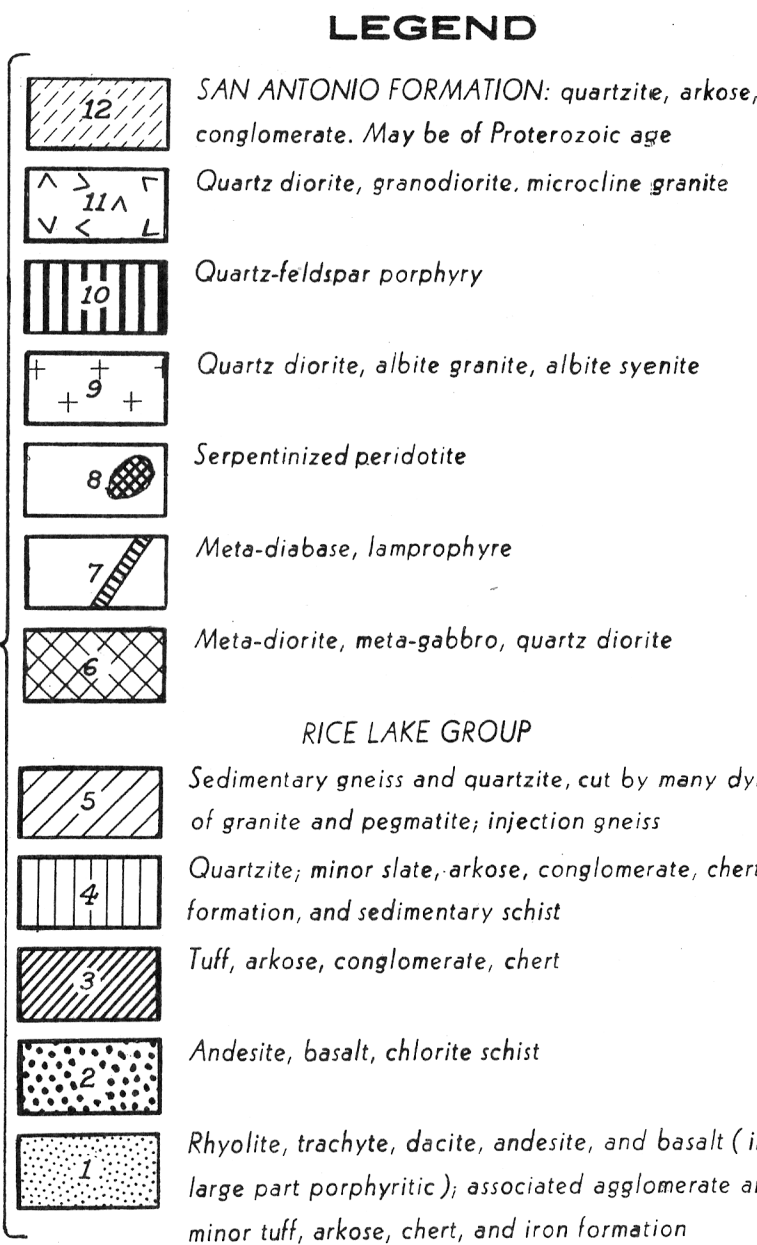


GEOLOGICAL SURVEY



Geology by C.H. Stockwell, 1939, and from published maps of the Geological Survey

DESCRIPTIVE NOTES

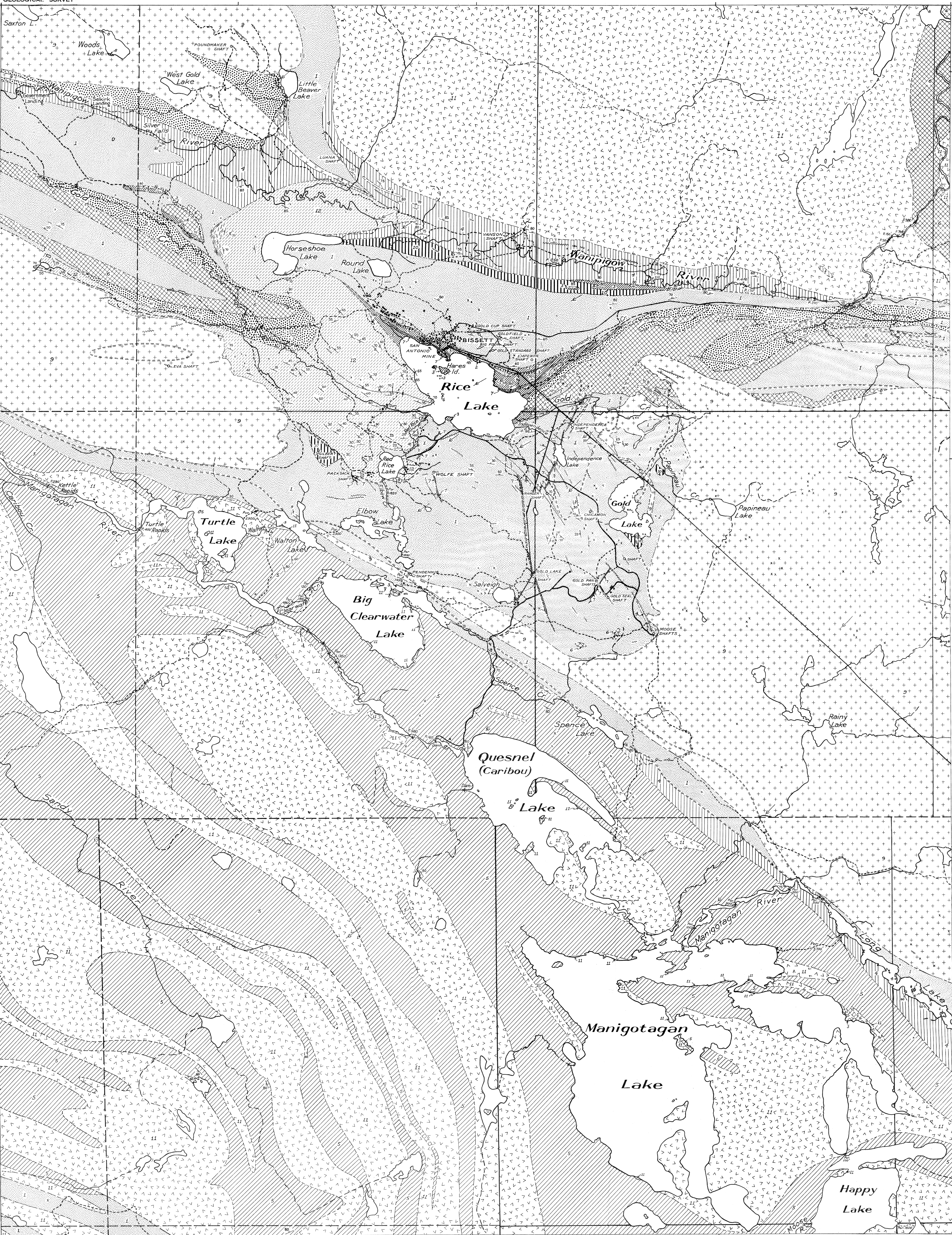
Basic to acidic lavas and pyroclastic rocks (1) of the Rice Lake group are interbedded with one another in layers from a few feet to 1,500 feet thick. Much of the lavas carry phenocrysts of plagioclase feldspar. Pillow structures are rare. Pyroclastic rocks are about as abundant as the associated flows. Near the contact with the large granitic body (9) east of Gold Lake the volcanic rocks are recrystallized to coarser than normal material and, rarely, are gneissous. Interspersed with these grey to black volcanic rocks are dark green lavas (2) that, in part, are pillowed and amygdaloidal. Sedimentary strata (3) are interbedded with the volcanic rocks (1, 2) of the Rice Lake group. In many places they form bands too thin to map, but their occurrence is indicated by bedding symbols. Pebbles and boulders in the conglomerate consist of dyalite, porphyritic andesite, quartz-feldspar porphyry, chert, and vein quartz. Much of the tuff is thinly bedded and shows grain variation from coarse, at the bottom of each bed, to fine, at the top. The main body of volcanic and sedimentary rocks (1, 2 and 3) lying north and south of Rice Lake is apparently folded into a broad, easterly-trending anticline with the axis lying ½ mile or more south of the lake. Minor synclines occur within the major anticlinal fold. A thick series of sedimentary rocks (4) overlies this main body conformably and outcrops on the limbs of the anticline. The abundant quantities of the series is, in places, massive and without bedding structures; in other places it forms beds up to 10 feet thick; and, in still other places, it is thinly laminated. Interbeds of black slate are common. Near the contact with the granitic body in the northwest part of the map-area, the slate has been altered to biotite schist, and the quartzite is in places gneissous. Conglomerate boulders hold boulders and pebbles of granite, trachyte, and porphyritic andesite. Banded magnetite iron formation was noted at the east end of Horseshoe Lake and strong magnetic attraction in a drift covered area a mile north of the west end of this lake suggests the possible presence of iron formation there. In the southwest part of the map-area, where large sills and rocks of granitic rocks are abundant, the sedimentary rocks (4) are partly altered to quartz-plagioclase-biotite-muscovite gneiss (5) and are cut by numerous dikes, stringers, and lenses of granite and pegmatite and by lapilli injections of these igneous rocks. Many beds are gneissous.

The sedimentary and volcanic rocks of the Rice Lake group are cut by sills and irregular-shaped bodies of meta-diorite, meta-gabbro, and quartz diorite (6) and by apparently somewhat younger dikes and sills of meta-diorite and lamprophyre (7). Some of the lamprophyre dikes are younger than the granitic intrusions (9, 10, 11) and others are older. Very small bodies of serpentinized chondritic peridotite (8) occur at Woods Lake. The age relation of this peridotite to the other basic intrusions (6, 7) is unknown.

Basaltic and smaller bodies of granitic rocks comprise a sodic type (9, 10, 11) and a potassic type (11). Their age relations are unknown. In the sodic type the feldspar varies from albite to andesine and some of the rock carries phenocrysts of plagioclase or conspicuous eyes of quartz. In the potassic type microcline or orthoclase feldspar is also commonly present. Dikes of pegmatite are common in and near bodies of the potassic type but are rare in and near the sodic type. The latter is, however, the source of large bodies of porphyry (10), and of unmineralized smaller porphyry dikes. Areas within which these dikes are abundant are outlined on the map. Minerals noted in the pegmatites include quartz, feldspar, biotite, muscovite, tourmaline, garnet, magnetite, and apatite. Tourmaline was also seen in dikes of albite and granite.

The beds of the San Antonio formation (12) rest unconformably on rocks of the Rice Lake group and on granitic rocks (9) that cut this group. West of Rice Lake the strata have been folded into a syncline with a gently dipping south limb and an overturned north limb. South and west of Horseshoe Lake the uppermost beds of this fold face so as to apparently underlie adjacent lavas of the Rice Lake group. However, there is a wide zone of intense shearing along the contact and it is probable that the anomalous relationship is due to faulting. Feldspathic quartzite is the most abundant member of the formation. Cross-bedding is common. Well rounded pebbles are scattered at random in the quartzite or are concentrated in thin beds. Between some of the quartzite beds are thin partings of fine-grained, pale green sediment commonly showing a grain variation from coarser at the bottom to finer at the top. A basal conglomerate from 10 feet or less to 80 feet thick occurs along the granite contact on the south limb of the syncline. Rounded boulders and angular blocks of granite derived from the underlying rock are commonly 1 to 10 feet in diameter, the largest noted being 40 feet long and 20 feet wide. These lie in a matrix of smaller boulders and pebbles of a great variety of materials. The cement is of schist or arkose, and cracks in the underlying granite are filled with slate.

Vein quartz has been deposited along these fracture zones and faults that either parallel or cross the trend of enclosing rock formations. Minerals noted in the quartz include gold, pyrite, chalcopyrite, pyrrhotite, sphalerite, galena, molybdenite, arsenic, chlorite, bright green chromiferous mica, albite, orthoclase, and tourmaline. Many of the veins in pre-San Antonio rocks are probably genetically related to the sodic intrusions. The origin of those in the San Antonio formation is unknown. Gold production has been almost entirely from the San Antonio mine, on the north shore of Rice Lake; small amounts have come from several other deposits. San Antonio Gold Mines, Limited, reports that gold and a little silver to the value of \$10,346,165 were derived from 975,586 tons of ore mined from 1932, where operations commenced, and December 31, 1941, when reserves were estimated at 908,609 tons. Production was from a large number of veins arranged in two sets, one striking northeast and the other southwest, in a north dipping sill of meta-diorite. workings on 16 levels extend to a depth of 2,400 feet.



PRELIMINARY MAP 42-15

RICE LAKE
EAST OF PRINCIPAL MERIDIAN
MANITOBA
Scale: 2 Inches to 1 Mile

