Bericht 2011 über geologische Aufnahmen der quartären Sedimente im Stillupgrund (oberhalb Waldlalm) auf Blatt 150 Mayrhofen

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Roughly 40 % of the investigated area is coated with Quaternary sediments. In the remaining part, solid bedrock shows on the surface or is covered only with thin or dispersed drift. Three main genetic types of Quaternary sediments occur in the area: glacial (s. l.), alluvial and slope or residual, all of which originate from the Late Quaternary age or have been formed recently. Glacial sediments (moraines, outwash) occur mainly in the hanging valleys that surround the main valley and occupy a much smaller area in the back (SE) part of the main valley. Alluvial deposits (contemporary channel debris and alluvial fans) cover the floor and lower parts of the Stillup valley slopes. Scree, slope debris and boulders occur commonly in patches over the whole area.

Glacial sediments (*ss*)

End- and (less frequently) lateral moraines form well-pronounced and impressive sedimentary landforms in the valley. The most extensive and the highest ones occur on the NE, N and NW slopes of the main Zillertaler Alpen ridge, below the Greizer Spitze peak, Grosser Loffler peak, Keilbach Spitze peak and Wollbach Spitze peak. They occur at ca. 2,100–2,600 m a.s.l., reaching as high as 2,700 m at the margins of contemporary glaciers (e.g. at the western margin of Östliches Stillpukees glacier, at the eastern margin of Löflerkees glacier) or even a little above 3,000 m a.s.l. (west of the Vordere- and Hintere Stangenspitze peak). Remnants of terminal and lateral moraines are preserved at considerably lower altitudes, in the lower parts of Maderegglkar (1,960–2,390 m a.s.l.), Weißkar (2,130–2,350 m a.s.l.), Sonntagskar (2,100–2,300 m a.s.l.) and in Stapfelalm (1,570–1,840 m a.s.l.).

The age of the moraines can be partly determined with the use of topographic maps with the scale of 1:75,000 and 1:25,000 of Austria´s "Dritte Landesaufnahme", surveyed in the years 1887–1889 (sheets 5147 and 5147/3). The extent of the glaciers shown on these maps points clearly that the moraines located between 2,410 and 2,750 m a.s.l. on the NE rim of the valley (in Maderegglkar, Weißkar and in Sonntagskar) and between 1,990 and 2,520 m a.s.l. on its SW rim (in Lappenkar, Birbergkar and Finsterkar) were deposited during the Little Ice Age (roughly in the middle of the 19th century). Glaciers infilling SW cirques of the Stillup valley were apparently longer than those in NE cirques, probably due to more favorable conditions of sedimentation of snow on a lee side of the ridge bordering the valley from SW. The glaciers that filled large cirques N of the main Zillertaler Alpen ridge (Lőflerkar, Eiskar and nameless cirque actually occupied by the Östliches Stillupkees) ended at the height of 2,250–2,400 m a.s.l., i.e. not much lower than the present glaciers (Westliches and Östliches Stillupkees, 2,300–2,550 m a.s.l.), which benefit from favourite position in a "shade" of north facing slopes and walls and haven't "retreated" much since the Little Ice Age. Older moraines, probably from the Egesen (Younger Dryas) stage are preserved around and N of Stapfenalm (1,575–1,730 m a.s.l.) and in the lower parts of Sonntagskar, Weißkar and Maderegglkar (1,900–2,400 m a.s.l.). They form the low ridges that can hardly be seen in the field, but can easily be detected on airborne images and on the shaded DEM.

Younger, post-Little Ice Age glaciers left their end- and lateral moraines mainly high on the N slopes of the main ridge (2,100–2,740 m a.s.l.). The glaciers of that age were much smaller in other cirques surrounding the main valley. They left their end moraines there at the altitude of 2,450–3,000 m a.s.l.

Only a few of contemporary glaciers form end moraines. They are rather small, relict cirque glaciers terminating on steep slopes, where no or only some sediments can accumulate.

One rock glacier was found in Lappenkar, below the Lappenscharte pass. It is probably still active, as there are several ridges of freshly pushed-up material. Another one exists probably just N of the Grüne-Wand-Spitze peak, ca. 200 m below it. It is a large field of blocks, infilling a cirque and showing no traces of activity.

Large parts of the floors and slopes of the cirques are coated with slightly rounded blocks and debris, which probably represent the remnants of the moraines, washed out and transformed by consecutive periglacial processes. Similarly, poorly sorted and more angular debris and blocks, infilling terminal depressions or, more generally, located on the proximal side of the end moraines, are interpreted as ablation moraines. Both have been provisionally subdivided into three age events: Little Ice Age (ca. 1850), older (Egesen) and younger (20th century), based on their relationships to the end- and lateral moraines.

Fluvio- and limnoglacial sediments

Debris and block fields located in the forefield of the end moraines that reveal a fluidal pattern on aerial photographs and an orthofotomap have been interpreted as fluvioglacial (outwash) sediments. They are quite common on gently dipping surfaces of all cirques surrounding the Stillup valley as well as in the valley itself. The debris can be assigned to the Little Ice Age glaciation or to younger glacial stages, including contemporary glaciers. The block fields form flat and vast fluvioglacial fans in its uppermost par above the Taxachalm. They were probably formed by meltwater streams during all glacial events of the Holocene. The narrow and discontinuous fluvioglacial terrace stretches along the Stillupbach River. Its upper surface reaches as high as 3–7 m above the river level. It is the only terrace visible in the Stillup valley. It was formed generally in the Holocene. It reflects periods of intense outwash carrying and laying down more load, therefore connected with intense glacier melting out.

Relatively more fine grained sediments (mud and coarse sand with admixture of debris and poorly rounded gravel) partly fill terminal depression of the Östliches Stillpukees glacier and form a well-pronounced limnoglacial plain dissected by an actual meltwater creek. A small ephemeris lake can be found there too.

Periglacial sediments

Periglacial phenomena (frost cracking, frost heaving, solifluction etc.) have been active since the "retreat" of the Würm and Holocene glaciers. They have affected both the sediments and landforms created earlier as well as solid bedrock. Original glacial (s.l.) sediments have been reworked and have lost their diagnostic features. Therefore, the large fields of what originally was a glacial sediment (moraine: ablation, basal etc.) can now only be interpreted as unspecified moraine remnants. The most pronounced result of the frost phenomenon is the formation of vast fields of blocks, which occur in patches almost over the whole area above the valley. Finally, slope debris and scree are the results of the same phenomenon. The building of the block fields and slope sediments continues till today. Older layers are covered by younger ones. Therefore, their age cannot be specified as among the block fields or slope debris older, e.g. early Holocene remnants are equally probable to contemporary ones.

Fluvial sediments and landforms

The narrow valley floor does not leave much room for alluvium to be accumulated. It is merely a narrow zone of wild braided river sediments (poorly rounded gravel, coarse sand and loam) that fills the dissection of the fluvioglacial terrace. A much larger part of the valley slopes are covered with coarse-grained, poorly-rounded debris and blocks deposited by tributaries and forming large alluvial fans. The largest fans have been formed below the mouths of relatively small cirques hanging immediately over the main valley (e.g. Finsterkarl and a no-name cirque N of it), while much larger cirques located farther and higher from the main valley have formed much smaller fans. This is probably due to more favourable conditions for laying down washed-out load on the slopes below the cirques, but still high above the valley slopes.

Blatt 163 Voitsberg

Bericht 2012 über geologische Aufnahmen auf Blatt 163 Voitsberg

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Nach dem Erstellen der digitalen Manuskriptvorlage für das Kartenblatt 163 Voitsberg (Geol. B.-A., 2008) wurden im Berichtsjahr 2012 folgende Tätigkeiten durchgeführt:

1. Begehungen/Befahrungen entlang der Hauptbewegungslinien im Gesamtbereich des Kartenblattes zur Dokumentation neuer Aufschlusssituationen.

2. Begehungen im Bereich Pfaffenkogel und NW von Rein, da hier nach der Sturmkatastrophe „Paula" im Jahr 2008 zahlreiche neue Forstwege zur Bewältigung der Forstschäden angelegt wurden.

3. Begehungen im Raum Voitsberg zur Klärung der Grenzsituation der Raasberg-Formation zum unterlagernden Kristallin und der Schöckel-Formation.

Alle Korrekturen/Änderungen werden direkt in die digitale Manuskriptvorlage eingebracht. Die nachstehend angeführten Beobachtungen beziehen sich auf die oben genannten Berichtspunkte 2 und 3.

Am Pfaffenkogel (S Kleinstübing) sind die unter den Dolomiten der Flösserkogel-Formation (Pfaffenkogel-Subformation) liegenden dolomitischen Silt- und Sandsteine (Göstinggraben-Subformation) nun dank der neuen Forstwegaufschlüsse besser gegen die Dolomite abzugrenzen. Bei der Bahnübersetzung (ca. 1 km N des Freilichtmuseums) wird die Göstinggraben-Subformation im S von einer WNW verlaufenden Störung begrenzt. Der NE Hangfuß des Pfaffenkogels, in der Manuskriptvorlage als Bergsturzmaterial ausgewiesen, ist aufgrund der besseren Aufschlusssituation nun als Hangschuttareal zu klassifizieren.

Am Gsollerkogel (NE Rein) wurde eine Weidefläche NW Kote 668 m ursprünglich als hochliegendes Neogen angesprochen (EBNER, Mitt. Ges. Geol. Bergbaustud. Österr., 29, 99–131, 2 Kt., 1983). Einige Aufschlüsse zeigen nun aber, dass in diesem Bereich tiefgründige Bodenbildungen über siltig-sandig dominierten Bereichen der dolomitischen Flösserkogel-Formation auftreten.

Im Bereich Rein–Pleschkogel–Heiggerkogel–Mühlbacherkogel ist das Unter- bis Mitteldevon durch die fazielle Verzahnung der dolomitisch dominierten Flösserkogel-Formation zur kalkigen Heigger-Formation gekennzeichnet. Die monotone Ausbildung der Schichtfolgen erschwert die Abgrenzung der einzelnen Subformationen der Flösserkogel-Formation, von denen lediglich die Pfaffenkogel-Subformation mit massigen Dolomiten im Bereich des Hochsteins (Kote 925 m) auch morphologisch gut erkennbar ist. NE des Treffenberges und Mitterkogels wurden in den Dolomiten geringmächtige Einschaltungen von Tuffiten gefunden. Die rotbraunen Gesteine zeigen im Schliff in einer dolomitisch-serizitischen Matrix eckige bis gerundete klastische Quarzkörner, stark serizitisierten Plagioklas und ?vereinzelt Blasenhohlräume. Sie sind vergleichbar mit Tuffen, die S des 2012 begangenen Areals vor Jahren auch im Pechelgraben in einer Nahposition der Göstinggraben-Subformation zu Dolomiten der Flösserkogel-Formation festgestellt wurden. Die Tuffe des Pechelgrabens zeichnen sich aber durch die Dominanz und besser erhaltene magmatische Plagioklase (mit Plagioklasleisten) aus. Die Tuffe/Tuffite können mit den basischen vulkanischen Einschaltungen der Admonterkogel-Subformation auf Blatt 164 Graz parallelisiert werden, wo sie im Grenzbereich der Göstinggraben-Subformation zu den hangenden Dolomiten auftreten (FLÜGEL et al., Geol. Karte d. Rep. Österr. 1:50.000, Bl. 164 Graz, Geol. B.-A., 2011).