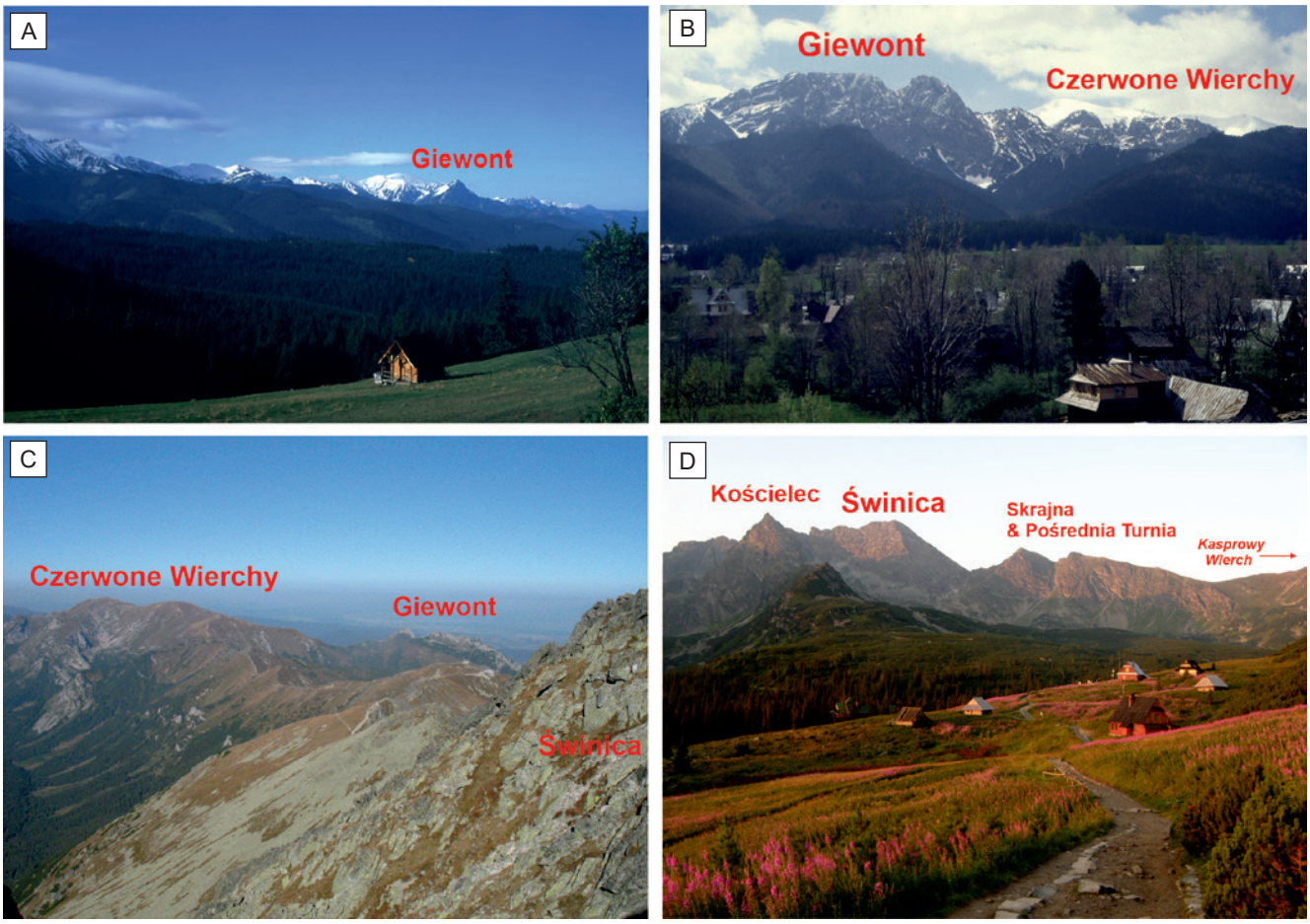

Fig. 56. Panoramic view of the Tatra Mts with most characteristic shape of the Giewont Mt (from north – A, B and from south – C) and the Gąsienicowa Hala area during sunrise (D), including Liliowe Pass (D)

The oldest part of this flysh – the Zakopane Formation (Lexa *et al.*, 2000) is well exposed in the streams in the marginal part of the Tatra Mountains. The uplift of the Tatras, dated using apatite fission tracks, took part probably during the Miocene (15–10 Ma) (Golonka *et al.*, 2005). Glaciation covered all higher areas of the High Tatras and parts of the Western Tatras. The Tatra Mountains (especially the High Tatras) are known to have undergone four glaciations. The most extensive transformations were caused by a glacier 100–230 m thick. Valleys were gouged by the glaciers into the characteristic U-shape. Hanging valleys were created in subsidiary valleys, he glacial erosion also sharpened the mountain ridges and formed deep cirques, with terminal moraines creating large numbers of glacial lakes after the ice had retreated. Material carried down by the glaciers to the foreland formed glacial cones, on one of which the Polish town of Zakopane now stands. The glaciers disappeared from the Tatras about 10,000 years ago. There is now no permanent lying snow on the mountains. The karst, whuch include karrens, abysses, vauclusive springs and limestone caves play important role in creating the Tatras sedimantary cover lanscape. Six caves are open to public in Poland, including Jaskinia Mroźna (the Frosty Cave) with electric ligh, however. the most interesting cave accessible to the public is Belianska jaskyna in Tatranska Kotlina in Slovakia.

Tatra Mountains belong today to Tatra National Pak and are well protected, by in the past, until 19th century the ores were mined in the Kościeliska and Chochołowska valleys. The old mining road, so-called Iron Road is now the popular walking trail connecting Kościeliska Valley with Kuźnice, the site of 19th century steel, today the site of lower station of Kasprowy Cable car.

Stop 19 – Liliowe pass – Lower Triassic, nappe structures (Figs 54, 55)

(*Michał Krobicki*, *Jan Golonka*)

Using cable car from Kuźnice to Kasprowy Wierch (1987 m a.s.l.) we can go to the central part of the Tatra Mountains.

The peak of the Kasprowy Wierch is built by Hercynian (Carboniferous) crystalline rocks that form an isolated tectonic island (so-called "Goryczkowa hat" = Goryczkowa Crystalline Island) (Fig. 53) which overlying Mesozoic sedimentary rocks of the autochthonous Tatric domain. Liliowe Pass is very famous place in the Polish history of geology. Wieczorek (2000) described it as follow: "Here, during IX International Geological Congress (Wien, 1903) a discussion between Victor Uhlig – the author of Geological Map of the Tatra Mts and Maurice Lugeon – who had never been in the Tatra Mts before, took place. After this heated discussion the nappe conception of the Tatra Mts structure was accepted" (Wieczorek, 2000: 257) (comp. Fig. 51; Krobicki, 2022).

On this pass we can see autochthonous Lower Triassic red quarzitic sandstones of flood plain to lagoon deposits of the so-called Alpine *Werfen*-type facies. On the other hand, the whole tectono-structural position of the Tatra units is well visible (during good weather day!) and full context of connection between crystalline core of the High Tatra and sedimentary cover of the nappe structures.

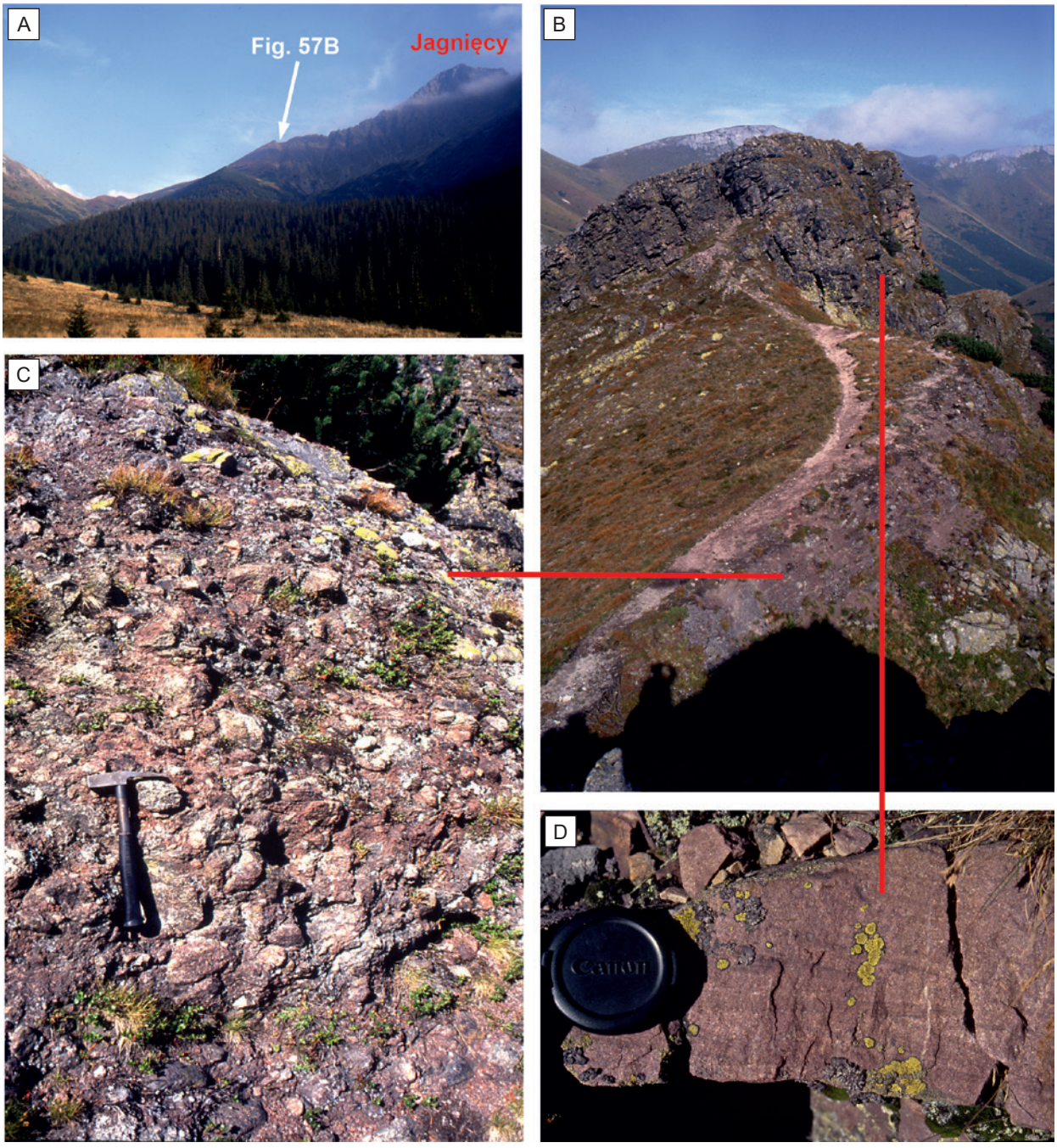

Fig. 57. Panoramic view of the Jagnięcy Mount (A) (Slovakian part of the Tatra Mountains) with granitoidic basement covered by the oldest sedimentary rocks in the Tatra Mountains – Verrucano facies (B, C) and the lowermost Triassic Verfen-type quartzic sandstones with cross-bedding structures (D)