

# **Frankfurt versus Berlin: The Red Sea explorers Wilhelm Hemprich, Christian Ehrenberg and Eduard Rüppell**

**by Wolfgang Klausewitz**

The beginning of the marine biological exploration of the Red Sea dates back to the 18th century. This was the Danish »Arabiske Rejse« (Arabian journey, HANSEN 1962), which started in Copenhagen in 1761 with the aim of studying in southern Arabia the philological, geographical and biological background of the Bible, including the identification of the biblical names of animals and plants. This mission came to an disastrous end as five of the six expedition members died during the journey in Arabia. This was also the fate of the Finnish-Swedish naturalist FORSKÅL (also spelled FORSSKÅL), who collected fishes and other marine animals in the Red Sea. After a long roundabout voyage via Bombay and South Africa, the collected material and other documents of the expedition eventually reached Copenhagen. The scientific results with the descriptions of the collected animals were posthumously published by FORSKÅL (1775) as »Descriptiones Animalium« (see also KLAUSEWITZ & NIELSEN 1965).

The second exploration was based on the Egyptian expedition of the French Army from 1798 to 1801. During that time a rather small collection of marine animals was gathered from the northern Red Sea and the Mediterranean. The ichthyological results were published by Isidore GEOFFROY SAINT-HILAIRE (1817, 1829) as »Histoire naturelle des poissons de la mer Rouge et de la Méditerranée« (Natural History of the Fishes of the Red Sea and the Mediterranean).

The first comprehensive surveys of the marine life of the Red Sea were carried out by four Germans (KLAUSEWITZ 1964): three during the first half and one during the second half of the 19<sup>th</sup> century. In 1824 and 1825 the zoologist Wilhelm HEMPRICH and the botanist Christian EHRENBURG from the Royal Zoological Museum in Berlin collected marine organisms in the northern and southern Red Sea (HUMBOLDT 1829, LAUE 1895, STRESEMANN 1954). One year later, 1826, Eduard RÜPPELL of the Senckenberg Society (Senckenbergische Naturforschende Gesellschaft) and Senckenberg Museum in Frankfurt on the Main surveyed the same areas (MERTENS 1949). From 1864 to 1869 and 1872 to 1875, while working as a physician in the Egyptian seaport Kosseir, the medical doctor Carl Benjamin KLUNZINGER from Stuttgart also studied the marine animals of the northern Red Sea (KLUNZINGER 1870, 1878, 1915, KLAUSEWITZ 1964). Having returned from his first long stay, he published his outstanding work »Synopsis der Fische des Rothen Meeres« (Synopsis of the fishes of the Red Sea) (1870/71, 1964). After his second return in 1875, he published »Die Korallenthier des Rothen Meeres« (The coral animals of the Red Sea) (1877/79) and the uncompleted book »Die Fische des Rothen Meeres« (The fishes of the Red Sea) (1884). Finally, he published two comprehensive papers on crustaceans »Die Spitz- und Spitzmundkrabben des Roten Meeres« (Oxyrhynchous and Oxystomatous crabs of the Red Sea) (1906) and »Die Rundkrabben des Roten Meeres« (Cyclometopous crabs of the Red Sea) (1913).

KLUNZINGER's large collections are not only in the State Museum in Stuttgart, but partly also in Berlin, St. Petersburg (Russia), Vienna, Frankfurt and Cambridge.

In this article, a closer look will be taken at the three Germans mentioned: their educational background, their competition, their fate and their scientific results. Perhaps their most common feature is that they were almost of the same age: RÜPPELL was born in 1794, EHRENBURG in 1795 and HEMPRICH in 1796. But the courses of their lives were very different.

A particularly bright student, EHRENBURG became a doctor of medicine. For his thesis he carried out a comprehensive study of the lower fungi with the help of a simple home-made wooden microscope (EHRENBURG 1818). The results of EHRENBURG's research work were regarded as a scientific sensation as he discovered the sexuality and sexual reproduction of these fungi which were regarded at the time as the results of steady processes of abiogenesis ("Urzeugung"). With these discoveries, EHRENBURG became an acknowledged and widely known scientist. At the age of 25, he received several honours and was even offered a professorship by the University of Königsberg (today Kaliningrad). At the same time he was ordered by the Prussian king to travel to northern Africa to explore the biological world of that region. This project had been proposed by Alexander von HUMBOLDT, and EHRENBURG was supposed to carry it out in cooperation with his colleague and friend Wilhelm HEMPRICH.

As HEMPRICH's father was a physician, he also became a doctor of medicine and acted for a while as a medical officer. Since zoology was his actual field of interest, he became a lecturer in natural science and physiology at Berlin university and a collaborator at the Zoological Museum. Furthermore, he published a voluminous text-book entitled »Grundriß der Naturgeschichte« (Fundamentals of natural history) (HEMPRICH 1820). Had he survived the expedition in Africa, he would have become one of Germany's most distinguished scientists and might have taken the leading role of German zoology in Berlin.

The career of Eduard RÜPPELL from Frankfurt was quite different. He became an economist in order to continue his father's business. He worked successfully as an economic expert in London, but after one year he was forced to stop working due to serious tuberculosis of the lungs. To recover from this, Eduard RÜPPELL left London for Italy and then travelled to Egypt. There he collected minerals and coins, but above all it was the visits to ancient Egyptian monuments that made him consider becoming an archaeologist. However, the celebrated orientalist Ludwig BURCKHARDT suggested that he should first go back to Europe to study the natural sciences and then to return to Northern Africa for exploration. RÜPPELL began studies at the University of Pavia in Italy, mainly physics, mathematics and chemistry, geology and mineralogy as well as practical mapping. It was only during a stay in Naples that he came into contact with natural history, studying the fishes and crustaceans of the Mediterranean. Meanwhile, he was also preparing himself for his project of a great expedition to Africa.

Meanwhile, in 1820 HEMPRICH and EHRENBURG set out on their African mission from Berlin. During the first three years they collected land animals and plants in Egypt and Nubia, the Sinai and Lebanon. Despite many difficulties, they were very successful in gathering large collections in all the areas which they visited.

Eduard RÜPPELL started his African tour almost two years later in 1822. He travelled to the same areas as HEMPRICH and EHRENBURG, with the exception of Lebanon. Despite his association with the Senckenberg Natural History Society in Frankfurt, RÜPPELL managed his projects himself and acted fully independently. So far as the finances were concerned, he was a well-to-do man who was able to pay all the expenses of the expedition from his own

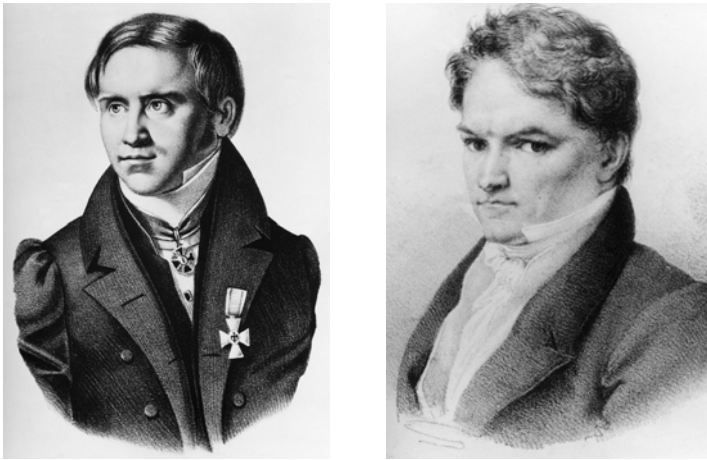


Fig. 1. Left: Christian EHRENBURG, at an age of approx. 35 years. Right: Eduard RÜPPELL, at an age of 33 years. Drawn 1828 in Milano on his way from Africa back to Frankfurt. By courtesy of the Akademie der Wissenschaften, Berlin (left photograph) and Historisches Museum Frankfurt (right photograph).

pocket. Apart from that, he was an impetuous, adventurous and courageous character. For these reasons RÜPPELL was in some cases more successful than his colleagues from Berlin in his collecting activities and in his trips to unexplored areas.

Not surprisingly, therefore, there developed a competition between the two Berliners ("Prussians") and RÜPPELL. The letters and reports contain opinions about the colleague "on the other side" and provide evidence of their antagonistic relationship. The zoologist HEMPRICH, however, had a high opinion of RÜPPELL. He admired not only his more favourable working conditions, but also his activities, his boldness and the results of his collecting missions. HEMPRICH was therefore interested in cooperating with RÜPPELL, but EHRENBURG totally disliked the idea. RÜPPELL too was fond of HEMPRICH and wrote in a letter: »He is a very kind and interesting person, of firm character and loves his scientific work. I would like to cooperate with him.«

The relationship between EHRENBURG and RÜPPELL was of a completely different nature. Both were difficult characters, with little understanding of the other and with strong feelings of mutual competition. They had not liked each other from the beginning. In a report to his minister of cultural affairs, EHRENBURG wrote that he did not have a high opinion of RÜPPELL's character. RÜPPELL, in turn, passed a very harsh judgement on EHRENBURG. In a letter to Frankfurt he wrote: »EHRENBURG is a composition of falseness, envy and jealousy. He even tries to depreciate the merits of his fellow-traveller« [HEMPRICH].

After receiving new funds from Berlin, HEMPRICH and EHRENBURG in 1823 began their marine biological studies on the Gulf of Suez and along the Arabian coast between Aqaba and Mohila. They collected many fishes, made drawings of various unknown species and studied the anatomy of a number of specimens. Furthermore, they collected molluscs and crustaceans, actinia and other coelenterates. EHRENBURG explored the coral reefs and studied the Protozoa. In the winter 1823/24 EHRENBURG continued his collecting and research work near Tor on the Gulf of Suez.

In November 1824, HEMPRICH and EHRENBURG started their last great expedition to the southern Red Sea. After visiting different areas on the Arabian coast, especially the vicinity of Gunfucla, and the Yemen near Loheia, they surveyed and mapped the volcanic island Qutumbus, the Farsan Islands and the island Kamaran. They crossed the southern Red Sea and visited the Dahlak islands. It goes without saying that in all these places they collected marine animals. EHRENBURG, in addition, continued studying Protozoa.

After reaching the African coast, HEMPRICH undertook an excursion to the Gedem mountains, while EHRENBURG stayed sick at the camp. HEMPRICH's overland journey ended catastrophically. He and almost all of his assistants were seriously infected with the dangerous Massawa fever. EHRENBURG recovered, while HEMPRICH died in June 1825. After this disaster, EHRENBURG walked to the Taranta mountains and the hot springs of Aylet, reaching the border of the Abyssinian mountains. This was the end of the great Berlin mission. Still weak, EHRENBURG started on the way back to Cairo and finally left Egypt at the end of 1825 (LAUE 1895).

One year later, 1826, RÜPPELL began his marine biological studies of the Red Sea. At first, he collected mainly crustaceans and particularly the great diversity of crabs on the Gulf of Suez near Tor. As a self-taught man in systematics, he carried out preliminary research work on marine animals. Subsequently, he went to the southern Red Sea, mainly to the Dahlak Islands and the coast of Massawa where the Berlin colleagues had been earlier. There, he collected fishes, molluscs, crustaceans and other invertebrates. It was on the African coast that he too was infected with the Massawa fever, but thanks to good medication he recovered within two weeks. In 1827 he finished his mission and returned to Europe.

From 1830 to 1833, RÜPPELL carried out a second expedition to Africa, starting on the southern Red Sea and continuing later with a mission to Abyssinia = Ethiopia. On the Dahlak Islands he collected the sea-cow of the Red Sea which he immediately described as *Dugong hemprichi* (= *Halicore tabernaculi*). Once more, he collected and studied numerous fishes and invertebrates along the African coast.

What was the fate of the collections of these three explorers, what happened to their scientific material in Berlin and in Frankfurt? The administration in Berlin had decided that the scientific interpretation and publication should be carried out after the return of the explorers. A voluminous work with descriptions of the geography, fauna and flora of Northern Africa and Western Arabia as well as the Red Sea was planned. However, the realization of the project suffered severely from two shortcomings. One was the sluggishness of the state apparatus in giving official approval for the research work, the illustrations and publication. Thus it was two years after his return before EHRENBURG could start, in 1828, with the publication of the introduction of his planned comprehensive work »Symbolae physicae« with HEMPRICH and EHRENBURG as the authors. Unfortunately, this remained an incomplete torso. Furthermore, he published the geographical report as another uncompleted series (HEMPRICH & EHRENBURG 1828a). In addition, he was able to publish several preliminary papers on marine subjects, mostly in the years that followed (LAUE 1895).

The second disadvantage was that Wilhelm HEMPRICH was no longer present. He had not only been the manager and organizer of the expedition in Africa, but as a zoologist he had been the vertebrate specialist. Had he survived, he would no doubt have been the organizer of the scientific processing of the huge collection of African animals and plants, the research work, the artists' work and the publications. He himself would have ensured the rapid publication of the results of his studies on the collection of vertebrates. The introverted scholar EHRENBURG, however, had difficulties in dealing with demanding management tasks. As a botanist and microbiologist, it was also rather difficult for him to carry out the research work

on vertebrates. He gave the fishes from the Red Sea, a list of names and a series of drawings to Baron CUVIER in Paris who included them in his comprehensive work »Histoire naturelle des poissons« (Natural history of the fishes). In this work EHRENBURG was mentioned, but the authors of the new species were CUVIER & VALENCIENNES (1828-1849, compare DOR 1984). For their descriptions, the French authors used the ten plates with drawings of fishes, but these were only published much later by HILGENDORF in 1899. Based on his studies, EHRENBURG wrote three papers on reef corals and coral reefs of the Red Sea in 1832 and 1834. He decided, however, no longer to pursue the great publishing project. He subsequently became a famous microbiologist, publishing a fundamental treatise on the biological criteria of the Protozoa (EHRENBURG 1838), and even the celebrated founder of the field of micropalaontology (EHRENBURG 1836, 1854; LAUE 1895). As for the results of his great African mission and his expedition to the Red Sea, these unfortunately have to be considered a failure. There are still in existence drawings, maps and other original documents from the expedition of HEMPRICH and EHRENBURG in the archives of the Akademie der Wissenschaften in Berlin, but they have never been published.

The situation in Frankfurt was quite different. As early as 1824, two years after RÜPPELL had begun his journey and three years before finishing it, the directorate of the Senckenberg Society decided to start the publication of the first results of his expedition. The zoologist Philipp CRETZSCHMAR, vice director of the Society, had been charged with preparatory work. In 1826 he began the series by publishing the first parts of »Atlas zu der Reise im nördlichen Afrika von Eduard Rüppell« (Atlas of the journey in Northern Africa by E. R.), describing mammals and birds (CRETZSCHMAR 1826, 1826/30a, b). After his return, between 1828 and 1830 RÜPPELL continued the 'Atlas' with the description of the fishes of the Red Sea with many new species. Furthermore, he described in cooperation with the zoologist Friedrich LEUCKART from Heidelberg various molluscs and other invertebrates from the Red Sea. Additionally, in 1830, RÜPPELL published an excellent paper describing various crabs from the Red Sea. Finally, he issued a popular-science book on his travels in northeastern Africa and northwestern Arabia.

After returning from his second African expedition in 1834, RÜPPELL entered the most productive scientific phase of his life, publishing 30 systematic papers, including a large treatise entitled »Neue Wirbeltiere zu der Fauna von Abyssinien gehörig« (New vertebrates belonging to the Abyssinian fauna). Fishes constitute an important part of this publication. He described not only the external features of the species but also some of their anatomical characteristics, and in several cases he added informations about their biotopes, nutrition and even their relation to man. Altogether, he described 19 new genera and more than 200 new species of fishes (MERTENS 1949). In terms of his systematic research work and his publications, RÜPPELL became the first important explorer of the Red Sea fauna. Furthermore, he published a two volume book on his Abyssinian travels in 1838 and 1840.

Frankfurt versus Berlin? Despite the earlier date of their missions and the more favoured personnel, Berlin came off second best. If HEMPRICH had survived, the situation would certainly have been different. He would have started publication as early as possible. He might have even attempted to cooperate with RÜPPELL, which had already been his intention in Africa and was in line with the plans of Professor LICHTENSTEIN, the director of the Royal Zoological Museum in Berlin. Even Alexander von HUMBOLDT would have supported this idea. Instead, there was a deep animosity (antipathy) between RÜPPELL and EHRENBURG, an antagonism which grew into a profound conflict between the two and which lasted for many years. It even affected the relationship between the two museums of Berlin and Frankfurt.

**Acknowledgements.** The author is very grateful to Mrs Ingeborg KILIAS, Berlin, for her archive records, and also to Ms Annette FRICK, Brussels, and Prof. Dr. W. ZIEGLER, Frankfurt a.M., for reading and substantially improving the text of the manuscript.

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