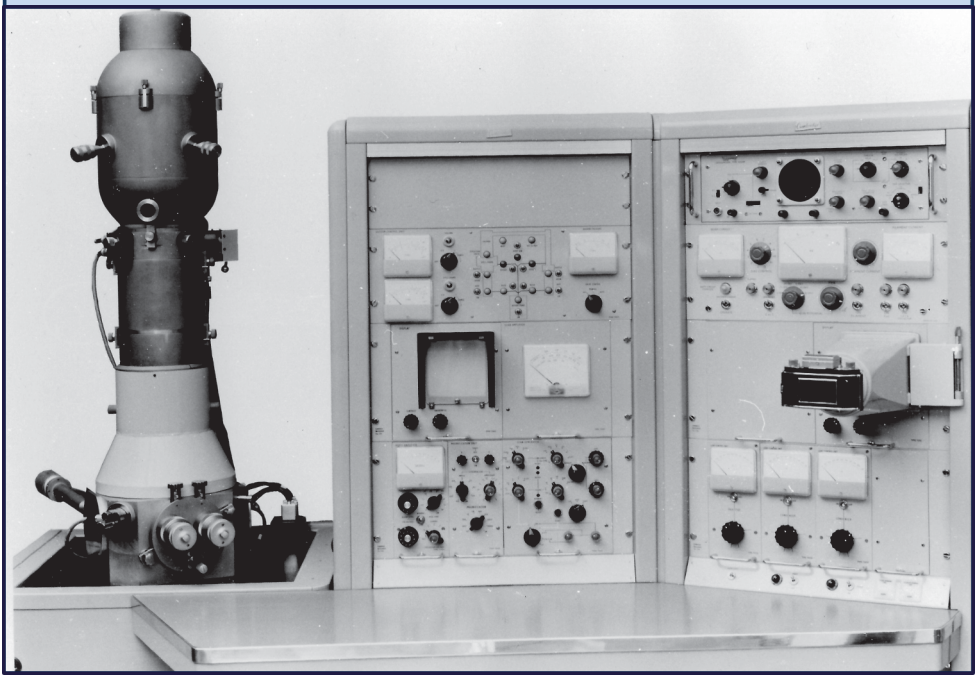
SEM Diaries - 32

Conferences, Lectures, and Coccoliths

Jeremy Poole



The Cambridge Stereoscan Mk I SEM. This was first produced in 1965, so it is approaching its 60th Anniversary. At the SEMT meeting in December there was a lecture on restoring another very old SEM to working order. (Source: Wikipedia. Creative Commons 2 License. https://en.wikipedia.org/wiki/Cambridge_Scientific_Instrument_Company)

I have only been to London twice since the COVID-19 pandemic, and both visits were in early December, a year apart, to attend the annual get-together of the Society for Electron Microscope Technology (SEMT). As reported in SEM Diaries - 27 in the January 2022 edition of Balsam Post, this is an opportunity for users of electron microscopes (both SEM and TEM) to catch up with suppliers and other users. The event, held at the Natural History Museum, includes plenty of time for networking but also features a lecture programme. One of the lectures comprised a video of the restoration of an ISI Super 1 SEM from the 1970s. This reminded me that the Cambridge Stereoscan, the first commercial SEM, is approaching its 60th anniversary (in 2025) so I thought it appropriate to include a picture of it above in this PMS anniversary year.

On going round the trade stands I was able to make my peace with a couple of suppliers whom I had given a hard time over the previous year, and also to talk to

a representative of GATAN/AMETEC about my EDS interest. It was also gratifying to see that Deben UK are still using some of my micrographs of spider heads to advertise their backscattered electron detector, even though I no longer have that kit! Needless to say I also had a long chat with the Marketing Director of TESCAN UK.

I hope to get to two further conferences this year. The next one will be the Microscience Microscopy Congress in Manchester (MMC2023). This provides a great opportunity to chat with manufacturers, who have to be friendly in return. I shall also put in a bit of time on the QMC stand there. The other is EM-South West, held at Plymouth University, at which I made my first appearance last year.

While my local University of the Third Age (U3A) does not have a microscopy section (unlike Northampton U3A) it does have a Science Group. Members are encouraged to give a lecture at a monthly meeting, so my turn comes up periodically, and I always choose a subject that allows me to show some electron micrographs. Last year I spoke about "plant sex" as a platform for showing micrographs of pollen, and I repeated this talk at the PMS May Meeting at Husbands Bosworth. My U3A talk prompted a member of the committee of Sherborne Science Cafe to suggest that I give the lecture at one of their monthly meetings, and this duly took place on the 25th January this year. I managed to set up an Internet link with my SEM at home and was able to demonstrate my SEM in real time. Despite the cold and wet weather, there was an attendance of around 60 people.

My recently gained interest in mineralogy has led to my joining our U3A Geology Group. Although their interest is mainly aimed at the large scale, i.e. landscape and quarries, rather than microscopic objects, I have been invited to give a talk on the SEM in mineralogy, at which I shall be able to talk about some of the subjects I have described in the previous two numbers of SEM Diaries. I have also joined the Dorset group of the Geologists Association (with the unwieldy acronym DGAG) and their events organiser has already raised the possibility of my addressing one of their meetings!

Just to prove that mineralogy has not totally taken over my life, I have been invited to give a talk on the subject of spiders (again using SEM images) at a meeting at the Bournemouth Natural Science Society. This takes place on the 27th May.

To cap my "lecture circuit for 2023" I have been invited to present at the annual "Day of Electron Microscopy" in Brno, Czech Republic on March 25th. This is the home of both TESCAN and Thermo-Fisher, each an important manufacturer of electron microscopes. Indeed, I read somewhere that the Czech Republic is the source of 30% of all electron microscopes world-wide! One of the themes of the day is tardigrades. TESCAN found my tardigrade images on my website and are using one of them for publicity. The organisers have also asked me for between 10 and 20 of my images for them to blow up large and have on display around the city of Brno! While in Brno I shall visit the TESCAN site and have a chat about EDS with one of their applications engineers.

The title of the talk, as suggested by TESCAN is: "The Art of SEM: From Fantasy to Reality in Half a Century" and I have been asked to describe my interest in the SEM from my first seeing a Cambridge Stereoscan in 1968 to being a proud owner of a TESCAN MIRA today. It is intended for a general audience, so I shall not be expected to talk about how the SEM works, more show lots of pictures and hopefully tell a few self-denigrating but amusing anectotes.

Although my mentioning these various invitations might be seen as boasting, anyone who needs to find lecturers for club meetings will know what a thankless task that can be, so they will accept any offers, even from me! Anyhow, I do enjoy sharing my enthusiasm for electron microscopy, and preparing the lecture material always teaches me more about the subject in question.

Talking about learning, I have mentioned the collaboration I have continuing with PMS members (and their friends) in the previous two issues of SEM Diaries. Well, I have also been in touch with several local palaeontologists and mineralogists offering to image interesting material with them. I use the term "with"

advisedly. I prefer them to be there when I am imaging their material, and I am sure they enjoy the process too. Recently, the events organiser from DGAG mentioned earlier, brought round some samples he had collected in the Southern Ocean while a student back in the 1970s. The material was from seven different sites, gathered at depths of between 1km and 5.4 km, and rich in forams. It was interesting that some of the samples were "pure" forams, with no significant contamination by sand or silt. In addition to providing good images of at least three different species of foram, the samples contained plentiful fragments of radioloarian.

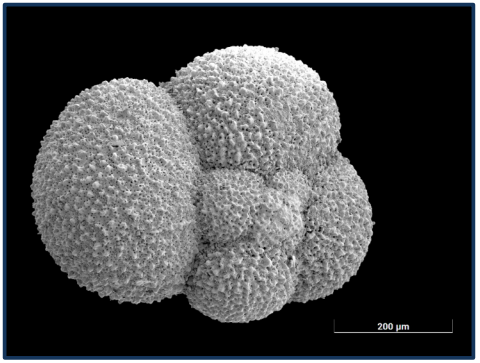
On examining some of the forams in more detail I detected tiny mushroom-shaped objects, which I soon identified as coccoliths. To quote Wikipedia:

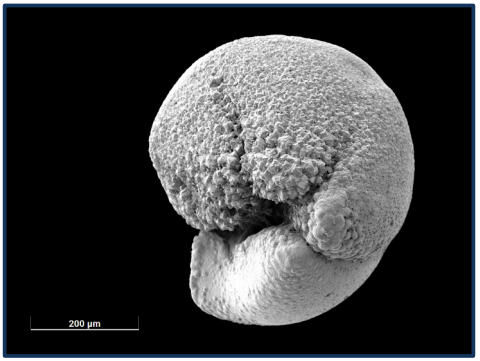
> *Coccoliths are individual plates or scales of calcium carbonate formed by coccolithophores (single-celled phytoplankton such as Emiliania huxleyi) and cover the cell surface arranged in the form of a spherical shell, called a coccosphere.*

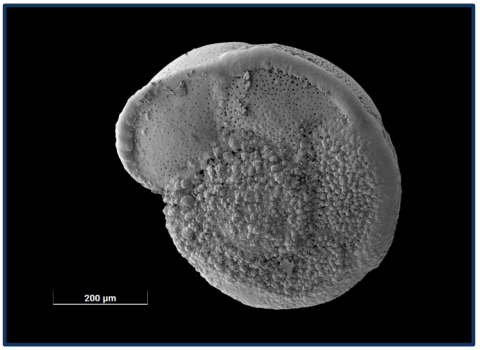
This was the first time I had come across these, and I have included two images of them on the next page.

Following this find I picked up a piece of chalk while out walking, and succeeded in locating plenty of cocooliths within it.

Busy but exciting times!

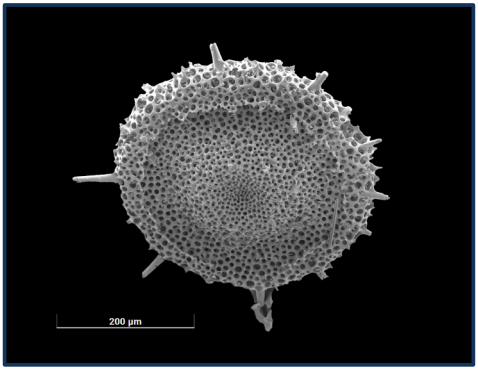


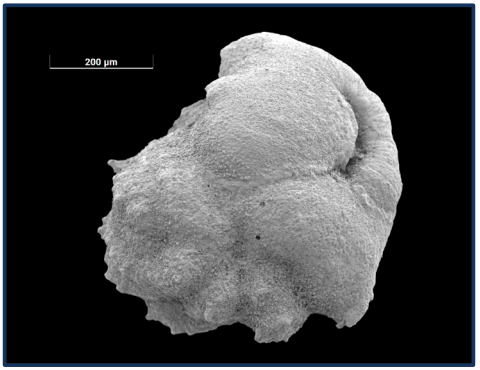


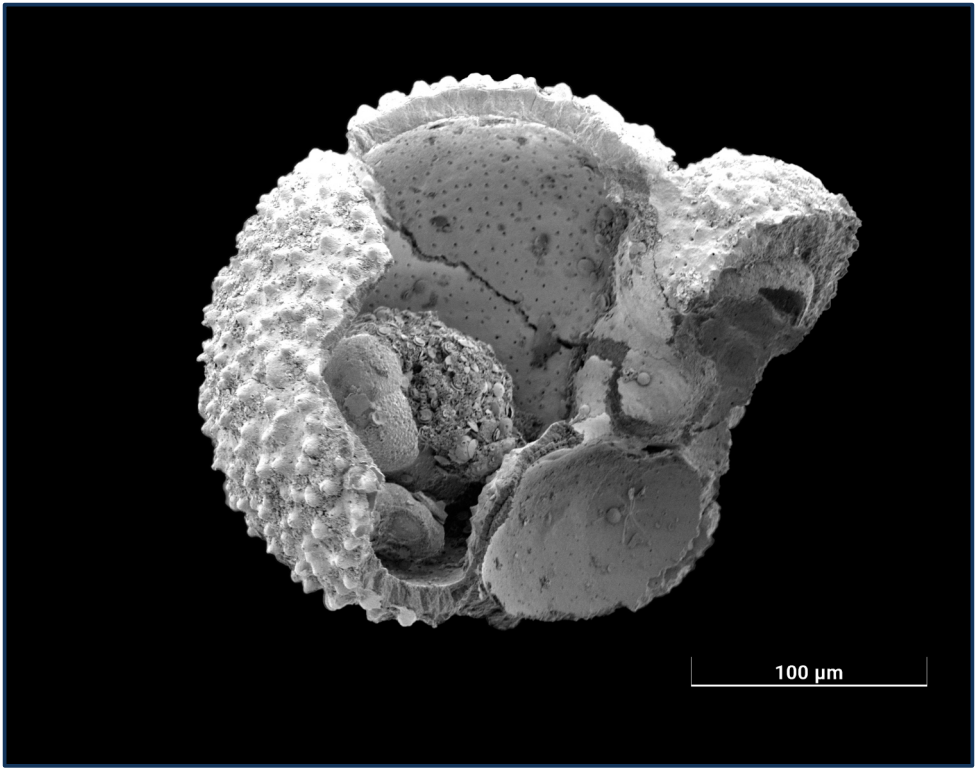


Right: Various species of foram found in the Southern Ocean

Below: A fragment of a radiolarian from the same location







Above: Broken test (shell) of a foram showing debris with many coccoliths inside. Individual coccoliths can be seen on the “plates” to the right.

Below: Two images of individual coccoliths