other way, it seems, to explain this type of blanket drift and the sometimes intervening driftless areas. Relative to this question, we had quite a heated argument with a young geologist in charge of the geology section of the Museum in St. John, Nova Scotia. He had spent several summers mapping Prince Edward Island and the adjacent shoreline and had never noticed these anomalies. To this young geologist drift was drift; he was mapping it along with the underlying formations and how it got there was a matter of speculation and therefore out-of-bounds for the scientist.

It is well known that glacial ice can pluck angular boulders out of the bed rock and carry them along, but if there is no movement of the ice, nothing can be picked up and nothing can be dropped. Such a blanket of ice preserves the bedrock from weathering, probably with little change in millions of years. Thus the Canadian Shield has been protected from the powerful agents of weathering such as rain and sun, the air and its oxygen, the prying effects of roots and plant acids that break up the rocks in warmer climates.

Another interesting feature of impact craters is a study of the uneven blast effects as a means of determining the direction of approach of the striking body. Most impact craters show the effects of uneven blast, even small craters. Sections of the rim may be blown away or large heaps of rock thrown out in certain sectors beyond the rim. This is probably because meteorites are seldom perfectly round and seldom fall at right angles to a perfectly flat earth surface. Large lunar craters usually show this uneven distribution of ejected material, if we look closely, although the general impression is that they are round. Practically all terrestrial meteorite craters show this lack of symmetry in outline and in the distribution of ejecta. For example, the Arizona Meteorite Crater is not round but rather a square with the corners rounded off, and the ejecta is concentrated on the northeast and southwest sides. (See figure No. 15) Another example, the Dalgaranga Crater in Western Australia* is quite small, being only 75 feet in diameter and about ten feet deep. It was made by an iron meteorite striking in almost perfectly flat ground. It blasted a crater out of very hard laterite rock of uniform quality, yet it made a crater that is not round and threw out the rock in a very uneven pattern. (See figure No. 16)

The Hudson Bay Arc is not perfectly round, and while its rim features cannot be extrapolated from small crater forms, it does show strong signs of crescent faulting that may be compared to similar faulting around Mare Crisium and Mare Humorum.

The direction of approach is indicated by several features as having been from a high angle and a little south of east. In the central sector east of the arc, all of the lakes are elongated in an ESE direction, while to the north and south, the lakes gradually lose their directional elongation and become (near the tips of the arc) completely irregular in shape. (See fold map)

This would lead one to believe that the ice was literally pushed across the bedrock in the eastern section, gouging out the rock basins and moving the whole mass somewhat up-grade and over the divide onto the Atlantic slope. In fact this heavily glaciated country is so nearly level that one of the large rivers, Leaf River, heads within 18 miles of the rim of the Hudson Bay Arc and flows through Lake Minto (surface elevation 450 feet) to the northeast

*The author visited Dalgaranga Crater along with Dr. & Mrs. H. H. Nininger in February of 1959.

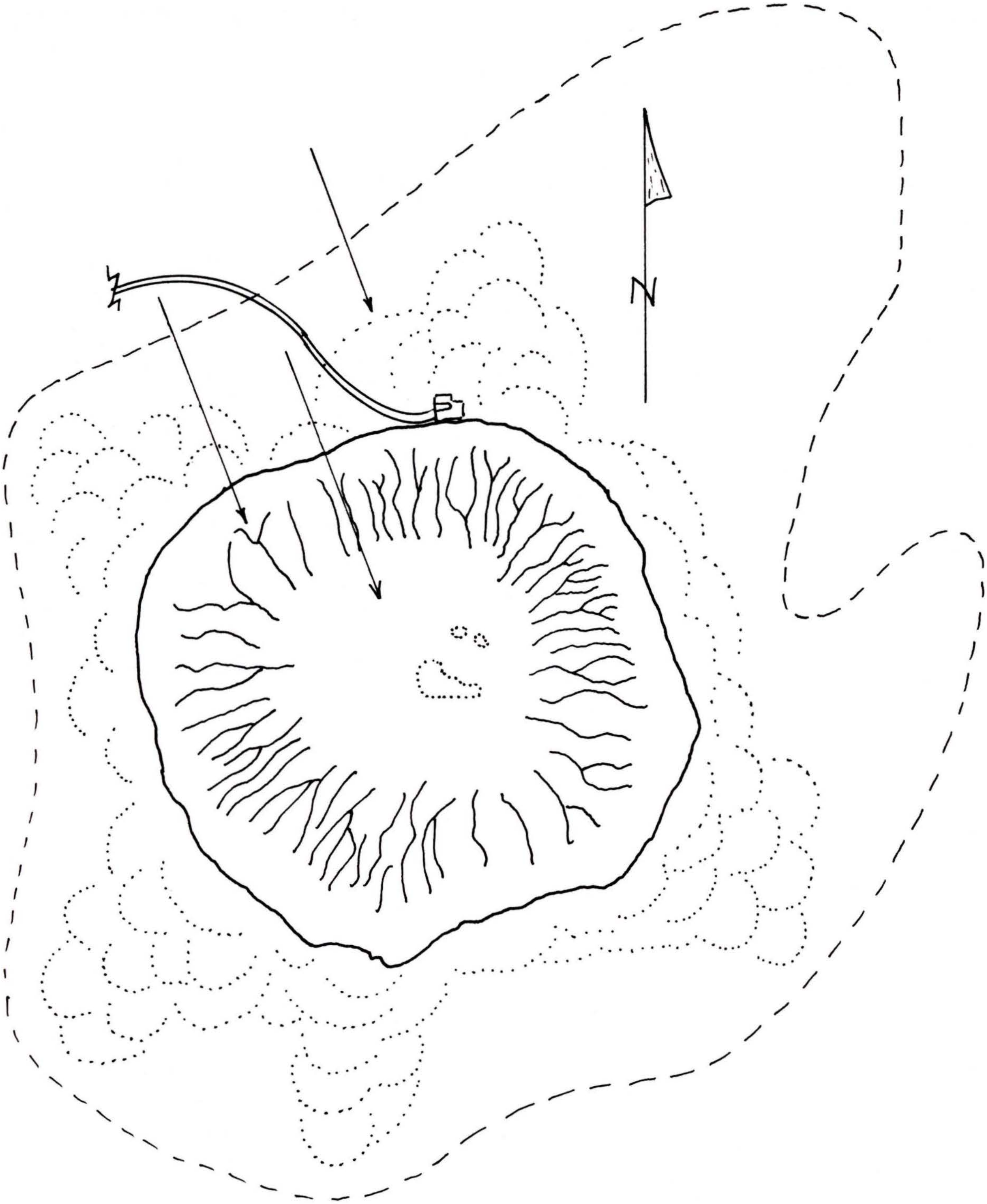

FIG. 15
METEOR CRATER, ARIZONA
The solid lines show the rim of the crater and the erosion gullies inside the crater. The dotted lines indicate the bulk of the rock debris thrown out and the dashed line shows the outer limits of this ejecta.