

Fossil-gathering and the law

Fossils are beautiful prehistoric relics and one could hardly wish for clearer evidence of the landscape and habitats existing here millions of years ago. But the supply is not limitless, and it will not be replenished. So it is important that fossil-gathering should be carefully and considerately undertaken, so that a future generation will also be able to take pleasure in these beautiful remains and scientists after our time will have material for study.

The Penal Code, the Environmental Code and "Everyman's Right"

Hammer extraction of fossils from a block or bedrock is not a part of "Everyman's Right" (common rights of access). It is prohibited by law (Chap. 12 of the Penal Code) and counts as interference or, in aggravated cases, criminal damage.

Loose fossils and stones are part of the ground and the property of the landowner. The taking away of individual souvenir stones or pieces of fossil of no economic value may be permissible – this can be read into "Everyman's Right" – but you are never permitted to remove stones from walls and other heritage structures, nor may you remove them from a quarry or stoneworking facility without permission. If you do, this is interference or criminal damage under Chap. 12 of the Penal Code. The taking away of more than individual stones and fossils for sale requires permission from the landowner and the County Administrative Board.

The Byarum Rauk Stones are a nature reserve, with the rules clearly signposted.



"Everyman's Right" is an individual right. Thus it does not apply collectively to geological societies, organisations, tourist enterprises and suchlike and cannot be pleaded by them in support of organised activity on someone else's land. An arranger must have sufficient knowledge of the terms of "Everyman's Right" and must inform the participants accordingly.

If the landowner consents, it may be permissible to extract stones and fossils or remove loose ones, but not if the collecting is "liable to have a significant impact on the natural environment" (Chap. 12, Section 6, the Environmental Code). In this case, the County Administrative Board must be consulted first. The removal of a souvenir fossil does not rank as "significant impact on the natural environment", but fossil-gathering is always prohibited in protected areas, such as nature reserves and national parks.

Legal possibilities

It may be a good idea to ask companies engaged in quarrying operations in Öland for permission to extract and gather fossils on their land. They already have official permission for quarrying, and the stone is already exposed. Perhaps there is an area from which you can remove fossils without any harm being done.

If you have any further questions about fossil and stone collecting, feel free to call the County Administrative Board on +46(0)480 821 95 or to e-mail miljoexp@h.lst.se.

This brochure is a joint production by the Öland Limestone Project and the Kalmar County Administrative Board. The purpose of the Öland Limestone Project is to highlight present and future opportunities for Öland limestone and the island's quarrying industry.

© Projekt Öländsk Kalksten & Länsstyrelsen Kalmar län
Text and production: Göran Falk, Jan Mikaelsson, Mats Waern, Svante Brandin, Markus Forstlund, Therese Säfström
English translation: Roger Tanner, Ordväxlingen AB
Watercolours: Peter Larsson and Lasse Karlsson
Photo credits: Anders Johansson, Magnus Strindell, Göran Falk, Therese Säfström. The cover pictures show Byrums Raukar, fossilised fragments of lumpfish, Källa Old Church and the historic stonemasonry site at Jordhamn (rear cover).
Layout: Therese Säfström
ISBN: 91-974576-7-1
Printed: Kalmar Sund Tryck, 2005

LIMESTONE AND FOSSILS IN ÖLAND



LÄNSSTYRELSEN
KALMAR LÄN



Mål 2 Södra
Projektet stöddfinansieras av
EUROPEISKA UNIONEN
EG:s strukturfond

Long before human times

Some 550 million years ago, the flat crystalline basement platform flat making up the true foundation of Öland was submerged by water. The bedrock which is now Sweden was at that time located south of the Equator, with an almost tropical climate.

Particles of sand fell to the bottom of the water, eventually composing the sandstone which lies on top of the crystalline basement. Later on, small clay particles also sedimented – these are now the clay and alum shales – and last of all came lime mud and shell fragments which, in the course of millions of years, solidified into limestone.

All this exciting development took place during the geological periods known as Cambrian and Ordovician. It's a mind-boggling thought that just one millimetre of limestone was something like a thousand years in the making.

The Öland bedrock bears traces of early life! We see them in the form of fossils, i.e. petrified remains of plants and animals.

A schematic cut-away picture of the Öland bedrock.



It is seldom one finds shell fragments from a complete trilobite, but Öland limestone includes plenty of shell fragments otherwise.



The Orthoceratites found in Öland are often clearly segmented.

Fossilised life

The sandstone, which is best observable as loose blocks along the seashores, for example, includes traces of an early sand worm, Skolithos. This is often visible as vertical, brownish-red, sand-filled burrows in the horizontally stratified basal sand. Several different fossils are found in the shales and limestone. The Orthoceratites are a common group of fossils – so common, in fact, that the Öland sandstone, orthoceratitic limestone, is named after them. The Orthoceratites were a kind of octopus with an outer shell. The shell was divided into chambers linked together by a tube and believed to have functioned like the ballast tanks of a submarine. Traces of the animal's soft tissue are hardly ever found, only the cylindrical outer shell. Not all Orthoceratites had a straight shell. In the *Lituites* family the shell is tightly coiled at the rear, resembling a bishop's crozier.

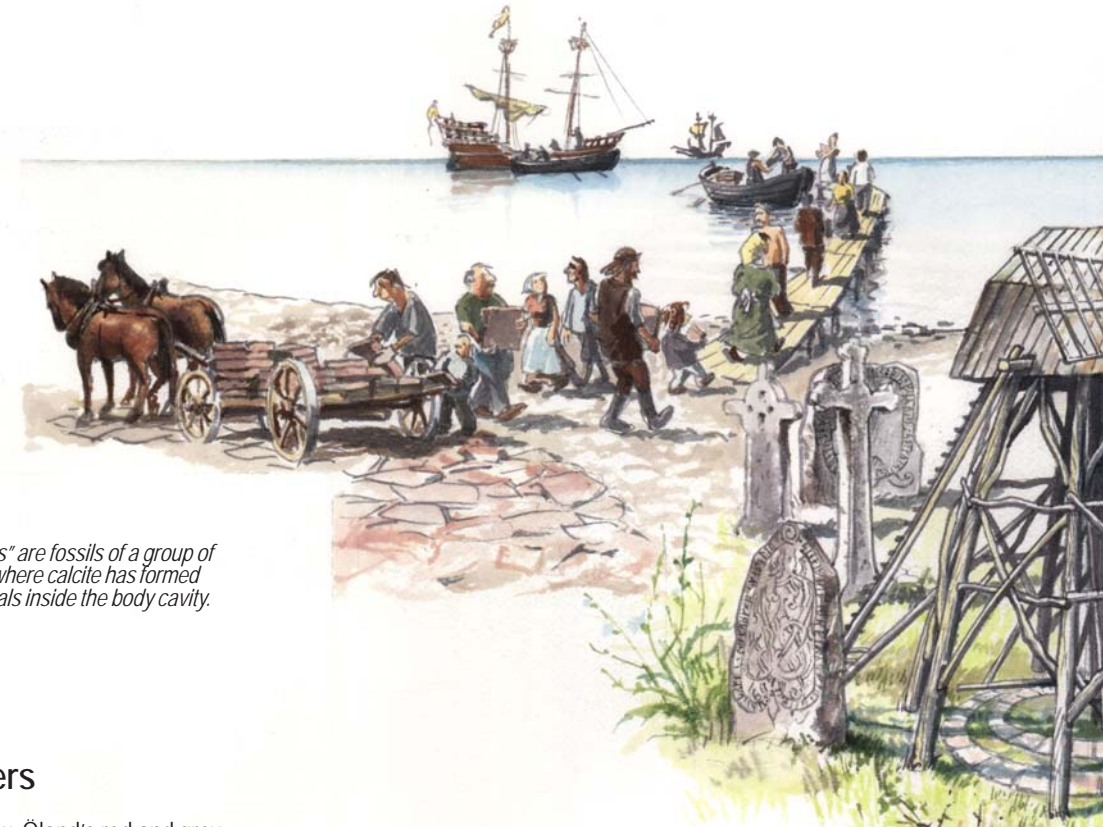
Next to the Orthoceratites, remains of trilobite shells are the most conspicuous of Öland fossils. The trilobites belong to the arthropods – articulated animals – and are distant relatives of the crustaceans and arachnids living today. All that remains of them is their "shell", which they are believed to have changed in much the same way as crustaceans do nowadays. The trilobite body was divided into three parts or "lobes" – hence the name. The head shield (cephalon) was equipped with very highly developed eyes. The middle part (thorax) was made up of a number of small interlocking segments. The tail shield (pygidium) protected the rear part of the body. Attached to the abdomen were webbed or tubed feet.

In the limestone one also finds a small, near-circular fossil which Linnaeus dubbed "crystal apples". This represents an extinct group of echinoderms, i.e. is distantly related to present-day sea-urchins. In broken specimens the cavity inside the fossil – i.e. what used to be the animal's body cavity – is more or less full of small glittering calcite crystals.

There are, of course, other fossil groups to be found beside those we have now mentioned. Fossil molluscs, mussels and brachiopods are not exactly uncommon, nor are traces of small, colonial marine organisms called graptolites.



"Crystal apples" are fossils of a group of echinoderms where calcite has formed beautiful crystals inside the body cavity.



Stone and the islanders

For over fifteen hundred years now, Öland's red and grey limestone has played an important part in the islanders' economy, which in times gone by was based on a combination of stone-quarrying, cattle-farming and fishing. Limestone has been quarried in large parts of Öland and upgraded for mortar and building material.

Stone walls, prehistoric forts, churches, Borgholm Castle and other buildings of Öland testify to the local use of stone. Exports of Öland limestone are recorded since medieval times, when it was shipped in large quantities to countries round the Baltic to be made into churches and other monumental buildings, as well as decorations like baptismal font and doorways. The art of the stonemason was highly developed as this time.

During the 16th and 17th centuries, Öland stone was used for a widespread refurbishment of Swedish castles, and Öland limestone became Sweden's dominant stone export commodity. At Dälje, the stonemasons' village on the Horn promontory, sculptures and

decorations were carved to perfection under the direction of German, French and Belgian stonemasons.

Old quarries today are important mementoes in the manmade landscape of Öland, bearing witness to a long tradition of stone-quarrying and upgrading, a tradition still carried on using modern techniques. Limestone today is put to the same uses as it was a thousand years ago, as a building material and for cement, both in Sweden and in the other countries round the Baltic.

