

nous, lies lateral to the core between the Serla Dolomite and the Schlern Dolomite; between the buildups this sequence is covered directly by volcanics (prevalently latites) and other volcanoclastic rocks. Prevalently terrigenous sediments (Raibl Formation) ended Middle Triassic sedimentation and disconformably overlie the carbonate masses.

In the literature, from the last century until the most recent papers, the carbonate buildups have been interpreted as coral reefs with internal lagoons (the bedded parts); the volcanics and the associated sediments filling the interreef basins have been regarded as contemporary with the reefs. The Dolomites became famous as a classic region for paleoreefs and spectacular lateral facies changes (heteropic contacts).

The following data are from a new detailed field examination and sedimentologic analysis. The massive part of the buildups is prevalently mud-supported grainstone (pelletoid and skeletal grains) and is characterized by the presence of "reef tufa" (fibrous carbonate in cavities with irregular, in many places lobate, walls). The stratified part consists of thick beds of mud-supported grainstone (pelletoids). The grainstone is commonly burrowed, has crinoids and algae (*Diplopora*), and has thin interbeds of laminated micrites, common pisolites, intraclastic breccias, sheet cracks, and "tepee" structures. The boundaries between carbonate bodies and surrounding volcanoclastic rocks are abrupt, without transitional facies; the bodies interfinger with the underlying Livinallongo Formation which, in the transition zone, contains abundant, commonly graded breccias. In places the upper part of the buildups interfingers with muddy carbonate sediments that end the basin sequence. These data suggest a different interpretation from the classic one. On the higher parts of the basal blanket dolomite, banks of shallow-water carbonate sediments developed and grew. These carbonate banks were exposed periodically, keeping pace with subsidence, and reached thicknesses of about 1,000 m.

A starved-basin sequence was deposited in progressively deeper waters to a maximum depth of about 800 m. Later the products of the submarine volcanic eruptions filled the interbank depressions rather quickly, literally "suffocating" some buildups and fossilizing their primary morphology. At the end of the Middle Triassic the almost complete topographic leveling caused a renewal of the carbonate sedimentation which led to the development of slightly raised banks and, in places, small coral reefs.

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LATE ORDOVICIAN BENTHIC COMMUNITY STRUCTURES IN ST. LAWRENCE LOWLANDS, QUEBEC

Invertebrate faunas in the shale, siltstone, and sandstone of the Nicolet River and Pontgravé River Formations in the St. Lawrence lowlands, Quebec, represent the northernmost expression of Late Ordovician Appalachian clastic-facies, benthic marine communities. Strata exposed along the axis of the Chambly-Fortier syncline have bedding, texture, and primary structures characteristic of a regression sequence, a pattern that is mirrored in well-defined onshore-to-offshore faunal assemblages.

About 50 species dominate the Nicolet-Pontgravé fauna, mainly articulate brachiopods, bellerophonitid gastropods, bivalve mollusks, crinoids, and trilobites. There are benthic marine communities, recognized on

the basis of species, which consistently occur together. The *Dalmanella-Cryptolithus* community is widespread and lived on or in muddy silt and mud of the outer infralittoral zone. The community has high faunal diversity, especially nuculoid bivalve mollusks and trilobites, but normally has low density. The *Leptaena-Sowerbyella* community has patchy distribution. This dominantly strophomenid brachiopod fauna, sporadically associated with diverse praecardioid bivalve mollusk populations, lived on fine silt bottoms of the inner and outer infralittoral zone. The *Ambonychia-Modiolopsis* community has low faunal diversity but many epifaunal, suspension-feeding, bivalve mollusks, especially perlioids and modiomorphids. The community lived on fine sand and silt of the inner infralittoral zone and has patchy distribution. The *Rhynchotrema-Catazyga* community, which has very patchy distribution, lived on muddy silt of the inner infralittoral zone, has very low faunal diversity, and contains coquinas of monospecific character, dominantly rhynchonellid.

The pattern of high-diversity, low-density offshore communities transitional shoreward into low-diversity, high-density communities may be explained most simply by differences in the degree of environmental fluctuations.

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GEOLOGIC-INFORMATION SYSTEM: METHODOLOGY, DESIGN, AND OBJECTIVES

The information system, SIPS, is designed to handle and transfer data relating to subsurface geology. The data are of 2 types: geologic research materials available in the Subsurface Laboratory, and information concerned with the documented research relating to subsurface geology.

Methodology of the information system involves formulation of the system, specification of the theoretical framework, search for relevant techniques to implement the formulation, and defining the procedure.

The system is designed to transfer the information by selective retrieval specified by the subsurface geologist, whether stratigrapher, sedimentary petrologist, or petroleum geologist. The geologist is provided with a list of pertinent material in a specified location within designated stratigraphic and depth intervals that correlate with the search criteria. Relevant research documents are retrieved selectively to provide bibliographic and abstract listings through a variety of search options based on concept formulation and descriptor indices.

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DEPOSITIONAL HISTORY OF NORTHERN ALASKA¹

Facies of most rock systems in northern Alaska are related spatially to 4 major structural features: (1) a broad regional high near the north coast, which is a locus of unconformities and of nearshore facies in the upper Paleozoic through lowest Cretaceous rocks, (2) the deep Colville geosyncline between the coast and the Brooks Range, which contains the middle and Upper Cretaceous molasse deposits, (3) a narrow zone of shallow thrusts, the "Disturbed Belt" in front of the

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