3.2.4. Stop 5 – Vinz and Cellon formations

The ascent to Mt. Freikofel starts along a NW-SE trending fault, which marks the transition from the Rauchkofel Fm. to the Vinz Fm. After the fault, at an elevation of 1642 m and coordinates N 46°36'00.3" E 12 58'31.3", the upper part of the Vinz Fm. is exposed (Fig. 15). This unit consists of two interlayered facies (BANDEL, 1972; SCHÖNLAUB, 1985; KREUTZER, 1992; SCHNELLBÄCHER, 2010; PONDRELLI et al., 2015b): (1) medium dark grey, thin to medium bedded, wackestones to packstones and (2) medium dark grey, medium to thick bedded, poorly sorted coral- and stromatoporoid-bearing rudstones (more rarely floatstones) and grainstone matrix; sometimes rudstones shows a fining upward trend up to grainstones. The base of this succession, right after the fault, belongs to the Eifelian Stage (PERRI & SPALLETTA, 1998), but the base of the Vinz Fm., dated elsewhere as Emsian (PONDRELLI et al., 2015b), is not exposed here.

The succession shows a thickening and coarsening upward trend which characterises the transition to the following Cellon Fm. (Figs. 11, 12, 15), which has been dated as lower Givetian. The Cellon Fm. consists of medium dark grey, very thick bedded, poorly sorted, coral- and stromatoporoid-bearing rudstones and subordinate floatstones with clasts up to ~40 cm of diameter and grainstone matrix; sometimes rudstones show a fining upward trend up to grainstones. Locally the base of the bed shows inverse grading with laminated grainstones passing to floatstone/rudstones. However, the deposits are mostly disorganised. The Cellon Fm. deposed in correspondence of the maximum extension of the reefal facies (BANDEL, 1972; SCHÖNLAUB, 1985; KREUTZER, 1992; SCHNELLBÄCHER, 2010).

The wackestone to packstone facies represent a pelagic depositional setting, while the breccia deposits represent gravitative-driven flows reworking shallow water, mostly reef-derived materials. This in turn implies the establishment of a reef and a slope connecting the shallow water environment with the basin. The base of the Vinz Fm. probably corresponds to a physiographic change of the basin from ramp-type to a rimmed shelf margin (BANDEL, 1972).

3.2.5. Stop 6 – Top of Mt. Freikofel

Walking along the path to the summit of the mountain, we will cross the Cellon Fm. up to the Freikofel Fm (Figs. 11, 12, 16). The transition has been dated as lower Givetian (PONDRELLI et al., 2015c).

A phosphorite-rich horizon (BANDEL, 1972) is present about 9 meters below the top of Cellon Fm. The transition to the Freikofel Fm. is marked by a progressive decrease, although with some fluctuations, of the breccia facies. The Freikofel Fm. consists of three well-bedded facies: (1) medium dark grey, medium to thick bedded, lithoclastic rudstones (subordinately floatstones) sometimes showing fining upward grading; matrix consists of grainstone (subordinately wacke-/packstone); (2) medium dark grey, thin to medium bedded grainstones and subordinate packstones locally showing fining upward grading; planar and subordinate cross lamination is present; (3) very thin to thin bedded, moderate pink to grey mud-/wackestones (BANDEL, 1972; SPALLETTA & VAI, 1984; SCHÖNLAUB, 1985; KREUTZER, 1992; SCHNELLBÄCHER, 2010; PAS et al., 2014).

The Freikofel Fm. was formed at the slope of a carbonate apron (SCHNELLBÄCHER, 2010; PAS et al., 2014). Deposits of hyperconcentrated and concentrated density flows and turbidity flows predominate. Thin interbeds of pelagic sediments are rarely preserved.

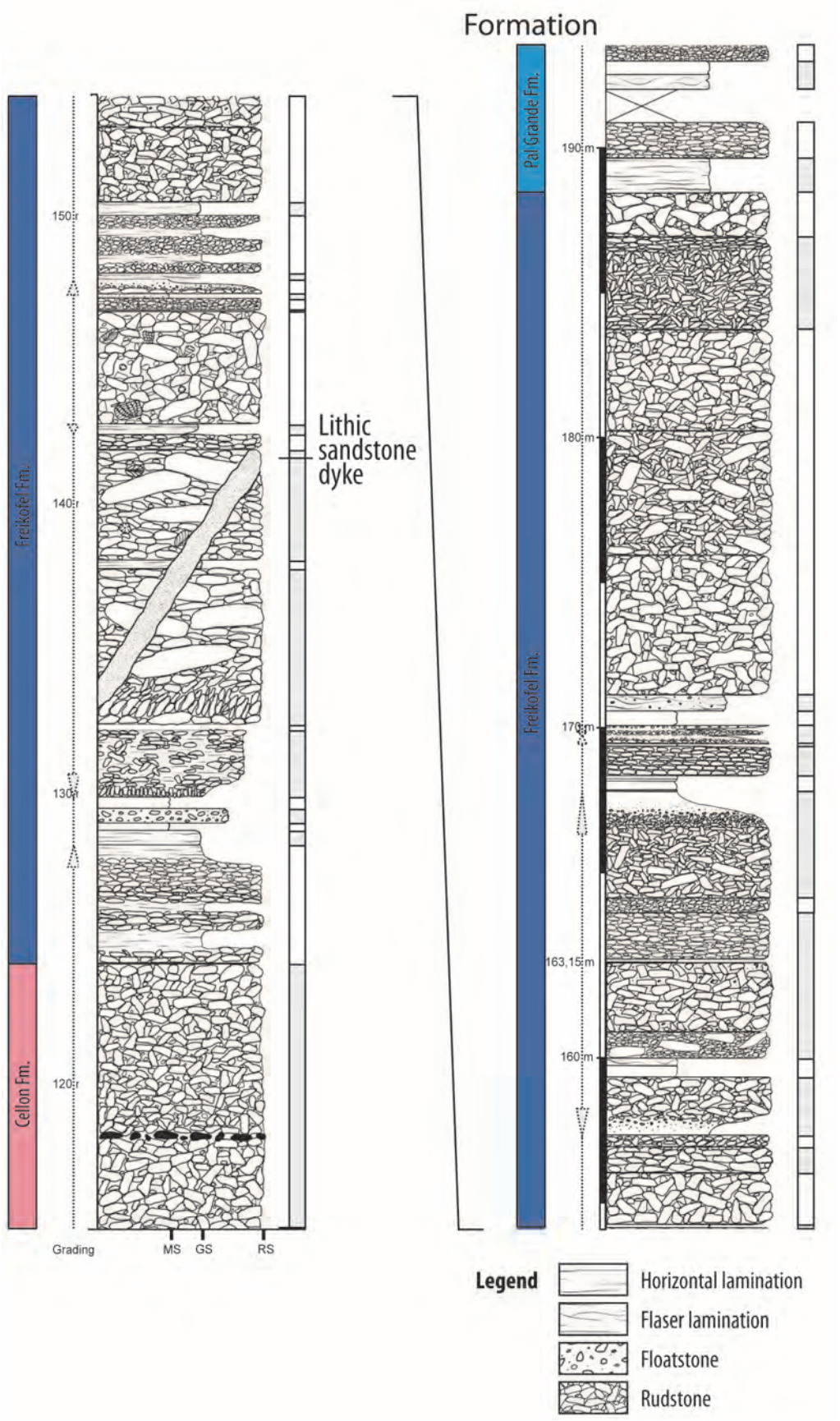

Fig. 16. Stratigraphic log of the upper part of the Freikofel section, correspondent to the upper part of the Cellon Fm., the Freikofel Fm. and the lower part of the Pal Grande Fm. (after SCHNELLBÄCHER, 2010).

Fig. 17. Panoramic view of the Creta di Timau area, with simplified stratigraphy and tectonic. The westward part of the complex shows the sharp boundary between the Rauchkofel and Kellerwand formations.

The top of Mt. Freikofel offers a spectacular panoramic view of the geology of this part of the Carnic Alps. To the southeast, the southern part of the anticlinal structure can be seen (Fig. 17), showing south-dipping beds of the Rauchkofel Fm. and the sharp transition to the Kellerwand Fm. The Rauchkofel Fm shows a clear thickening upward succession which reflects a shallowing upward trend abruptly interrupted at the base of the Kellerwand Fm. On the Eastern end of the cliff, the fault-bounded Creta di Timau represents part of the north-dipping flank of the anticline.
Toward the West (Fig. 18), the same succession of the Mt. Freikofel crops out in the Pal Piccolo and Cellon mountains. Instead in the Pizzo Collina, Mooskofel, Gamskofel and Polinik, the Devonian consists of shallow water facies.

Fig. 18. Panoramic view to the west from the Mt. Freikofel top. The Pal Piccolo and Cellon mountains consists of the same succession as the Mt. Freikofel. More to the west, the transition to the Devonian shallow water platform occurs.

3.2.6. Stop 7 – Freikofel and Pal Grande formations

Starting the descent from Mt. Freikofel in western direction, we will observe the gradual increase of thin-bedded grey and pink mud- and wackestones that will pass to the Pal Grande Fm. (Figs. 11, 12, 19). The formation boundary is assigned to the Frasnian according to conodont data (SPALLETTA et al., 2015a).
From the Lower Frasnian, the succession records low occurrences of reef-builder debris and/or shallow water-derived allochems compared to the high proportion of fore-reef-slope-derived lithoclasts (PAS et al., 2014). These data suggest a deposition during a period of low carbonate productivity within the shallow water settings, which in turn suggest that the early