Limestone injection bodies consist largely of carbonate mudstone or of crinoid-rich packstones and grainstones. Sorting ranges widely, but commonly is consistent within individual bodies. Most grains are of coarse sand and fine conglomerate sizes. Noncrinoidal grains are mostly of bryozoan debris but include other skeletal material and host-rock fragments. Poorly sorted and/or coarser-grained masses probably result from wholesale injection of substrate sediments. Mudstone bodies could originate as filtrates (*cf.* Philcox, 1963). Tabular dikes dip steeply and are up to 6 feet wide. Some persist laterally and/or vertically for 50–100 feet.

The injected material occupies dilational fractures that apparently formed penecontemporaneously with the growth of the build-ups, probably prior to their burial by later deposits. Extensive cementation of the core facies by fibrous and syntaxial rim cement preceded injection; most cementation of crinoidal flank and substrate facies occurred later. The early cementation is interpreted as a "normal marine" intra-sediment process, rather than one dependent upon subaerial emergence.

Factors believed important in the origin and localization of the injections are: (1) high differential sedimentary loads on the substrate, (2) low permeability of the core facies, (3) loose-packing of "avalanche-face" deposits, and (4) little early cementation of the substrate.

Geochemical Study of Soil Profiles from the Bathurst Area, New Brunswick, Canada*

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This study was undertaken to determine the amounts, vertical distribution, and nature of iron, manganese, lead, copper, zinc, arsenic, antimony, silver, tin, and cadmium in Podzol soil profiles from the Bathurst region of northeastern New Brunswick. About one quarter of the profiles examined were from soils overlying sulphide deposits in the area.

Total amounts of these elements were determined in the soil horizons of the profiles. Ph, organic carbon, cation exchange capacity, and free iron were also determined for the horizons of some profiles. Statistical correlation studies showed the relationship of the elements to pH and total iron in the different soil horizons.

Amounts and distribution of trace elements in profiles overlying sulphide deposits differed from the other profiles and appeared to be strongly influenced by the underlying deposits. In the profiles not overlying sulphide deposits, podzolization processes strongly influenced the vertical distribution and amounts of trace elements in the soil profiles. Lead and silver were associated with high organic accumulation in the surface horizons; intense leaching in the A_2 horizons effectively removed all elements except tin and antimony; increase of free iron in the B horizons was accompanied by increased amounts of associated arsenic and lead; the relative lack of weathering in the C horizons was indicated by higher values for some of the more mobile elements such as zinc, copper, and manganese.

Join Mg_2SiO_4-$CaMgSi_2O_6$-Iron Oxide and Its Bearing on Ultramafic Rock Genesis

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The quenching technique has been used to study the liquidus surface of the join Mg_2SiO_4-$CaMgSi_2O_6$-iron oxide in air, in CO_2, at 10^{-6} atm p_{O_2}, and at 10^{-8} atm p_{O_2} (1 atm total

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