



*veneris*. Also present are the nationally rare Small Hare's-ear *Bupleurum baldense* and White Rock-rose *Helianthemum appeninum*.

The area's low pollution levels, and the variety of habitats present within the site, have enabled a rich and diverse lichen flora to develop. In the wooded parts, the presence of old-forest indicator species is of note, for instance *Lobaria laetevirens*, *Nephroma laevigatum* and *Sticta sylvatica*. Lichens of alkaline bark are frequent, including *Bacidia phacodes*, *B. rubella* and *Cryptolechia carneolutea*. On limestone crags the most shaded rocks support a community dominated by *Lepraria crassissima* and *Lepropeaca chrysodeta* but also including *Caloplaca cirrochroa* and *Cyalecta jenensis*. A number of rare species occur on the limestone, notably *Buellia leptoclinoides*, *Opegrapha lithyrga* and *Rinodina oxydata*. Highly selective calcicoles are well represented, such as *Bacidia cuprea*, *Caloplaca aurantiaca*, *Cladonia pocillum*, *Petractis clausa* and *Squamarina cartilaginea*. More acidic rocks are indicated by the presence of *Fuscidea cyathoides* and *Pertusaria lactea*.

Hope's Nose exhibits excellent exposures of the Devonian Daddyhole Limestone (Eifelian) and displays the typical characteristics of this unit as well as unusual features such as evidence of penecontemporaneous erosion, within the limestones of the old Hope's Nose quarry. District sub-facies can be recognised in the limestone exposed here and it is a well known Devonian locality with unrivalled exposures in the Torquay Limestone.

A series of mineralised veins cutting through Devonian limestone are exposed in the rock platform on the eastern side of Hope's Nose. The vein fillings consist mostly of calcite, haematite and dolomite but small quantities of native gold also occur, as fine branching filaments. Recent detailed research has also revealed the presence of very rare palladium minerals (isomertieite and mertieite II). This is the only known occurrence of this assemblage of minerals in Britain, making this a nationally important site for mineralogical structures.

Hope's Nose and Thatcher rock are key sites for studies of Quaternary stratigraphy and sea-level change. At Hope's Nose a shore platform at 8m is overlain by cemented raised beach, comprised of cobbles and boulders at its base, fining upwards into bedded sands. Blown sand and hillwash lie above. A similar raised beach occurs on the offshore stack of Thatcher Rock. The beach deposits are particularly important for their assemblages of fossil marine molluscs and foraminifera. Seventeen species of mollusc have been recorded from Hope's Nose and forty-three from Thatcher Rock. The assemblages from both sites are temperate in nature, although that from Thatcher Rock indicates slightly cooler conditions than those of the present day. Amino-acid dating suggests that the Hope's Nose beach relates to oxygen isotope stage 7 (ca. 210,000 years B.P.). The well-preserved molluscan faunas and the sedimentary detail of the raised beaches are of crucial importance for dating and interpreting Quaternary sea-level changes and related environmental conditions in south-west England.

The Devonian limestones of Hope's Nose display structural features of considerable geological interest. A rare example of a flat-laying dislocation (thrust fault) cuts through the strata near the southern point of the headland. The west facing cliff there also provides an outstanding exposure of a large recumbent fold of the limestones, which are overturned on the northern side of the fold and transected by the thrust beneath. The two structures are probably of the same age and provide important evidence of northward-directed over-thrusting during the Variscan mountain building episode in the late Carboniferous period.

The Long Quarry area includes the type section of the Devonian Walls Hill Limestone. The best exposure of this stromatoporoid-rich unit can be seen here in the quarry floor. The steep dip of the beds allows an easy bed-by-bed examination to be made. Within the formation it is possible to recognise four distinct sub-facies not seen elsewhere in the

marine carbonate sediments of the Torquay Limestone. The site is unique in so well displaying the development and form of a stromatoporoid reef.