Facies Types and Paleoecology of the Ernstbrunn Limestone of Dörfles
(Th. HOFMANN, 1990)

Six different facies types were distinguished with the carbonate classification after DUNHAM (1962) and EMBRY & KLOVAN (1972).

An analysis of selected foraminifera shows the abundance of certain taxa in distinct facies types (Fig. 105).

○ Wackestone facies and Transitional facies

Smooth weathered surfaces and the lack of macrofossils are characteristic. Mostly we find a micritic matrix, sometimes (transitional facies) sparitic blocky cement. The transitional facies is to a certain extent grain supported and shows similarities to the packstone facies. These two facies types are often found together. Bioturbation seems to be responsible for this. Peloids, fecal pellets, various coated grains, some algal fragments, and foraminifera are the main components of these two facies types.

Among rarely occuring foraminifers, *Trocholina* sp. is the most abundant.

○ Pack- and Grainstone facies

(Fig. 106)

A rough weathered surface is characteristic in the field. This is the result of differential weathering of components and matrix.

It is possible to distinguish between packstones and grainstones only in thin sections. Peloids, bioclasts and rarely also intraclasts occur together with many algae, which act as encrusting organisms (*Lithocodium, Bacinella*) building sometimes cm-large nodular aggregates or oncoids. Various sections of dasyclad algae give important enviromental information. Nearly all components are coated either by a thin micritic envelope or by encrusting algae.

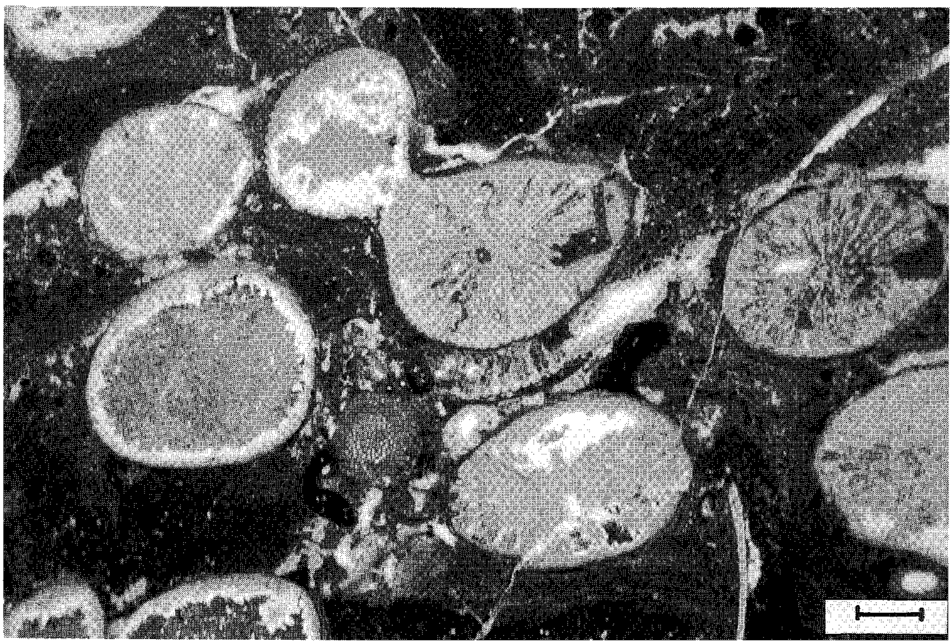

Fig. 100: Thin section of the coral Limestone (Ernstbrunn Formation).
Ernstbrunn quarry; length of scale 2.2 mm.

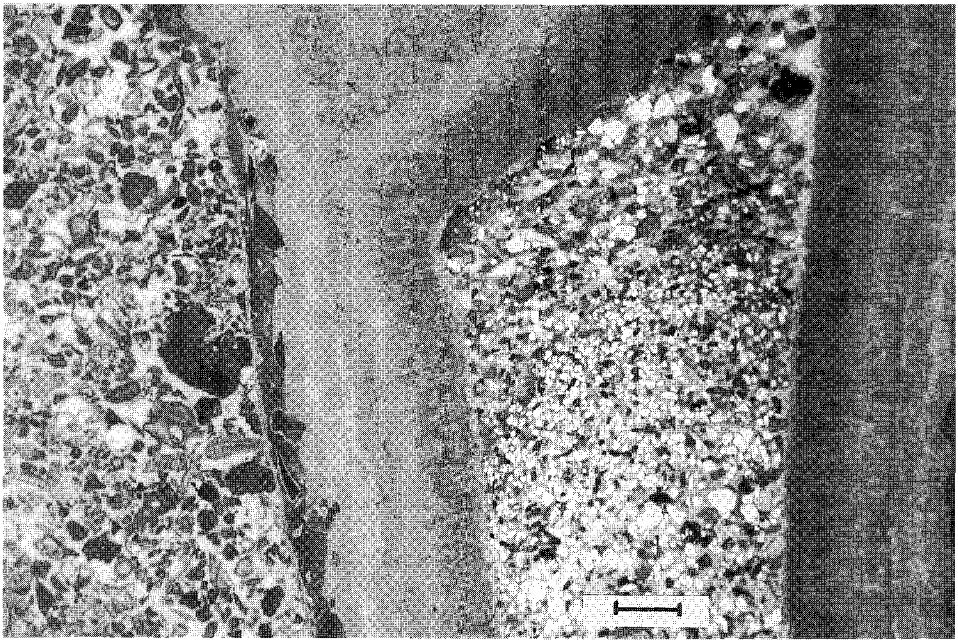

Fig. 101: Detail of cement and cavity filling in the Ernstbrunn limestone.
Ernstbrunn quarry; length of scale = 1,33 mm.

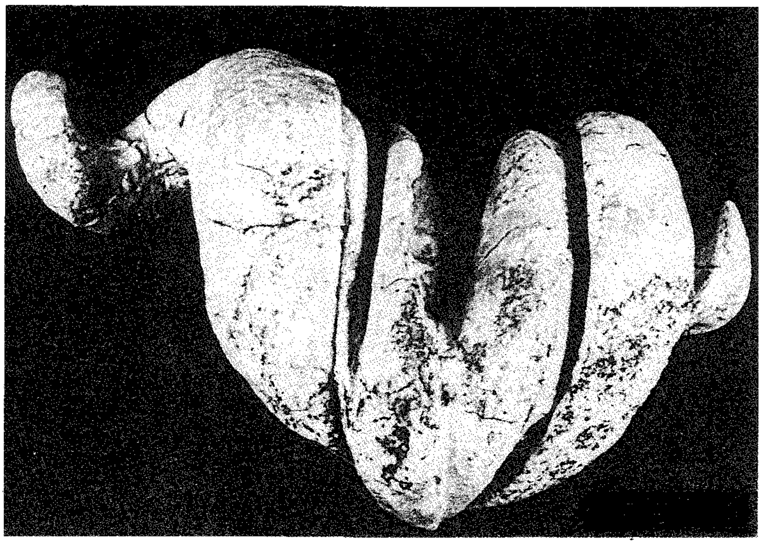

Fig. 102.
Steinkern of *Diceras arietinum*.
Ernstbrunn Limestone.
Collection Gottschling.

The packstone facies yields a great variety of foraminifers with a great diversity of taxa.

○ Algal Bindstone facies
(Fig. 107)

Encrusting algae like *Lithocodium, Bacinella, Thaumatoporella parvovesiculifera*, build large flat aggregates covering and stabilizing the sediment. A grid like sur-

Fig. 103: Ernstbrunn Limestone, pockets filled by Klement glauconitic marly sandstone.
Ernstbrunn quarry.

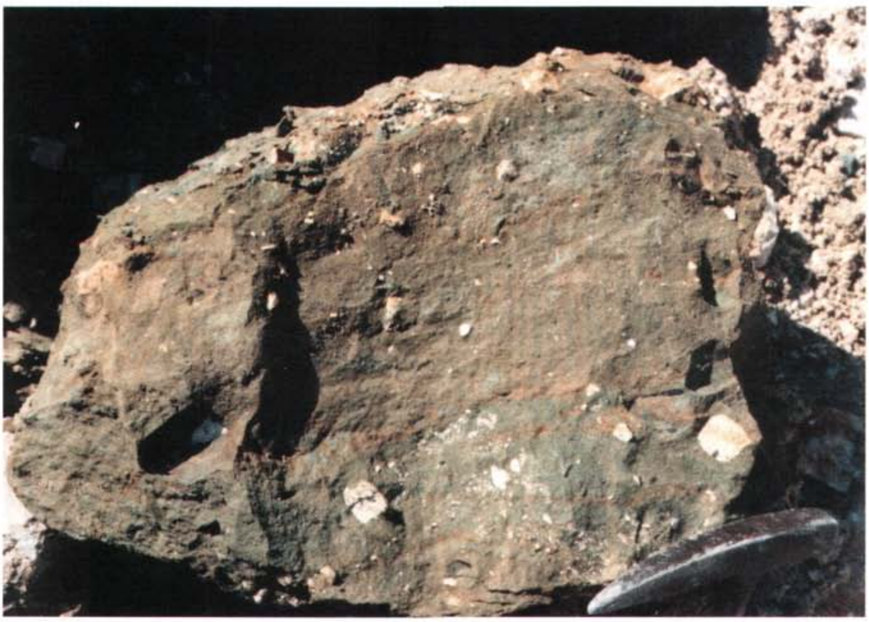

Fig. 104: Klement Group, glauconitic marly sandstone with components of Ernstbrunn Limestone.
Ernstbrunn quarry.

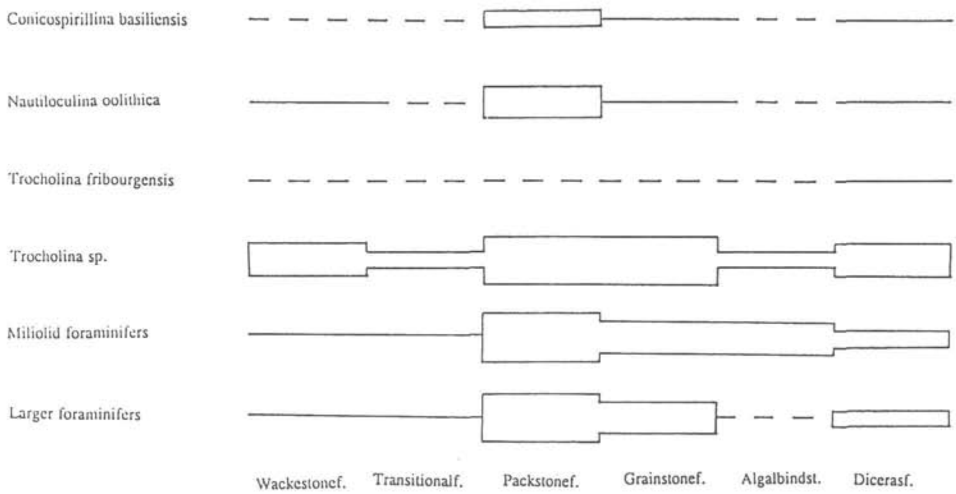

Fig. 105: Distribution of Foraminifers.

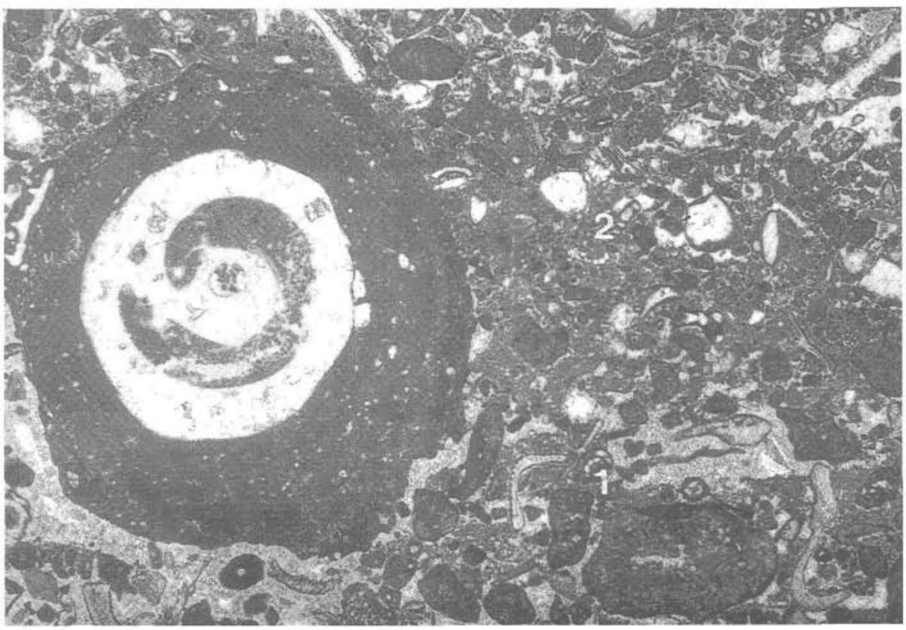

Fig. 106: Pack-Grainstone Facies (DöV/p).
Poorly sorted, grain supported sediment with two generations of sparite. The oncoid, *Nautiloculina oolithica* (1), fragments of dasyclad algae (2) and micritic encrustations provide more information about the environment.
Enlargement ≈ ×10.

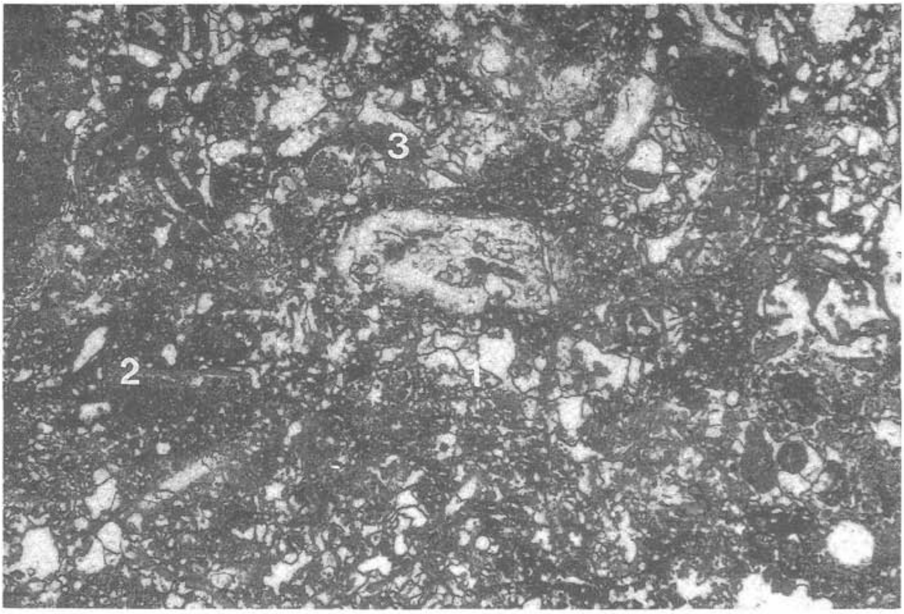

Fig. 107: Algal Bindstone Facies (Döv/10).
Binding components *Bacinella* (1) and *Thaumatoporella parvovesiculifera* (2) stabilize the surface of the sediment. Internal voids may be filled with pellets (3).
Enlargement ≈ ×10.

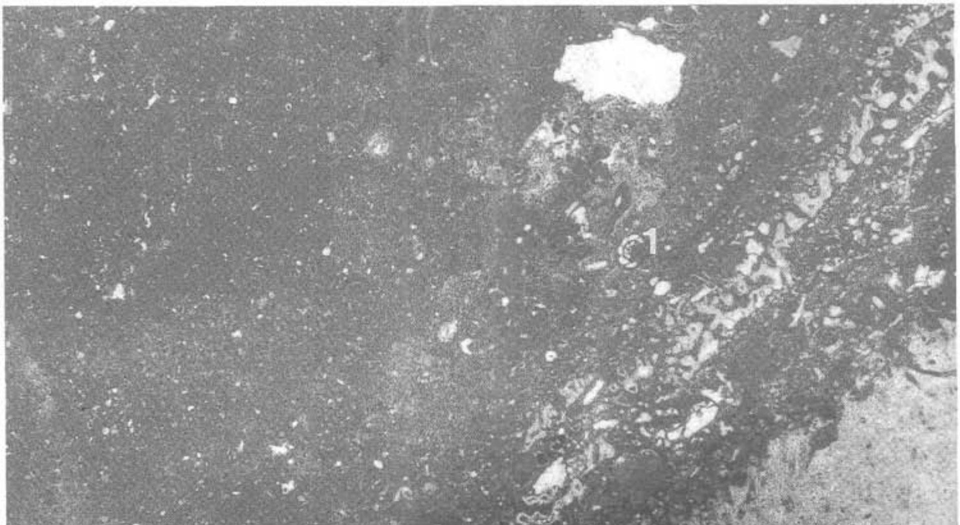

Fig. 108: *Diceras* Facies (DöIII/4).
Thick encrustations cover the bored shell of bivalve (*Diceras*?). Fine sediment, here with *Nautiloculina oolithica* (1), is found between these shells.
Enlargement ≈ × 11.

face is typical in the field. Internal vugs may be filled either totally or partly with pellets or silt, in the later case dog tooth cement is occasionally observed. Sometimes areas with pack- or grainstones are observed in between this facies. These sparitic sediments indicate a higher energy, which seems to be responsible for the origin of cm-large nodular aggregates or oncoids found in the pack- and grainstone facies. Fissures were filled synsedimentarily (Fig. 108). Miliolid foraminifers are most frequently observed followed by *Trocholina* sp.

○ *Diceras* facies (Bafflestone facies)
(Fig. 108)
Densely packed *Diceras* shells coated by encrusting organisms in association with nerineid gastropods are typical for this facies.
The "Steinkerne" of *Diceras* specimens – shells are rarely preserved – are the most common fossils in the Ernstbrunn Limestone (Fig. 102).

Paleoecology

Twenty two taxa of dasyclad algae (green algae), which are most valuable for enviromental interpretation, have been described. Typical ecological conditions for these organisms are quiet, shallow, tropical lagoons with muddy or sandy ground (WRAY, 1977).

According to FLÜGEL (1982) a high rate of encrustation occurs in water depths from 15–20 meters. Furthermore, foraminifers like *Conicospirillina basiliensis* and *Nautiloculina oolithica* are typical for limestones deposited in a shallow agitated milieu (BERNIER, 1984). Miliolid foraminifers are described from the backreef lagoonal sediments of Stramberk (Ernstbrunn) reef complex (ČSFR; ELIASOVA, 1981).

No storm deposits have been found.

The Ernstbrunn Limestone was therefore deposited in a shallow, tropical lagoon. Wackestone facies show a quiet regime, whereas grainstone facies indicate some water agitation. There is no evidence for inter/supratidal or brackish conditions. During the upper Jurassic, the investigated area belonged to the inner part of a carbonate platform (ELIAS & ELIASOVA, 1986).

STOP No. 2/3

LOCATION: Au near Klement (Figs. 95,97,109).
TECTONIC UNIT: Waschberg Zone.
FORMATION: Ernstbrunn Formation.
AGE: Malmian.

The Au outcrops are also situated in the frontal part of the Waschberg Zone (Fig. 98).

We find two types of Tithonian sediments at Stop 2/3. Small ridges of dolomitized limestone (position 1 in Fig. 109) represent the Ernstbrunn Formation (Figs. 110,111). Toward NE another small ridge (position 2 in Fig. 109) shows a rich fossiliferous limestone (Figs. 112,113).

500 m north of the dolomitized limestone the exploratory well AU1 was situated. The well penetrated a series of Klippen of Malmian Ernstbrunn limestone, Klentnice beds and Klement beds within the Waschberg zone (Fig. 98).