

The Radiolaria of Barbados, sea gems under the microscope

Stefano Barone, Italy

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The Radiolaria (Radiolaria, Müller 1858) are marine protozoa that form part of the zooplankton: they possess such intricate and elegant mineral skeletons that since their discovery, they have aroused a lot of interest on the part of microscopists and researchers from all over the world. The fossil species are known since the Cambrian period, but there are also living species that inhabit all oceans although many humans ignore their existence because of their microscopic size.

The publications of the biologist, zoologist, philosopher and German artist Ernst Haeckel (1834-1919) were the first to spread the knowledge of Radiolaria even amongst non-professionals. In particular, thanks to the work published in separate parts starting in 1899 (and in full, 1904) and entitled *Kunstformen der Natur* (known in English-speaking countries as *Art Forms in Nature*). These contained a series of plates presented in the same sublime design, many of which are indeed dedicated to these protozoa. It is easy to forget the passage of time when you stop to admire the plates of Haeckel, in which art and science are married. It is no coincidence that the Radiolaria immortalized in *Kunstformen der Natur* inspired the Art Nouveau artists René Binet, Hermann Obrist and August Endell. The most striking example was probably the La Porte Monumental Paris, erected for the Exposition Universelle in 1900 on the Place de la Concorde and precisely designed by Binet, who reproduced a kind of gigantic skeleton of Radiolaria.

Haeckel devoted a good part of his life to the study of these microscopic organisms: in 1862 he published his *Monographie uber Radiolarien* (Monograph on Radiolaria) which contained the description of 144 new species of radiolarians which were collected during a six-month stay in Messina. Also in 1887 he described 739 genera and 4318 species in his contributions to the *Report on the Scientific Results of the Voyage of HMS Challenger During the years 1873-76*. The famous Challenger expedition laid the foundation of oceanography with its journey of 68,890 miles marine (127,580 Km), performing 497 explorations in deep water, 133 dredgings of the seabed, 263 serial observations of seawater temperature and 151 fishing operations offshore.

In contrast, the book *Nature Through Microscope and Camera* written by Richard Kerr in 1909 was undoubtedly presented for a general audience, but describes in a very effective way (through an English language that is exquisitely archaic) the strong emotional impact that is aroused from the observation of Radiolaria even amongst amateur microscopists:

"When a number of these fossil forms are placed under the microscope, they will be found to be a thing of beauty and a joy for ever.

It is no exaggeration to say that sermons have been preached which have been prompted or suggested

by a microscopic view of these matchless and exquisitely beautiful organisms-part of Nature's building material. And why not? Nature is the 'other book,' and the more both books are thoroughly understood, the more they will be found to harmonise.

I recommend the polycystina to all grades of thinkers, to scholars of every school of research, to divines, to philosophers, to teachers of youth, to leaders of thought, with the full confidence that the study of these almost invisible relics of life will impress their minds with the grandeur of Nature, the marvels of geology, the possibilities and the potentialities of mere specks of flint. And Their influence is not likely to end even there.

Richard Kerr was in this case referring to polycystina fossils of Barbados which, especially from the Victorian era to the first half of the last century, aroused a strong interest among both preparers of microscope slides and among their customers. These Radiolarians with their wonderful shapes were used both for expensive arranged microscope slides (mounted dry or in Canada balsam) and for the cheaper "strew slides". Today the present author is working to restore the old glory of these microscopic "gems of the sea", by undertaking accurate micromanipulations (in Styra or mounted in Canada balsam) and the prepared slides have attracted purchasers from all parts of the world. The Radiolaria have been sourced and identified by collection of fossil samples from Barbados sites at Bissex Hill, Bath Cliff, Pico de Teneriffe and the most famous, Springfield. Although there's relatively little distance between them, each location presents differences in the distribution of species.

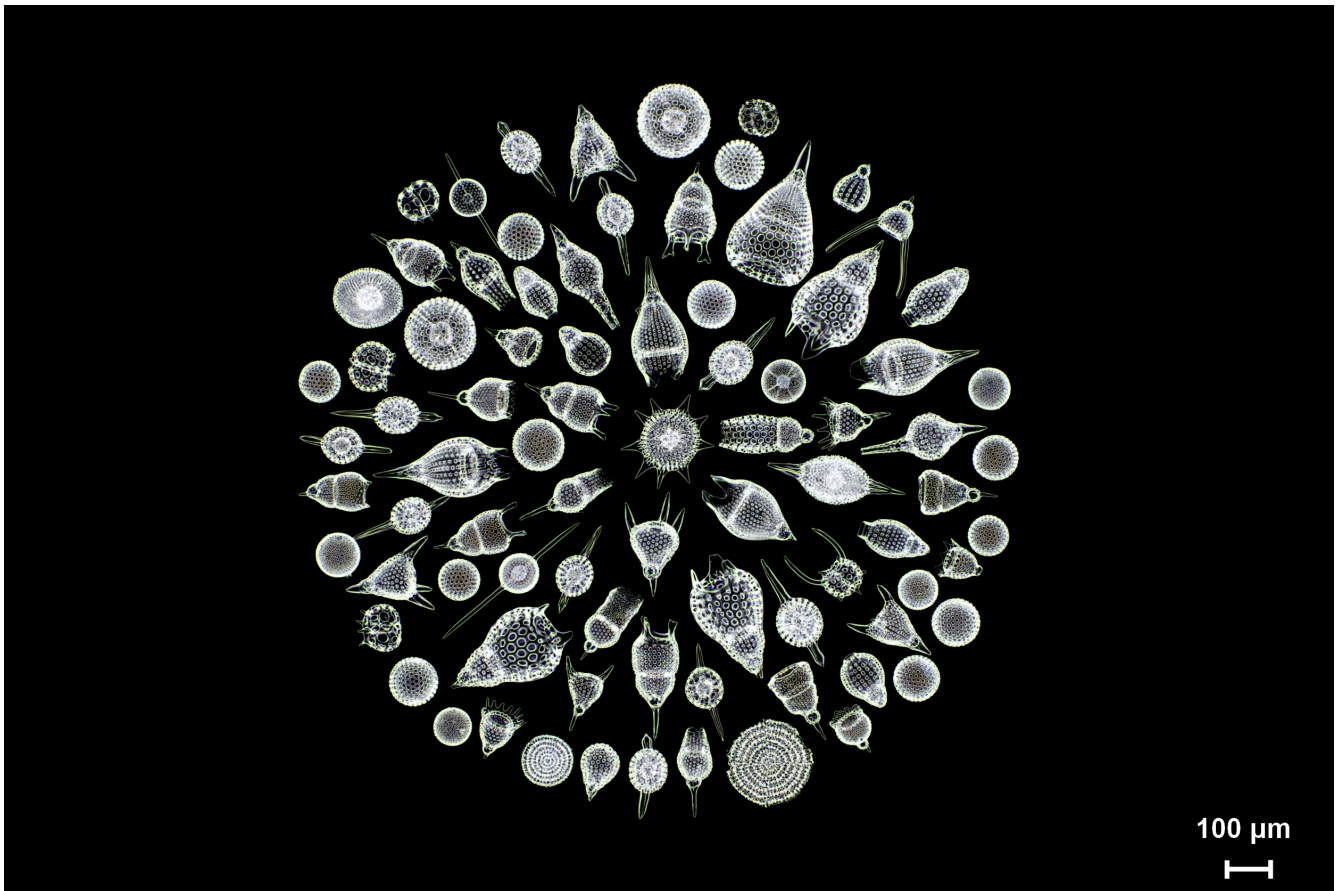
By observing Radiolaria under the microscope it returns observers to nearly children by applying the law of psychology of 'Good Gestalt' (according to which complex structures tend to be viewed as mere forms): you can imagine crowns, tiaras, scepters, asters, helmets, arrows, trumpets, chandeliers, steering wheels, crowns of thorns, space probes, totems, kites and flowers, but in reality each one triggers each observer's personal projections.

The Radiolaria along with diatoms are still among the most interesting biological subjects to be observed under a microscope, although diatoms undoubtedly enjoy greater fame probably for two reasons: prepared slides of Radiolaria today do not have the same prevalence of yore and also they are more difficult to photograph because of their considerable thickness (which requires the use of either low magnification objectives or the stacking focus programs).

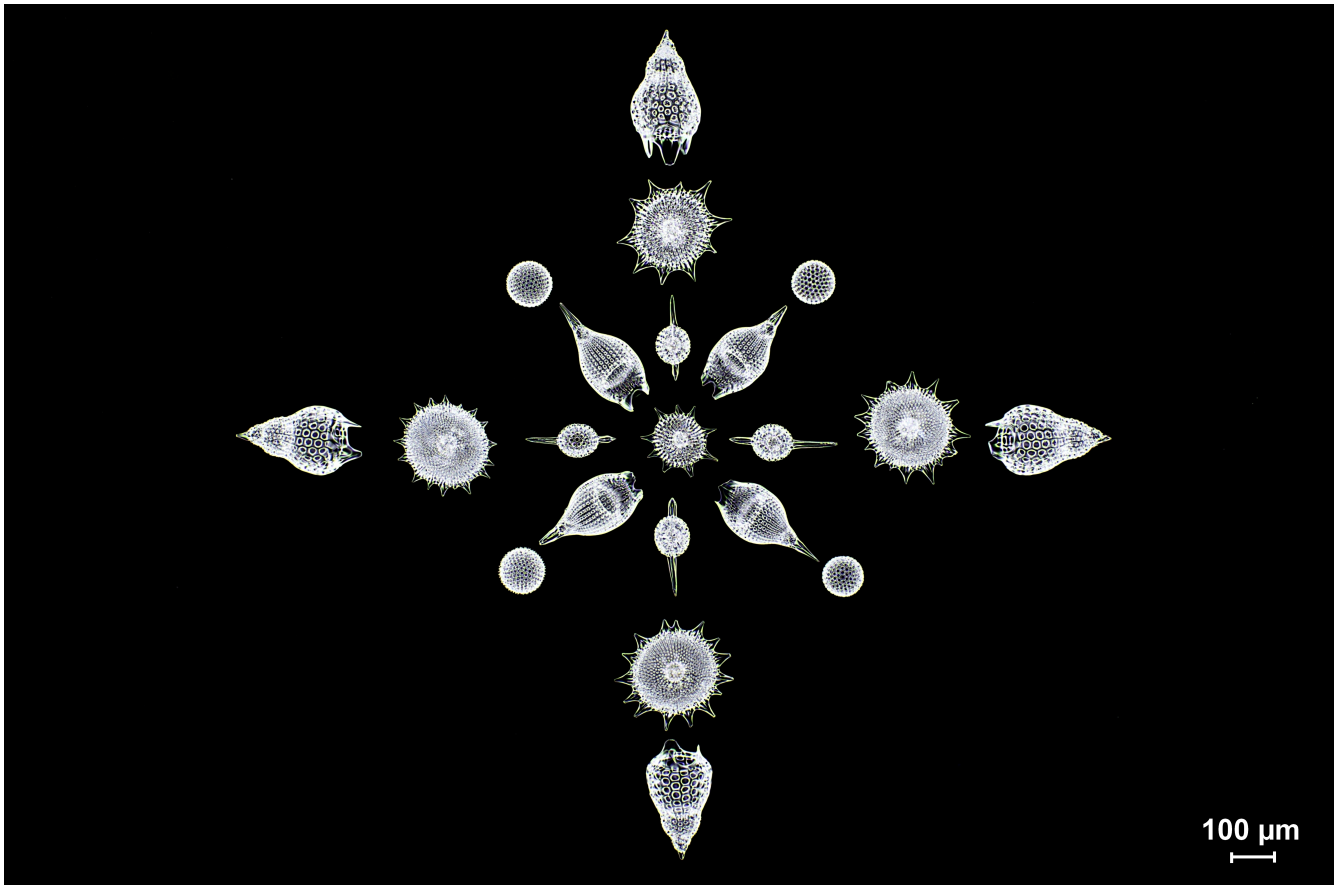
Finally, I would also like to associate the fascinating shapes of Radiolarians (like those of many diatoms) to the collective unconscious archetypal images that were so dear to Carl Gustav Jung (1875-1961). I believe that the experience of using the microscope must not be relegated solely to scientific research itself: according to the sensitivity and the viewer's disposition, it can be a contemplative journey of what is inside and outside of us, a trip to some which paradoxically is also spiritual. And Radiolaria (without detracting from the best-known diatoms) facilitates us enormously in this adventure to infinity.

Email author: info@diatomshop.com

Pictures:



1. Mandala with Radiolaria Barbados (various locations) micromanipulated by Stefano Barone. Assembly performed in Canada balsam. Photomicrography darkfield.



2. Radiolaria Barbados (Bath Cliff) micromanipulated in the Victorian style by Stefano Barone. Assembly performed in Styrax which was formulated by the author. Photomicrography darkfield.

This English version is an edited Google translation.

The author's original Italian version can be read [here](#).

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