becoming sad to contemplate. They leave us to secure the better grade positions which we cannot offer them. We have also received remarkable intellects from other states (the white plague sends us other things besides money). Indeed, without the culture and intelligence that reside with us in many a less vigorous body, we would be poor indeed, yet it is hard to see our own hardy sons leaving us, when we know only too well the chances that life mates for our educated daughters will be found more and more among those of less rugged health.

With the full realization of our need for more income and for more employment of the better class, the prospects of any business in New Mexico which can bring to this state a large share of the twenty-three million dollars now going across the ocean, seems like a lighthouse to a bewildered mariner. Our potash beds have that possibility.

We are indebted to a New Mexican for a remarkably fine technical presentation of the potash situation in this state. James S. Wroth, a native of Albuquerque, son of the late Dr. J. H. Wroth, for many years secretary-treasurer of the Board of Regents of the University of New Mexico, is the author of Bureau of Mines Bulletin No. 316 (1930), entitled "Commercial Possibilities of the Texas-New Mexico Potash Deposits." Mr. Wroth is a mining engineer with the Bureau.

Up to the time (October, 1929,) of completion of his manuscript for this bulletin, 13 wells had been completed. Potash deposits capable of commercial exploitation had been discovered in all of them. Experimental work on these deposits at the Bureau of Mines Non-metallic Minerals Experiment Station at New Brunswick, N. J., has shown how the material may be processed so as to yield refined potassium salts. Refined products can be the potassium sulfate or the sulfate of potash-magnesia. Cost of producing the former is estimated at \$16 per ton, and the latter at \$8 per ton. Other mixtures of commercial grades of potash salts are also possible. It is interesting to note that the imported potassium sulfate, and the sulfate of potash-magnesia, have not sold for less than \$38 and \$22 a ton respectively, since 1914, while the estimated New Mexico costs are \$16 and \$8. The imports for 1928 cost us almost 23 million dollars, and made up 88 per cent of our consumption. The potash salts produced in America that year were valued at three million dollars, and supplied 12 per cent of our needs. Nineteen twenty-nine import prices were nearly 10 per cent higher than those mentioned above.

Much of the foreign-produced potash, particularly the Alsatian salts, is in the form of the chloride, and excess of chloride in the soil is unfavorable for many crops, whereas the sulfate portion of the American potash salts is beneficial. Magnesium is also an element required by the soil in the form of salts; magnesia starvation results from its absence. The \$8 a ton fertilizer mentioned above, fills a real want where, in addition to the potash, magnesium salts are also required. When compared to the average composition of the fertilizers mixed in the United States for 1925, crude New Mexico (and Texas) polyhalite would be a satisfactory form of potash for nearly all of the average mixtures.

Fuel for power production in the areas which are to become the great potash producing districts of the western hemisphere, presents no problems. Some of the area is in close contact with oil and gas wells, and no part is remote from them. Moreover, continued drilling is extending very rapidly the boundaries of the known gas and oil districts.

Mr. Wroth has divided the American potash market into five zones as follows:

1. Atlantic coast and seaports.
2. Gulf coast and seaports.
3. Interior points in the Southern States.
4. Interior points in the Central States.
5. Pacific coast seaports in California.

Having done this, he selected a point in Texas, and a point in New Mexico, 135 miles by rail farther west than the Texas selection, as hypothetical shipping points for potash salts. Based on existing tariffs, freight rates from the New Mexico point selected, to the first four zones are three to four times the rate from the Texas point, "a difference that the actual distance of 135 miles between the two points hardly justifies."

It is assumed that reduced freight rates will be granted when American potash production from our Southwestern

beds gets under way, and a really significant tonnage is available for the railroads. An average of the estimated reduced rates shows that Southwestern potash can reach each of the five zones shown above, and in the order shown, at \$8.75, \$5.75, \$7.75, \$8.25, and \$10.75 a ton respectively. Imported potash has to pay an average rail freight rate of \$7.00 to our interior zones; thus it seems entirely possible for our new material to compete with foreign potash, even at eastern ocean ports, although the Pacific Coast market, being close to Searles Lake in California, does not seem promising. On the other hand Searles Lake production is confined to the muriate (chloride), and recent work on the use of sulfur as a fertilizer has shown that the northwestern states have soil which is greatly benefited by the addition of sulfates, and New Mexico potash is in the sulfate form.

Manufactured chemicals which require crude potassium salts as a base, in addition to other materials found in New Mexico, are the carbonate, chlorate, bicarbonate, and permanganate. They range in price from \$105 to \$320 a ton. Our cheap gas and oil for fuel should more than meet any handicap in freight.

If the statement that 50 per cent of our national income is distributed in the area occupied by 40 per cent of our people, calls for further scrutiny concerning what that 40 per cent is doing, the answer is—manufacturing. New Mexico in its isolation, has an insurmountable handicap which prevents the manufacture of some things. This is not true for all things. No congested population is overflowing Death Valley or Searles Lake Basins, yet industry is there. What is indispensable is sought where it exists, and potash is indispensable. Potash presents possibilities of manufacturing income being distributed in this state. As the day of commercial potash extraction comes, there may be further awakening in New Mexico to the need of investigations into our other raw materials, their uses, their markets, and the possibilities of other home manufactures.