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Artikel: Hydrologische Untersuchungen im Gebiete der Valle Onsernone (Kanton Tessin) : mit besonderer Berücksichtigung des Kolkphänomens
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Summary

The valley of Onsernone (Switzerland) and its side-valley, the valley of Vergeletto, are unbedded in the radics of the Penniniccovers. The subsequent drainage is generally maintained. The ground wherefrom the rivers Isorno and Ribo get their water show a real fluviatile formation, which wasn't effaced by the glacial period. Today all this country is free of glaciers.

The average altitude of the district in question amounts to 1590 m. 75% of the entire surface lie between 1200—2100 m, what proves that this district hasn't yet lost its formerly disposition. The climate can be considered as mediterranean. Centovalli and Onsernone with their 2050 mm of precipitation appertain to those districts of Switzerland having the utmost of precipitation. The predominant wind in winter is a «Föhn» coming from north. The most winds however come from north-west and south-west.

The general type of vegetation comprises forets of oceanic beechtrees and of continental larches and silver firs. The great plentifulness of species and the rare species in the lower parts justify the determination «Alpine Insubricum».

Among the fifferent morphologic formations the Potholes seem to engage an exceptional position, their formation not proceeding like in the lowland, but beeing tectonicly conditioned, and we can find them only in a relatively short part of the water course. Formation of Potholes, very similar to «Kolk» in their exterior forms is only seen in the «Wanda»-ravine. All Potholes show a typical longitudinal profile: caldron-shape by vertical falling, tub-shape by oblique-falling of the ground. Mostly their is also a simultaneous plastering of the ground with boulders, which are removed by highwaters. Responsible for the speed of the water is the drop of the water-surface and not that of the bottom. By the same surface of water's drop the mass of energy grows with decreasing speed of sink. It ensues: that the smaller the drop the deeper the pothole. We also find an evident constance in the alluvial formation. The accumulation takes places between the autumn's and spring's highwaters, whilst the state generally remains stable during summer. In the Isorno-River the average mass of boulders amounts to 44 000 m^3 yearly.

The mathematic calculation of the Pothole's depth has lead to a change of the Schoklitsch' and Eggenberg' formulas, as these would have given much too high values. The heterogeneous formation of the river-bed prevents a lawful accumulation of alluvions. The sporadic accumulations of gravels mostly appear as smaller or bigger piles of gravels behind big boulders, but only seldom as river sand-banks. The relatively frequent sand-banks at the riverside are mostly formed after sudden enlargements of the transverse section.

The curve of precipitations in the valley of Onsernone shows, corresponding to the Mediterranean-type, three peaks: May/August, September and November. The average for the period of 1949 to 1953 amounts to 1938 mm or 230,6 Mill. m^3. With increasing altitude the precipitations decrease for 54 mm/100 m.

The discharge of water is composed of that mass of water, which immediately after each precipitation flows off and thatone, which appeares in form of fountains. In average the Onsernone-Valley yields 183,7 Mill. m^3 of water a year. From December to March we have a minimum of amounts. The increase to the maximum amount in May with a discharge of 156 liters. Then we see a steady decrease till September and a new maximum in November. The maximum discharge of Isorno-River amounts to 9,5 Mill. m^3 per day, the minimum only to 47 000 m^3. The Summer-months require 73% of the yearly discharge, the Winter-months only 27%.

Discharge — precipitation

According KELLER there is the following proportion between discharge and precipitation, available for Central-Europe:

$$D = 0{,}942 \cdot (P - 430)$$

For the Onsernone-Valley the following formula is available:

$$D = 151{,}3 + 0{,}87\ (P - 193{,}7)$$

Erosion and vegetation

Both of them substantially depend upon kind and intensity of the precipitations. Especially torrential rains are of great importance, but usually they seldom hast longer than one hour. 65% of the precipitations are discharged.

Origin of boulders

Most of the boulders come from the area of the real Alpine pastures and the district between the former and the recent woodlimit. The strongest effect of the erosion is found immediately below wellwooded districts.