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UNIVERSITY OF WISCONSIN

WISCONSIN GEOLOGICAL SURVEY

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URANIUM PROSPECTING IN WISCONSIN

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The following list of questions and answers has been prepared to cover the answers to questions that are often asked regarding uranium prospecting in Wisconsin. It is not intended to cover the technical aspects of the subject; for this information everyone interested should obtain the following publications:

1. "Prospecting for Uranium". Price 55¢ from the Superintendent of Documents, Washington 25, D. C.

2. "Prospecting with a Counter". Price 30¢ from the Office of Technical Services, Department of Commerce, Washington 25, D. C.

1. How may claims be staked in Wisconsin?

There is no land in Wisconsin open to claim staking.

2. Why may claims not be staked on federal land in Wisconsin as on much of the federal land in the West?

Public lands and national forest lands in Wisconsin are withdrawn from entry under U. S. Mining Laws (See RS 2345, 30 U.S.C. 48). Minerals on these lands may be exploited under lease or permit only and may not be acquired by claim staking. Anyone desiring to exploit minerals on national forest lands in Wisconsin should apply directly to the Director, Bureau of Land Management, Washington 25, D. C. An adequate description of the land is necessary and the application should state the mineral which is to be prospected for or mined. Similar restrictions apply to Indian lands and Farm Security land. Permits may be requested from the U. S. Department of Interior, Office of Indian Affairs, Great Lakes Area Field Office, Ashland, Wis.

3. Is prospecting allowed on state-owned lands?

Prospecting may be conducted without special permit on state lands by surface examination and with such hand instruments as Geiger counters. Small samples may be taken for the purpose of assay provided that this does not result in disfiguration of natural monuments. All persons availing themselves of this privilege must observe all state laws and regulations. Such prospecting does not give the prospector any title to, or priority on, the land.

4. How may title be obtained to state lands for prospecting or mining?

If good evidence is presented to show that valuable minerals may be present on state lands, a request may be made to the state agency controlling the land for a permit to prospect and/or a mining lease. No standard policy has yet been adopted by the state on the form of these permits or leases, but the general opinion is as follows.

Permits to prospect may be issued for limited areas and be valid for a limited time. The applicant should prove financial ability to undertake the type of work contemplated. Such prospecting involves subsurface exploration by drilling, tunneling, trenching, etc., and representative sampling to prove, as far as possible, the grade and tonnage of the deposit. If the deposit is found to lack the potential to be mined, the surface of the land shall be restored to its natural condition. If prospecting reveals minable ore in economic quantities, a mining lease may be drawn up.

Mining leases grant permission to remove ore and provide for the payment of fees and royalties to the state, as well as for the minimum development necessary to retain the lease.

5. How may permission be obtained to prospect or mine on private property or on land owned by a town or county?

Permission must be obtained from the owners. Most towns and counties, as well as many private owners, will permit examination of their lands without any formal contract. If the prospector wishes to option land for mining or prospecting, a lease or similar agreement, protecting the interests of both parties, should be drawn up.

6. Does the owner of the surface land always own the mineral rights?

No. In many instances the mineral rights have been purchased or withheld. It is essential, of course, to determine whether or not the mineral rights have been separated from the surface rights and, if so, who owns them. All mining contracts must, of course, be drawn up with the owner of the mineral rights.

7. Is there a State map showing the ownership of land?

No. This is shown on county plat books which are available from the office of the County Clerk. These show the ownership of the surface but not the mineral rights; this must be determined by inquiry from the property owner and corroborated by the title of the property.

8. Where can I buy Geiger Counters or Scintillators?

Lists of manufacturers are given in the publications listed above, but many local stores are now carrying this equipment.

9. Is uranium the only naturally occurring radioactive element?

No. There are several others, the most common of which is thorium.

10. Can a counter distinguish between uranium and thorium?

No. Chemical tests are necessary.

11. How are rocks "tested" for uranium?

"Tests" are of two categories. (1) Radiometric tests by counters to determine the relative radioactivity of the sample. This indicates whether or not the specimen is radioactive enough to warrant further investigation. Sometimes this radioactivity is expressed as percent eU_3O_8. The "e" means that the sample is as radioactive as an equivalent amount of uranium oxide, however, as none of the radioactive element may be uranium, the expression is misleading. (2) Chemical assay. This gives the actual percentage of uranium oxide, as determined by chemical analysis, and is often expressed as cU_3O_8, with the "c" denoting chemical assay.

12. Where may specimens be sent for examination?

Chemical assays are made by the U. S. Geological Survey, Geochemical and Petrology Branch, Bldg. 213, Naval Gun Factory, Washington 25, D. C. The service is free but only samples that show high radioactivity are thus assayed.

Radiometric tests are made by the above agency and by both the Wisconsin Geological Survey, University of Wisconsin, Science Hall, Madison and the U. S. Atomic Energy Commission, Ishpeming Sub-Office, P. O. Box 119, Ishpeming, Michigan. If the radiometric assay of samples forwarded to the Atomic Energy Commission, Ishpeming Sub-Office shows them to be of potential ore grade, 0.1% or better, a portion is forwarded to Washington for chemical analysis. There is no charge for these services.

13. Where have there been uranium "strikes" in Wisconsin?

There have been no strikes of commercial uranium ore in Wisconsin to date, although several areas of above-average radioactivity have been noted, namely:

1. Stettin Township near Wausau in Marathon County. Radioactive anomalies were discovered by Mr. R. C. Vickers of the U. S. Geological Survey several years ago and the summary results were published in a joint publication of the U. S. Geological Survey and the Atomic Energy Commission, entitled "Nepheline Syenite Complex, Marathon County, Wis." pp. 171-2 of TEI-440 "Geologic Investigations of Radioactive Deposits." Dec. 1953-May 1954. It was determined that the radioactive element was thorium and not uranium. Subsequent exploration by private companies and individuals has confirmed this fact. Whether or not this occurrence will be of economic value as a source of thorium depends upon (a) the amount of ore grade material present and (b) the demand for thorium. At the present time the market for thorium is satisfied with ores that are more easily processed than the above. Areas of radioactivity located by Vickers are shown on the attached map.

2. The Franconia formation in the vicinity of Tomah, Monroe County. This is a flat lying sandstone formation of Cambrian age. It is often called a "dirty" sandstone as it contains silty and shaly beds in contrast to the "cleaner" (orthoquartzitic) sandstone formations above and below. It also contains the green mineral, glauconite, giving it a speckled or greenish appearance. It is used locally for surfacing dirt roads.

Counter readings on this formation are often from 3-5 times above background, but individual specimens show low radioactivity, on the order of 0.035% equivalent U_3O_8. No evidence of local concentration in beds or veins has been noted in the outcrops, and the radioactivity appears to be thoroughly disseminated throughout the entire formation. Such low grade activity is not uncommonly associated with black shales and phosphate deposits. Although the occurrence above is not presently considered to be of commercial value, it is of scientific interest, and it is hoped that a geologic investigation of the area can be undertaken next year.

3. Granitic rocks in northcentral Wisconsin. Almost all granitic rocks contain a very small percentage of radioactive elements; these are commonly somewhat concentrated in local "hot spots". Hand specimens may assay ore grade, but the overall grade of the prospects is generally low. None of the prospects, investigated so far, has been of commercial significance.

14. Where are the best places to prospect in Wisconsin?

As no uranium deposits of commercial grade have been discovered in the State, this question can only be answered by analogy. The geologic age and nature of some of the rocks in the State is similar to those in which the Canadian uranium deposits occur. These are the granitic and metamorphic rocks of Precambrian age and they form part of the "Canadian Shield". They include the rocks which are shown on the accompanying map as pre-Keweenawan, Keweenawan, and quartzite rocks. They are usually covered with glacial deposits and outcrops are poor.

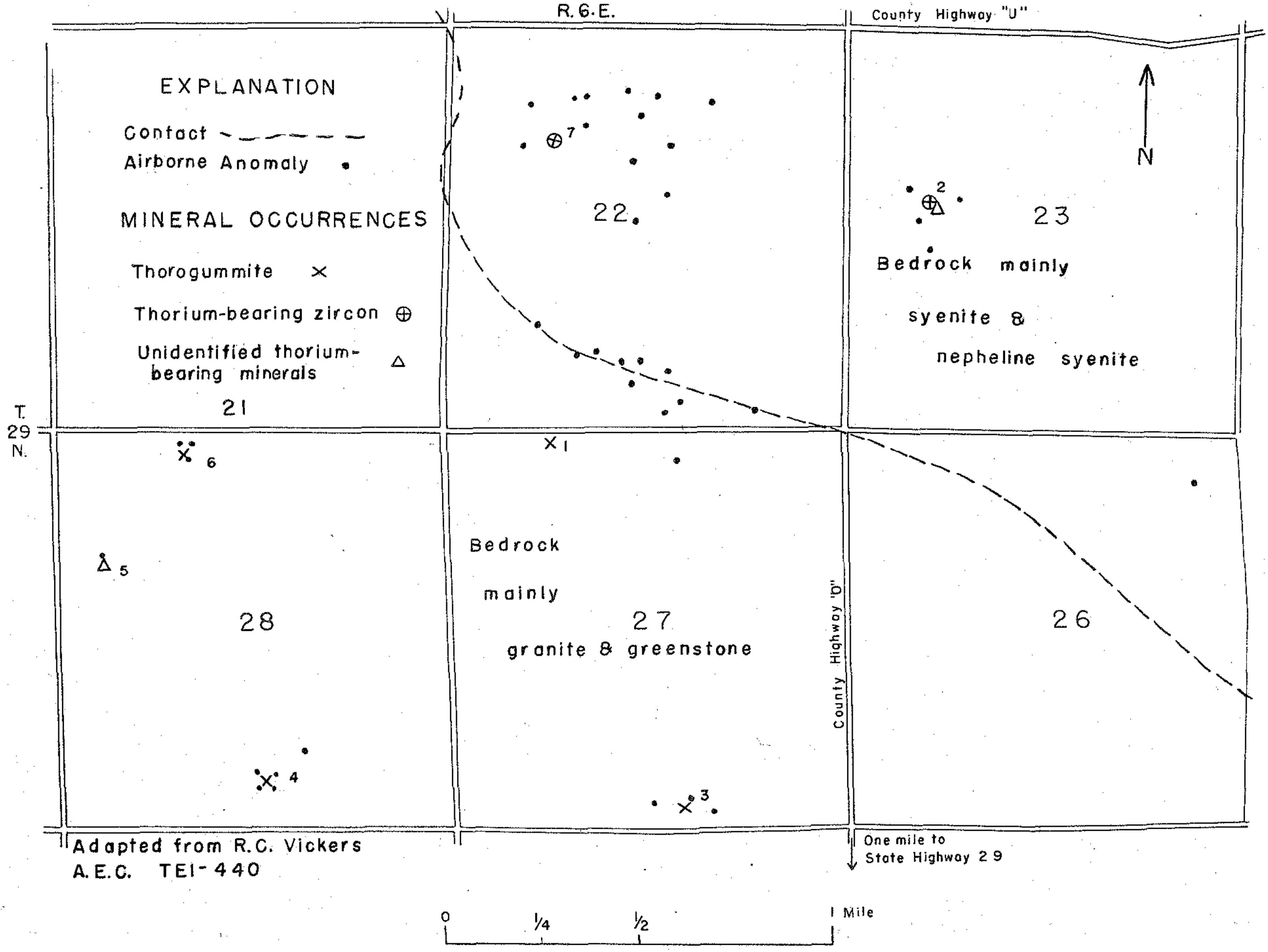
The formations from which uranium is produced in the Colorado Plateau area are lacking in this State.

15. Will geologists from state or federal agencies examine my land for uranium and other minerals?

The State Geological Survey and, in the case of radioactive minerals, the Federal Survey or Atomic Energy Commission will often send geologists to inspect a prospect free of charge, provided that the prospector has presented good evidence to show that their time will be well spent. Samples of the prospective ore and details as to its location and mode of occurrence should be presented to support any such request.

For more extensive coverage than is contained in the Government publications listed above, the book "Minerals for Atomic Energy" by R. D. Nininger is recommended. This is published by D. Van Nostrand Co., Inc., 250 - 4th Ave., New York 3, New York. The price is about $7.50

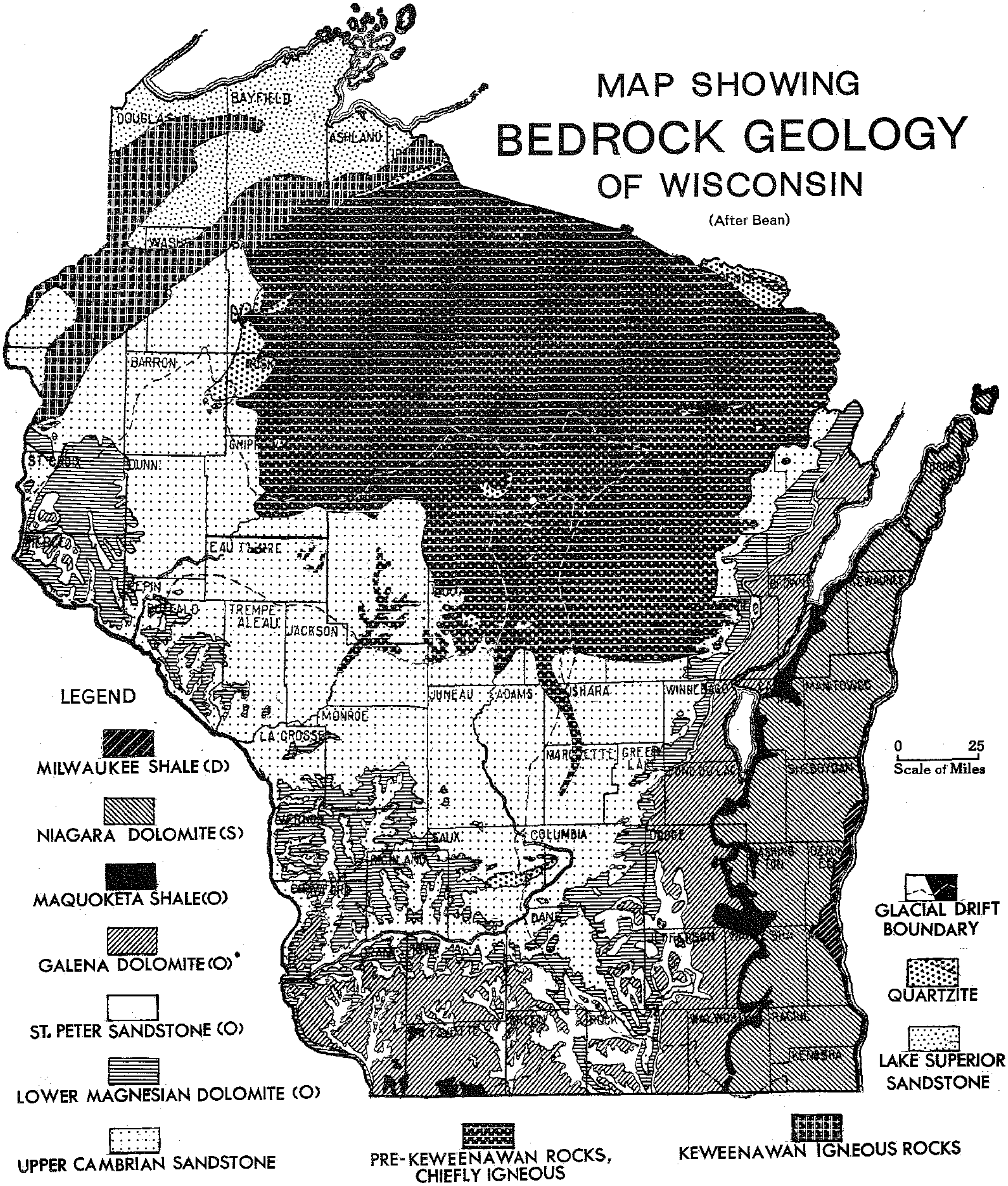
A colored geologic map of the state may be obtained for 30 cents from the Wisconsin Geological Survey.



Adapted from R.C. Vickers
A.E.C. TEI-440

MAP SHOWING
BEDROCK GEOLOGY
OF WISCONSIN

(After Bean)



SOILS DIV., WISC. GEOL. AND NAT. HIST. SURV.

* and Platteville.

Note: In legend, left, formations are in order of age, youngest at top.

F.D.H., 1950