

Letter that Ernst Haeckel wrote to his father  
from Messina  
on 15 December 1859

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In his journey towards Messina, initially planned together with Carl Gegenbaur<sup>1</sup>, Ernst Haeckel left Jena on 28 January 1859, passed through Halle and Würzburg, and subsequently travelled to Genoa, Florence, Rome and Naples. In Florence he visited Amici's workshop and purchased a small microscope with water-immersion object-glass for 240 Francs. This purchase, which Haeckel was initially fearful to communicate to his father due to the substantial expense that weighed heavily on his budget, was to prove extraordinarily valuable in his research on plankton<sup>2</sup>. Likewise his thirteen-month stay in Messina between 1859 and 1860 was to prove of fundamental importance for his scientific future. During that period his use of the microscope allowed him to gain a deep knowledge of the animal life of the Mediterranean, documented in his great monograph *Die Radiolarien*, published by Reimer in Berlin in 1862 complete with the author's splendid illustrations. Furthermore, his systematic study of Radiolarians provided him with a wealth of material on which to apply Darwin's theory of evolution<sup>3</sup>.

“Dearest father! ... Now that I see that my finances are sufficient and that the amount I have spent thus far and expect to spend overall is even less than my initial calculations, I can at last confess to you a greater expense that until now I have not mentioned as I believed you would have judged it superfluous and been angered. But now that through scrupulous economy this expense is once again covered and in the meantime it has brought me the most excellent advantages, I can confess it to you. Passing through Florence, I bought a microscope from the renowned Professor Amici for 250 Francs (about 70 Florins), identical to the one that Professor Ehrenberg brought with him from his latest journey to Italy<sup>4</sup>. It is a so-called ‘immersion instrument’, which only this excellent optician has to date succeeded in constructing. The mechanical part, the screws, etc., and likewise the entire mechanism, are fairly impractical, unrefined, imperfect, but the lenses – the most important thing – are absolutely excellent. However the most powerful object-glass can be used only if it is immersed in water and placed in direct contact with the object being examined without an air gap. It is from this device that these immersion microscopes derive their name. They are consequently very inconvenient to use and the light that reaches them, which is not collected as is normal by a concave mirror but instead by a spherical prism, is metered parsimoniously. All these disadvantages, however, are easily compensated by the extraordinarily powerful magnifications that they can reach and which for certain extremely fine objects is of inestimable value. While the normal linear magnification assured by the best microscopes, including my large Schieck, can reach just 300-400, at most 500 times, while remaining scientifically useful, this excellent instrument by Amici continues to guarantee a perfectly clear, sharp and reliable image at its maximum magnification – 1000 times in linear scale, in other words more than double the magnification! Now it is true that most objects that are habitually investigated are made in such a way that a magnification of 300 may be sufficient, or at any rate progress has not been made to date with a more powerful

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<sup>1</sup> Karl Gegenbaur (1826-1903), German anatomist. In 1852 he studied Mediterranean fauna in Sicily. He taught Anatomy and Physiology in Jena and Heidelberg.

<sup>2</sup> ERIKA KRAUBE, *Ernst Haeckel*, Biographien hervorragender Naturwissenschaftler, Techniker und Mediziner, 2. Aufl., Teubner, Leipzig 1987, p. 37.

<sup>3</sup> RAINER BRÖMER, *Ernst Haeckel e gli italiani*, in *Haeckel e l'Italia. La vita come scienza e come storia*, Edizioni Centro Internazionale di Storia dello Spazio e del Tempo, Brugine 1993, p. 80.

<sup>4</sup> Cf. *Libro de' conti del laboratorio* (Workshop account book), on the date of October 1858: “From Prof.<sup>e</sup> Ehrenberg of Berlin for small microscope taken with him during his journey [francs] 200”. Christian Gottfried Ehrenberg (1795-1876), German physician and naturalist. One of the most important naturalists of the 19th century.

magnification. But on the other hand there are large classes of objects for which a higher magnification is enormously desirable and hopefully will allow considerable further progress to be made.

It was a fortunate coincidence that put that powerful instrument into my hands for the work that I have to perform here, which is of the latter type. I did not suspect when I purchased it in Florence how useful it would be. It has already allowed me to discover a couple of very interesting structural elements in extremely fine infusorians, and I hope to make further important discoveries. My main occupation, in which I am now making good progress and which brings me extraordinary joy, concerns rhizopod radiolarians, an animal class that was discovered just a few years ago by Ehrenberg (in their siliceous shells) and subsequently observed living by Johannes Müller. These extraordinary and fascinating creatures are on the lowest rung of the ladder and right on the edge of the animal kingdom, and for this reason are worthy of the most meticulous study. Almost all of them are microscopically small gelatinous specks that swim on the surface of the sea, most of them clad in a splendid transparent siliceous shell like glass of the most lovely structure. This shell appears generally as a fine lattice in the form of balls, bells, helmets, stars, etc. Up to now it is the gracious forms of these shells that have largely been described, being highly attractive for their beauty and inexhaustible variety of shapes, partly in Ehrenberg's great *Microgeologia*<sup>5</sup>, and partly in the last *Opus posthumum* of Johannes Müller."<sup>6</sup>

(English translation by John Freeman)

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<sup>5</sup> CHRISTIAN GOTTFRIED EHRENBERG, *Mikrogeologie*, Voss, Leipzig 1854.

<sup>6</sup> This letter was published in German in Ernst Haeckel, *Italienfahrt. Briefe an die Braut 1859/1860*, Koehler, Leipzig 1921, p. 135-136, and in GEORG USCHMANN, *Ernst Haeckel. Biographie in Briefen*, Urania, Leipzig-Jena-Berlin 1983, p. 54-55. But since it has several transcription errors, the text was revised and corrected using the original manuscript with the cooperation of Dr. Thomas Bach from the Ernst-Haeckel-Haus in Jena, to whom I express my most sincere gratitude.