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### Southwest Side of the Ossipee Mountains

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## TRIP A-5

SOUTHWEST SIDE OF THE OSSIPEE MOUNTAINS,  
NEW HAMPSHIRE\_/\_

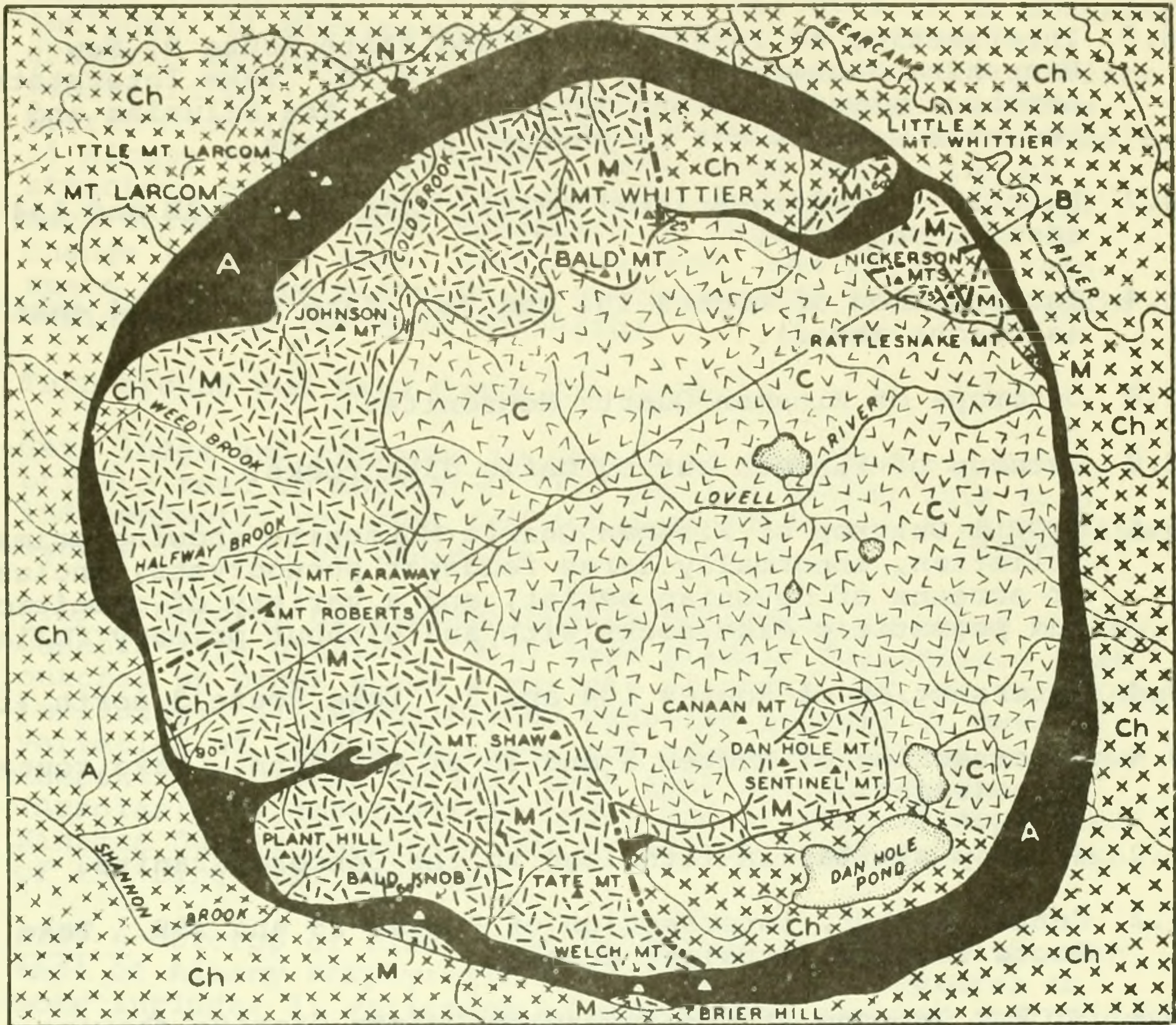
Lincoln R. Page  
U.S. Geological Survey  
Boston, Massachusetts

Two short traverses will be made across the outer ring of the Ossipee Mountains ring dike structure on either side of the Tuftonboro-Moultonboro town line to see the Albany Porphyritic Quartz Syenite of the White Mountain Plutonic Series and the Moat Volcanics as well as the enclosing rocks. Stops will also be made enroute to see the Kinsman Quartz Monzonite and associated dike rocks and Winnipесаaukee Quartz Diorite of the New Hampshire Plutonic Series.

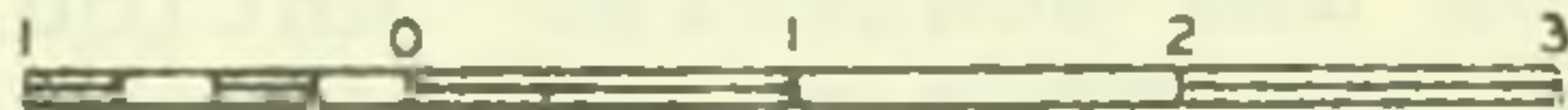
REFERENCES CITED:

- Billings, M. P., 1956, The geology of New Hampshire, Part II, Bedrock geology: Concord, N. H., New Hampshire State Plan. and Devel. Comm., 203 p.
- Quinn, Alonzo, 1941, Geology of the Winnipесаaukee quadrangle, New Hampshire: Concord, N. H., New Hampshire State Plan. and Devel. Comm., 22p.





SCALE IN MILES



- |                |  |                                |
|----------------|--|--------------------------------|
|                |  | CONWAY BIOTITE GRANITE         |
| DEVONIAN ?     |  | ALBANY PORPHYRITIC NORDMARKITE |
|                |  | MOAT VOLCANICS                 |
|                |  | VOLCANIC NECK                  |
| PRE-CAMBRIAN ? |  | CHATHAM GRANITE                |
|                |  | FAULTS                         |

Figure 1. Geologic Map of the Ossipee Mountains  
 After Louise Kingsley, 1931, Am. Jour. Sci., v. 222, p. 141



ROAD LOG FOR TRIP A-5

## Milage

- 0.0 Intersection of Interstate 93 and State Route 9, New Hampshire Highway Motel, Concord, N. H. Take Interstate 93 north. Outcrops along Interstate 93 are Silurian and Devonian schists cut by younger pegmatites.
- 30.7 Exit 23 (Meredith-Bristol exit); take Routes 3B and 104 east to Meredith.
- 31.4 Intersection of Routes 104 and 3B. Take Route 104 east (straight ahead).
- 31.8 Outcrops of Kinsman Quartz Monzonite.
- 32.8 Outcrop of Kinsman cut by mafic dike rocks.
- 35.6 STOP 1 Outcrop of Kinsman Quartz Monzonite showing primary foliation, abnormally large feldspar phenocrysts, inclusions or screens of Devonian schist, and a variety of granitic and pegmatitic dike rocks with and without primary foliation.
- 39.4 Intersection of Routes 104 and 3. Take Route 3 north (left).
- 40.4 Intersection of Routes 3 and 25 at Meredith. Take route 25 east (right).
- 44.2 Outcrop similar in lithology to the Concord Granite.
- 45.2 Center Harbor, intersection of Routes 25 and 25B. Take Route 25 east (straight ahead).
- 45.8 STOP 2 Outcrop of Winnipiesaukee Quartz Diorite showing primary foliation and scattered lenticular feldspar phenocrysts in one of the more potassic facies of the pluton.
- 50.1 Moultonboro, intersection of Route 25 with Route 109 north. Take Routes 25 and 109 east (straight ahead).
- 50.2 Leave Route 25. Take Route 109 south (right).
- 52.8 Intersection of Routes 109 and 171. Take Route 109 south (right).
- 57.0 STOP 3 Panorama of area to be studied on Ossipee Mountains and discussion of rock types and structure.
- 57.1 Intersection, turn east (left).
- 57.7 Intersection, turn north (left).



- 58.6 STOP 4 Intersection with Route 171. Turn east (right) across bridge and park. Traverse up brook, about half a mile across contact of Winnipiesaukee Quartz Diorite and Albany Porphyritic Quartz Syenite. Features to be observed include: 1) Winnipiesaukee Quartz Diorite containing granitic and pegmatite dikes and mylonite streaks on minor faults in wall of ring dike structure; 2) Winnipiesaukee Quartz Diorite screens in Albany Porphyritic Quartz Syenite; 3) Albany Porphyritic Quartz Syenite in outer ring of structure cut by mylonite streaks, in contact with wall rock screens and Moat Volcanics of subsiding block; 4) change in grain size, quartz content, and color of feldspars in syenite relative to contacts; and 5) petrographic variations in the Moat Volcanics.
- 58.6 Turn around and take Route 171 north.
- 60.4 Gate lodge and entrance to Castle in the Clouds. Take private road up mountain. (If you are taking this trip independently you must pay a fee of \$1.75 and arrange with owners to stop en route.)
- 60.5 STOP 5 Outcrop of Kinsman Quartz Monzonite in brook cut by Concord-type granite. Both have primary foliation. Next outcrop up brook shows a variety of rocks and age relations including: 1) inclusions of Devonian schist; 2) several varieties of intrusive rocks and migmatites(?) of the New Hampshire Plutonic Series, both syn- and post-tectonic (Acadian); 3) amphibolitic beds; and 4) very feldspathic Kinsman Quartz Monzonite cut by 1-inch light-colored dike of the ring dike sequence.
- 60.6 STOP 6 Outcrop of black Moat Volcanics in brook with contact of Albany Porphyritic Quartz Syenite. Features to note include: 1) variation of phenocryst content and epidote clots in Moat Volcanics; 2) apophyses of Albany Porphyritic Quartz Syenite with glassy selvages cutting the Moat Volcanics; 3) pink feldspars and black ground mass of outer part of the Albany; 4) granite and other inclusions decreasing in abundance inward from the outer contact of the Albany Porphyritic Quartz Syenite; and 5) dip of the contact and related columnar jointing.
- 61.0 Glacial erratic of syenite from the North Conway region.
- 61.1 STOP 7 Short walk up trail to falls. First outcrop in brook contains granitic inclusion in Albany as at Stop 6. None known between stops 6 and 7. Dike of Albany cutting Albany. Traverse upstream to contact of Albany with amygdaloidal Moat Volcanics. Albany shows decrease in grain size and increase in pink feldspar toward intrusive contact with Moat. Several dikes of Albany in Moat are cut by dark greenish dike rock at the base of the falls. This dike rock is an offshoot of the matrix of the breccia that forms the diatrema exposed above the falls at the next stop. Several similar dikes cut the Moat in this area.
- 61.3 Glacial erratic of same type as at 61.0.



- 61.4 STOP 8 Albany Porphyritic Quartz Syenite showing banding, ignimbrite structures, and inclusions of Moat Volcanics.
- 61.6 STOP 9 Downhill to brook. Outcrop of small diatreme containing blocks of all rock types known in the immediate area plus plutonic rocks with no known exposures. Uphill side of diatreme cut off by fault.

Return to road and take trail upstream about 1/4 mile to outcrop of Moat Volcanics showing light-colored bands or segregations cut by intrusive breccias.

- 62.2 STOP 10 Parking lot. Walk up road to Castle in the Clouds. Outcrops show various types of inclusions and ignimbrite structures. These are best seen in the rock walls of the castle. The granite trim at the doorway of the castle is from the Conway Granite mass in the center of this ring structure. This rock has a primary foliation as distinct from the Conway Granite at the Redstone quarry in North Conway, N. H. From the castle one can see the ring structures of Red Hill and the Belknap Mountains, the fault scarp of the structure that cuts off the diatreme, and outcrops of Albany-type rocks within the Moat Volcanics mass.

From the parking lot, well-developed glacial channels can be seen in the fields to the north.

- 64.0 Re-enter Route 171. Turn north 1/2 mile to intersection of Routes 171 and 109 (or south 1.7 miles to gate lodge of Castle in the Clouds). Return to New Hampshire Highway Motel.