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Enhancing observation by drawing: Alveolinids models by Manfred Reichel (1896-1984)

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Graphic representation is a fundamental tool in morphological studies, as paleontology. A paradigmatic example is the alveolinid drawings of Prof. Manfred Reichel (1896-1984). Thanks to these drawings his research on foraminifera, had an important impact on micropaleontology. Manfred Reichel studied Fine Arts, but later he began a scientific career on biological sciences and becoming a professor in micropaleontology, at the Geological and Paleontological Institute of the University of Basel, Switzerland. His background in art had a benefit in his scientific production, especially with the extremely complex foraminiferal structures. By means of illustrations, inspired by the French naturalists, he was able to solve the most complex internal architecture of forams. His drawings display foraminifera's internal 3D structure in such a comprehensible way that has not been improved using modern techniques. His work has been used by different generations of paleontologist to understand the internal architecture of forams and are still used today. The aim of this study is to analyze the process that Reichel followed to create some of his most representative drawings. This study is based on the examination of a selection of Reichel's drawings (n>40) held at the Natural History Museum in Basel. In addition, his family and students have been interviewed supplying useful information to understand how he applied his artistic skills to teach and research. This study illustrates the steps followed by Reichel in the creation of a drawing of alveolinid. The process represents the transformation of the morphological data from 2D images (polished rock sections) into a comprehensible 3D image. A description of the process of observation, comparison, sketches and studies, concluding with the final three-dimensional drawing is shown. The results show that that the classical convention in drawing is still and irreplaceable tool in natural sciences, because it allows to define aspects that cannot be equally appreciated shown by other means (text or photography). Drawing it can also be a scientific analytical tool with an artistic identity, we present an example where rigor is intrinsically linked to a high sensibility, and a deep knowledge of drawing that brings as a result a beautiful piece of art.