Economic geology - Jersey: description of 1:25 000 Channel Islands Sheet 2

From Earthwise
Jump to navigation Jump to search

From: Bishop. A. C. and Bisson. G.1989. Jersey: description of 1:25 000 Channel Islands Sheet 2. Classical areas of British geology, London: HMSO for British Geological Survey.

Jersey (Channel Islands Sheet 2). 1:25 000 series - Classical areas of British geology

Plate 24 Ronez Quarry, St John. (Photograph by Dr A. C. Bishop).
□

Contents

Chapter 10 Economic geology

In the past the population of Jersey was much smaller than it is at present and the needs of the islanders were met from the island's own resources, though they have always been dependent on the outside world for such basic commodities as metals and cement. The present economy depends principally on tourism, agriculture, and finance, and does not rely on the exploitation of natural resources, though water supply is of critical importance.

Quarrying

In the earliest times the basic need for shelter was met by caves. Later, the first builders–the constructors of the Neolithic dolmens–used wattle and daub for their houses, but slabs of rock for their tombs. Some of these rocks were of considerable size, and many were transported several miles (Mourant, 1977); thus granite from Mont Mado was taken to La Hougue Bie and other sites in Neolithic times. Also, the builders seem to have preferred certain rock types to others; for instance, Fort Regent granophyre is common in dolmens. In due course the abundant rocks suitable for building in virtually every part of the island were put to use; granite and diorite were particularly favoured, and builders simply took material from the beaches or removed blocks from reefs or outcrops using rudimentary tools.

As the need for more substantial buildings for housing, commerce and defence increased, so quarries were opened, though Rybot (1947) commented that quarries as they are known today did not come into being until the 18th century and even then were worked in a primitive manner. Nevertheless there is evidence that the Mont de la Ville, on which Fort Regent now stands, was probably quarried both by the dolmen builders and in the Middle Ages, before it was extensively worked during the late 18th century. By the 19th century the demand for rock for major building and construction works had so increased that new quarries were being started. Between 1847 and 1856 the large quarry at St Catherine [712 531] supplied material for the construction of the nearby breakwater. Though this is built mainly of Rozel Conglomerate, many of the granite coping stones were imported, probably from south-west England. This impressive structure was designed to be the northern arm of a large harbour, and a smaller quarry in ignimbrite at Archirondel [7092 5180] was opened to supply rock for the incomplete southern arm, which however, like its northern counterpart, also consists mainly of Rozel Conglomerate. The conglomerate for the southern arm was transported by rail from a quarry in the valley that runs eastwards to the sea from north-east of St Martin's Church.

Although rock was transported within the island from quarry to site, it made sense to use material that was locally available, and rock was quarried on the foreshore at low tide. There are evidences of such workings in many places on the south coast of the island. Jersey granite is difficult to work and to carve, and much granite was therefore imported, especially from the Chausey Islands. Chausey granite lacks the close jointing of the Jersey rocks and is easier to work, and it is thought that the technique for the accurate splitting of stone was introduced by Chausey workmen (Rybot, 1926). The use of Chausey granite for elaborate carvings in churches, for the carved troughs and wheels of crushers for cider making, as coigns and lintels of houses, and in Jersey fireplaces, extended over many years and has been documented by Stevens (1965, 1977). Rock for building was also imported from Les Minquiers and was used in the construction of Fort Regent. A considerable amount of Les Ecréhous gneiss—more than appears to have come from Les Minquiers—was imported from the 17th century (and possibly earlier) until at least 1811 and was used extensively in buildings, principally around Rozel (Mourant, 1956). At this time quarrying on Les Ecrehous was encouraged by the Admiralty in the hope of removing the islets altogether, as they were thought to be protecting French warships from British naval guns.

Towards the end of the 19th century the general demand for rock was such that its export–chiefly to Great Britain–became an economic proposition. Quarries at or near the coast were best situated for this purpose. Noury (1886) mentioned the commencement of quarrying at La Houle, and the resulting Ronez Quarry [617 568] is the largest working quarry in Jersey (Plate 24); great quantities of rock have been exported, chiefly for use as setts and kerbstones, and as road metal. The Mont Mado Quarry [637 556] at St John was much older and yielded perhaps the most handsome of all the Jersey monumental and building stones, a slightly pinkish grey aplogranite. Flees (1817, p. 310)

commented 'The stone from this spot is preferred to any other in the island. Many of the most ancient houses are built with it. It works readily, and a flat surface is easily obtained.' The quarry was filled some years ago.

Farther south, at Handois [6322 5386], the same facies of the north-west granite was quarried as a china-stone, which was reported to fuse more easily than that from Cornwall and was hence used for pottery glazes. The china-stone was discovered in about 1866 and it was quarried, crushed on site, and then shipped for use in the pottery industry (Furnival, 1904). Molybdenite that was found in this quarry was set aside and sold separately, probably to mineral dealers but possibly also as ore.

Rock was not quarried only for masonry: crushed rock—especially rhyolite from Anne Port—and even masons' chippings were used as road metal and for macadam. In places, for example at Longueville, Grouville Arsenal and La Moye, the rocks are so deeply decomposed that they were worked directly as gravel for use on the roads and some was even exported to Britain for making gravel paths.

The German occupation of Jersey from 1940 to 1945 saw a resurgence in quarrying to supply aggregate for concrete gun emplacements, defensive positions and anti-tank walls. Not only was the output of existing quarries increased and directed to this end, but old quarries were reopened and crushing plant was imported from Europe to speed the process. Railways were built to take the aggregate to the construction sites. A particular feature of this time was the excavation of several storage tunnels driven in the valley sides and totalling some 10 km in length; most of these are now sealed but one, in St Lawrence, was equipped as a hospital and is open to the public.

Since the war the quarrying industry has declined as fabricated materials have replaced natural stone in building and construction. A few working quarries remain and in recent years have supplied large amounts of rock for harbour works and land reclamation schemes at St Helier.

Siliceous flint-like rock, derived from French Oligocene freshwater deposits, was imported in Medieval and later times to provide the famous French burrstones for the local mills.

Sand and gravel

Removal of sand and gravel from the Jersey beaches is forbidden by law, but there is no doubt that large amounts were taken in the past for building purposes. During the second world war sand was removed from the beach at Grouville for use in the construction of fortifications. Some of this sand was used locally, but much was taken by barge to St Helier and St Aubin, whence it went by lorry or by rail to construction sites in the west of the island (Ginns, 1973). More recently, some sand was taken from St Ouen's Bay and Grève de Lecq when the Val de la Mare dam [578 5181 was constructed.

There are two major deposits of blown sand on the island, at St Ouen's Bay and at Grouville, and the greatest known thickness of 27 m was recorded at St Ouen's Bay (Keen, 1981; see also pp. 92–93). Both deposits have been worked from time to time and some of the abandoned pits at St Ouen have been used for waste disposal. Concern about the uncontrolled exploitation of the sand at St Ouen led

the States of Jersey to commission a report by the Institute of Geological Sciences on the resource potential of the area (Thurrell, 1972). The ecological significance of these dunes has been assessed by Ranwell (1975, 1976).

Brick clay and brickearth

Some 'clay' (a fine silt, probably redeposited loess) is present in the alluvial deposits in the St Helier basin and at St Ouen, and there is also some clay beneath shingle around the south and east shores of the island. These freshwater clays were formed in lagoons when sea level was lower than at present and in situations similar to those now obtaining at St Ouen's Pond. In addition the loess has provided brickearth of a quality suitable for making bricks; the most extensive unbroken sheet of loess–which is a silt rather than a clay–is in the district of Maufant (Old French meaning 'bad mud'), the name deriving 'from the nature of the soil… which in flat areas tends to become waterlogged' (Mourant, 1935, p. 493).

The clay in the St Helier basin was worked first, and the brickearth deposits were exploited from about the time of the Napoleonic wars, at Gallows Hill and West Mount, and most extensively in the Five Oaks area of St Saviour and at Mont a l'Abbe north of St Helier. When the loess at the brickworks at Five Oaks was exhausted, the underlying head and weathered andesite were hydraulically compressed into bricks.

Limestone

Eocene limestone occurs on the sea bed around Jersey, but limestone is absent from the island itself. Therefore limestone was formerly imported from France, particularly Carboniferous Limestone from Regneville, to be burned locally to produce lime. Large quantities of local marine shells were also burned at one time for this purpose. As recently as 1918 mortar was made from a mixture of crushed and sifted granite and imported lime, burnt locally (Dr A. E. Mourant, personal communication). Jurassic limestones from Dorset were much used in military construction.

Fuel

Fossil fuels are virtually absent from Jersey, and wood was probably the staple fuel until coal and oil were imported. There are records of coal being shipped to Jersey and Guernsey from Neath and Swansea in Elizabethan times (Williams, 1934). During the second world war, and especially in 1944–45 when fuel imports were impossible, an attempt was made to extract the peat in St Ouen's Bay in order to supplement the wood supply, but the enterprise proved to be both impractical and expensive, each rising tide flooding the trenches that had been dug. The peat beneath Grouville Marsh was also investigated and eventually some hundreds of tons were dug, but the primitive method of extraction made the fuel very expensive. The principal fuels now imported are coal, oil and natural gas.

Minerals

A list of the minerals that occur in Jersey has been compiled over the years and an account of them was given by Mourant (1961, 1978). Although metallic minerals do occur, there has been little metalliferous mining in Jersey, and such attempts as have been made were unprofitable and short-lived. Ixer (1980) has described the occurrence of ore minerals in the island and has distinguished five types of mineralisation:

1. Pervasive copper mineralisation associated with rhyolitic and andesitic volcanic rocks, for example at Bouley Bay. The principal minerals are chalcopyrite, 'idaite' and minor enargite group minerals. Mineralogically and texturally these deposits resemble the porphyry copper type of mineralisation.
2. Molybdenite-pyrite-chalcopyrite-sphalerite mineralisation associated with granite pegmatite and occurring as veins and in vugs within granite.
3. Vein mineralisation in granite, mainly magnetite-quartz and minor sulphides. This mineralisation is later than 2.
4. Minor sulphide-calcite mineralisation in the Jersey Shale Formation.
5. Zinc-lead-silver-antimony mineralisation in the Jersey Shale Formation at Le Pulec, genetically associated with granite.

Mourant and Warren (1934) described the history of mining in Jersey and the other Channel Islands. The best-known and the most successful attempt at metalliferous mining in Jersey was at Le Pulec [547 550], where three veins bearing galena and sphalerite were discovered on the foreshore in 1871. Shingle was removed so that the veins could be examined by a mining engineer brought from Cornwall: good silver values were reported by him (Williams, 1871) and by Ogier (1871), and proposals were made to work the ore. One plan to sink a shaft on land and extend from it a cross-cut to reach the lodes beneath the bay was never implemented, though the veins were worked on the beach at low tide. Despite the fact that some ore was exported, the operation seems to have been largely unsuccessful, for it was soon abandoned (Mourant and Warren, 1934).

Detailed descriptions of the Le Pulec mineralisation by Ixer and Stanley (1980) and Stanley and Ixer (1982) show that the sediments of the Jersey Shale Formation have undergone two periods of polyphase mineralisation. In the older, pyrite-pyrrhotine-marcasite were formed, and in the younger arsenopyrite-chalcopyrite-sphalerite, along with silicification and dolomitisation. The main ore-bearing veins at Le Pulec post-date these earlier phases, and comprise sphalerite and ferroan dolomite accompanied by polymetallic mineralisation from fluids rich in Pb, Cu, Fe, Ag, and Sb. This type of mineralisation is unique in Jersey.

Water supply

The water supply of Jersey comes mainly from the impounding of streams by dams constructed by the Jersey Waterworks Company. In St Helier formerly, and to some extent at present, water has been derived from shallow wells (up to about 10 m deep) tapping an aquifer in Pleistocene deposits in the rock basin beneath the town. In about 1920, overpumping of wells near the centre of the town drew in sea-water, and wells near the coast became salty and were abandoned.

In the plateau areas, water was formerly obtained by impounding the headwaters of small streams. Now, outside the areas served by the water authority, increasing use is made of deep bored wells. The depth to the water table and the probable yield are difficult to predict; much seems to depend on whether a borehole intersects one of the irregularly distributed water-bearing fissures in the rocks. A little water is drawn from the aquifer formed by blown sand near St Ouen's Bay (see pp. 92–93), and during droughts water is also obtained from the sea-water desalination plant at La Rosiere [5578 4805].

Authors and contributors

References

Glossary

Category:

- Jersey, classical areas of British geology

Navigation menu

Personal tools

- Not logged in
- Talk
- Contributions
- Log in
- Request account

Namespaces

- Page
- Discussion

□

Variants

Views

- Read
- Edit
- View history
- PDF Export

□

More

Search

Search Go

Navigation

- Main page
- Recent changes
- Random page
- Help about MediaWiki

Tools

- What links here
- Related changes
- Special pages
- Permanent link
- Page information
- Cite this page
- Browse properties

- This page was last modified on 14 November 2019, at 09:21.

- Privacy policy
- About Earthwise
- Disclaimers
- British Geological Survey NATURAL ENVIRONMENT RESEARCH COUNCIL
- Powered By MediaWiki Semantic MediaWiki