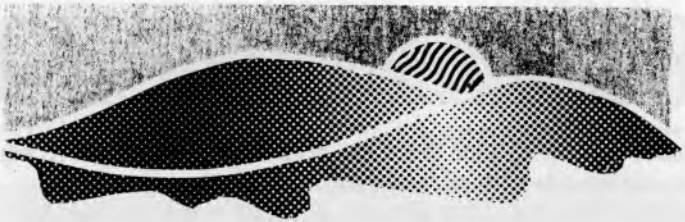


WHITE CLIFFS COUNTRYSIDE
PROJECT

Melanie Wrigley
Projects Officer

A Step Back in Time . . . . .

How an 'Earthwatch' expedition to study underwater meadows and coral reefs in the Bahamas gave Project Officer, Melanie Wrigley, a chance to glimpse the Dover of 100 million years ago.

The reader of the Dover Society *Newsletter* may wonder what connection there can be between the WCCP and a study of coral reefs in the Bahamas and also wonder why one of our project officers should be visiting San Salvador to learn more about the chalk grasslands of Dover and Folkestone.

However, there is a connection, and it was the work with the chalk grassland habitats that led to my Bahamas adventure. I was attending an environmental education conference in 1991 and the county adviser announced that there were special education awards available from the charity 'Earthwatch' to enable applicants to join one of their scientific expeditions. After obtaining more information from 'Earthwatch' and writing a report on how the experiences of an expedition "would further my personal and professional development", I waited in anticipation!

In January 1992 I received a letter from 'Earthwatch' offering me a place on an expedition and an award towards the cost. Excited to have been given this wonderful opportunity, I set to work to raise the necessary sponsorship. I was to join an on-going American project called "Underwater Meadows" which started in 1988. Twice a year teams collect samples from around San Salvador.

The research team met at the airport Holiday Inn in Fort Lauderdale, Florida on 16th July 1992. Professor Garriet Smith, the expedition leader, introduced himself and discussed travel arrangements to the Bahamian Field Station (BFS) on San Salvador Island. San Salvador, or Watling Island, is the most easterly of the Bahamian Islands and is thought to be the landing place of Columbus in 1492, this theory being supported by evidence in Columbus's journal. For instance, it is the only island with a N - S axis and green and amber seed beads have been discovered there by archæologists. Columbus reported giving such beads as gifts to the natives. I embarked on my adventure to San Salvador in 1992, the 500th anniversary of Columbus's voyage.

When I arrived I found that the BFS was a converted U.S. Navy base with laboratories and a library, sited on the berm of the beach a few metres from the sea at Graham's Harbour. Currently this is an almost pollution-free area and the sea grass beds are being surveyed and monitored to enable researchers to understand the natural fluctuations in the sea grass populations. Seagrass species grow throughout the world and are thought to be good indicators of oceanic pollution. The aim of our project was to discover whether seagrasses are accurate indicators of environmental change in coastal areas. Seagrass species are important particularly in tropical seas, where coral reefs thrive. As the sea water passes over the flowing, underwater meadows the water velocity decreases and sediment held in suspension falls onto the meadows. If the seagrass meadows die off the sediment falls on to the coral reefs instead. If this happens the slow-growing corals begin to die because the symbiotic algae cannot photo synthesize. If the corals die, the fish and shell-fish rapidly decline; the local people lose their food supply and their tourist attraction, which is so important to the economy of the Bahamian islands. Therefore an understanding of the seagrass meadows is a vital part of the jigsaw puzzle of safeguarding the delicate marine ecosystem.

We soon established a routine. Each morning we met in the lab. at 8.30, received the day's briefing and then loaded the equipment on to the trucks. We would travel to a sampling site where the team would split, forming one on-shore group and one snorkelling/swimming group. I was in the latter. It was our job to swim out with the sampling equipment and then dive to the sampling site below. We found the fixed, underwater transect line using simple triangulation, lining up landmarks at 90°. 20 metre transect lines were marked out with nylon line. At 2 metre intervals along that transect three core samples were taken from the sea-bed to collect samples of the underwater meadows – the sea grasses. Once the samples were raised to the surface the snorkellers swam with the samples back to the on-shore team for them to clean the seagrasses ready for the evening work in the laboratory. Some of the sample sites were 150 metres off-shore. We swam backwards and forwards for six hours a day collecting and ferrying seagrass samples.

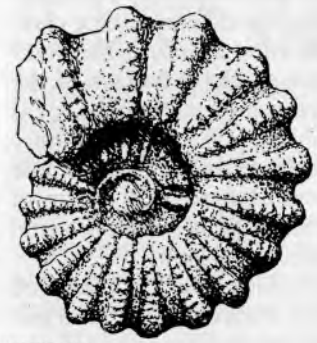
We would stop for lunch, either returning to the Field Station if close enough or eat peanut butter and jelly sandwiches al fresco! After lunch we would return to our duties collecting seagrass samples. In the evening work would start in the laboratory at about 6.30. We were taught how to identify the three species of seagrass that we were monitoring. We sorted and measured the samples collected during the day and put the samples into a drying oven – to be able to measure the dry weight three days later. We usually finished about 10 o'clock and then had some time to socialise!

This was the pattern of work each day on the Underwater Meadows project.

It was very pleasant driving to the many sample sites around San Salvador. Small mocking-birds flew around us and, from our high vantage point in huge trucks, we had an excellent view of the landscape and the wild life.

The variety of fish found among the coral reefs was astonishing. The fish keep close to the reef, which provides them with sanctuary, food and territory and many of them graze on the algae and seagrasses of the underwater meadows. Here can be seen the Blue Tang, a cobalt-blue, oval-shaped fish with a small yellow spot near the tail, concealing a scalpel-like blade, the Queen Trigger fish with blue 'smile' lines, its eyes set well back from its mouth to enable it to eat sea urchins without damage and the Parrot fish, with a beak-like mouth for munching its way through coral. The many species of the Parrot fish eat coral, digest the algae and excrete chalk particles. It is these chalk particles that largely comprise the white sand beaches of the tropical holiday brochures!

One day we were taking samples at a dazzling-bright, white beach at a place called Pigeon Creek, where a fine-grained sediment with the consistency of semolina stretched out under the sea, This was what I had really hoped to find. This environment was as close as could be found to the conditions that provided the sediment for the formation of the White Cliffs of Dover. This Bahamanian underwater seascape could be likened to being transported back in time to see Dover and Folkestone 100 million years ago. As I snorkelled with the samples away from the research team and seagrasses, I could imagine myself in the Cretaceous seas 100 million years ago, and swimming around me the creatures, long extinct, which became the ammonite and belemnite fossils found in our chalk today.



AMMONITE

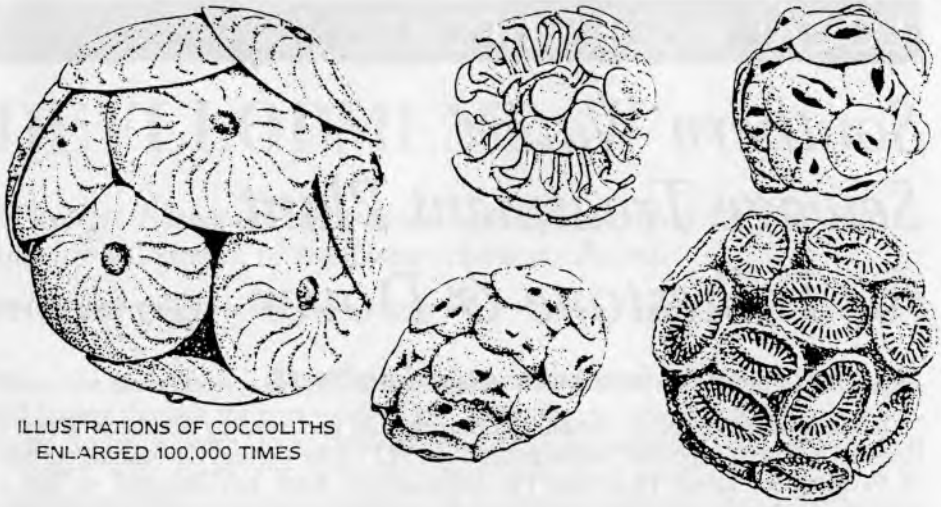
BELEMNITE

Chalk was formed (and continues to form) in warm, clear tropical seas. It is composed of the remains of tiny algae and some animals that lived by floating in the sea.

As the plants died their remains sank to the seabed and over millions of years built up hundreds of metres of chalk. Our chalk was forced up hundreds of metres from the sea-bed when Africa collided with Europe and the Alps were being formed. The chalk was eroded to give the gentle hills of the North Downs. The towering white cliffs at Dover and Folkestone were formed when the land bridge between Britain and France was breached only 8000 years ago.

The Bahamanian chalk sediments in process of formation and the solid carbonate that forms the islands are relatively new, only about one million years old, compared with the 100 million years of the chalk of our White Cliffs.

After my two-week expedition, monitoring the sea-grass meadows and coral reefs, collecting land plant specimens, photographing chalk formations, I felt as if I had had two weeks of natural history 'sensory overload'. I also felt privileged to have been able



ILLUSTRATIONS OF COCCOLITHS
ENLARGED 100,000 TIMES

to contribute to a scientific project monitoring ocean pollution, returning home with wonderful memories and colour slides to share with the local community.

I am extremely grateful to all my sponsors, who are, in alphabetical order:–

Arjo Wiggins Fine Papers Ltd.
Dover District Council (Sports Council grant)
Dover Harbour Board
'Earthwatch' Education Awards
Eurotunnel
George Hammond plc.
Pfizer Ltd. Sandwich
The White Cliffs Experience
and individual sponsors,
M. Chandler, S. MacMasters and Anonymous.

Also my thanks go to

Kim Wood, Director of Dover Water Sports for the loan of the underwater camera, Dover Sub-Aqua Club for practise and advice and to
Krysia Baczala, Kent County Co-ordinator for Environmental Education.

For more information about the charity, 'Earthwatch', telephone (0865 311 600 or contact Melanie Wrigley at 6 Cambridge Terrace, Dover.