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URANIUM IN SOUTHEAST NEW MEXICO

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Since the explosion of the Atom Bomb in 1945 the public, in gereral, has been made aware, through the press and radio, that the element uranium plays the chief role in the development of atomic energy. More recently the public has been told that uranium will serve as the source raw material for the generation of electrical power. Consequently, the word uranium has magic significance to most North American inhabitants, whether residing in Canada or the United States. The rush is on and uranium fever has reached astronomical proportions. As one old prospector commented recently: "The hills are just crawling with hopeful people lugging their geiger or scintillation counters all over the country."

In spite of its separation from the famous Colorado Plateau uranium area, Southeast New Mexico has not failed to receive its share of anxious and hopeful prospectors. And to the astonishment of many, uranium has been discovered in this area. However, uranium is a metal and it will combine with many other elements to form many different minerals so that it can be truthfully stated that uranium is where you find it. Some of these minerals are important as uranium ores; others have been found only in small amounts and are only of mineralogical significance.

Within Southeast New Mexico several Uranium occurrences have been located but the quantity may be expressed as showing some smoke but very little fire. Only two occurrences, one each in Eddy and Lea Counties, can be considered as bona fide uranium prospects.

In Eddy County, Archie Pitts and Bert Price of Carlsbad, former roughnecks on a Richardson and Bass drilling crew, discovered a radioactive occurrence in the Permian Yates Section, in Walt Canyon adjacent to Rocky Arroyo. This prospect located in the SE 1/4 of Section 26, T 21 S, R 24E, consists of a black uraniferous hydrocarbon substance, probably thucolite, in pin-head pellets, thin streaks and occasionally fist-size pockets in a light gray non-porous dolomite. The black radioactive pellets were restricted to a thickness of three feet and a width of approximately five feet on the outcrop. A small inclined fracture zone which did not continue through the underlying siltstone nor the thick overlying dolomite bed apparently provided a channel way for the migration of petroleum through this zone. The black material represents a petroleum hydrocarbon residue which solidified in the fractures, pore spaces, pockets and along the bedding planes of the dolomite. The black material as pellets and as coatings along the bedding planes makes up less than 1% of the rock mass.

Development work in this prospect consists of a 6' x 6' tunnel driven 60' into the dolomite. Chemical assays from outcrop and tunnel samples are given in Table No. 1.

Table No. 1
CHEMICAL ASSAYS FROM ROCKY ARROYO URANIUM PROSPECT

Sample	Description	U_3O_8 Content
Outcrop	Light tan dense dolomite with small black hydrocarbon pellets	.017%
Outcrop	Black hydrocarbon material from pocket in dolomite as above	.223%
Tunnel – 12' from portal	Channel sample of mine face, light gray dense dolomite with small pellets, no pockets or veins	.139%
Tunnel – 12' from portal	Channel sample of mine face through scattered pockets of black hydrocarbon material	.080%
Tunnel – 12' from portal	Selected large fragment of black hydrocarbon from large pocket	2.350%
Tunnel – 12' from portal	Black crystalline hydrocarbon from northwest pocket, three feet from floor	0.482%

These assays clearly illustrate that the uranium values exist in the black thucolite material and that the mine face would not run over .10% U_3O_8, the minimum uranium content purchased by the Atomic Energy Commission. The mine face, 60 feet from the portal where exploration has ceased, indicates that the amount of hydrocarbon material is decreasing with penetration from the portal. At the face most of the thucolite is confined to thin coatings along curved bedding planes separating one foot thick dolomite beds.

Most petroleum geologists in this region are familiar with the highly radioactive zones on the gamma ray logs of the subsurface Yates sand and dolomite section. The Rocky Arroyo deposit probably represents the surface expression of the phenomena exhibited on the gamma ray logs of hundreds of Yates sand wells.

This prospect is not considered important because:

1. The development drift on the "vein" failed to indicate mineable reserves of ore;
2. the ore obtained during exploration proved to be very low grade, less than .1% U_3O_8;
3. haulage costs to truck the ore to the Grants milling area would have been high,
4. the ore would have been difficult to process, probably requiring roasting before the uranium could be extracted, and as such may not have been acceptable to the AEC or uranium mill.
5. a large penalty for high carbonate content would have been levied against the ore, since $CaCO_3$ content over 6% greatly reduces the monetary value of any uranium ore.

Over 450 claims for uranium have been filed in Eddy County since the original discovery in Rock Arroyo. However, all of these filings have been made on the strength of the single occurrence of uraniferous hydrocarbon discovered by Price and Pitts. Therefore, although the Rocky Arroyo occurrence is an interesting one, I do not believe that this prospect or the Guadalupe Mountains as a whole are or will be an important uranium producing area. In Lea County the only known occurrence of uranium to date has been the discovery of trace amounts of carnotite in a clay pit near Pearl, 15 miles west of Hobbs by two Lovington prospectors, D.E. Moreland and F.H. Hooper. Moreland and Hooper obtained a state placer prospecting permit for one year on 400 acres in Section 23 and 100 acres in Section 14 T 19 S, R 35E, near the currently drilling Shell No. 1 Hooper wildcat oil well in the hope that commercial uranium ore would exist underground. The hope was based on traces of carnotite found in an old clay pit, once used as a source of drilling mud in the Hobbs field. The clay pit is on patented land in Section 24 and was not leased by Moreland and Hooper.

Extensive tests by Moreland and Hooper in Sections 14 and 23, including one cable tool hole drilled into the red beds in the SE 1/4 have failed to indicate the presence of uranium at any depth.

Specimens from the clay pit (not on Moreland and Hooper's prospecting permit) containing visible specks of carnotite were analyzed by the AEC. They contained .006% U_3O_8, which is far below the minimum grade of acceptat le ore. This occurrence of carnotite in red Tertiary clay is believed to be of minerological importance only and is not regarded as economically significant.

SUMMARY OF SOUTHEAST NEW MEXICO BASEMENT ROCKS

by
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Introduction

General remarks. – The information in this paper is taken from a larger report on the basement rocks of Texas and southeast New Mexico now nearing completion and soon to be published by The Bureau of Economic Geology, The University of Texas. The conclusions presented in this paper must be regarded as preliminary because all the data have not yet been processed. The paper also suffers because it attempts to treat the basement geology of an area much smaller than that in which the geological relationships of the major basement discussed herein can be recognized and demonstrated, namely, the whole of the southeast New Mexico, Texas, and southern Oklahoma area. The broad view of basement geology of the entire area has been presented in a progress report (Flawn, 1954) which should be consulted in conjunction with this article, whose principal contribution is a more detailed basement map (fig. 1) than was presented in the progress report.

This study of basement rocks (which is now nearing completion) would have been impossible without the wholehearted cooperation of oil companies and service companies operating in the area of study. These organizations and individuals connected with them generously contributed well samples and geologic data. The list of contributors is long and individual contributions to the project will be separately acknowledged in the final report.

Lithology and Structure of Basement Rocks

Geology of the basement. – Southeast New Mexico constitutes the western margin of the area of the basement rock study. In late Precambrian time the southeast New Mexico area included the western limits of a great granitic stable crustal block which is called the Texas craton (Flawn, 1954). A study of basement rock from sporadic wells west of the area of the craton provides a glimpse of a complex of met-