The Balaton Highland belongs to the Bakony Mountains, located in the southwestern part of the Transdanubian Range (TR) in Hungary. The structure of the TR is dominated by a NE–SW trending syncline. The Balaton Highland that makes up the southern flank of the syncline exposes the oldest rocks of the TR. The structure of the Balaton Highland was basically determined by compressional movements normal to the axis of the syncline. The most dominant structural element of the Balaton Highland is the Litér thrust of SW–NE strike, that resulted in a repetition of the Permian–Triassic sequence. The Pelsonian formations can be traced as more or less parallel belts on both sides of the Litér thrust (Figure G-1). Strike of the southern belt is disrupted by transverse thrusts (“Dörgicse horse-tail structure”) in the middle part of the Balaton Highland and by folded structures in several parts of the northern belt (BUDAI et al. 1999a, b). These dislocations are manifested in the anomalously wide surface extension of the Pelsonian formations.

The middle part of the Anisian of the Balaton Highland can be subdivided into the following three formations: Megyehegy Dolomite, Tagyon Limestone and Felsőörs Limestone Formation (lower part). The latter two represent the Pelsonian Substage whereas the Megyehegy Dolomite is placed into the Bithynian Substage according to the new concept presented in this volume (Figure G-2). Nevertheless, because this formation plays an essential role in the geological framework, and also because it was previously regarded as Pelsonian, the main features of the Megyehegy Dolomite will also be shortly described below. The coeval Pelsonian formations are characterised by significant lateral thickness changes (Figure G-3).
The Megyehegy Dolomite Formation consists of light grey, bedded dolomite. The lower part of the formation is made up by argillaceous, slightly bituminous, often biotetral dolomite containing crinoidal skeletal fragments and dasycladaceans (Physoporella pauciforata, Ph. pauciforata undulata, Oligoporella sp.). The original sedimentary structures have been commonly destroyed and dolosparitic texture became prevailing. The transitional interval towards the overlying Felsőörs Limestone is made up by argillaceous, bituminous dolomite.

The thickness of the Megyehegy Formation is not more than 10–20 metres in the northern belt and in the western part of the southern belt. In the central part of the Balaton Highland and on the Veszprém Plateau its thickness may reach 250 m.

The Megyehegy Dolomite represents a shallow subtidal carbonate ramp facies.

The platform carbonate succession of the Tagyon Formation is made up by cyclic alternation of white, light grey or beige bedded limestone and yellowish laminitic carbonates. The shallow subtidal fossiliferous limestone beds (akin to the C member of the Lofer cycle) contain rich dasycladacean (see PIROS, this volume) and foraminifer assemblages (Oravecz-Scheffer 1980, Oravecz-Scheffer 1987). The thin stratified, calcite-spotted limestone beds of intertidal facies corresponds to B member of the Lofer cycle. In some horizons, supratidal lithofacies were also detected (Budai et al. 1993). The Tagyon Formation develops gradually from the underlying Megyehegy Dolomite, while its upper boundary to the overlying Upper Illyrian crinoidal, ammonitic limestone (Vászoly Formation) is sharp (Budai & Vörös 1992; Budai & Haas 1997, Vörös et al. 1997).

The areal extent of the typical (non-dolomitised) Tagyon Limestone is restricted to the middle part of the Balaton Highland where its thickness varies between 50–100 m. On the Veszprém Plateau, the formation is represented by a cyclic dolomite sequence that shows the characteristic sedimentological features of the Tagyon Limestone; it is informally called „Tagyon Dolomite”. The upper part of the platform carbonate is penetrated by neptunian dykes filled with red crinoidal dolomitised limestone (Budai et al. 1993, 2001). The truncated surface of the platform carbonate is covered by a few centimetres of red clay of palaeosol origin, that is overlain by dolomitised limestone with ammonoids of late Illyrian age (Vörös et al. 1997, Budai & Haas 1997).

Concerning its facies characteristics and palaeogeographic position, the Tagyon Limestone is similar to the Steinalm Limestone and the Dosso dei Morti Limestone in Lombardy (Budai 1992, Budai et al. 1993).

The Felsőörs Formation represents a Pelsonian basin succession in the Balaton Highland. The lower part of the formation consists of bituminous, yellowish-grey, clayey dolomite. The thickness of this “transitional unit” above the Megyehegy Dolomite is about 10 m. The lower boundary of the Pelsonian substage can be drawn within the upper part of this unit. The Felsőörs Formation is made up of brownish-grey limestones, argillaceous limestones, and marls with tuffite intercalations in the upper part. It is subdivided into the following three, partly coeval members:

— The Forráshegy Member, that consists of grey, bedded, nodular limestone with dark grey chert nodules and lenses. Upwards the limestone becomes flaser bedded with marl intercalations.

— The Horoghegy Member, that is made up of poorly bedded, in some sections (e.g. at Felsőörs) clayey, biotetral limestone. The rich fossil assemblage consists mostly of crinoids and brachiopods (see Pálfy 1986 and this volume). In the Aszófõ section, the member is characterized by redeposited lithoclasts of platform foreslope origin (Budai & Haas 1997).
— The Bocsár Member is composed of dark grey, even bedded, laminated, bituminous limestone, tuffitic limestone and marl. Ammonites and pseudo-planktonic bivalves are common (Vörös 1987, Vörös et al. 1997).

The thickness of the whole formation (including the Illyrian part) shows a characteristic trend along the Balaton Highland. It reaches the greatest value (about 150 m) near the platform to basin boundary at Aszófő. From there it decreases gradually to the NE and pinches out on the Megye-hegy. The thickness and the age of the different members are also variable. The areal extent of the Horoghég Member is restricted to the surroundings of the Pelsonian platforms. Its thickness in the Felsőörs section is about 4 m, in the Aszófő section is about 3 m (Budai & Vörös 1988; Tatzreiter & Vörös 1991), whereas in its type section at Köveskál (Horog-hegy) it is less than one metre (Vörös & Pálfy 2002). The Bocsár Member is the most characteristic lithofacies in the basin interior between Balatonfüred and Aszófő. In the borehole Balatonfüred–1, the whole formation is represented exclusively by this lithofacies, in a thickness exceeding 80 m. The Forráshegy Member is characteristic to the northeastern part of the southern belt (Felsőörs, Megye-hegy).

Considering only the lower, Pelson part of the Felsőörs Formation, the thickness of this interval is remarkably uniform. In four well documented sections, the thickness of the Pelsonian sequence is not less than 20 m and rarely exceed 30 m (Figure G-2). This implies that the above described asymmetric pattern recorded in the thickness of the entire Felsőörs Formation developed only in the Illyrian.