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Second Section.

## Area's Rockwood Gorge One Popular Place For Caverns; Article Describes Six Caves

Because of Rockwood's proximity to this district the following story is reproduced from the Canadian Geographical Journal, a publication of the Royal Canadian Geographical Society. It was written by Jon N. Weber.

Rarely does the mention of a cavern nearby fail to excite the interest and curiosity of the young and adventurous in any community. These holes and crevices in the earth's crust are of ten merely empty pits and passages leading nowhere, floored with mud and presenting numerous hazards such as the loosely fastened slabs of rock which form the ceilings.

Yet there are always those who crawl through the keyhole passages and lower themselves into pits, obeying some irresistible urge to discover what mysteries lie ahead, past the reach of the flashlight, around the next corner or in the next passage.

The beautiful caves of the karst regions of Kentucky and Virginia or of England, France and Yugoslavia are well known and are so much publicized that many never realize that caverns occur in most parts of the world often right at home. The caves of Ontario are not large, nor do they contain an overabundance of beautiful and massive calcite stalagmites and stalactites which the more famous caverns possess.

Nevertheless the occurrence of a number of different types of caverns in Ontario, some

choked with small but beautiful calcite deposits, others providing homes for various forms of cave life, is certain to attract the amateur naturalist as well as the weekend adventurer.

The equipment required to explore caverns depends a great deal on the type of cave encountered. For cave entrances located near the top of bluffs or containing sink hole passages, a hundred foot rope ladder or rappelling rope is often useful. In most of Ontario's caves, however, no ropes of any kind are required.

Hard hats or close-fitting plastic helmets provide protection from low ceilings and from various calcite projections of the roof. Light is best obtained from electric torches using flashlight batteries or from carbide lamps which emit a one or two inch flame of burning acetylene gas which adequately illuminates even fair-sized chambers. Carbide lamps, which are available at some hardware stores, require refuelling with a small charge of water and calcium carbide every three or four hours.

No Major Hazards  
The caves of Ontario are too small to present any major hazards other than the dislocation of loose rock from the ceilings. Air is generally pure, pits are shallow, inhabitant animals are usually quite small and various disease bacteria prevalent in the guano deposits of more southerly caves are absent. In general, the caves of Ontario present few hazards to exploration except perhaps the prolific growths of

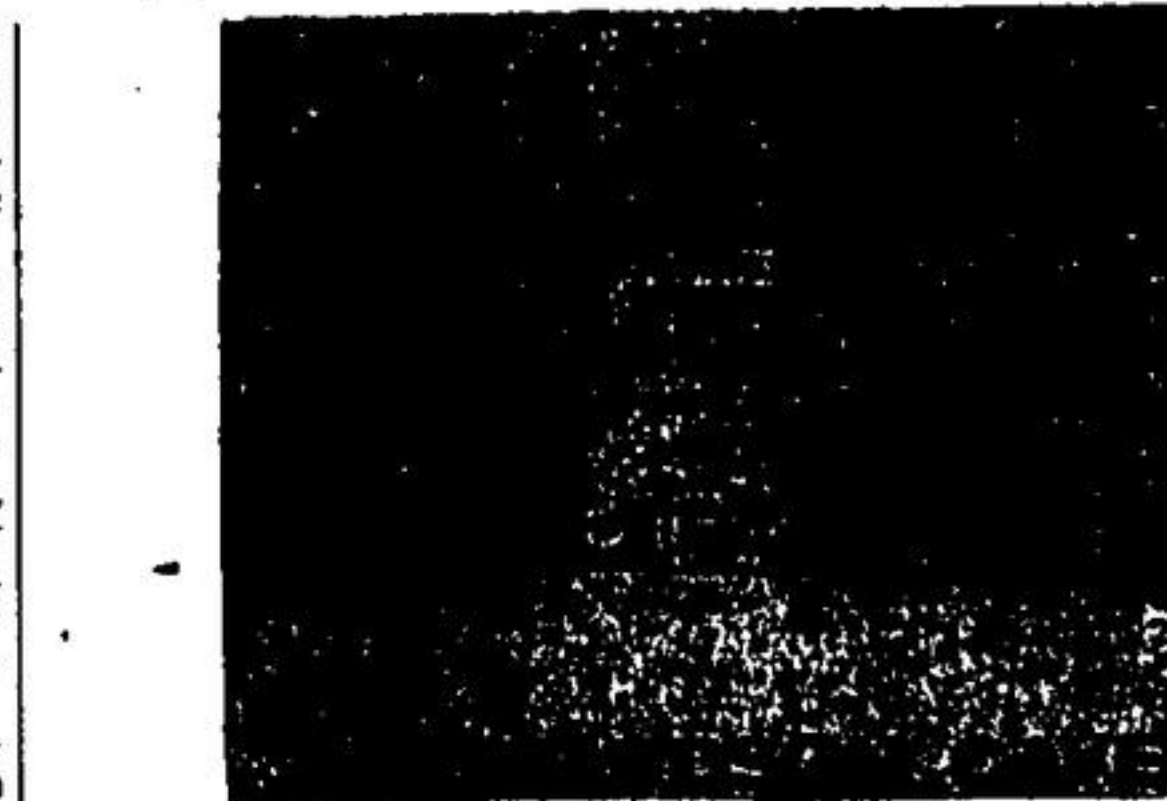


Figure 6: Plan of Richardson's Cave at Rockwood, the circled figures showing the ceiling heights.

polish ivy covering the entrance passages of most of the Bruce Peninsula Caves.  
Ontario's caves have attracted the attention of writers very little, possibly because the true beauty of them was not widely known. Sir George Gibb in 1880 mentioned a few caverns from Labrador to Lake Superior but many of them were insignificant and the list was by no means complete.

The most interesting caves are perhaps those at Rockwood, just a few miles east of Guelph. In the vicinity of the village of Rockwood lies a gorge approximately one mile long and one-sixteenth of a mile wide trending about NE-SW. Here the Eramosa River has cut 40 to 60 feet through the light grey dolomitic limestone of the Lockport formation.

Large masses of ennerite, a rock composed of the calcite stems of ancient sea-lilies or crinoids, form some of the cliffs, and the numerous abandoned lime kilns and extensive quarries indicate that the rock was once used in the preparation of lime and building stone. Many stone buildings and houses nearby are constructed of material excavated there.

Ten caves worthy of consideration occur here along with many more of lesser interest. Only three caves, Rockwood, Richardson's and Pierre's, Caves will

be described as they are typical of other caves in the immediate vicinity.

The entrance to Rockwood Cave, number 2 on Figure 1, is an opening 10 feet high occurring at the base of a 50 foot cliff of dolomitic limestone. The first recorded visit was made by Professor J. Hoyes Pantou, a geology instructor at the Agricultural College nearby, in 1887. His exploration of the area, for the purpose of showing his students examples of how water acts upon limestone, outlined a number of interesting caverns.

The total length of the entrance passage to Rockwood Cave is 168 feet. Two chambers are present, an entrance room 6 to 7 feet high and a second room 4 feet high which is connected to the entrance passage by a crawlway 1 1/2 feet in height (Figure 2).

The floor in most places is wet chocolate brown mud. Excavations in several parts of the cave indicate that this mud layer, which is commonly very compact, has a thickness that varies from several inches to more than one foot. Blocks of rock which have been dislodged from the ceilings are scattered throughout the cave; the largest one, several feet in diameter, is situated in the centre of the second or inner room. 75 feet from the entrance, two passages of short length extend perpendicular

to the trend of the main passage. 50 feet further another crawlway leads off to the right and is parallel to the first side passage.

**Continual Drip**  
Water drips from the roof continually, especially in the inner recesses, and small pools of water an inch or so deep occur at various places along the floor. Stalactites, white or brownish calcite projections from the ceiling, are numerous in the inner passages and may attain a length of three or more inches. Examination of the ceilings of the outer entrance passage suggests that at one time many stalactites and calcite encrustations adorned this chamber also.

However, the numerous visitors to the cave over a period of many years have no doubt been responsible for their disappearance. Pantou describes stalactites a foot in length and up to four and five inches at the greatest diameter in the innermost passages but these have now been removed. However, stalactites up to 10 inches in length may occasionally be unearthed from the chocolate brown mud at various points in the cave. Both the massive variety and the delicate "soda-straw" stalactites are found.

Several poorly developed "helictites" or worm-like stalactites have been discovered; along with small patches of "cave coral", a botryoidal or grape-like growth of calcite. Flowstone is fairly abundant in Rockwood Cave and forms "buccon rind" edges and other encrusting outgrowths along the cave walls.

Because of frequent human visitors to the cave, troglodytic animals have been driven out to the many smaller caves of the region. Bats are unknown in this particular cavern but spiders frequently inhabit the entrance passages which are much drier than the inner portions. Animal bones are occasionally "gummed" in the main passages and these consist largely of porcupine remains.

**Passage Under Chamber**  
Dr. Pantou, who first described the area, postulated a passage running under the inner chamber of the cavern, for when the mud floor is pounded, a deep hollow sound is emitted. This results, however, from the plastic consistency of the mud covering of the floor and the echoes produced in the closed chamber. Excavation reveals solid rock below.

The cavern owes its origin to several features of the surrounding countryside. Geological ages ago, forces within the earth's crust compressed the rock strata (Figure 6) forming a broad dome or small anticline of Rockwood. The forces acted from the north and from the south, forming the elongate fold which trends roughly east-west.

When rock is compressed in such a manner, two sets of fractures develop with numerous subsidiary fractures parallel to the major ones. These fractures, called conjugate joints, are minor fissures in the rock, incipient crevices where the ground water may enter and slowly dissolve away the limestone, thus forming underground passages. Some of the limestone is precipitated, forming beautiful stalactites or stalagmites within the cave, but the bulk of the rock is carried to the rivers in solution and finds its way into the ocean.

**Joint Patterns**  
The NE-SW and NW-SE joint

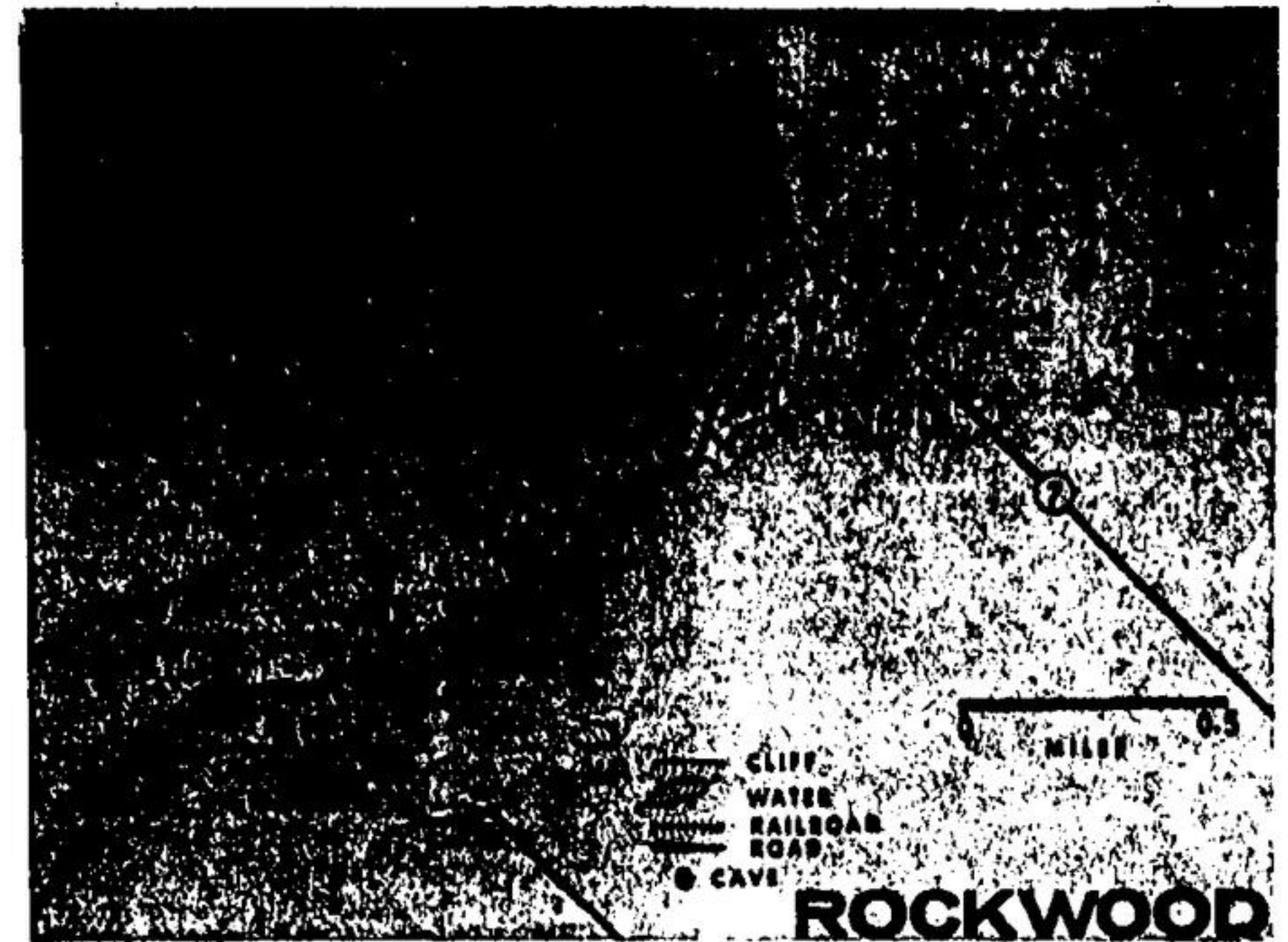


Fig. 1: Map Showing Locations of Some of the Larger Caverns

patterns produced by localized pressures in the crust are responsible for the "cubic" shaped outline of the plan shown in Figure 3. The beehive shape of the passages indicates that much of the cavern was excavated by ground water above the water table (see Figure 4). Had the cavern been formed below the water table where the entire rock is saturated with water, cross-sections of the passages would tend to be spherical.

Much of the mud covering the floor has been introduced by small rivulets which enter the cave during rainstorms through small impassable sinkholes in the rock pinnacle in which the cave occurs. Smaller amounts of mud represent the "insoluble" clayey matter of the rock which remains after the more soluble calcite parts have been carried away.

**Tension Joints**  
In addition to conjugate joints a second set of fissures called tension joints (Figure 6) originated at the crest of the anticline as the brittle rock was folded. These crevices provided easy access to small streams and gradually as water was directed along these channels, Rockwood gorge (Figure 4) was cut by the Eramosa River. The position and direction of these tension joints, of which no trace today remains, has controlled the position and direction of the gorge.

Richardson's Cave (No. 4 of Figure 1), also in the Rockwood area, has an entrance located at the base of a 60 foot cliff in a small gorge containing a creek which joins the Eramosa River

downstream. The entrance measures 2 feet wide and 1 1/2 feet high.

**Three Rooms**  
The cave (Figure 6) consists of three rooms: an entrance chamber 11 feet long and 5 feet wide with a maximum height of 7 feet, a chamber to the right 8 feet by 6 feet and up to 11 feet high which is connected to the main chamber by an 8 foot crawlway and a chamber to the left 8 by 7 feet with a ceiling of only 4 feet. Large blocks of rock scattered throughout the cave but the floor is covered with fine rock debris rather than clay.

Although some flowstone adorns the walls, deposits of lime are small and consist mainly of small stalactites up to 2 or 3 inches long. The cave provides an aegis for a number of brown bats and other small troglodytes. Spiders are quite numerous. Like Rockwood Cave, the plan is controlled by a set of perpendicular joints and it is possible that several passages could be extended by additional removal of clay and mud.

**Pierre's Cave**  
Pierre's Cave (No. 6 in Figure 1) is located at the base of a 30 foot cliff of dolomitic limestone. The entrance, about 1 1/2 feet high and 3 feet wide, leads to a short crawlway with two small rooms less than 4 feet in height but about 20 feet in diameter. Calcite deposits are more abundant partly because this cave is little known and more difficult to locate.

Hollow "soda-straw" stalactites are associated with the usual

massive variety and flowstone is quite abundant. Despite the very high relative humidity, the cave is frequented by bats and other small animals. Above the cliff numerous channels and holes up to 8 inches in diameter lead by sinuous passages to the caves below. In winter, these holes generally remain clear of snow.

**Numerous Potholes**  
The Rockwood area is known also for the numerous and well developed potholes which are located on both sides of the Eramosa River. The largest, locally called "The Devil's Pit" occurs at the top of the cliff in which Richardson's cave has been excavated. The pothole, an impressive sight, measures 18 feet in diameter and 25 feet deep.

Although at present on a pinnacle of rock high above the surrounding valley, this pothole forms the termination of a small gorge which a stream once traversed. The hole is egg-shaped, with its greatest diameter approximately half way down. At the base is a small opening to another and lower gorge. This opening, about 4 feet high and 2 feet wide, permits easy access to the base of the pit. Pantou in 1886 attempted to excavate the numerous boulders at the bottom and with the help of his students, was successful in obtaining several spherical "pot-hole grinders".

A great many smaller potholes are found throughout this area, some of which exhibit excellent form. Although several were excavated by Pantou, further digging often reveals more of the spherical grinders.

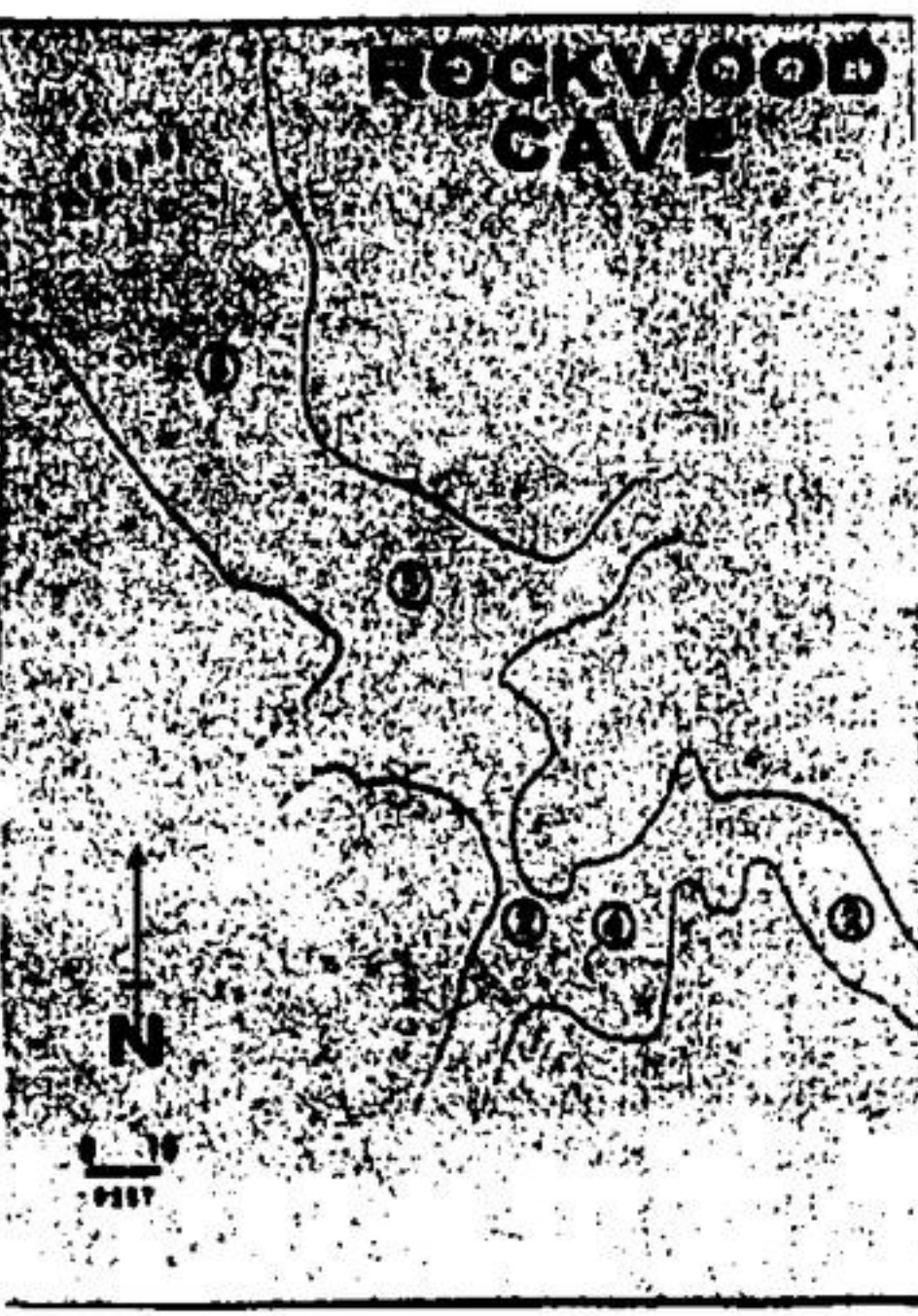


Figure 2: Plan of Rockwood Cave. Ceiling heights in feet are indicated by the circled figures.

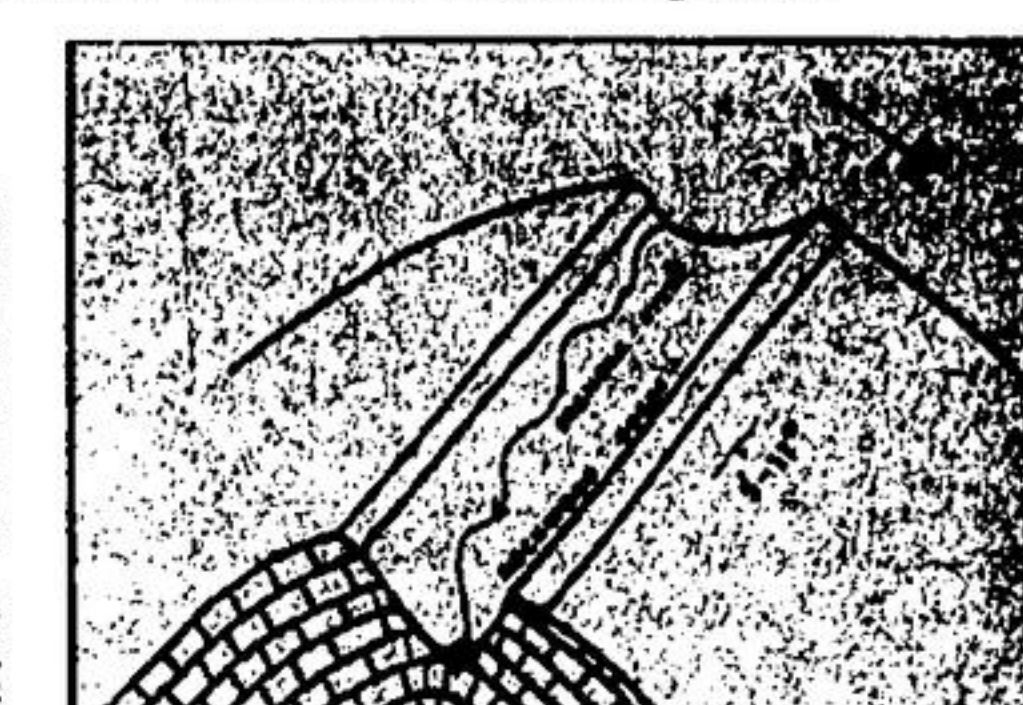


Figure 4: Diagram illustrating the position of the Eramosa River in the Rockwood anticline.



Figure 5: Diagram showing the formation of the Rockwood anticline and the conjugate joint systems along which the caves have been excavated.

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## Hornby Retarded School Campaign Needs \$28,000

Meeting in Milton Tuesday evening October 25, officials of the North Halton Retarded Children's Association and guests planned a 1960 canvass for \$28,000 in funds to build a new Sunshine School for Retarded Children.

Institutes. These institutes will conduct the campaign in the rural areas of Nassagaweya and Exquisite Townships and north of the area covered by the North Halton association.

Seventh Line near Hornby. Cost of the building is estimated at \$40,000 and the Department of Education will pay 30 per cent. The total. The County of Halton is expected to give \$2,500 and this leaves Acton, Milton, Georgetown and the townships to raise the remaining \$28,000.

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In November, Kinmen are studying the canvass and a decision is expected shortly. Campaigns will be conducted during the third week in November. Speakers and films on retarded children are available to groups, and can be obtained from Gerry Addison, Milton, TR 8-9556.

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