8. The Dachstein-reef of the Gosaukamm - An Upper Triassic carbonate platform and its margins

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The Gosaukamm massif forms the northwestern extension of the central Dachstein mountains, separated by the deep furrow of the Gosau lakes. Both mountain ranges belong to the Dachstein nappe, which was part of the large Upper Triassic carbonate platform of the Austroalpine sector of the Tethyan shelf.
Whereas the Dachstein and the adjacent karst plateaus mainly represent the lagoonal interior of this platform, the Gosaukamm represents a marginal reef, facing toward the deeper marine Hallstatt basinal facies - similar to the palaeogeographic model of ZANKL (1971), developed for the Hohe Göll area south of Salzburg, see Fig. 8.1.

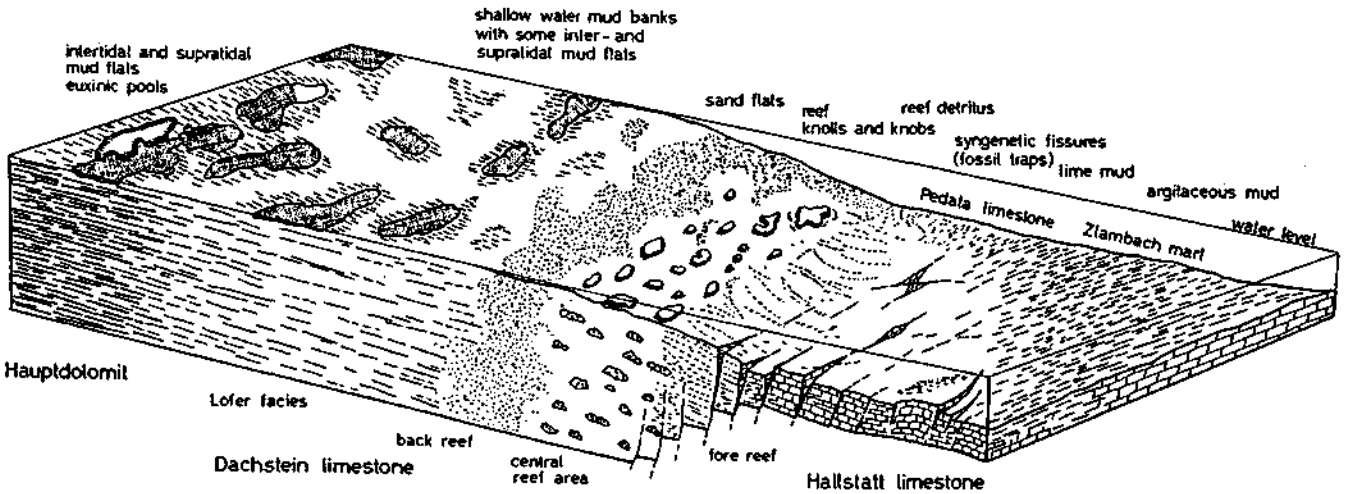

Fig. 8.1.: Palaeogeographic interpretation of the depositional environments in the Salzkammergut region during the Norian, after ZANKL (1971) (not to scale).

Transitional beds of slope- and nearby basin-facies are characterized by carbonatclastic sedimentation, derived from the platform as well as from the slope. These sediments are summarized under the term „Gosausee Limestone", in literature often referred to as „Pedata Schichten" according to the locally abundant brachiopod *Halorella pedata.* Exposures can be found mainly around the Gosau lakes and on the southwestern slopes of the Gosaukamm. Details of sedimentology and cyclicity of this bedded calciturbiditic limestone are given by REIJMER (1991). According to him the variations in turbidite composition can be attributed to fluctuations in sea level and resulting flooding and exposure of the platform. The so caused variation of platform sediment production could be matched with Milankovitch quasi-periodicities.
The former platform margin has been dissected during orogenesis by several dextral strike slip faults, see Fig. 8.2. The northwestern front part of the moving block was squeezed into the deformed basinal sequences of theTörleck and Zwieselalm anticlines. In this way the syncline of Roßmoos was formed, where Rhaetian Zlambach marls are preserved below a thin layer of the overturned Dachstein Limestone of the Kesselwand, Fig. 8.4.

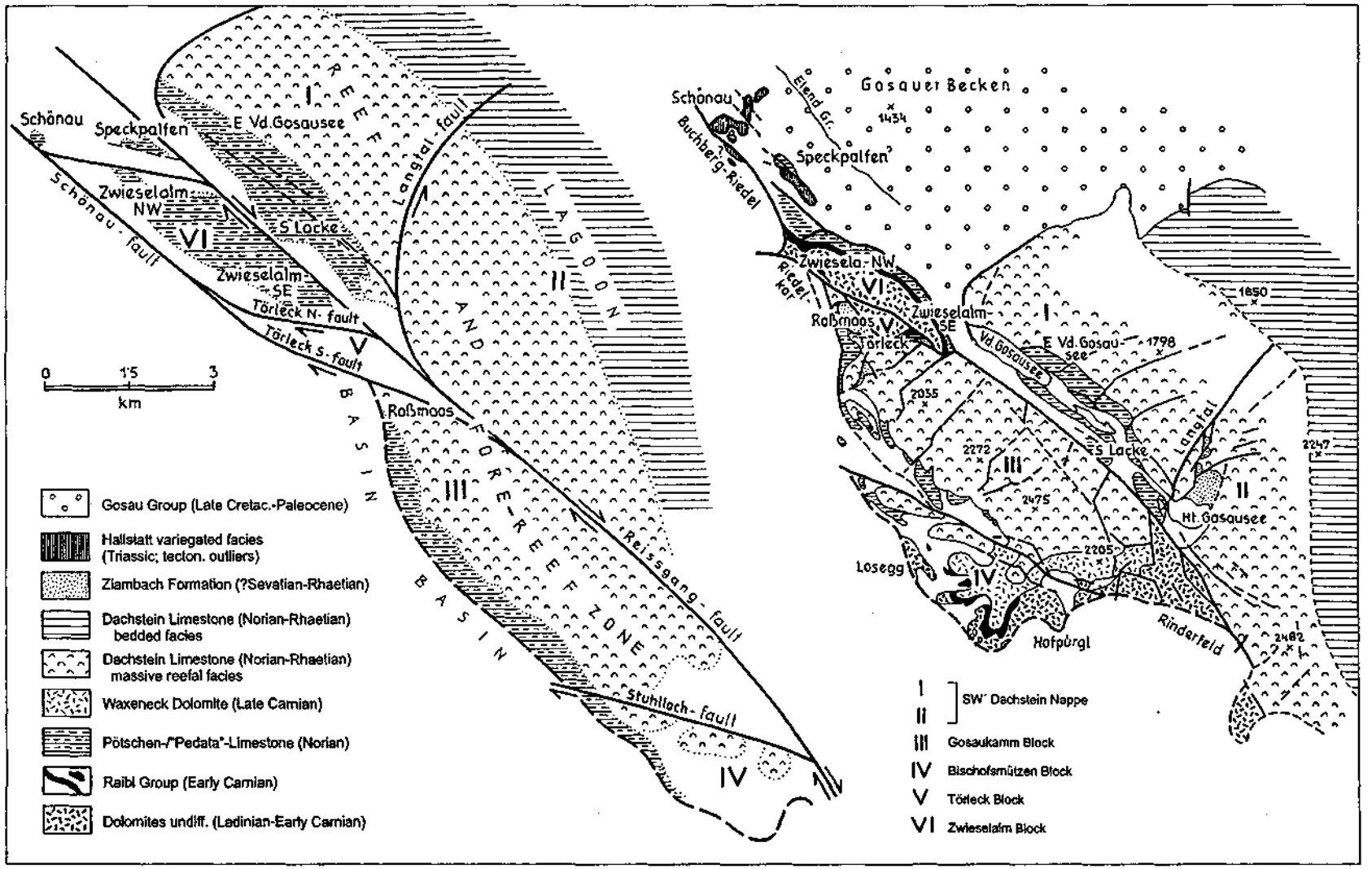

Fig. 8.2: Facies zones of the Dachstein platform margin in the Gosaukamm area. Restored geometry before strike-slip faulting After MANDL (1984).

The general investigation and mapping was done by SCHLAGER (1966, 1967), additional refinements have been contributed by TOLLMANN & KRISTAN-TOLLMANN (1970) and MANDL (1984). Palaeontological and microfacial research of the Dachstein reefs was done by the reef working group from the University Erlangen, summarized in FLÜGEL (1981); details from the Gosaukamm have been reported by WURM (1982). Short reports on the macrofauna are given by ZAPFE (1962, 1967). A recent study of corals was done by RONIEWICZ (1995).

The Dachstein reef limestone of the Donnerkogel group (localities 1-5, 19-20 in Fig. 8.3.) dominantly is composed of coarsegrained rud/floatstones and reef debris with only small, widely distributed patch reefs. The microfacies may be subdivided into up to 10 types (WURM, 1982).

A large scale bedding (some 10 meters) can be seen. The original dip of the reef slope was not 30° as today, but about 10-15° concerning displaced geopetal fabrics. The patch reefs show a dominance of non-segmented calcareous sponges as main framebuilders. Branched corals are less frequent.

Fauna and flora of the patch reefs and the detrital limestones is very rich. More than 50 species contribute to the construction of the reef framework, more than 60 species must be regarded as benthonic reef-dwellers. Pelagic elements from the open sea are known with *Heterastridium*, ammonites and conodonts.

The investigations at the Gosaukamm have shown, that the associations of foraminifera and of calcareous algae are significant for distinctive environments within the reef zone:

„Sessile foraminifera"-associations with *Alpinophragmium* and *Nubecularia* are connected with calcareous sponges and corals in patch reefs only.

„*Galeanella* - sessile foraminifera" - association with *Galeanella* and other miliolids have been recognized mostly in reef detritus of the central reef flat. A similar environment is indicated by an „*Ophthalmidium* - sessile foraminifera" - association with *Ophthalmidium*, *Quinqueloculina*, *Sigmoilina* together with *Nubecularia*.

The algal flora consists of red algae, rare dasyclads and common algal crusts around frame building organisms, often together with many tubes of *Microtubus communis*.

The marls and limestones of the Zlambach Formation at the locality Roßmoos are well known for a rich coral fauna (FRECH, 1890). Additional elements are non-segmented calcareous sponges, spongiomorph hydrozoans, bryozoans, brachiopods, ammonites (*Choristoceras haueri* MOIS.), echinoderm, serpulids, solenoporaceans.

The microfacies of Zlambach limestones is characterized by abundant reworked corals with encrusting organisms (e.g. *Nubecularia*, *Tubiphytes)* and some calcisponges and bryozoans. A packstone fabric is common, grain contacts often show stylolites. Miliolid and textularid foraminifera are found in the micritic matrix. Foraminifera have been described by TOLLMANN & KRISTAN-TOLLMANN (1970).

FLÜGEL (1962) interpreted the environment as off-reef shoals within a muddy basin somewhat deeper and near to the fore reef of the Gosaukamm reef.

The deeper and distal part of the Zlambach basin facies is not preserved at the Gosaukamm, but several kilometers to the northeast, at the type locality within the Hallstatt unit of Ischl-Aussee - for details see BOLZ (1974), PILLER (1981), MATZNER (1986).

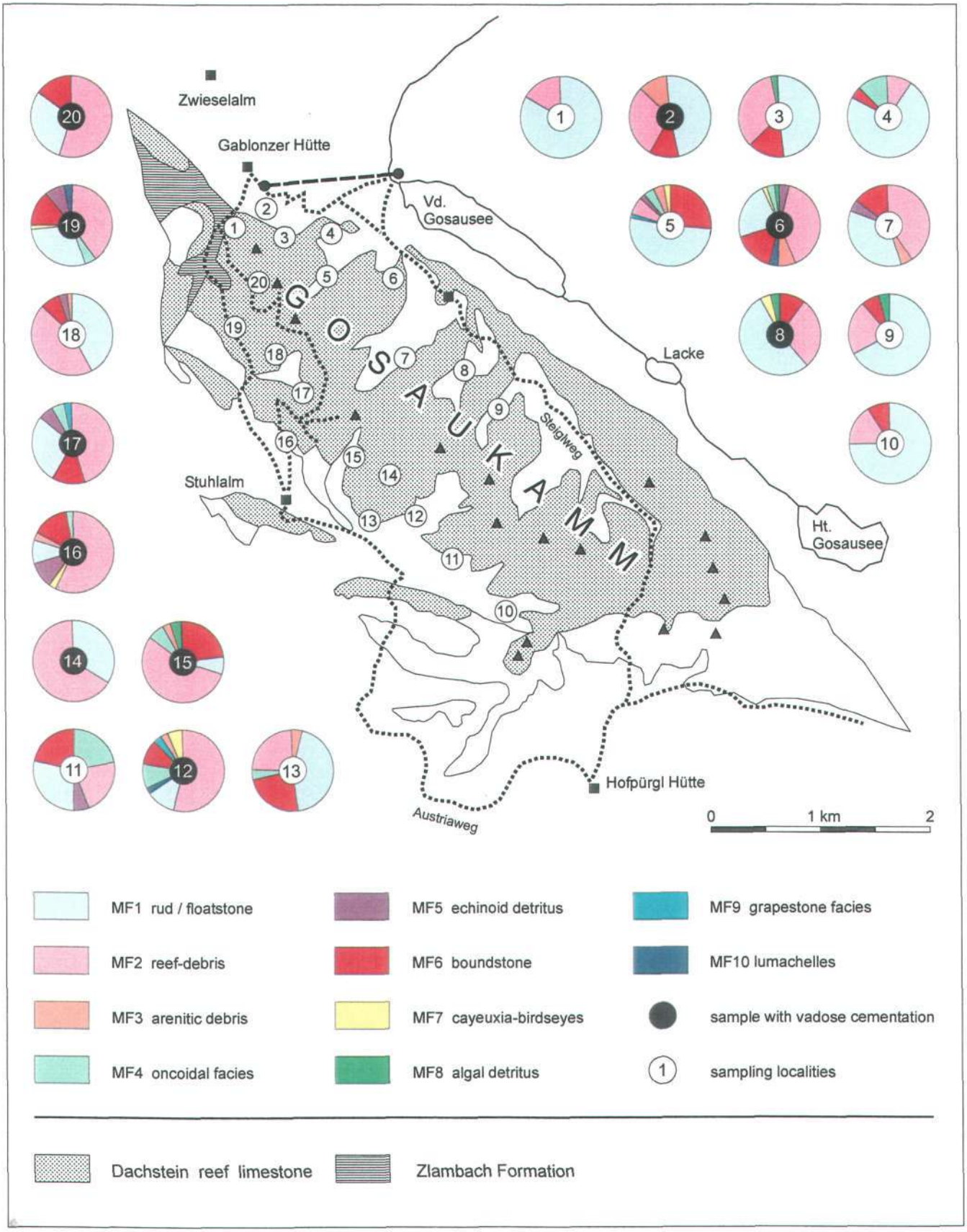

Fig. 8.3 : Microfacies composition of the Dachstein reef limestone (Upper Triassic) in the Gosaukamm area (Northern Calcareous Alps, Austria) according to WURM 1982.

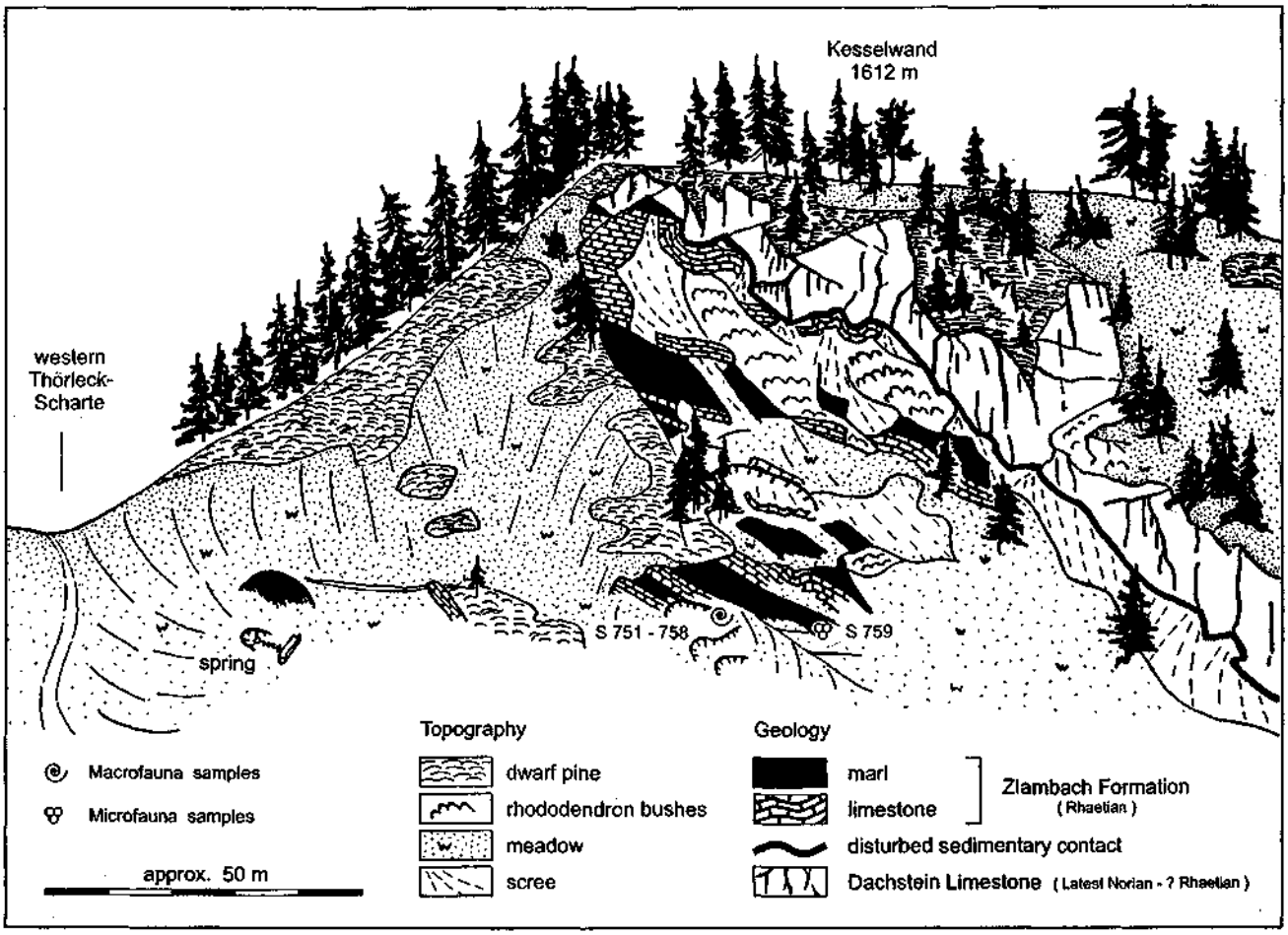

Fig. 8.4.: The localities Roßmoos (foreground) and Kesselwand.
After TOLLMANN & KRISTAN-TOLLMANN (1970), modified.

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