

BIOGRAPHY OF JOHANNES WALTHER (1860 - 1937)

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Who was Johannes Walther and what makes him an outstanding person in earth sciences? Johannes Walther was a sedimentologist when sedimentology as self-contained science did not exist. As a scholar of the famous zoologist and world-traveller Ernst Haeckel, Walther started as a biologist. His subsequent geological studies led him to the Limestone Alps where he got the first ideas for his later works on facies and marine carbonate sedimentation. His early investigations in the Gulf of Naples and the Red Sea made him the pioneer of German marine geology. Already in his first publications he developed a leading idea which can be found in almost all of his books and papers: the synthesis of geology with biology as well as the application and further development of the actualistic method. In his holistic facies studies Walther deduces the formation of sedimentary rocks by means of comparison with Recent sedimentary processes also considering the unique historical situation and the interplay with biological evolution. Walther himself called this working method "ontological". Today, most geologists know of Walther's law of the correlation of facies. A closer look at his work shows that a lot of his thoughts which were new at that time have become the common knowledge of modern geologists.

Johannes Walther comes from Thuringia. He was born on July 20, 1860 in Neustadt on the Orla. His father Kuno Walther, theologian in Neustadt was a very sociable and open-



Fig. 1: J. Walther in 1881
(from Seibold 1992)

minded person, who was especially interested in natural sciences. Johannes was very attached to his parents who already in his early days were convinced of the intellectual possibilities of their son and supported his scientific interests. Already at the age of 15 Johannes attended lectures of the famous biologist Ernst Haeckel, the botanist Strasburger and the philosopher Eucken at the University of Jena. Especially the lectures of Ernst Haeckel deeply impressed him and after he had met the professor of geology Adolf von Koenen, who took him out in the field in Hessia, he had the wish to study biology and geology. But an illness, comprising intensive and chronic headaches, casted a shadow over his late childhood and youth and forced him to interrupt school several times. Physicians recommended to avoid mental work. Because of this illness he was unable to take his school-leaving exam (abitur). But he did not give up. Fortunately, some of the professors at Jena, including Ernst Haeckel, who knew him and his situation encouraged him to acquire the appropriate knowledge for university studies on a private basis. In 1880, the Duke of Weimar excused him from passing the abitur and registered him as a student of natural sciences at the University of Jena.

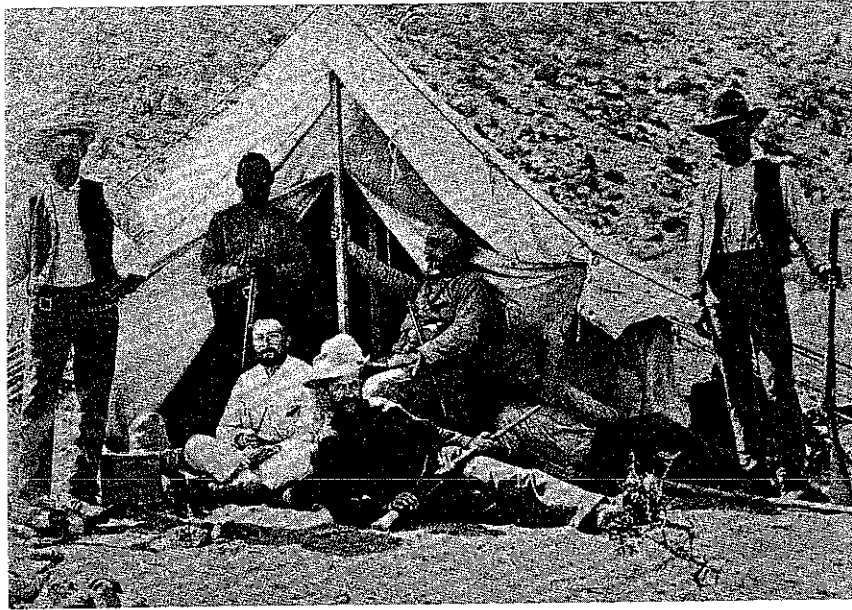


Fig. 2: J. Walther and G. Schweinfurth in the desert in 1886 (from Seibold 1992)

In the following years Walther's illness disappeared and he began intensive studies. In only 4 semesters he attended anatomy, archeology, botany, chemistry, geology, history, mineralogy, philosophy, prehistory and zoology. Nevertheless, he also took part in the "student life" and attended celebrations, dances and together with other students he founded the "Scientific Society of Students at the University of Jena". He also met Carl Duisberg, later to become the head of Bayer Leverkusen, who would become his best friend and with whom he would have intensive contact his whole life. In the summer of 1882 Walther received his doctorate. His dissertation has the title "Die Entwicklung der Deckknochen am Köpfskelett des Hechtes" (The development of the secondary bones at the skull of the pike). Because his long-standing promoter Ernst Haeckel was in Ceylon, he made his dissertation with the anatomist Oscar Hartwig. Nevertheless, Haeckel and his thoughts, including his enthusiasm for Darwin's evolution theory, had the largest influence on Walther as a student and Walther stayed close to him until Haeckel died in 1919.

After his doctorate, Walther continued with geological studies in Leipzig (1882) where he got to know Ferdinand von Richthofen, in Munich (1883, 1884/85) where he met Karl von Zittel. In Munich he also got to know Carl Wilhelm von Gümbel who gave him the first impulses for marine geological studies. Walther's visits to Anton Dohrn's Zoological station in Naples (1883/84) and at the Geological Survey of Austria in Vienna (1884) which gave him the possibility to do field-work with Edmund von Mojsisovics in the Limestone Alps were very important for his further scientific development. In Naples, Walther conducted his first marine geological and biological studies and in the Alps he got interested in marine carbonate sedimentation especially in the significance of calcareous algae as potential reef builders and in the diagenesis of reefal limestone (see section I). During these three and a half years of geological studies he published 8 scientific papers and in early 1886 the Philosophical Faculty of the University of Jena accepted his habilitation-thesis (qualification as a university teacher). It has the title "Untersuchungen über den Bau der Crinoiden mit besonderer Berücksichtigung der Faunen aus dem Solnhofener Schiefer und dem Kehlheimer Diceraskalk (Investigations in

the morphology of crinoids with special consideration of the faunas from the Solnhofen Shale and the Kehlheim Limestone). He became a so-called Privatdozent (lecturer without salary) at the University of Jena. Already then he had the idea of an actualistic sedimentology. This could not be realized without travelling.

During the following three years Walther undertook his journeys to the Sinai Peninsula and Egypt as well as his journey to India and Ceylon (see sections II and III). Besides his works on coral reefs he did the field-work for the publication "Die Denudation in der Wüste" (Denudation in the desert). In the summer of 1890 Walther was nominated an extraordinary professor and in April 1894, after long discussions in the faculty, he became the first Haeckel-Professor in Jena. The first time in his life he was financially independent. His monthly salary amounted to 1.500 Mark, which was less than that of a normal policeman. Around that time he undertook two more long journeys. In 1891 he attended the Geological Congress in Washington and took part in an excursion to the American West. In 1897 he travelled to the Caucasus and Central Asia to continue his studies on deserts. His book "Das Gesetz der Wüstenbildung" (The law of desert formation) was published in 1900. During his professorship in Jena he published 31 scientific papers, the textbook "Allgemeine Meereskunde" (General oceanography) which was also translated into English. Within the three volumes of his outstanding textbook "Einleitung in die Geologie als historische Wissenschaft" (Introduction to geology as a historical science) Walther explains the formation of rocks, especially of sedimentary rocks, by means of comparison with modern sedimentary environments also considering the interaction with biological evolution.

In 1899 he married Janna Hentschel. They had two children, Hellmut, born 1900, and Sigrun, born 1908.

On October 18, 1906 he was appointed to the chair of geology and paleontology at the University of Halle. At the beginning in Halle, he spent a lot of time and energy in the renovation of the institute. His lectures were well-attended as he was a fascinating and thrilling speaker. In 1910 Amadeus Grabau, who dedicated his textbook "Principles of Stratigraphy" to Walther, visited him in Halle. Beginning in the same year he undertook further journeys. In 1910 he went again to the Zoological Station in Naples to complete his monograph on Dove



Fig. 3: Walther in 1895
(from Seibold 1992)

Bank (see section IV). His second journey to Egypt in 1911 was reserved for investigations in the desert. In 1914 he travelled to Australia where he received two honorary doctorates. He cancelled the excursion to the Australian Desert he had planned because of the outbreak of the First World War. During his time in Halle he wrote fewer original scientific papers than during his time in Jena but he published numerous papers and five more textbooks, including "Geschichte der Erde und des Lebens" (History of the earth and life), "Lehrbuch der Geologie Deutschlands" (Geology of Germany) and "Einleitung in die Paläontologie - Geologische Fragen in biologischer Betrachtung" (Introduction to paleontology - Geological questions in biological view). He was also engaged in explaining geology to the general public by writing articles and giving public lectures and he also tried to introduce geology into the schools. Moreover, he was the president of the Academy of Natural Sciences Leopoldina from 1923 until 1931. In 1916 he was nominated a Privy Councillor.



Fig. 4: J. Walther in 1925
(from Seibold 1992)

Johannes Walther had 26 doctoral students. The most famous of them were Johannes Weigelt, who became his successor on the chair in Halle, Bruno von Freyberg, professor in Erlangen, Yen Chu Sun, who became a professor of geology in China and Ben Barnes, later professor of geology in Brasil. In 1927, one year before he retired, Johannes Walther was a guest professor at The Johns Hopkins University in Baltimore, Maryland. After 1928, the year he became a professor emeritus, he retired more and more from scientific work. Johannes Walther died on May 4, 1937 in Hofgastein, Austria, from a cerebral apoplexy.

During his life Johannes Walther received many scientific honours including 3 honour doctorates and 12 honorary memberships. It is interesting that these honours almost exclusively came from foreign countries, e.g. honorary memberships in the Royal Society of London and Geological Society of America. The same tendency showed up in the popularity of his books which were more popular in foreign countries than in his home country. One reason might be that Walther was a great intuitive stimulator but no perfectionist. He was interested in the large problems and connections in his science. Minute, detailed work was not his strong point. Specialists who were interested in precise and one-dimensional information like e.g. stratigraphers did not like Walther's holistic, four-dimensional facies studies. Some critics even reproached Walther with speculation. Twenhofel (1938) emphasized that many of Walther's publication titles start with "introduction". Walther knew that geology and especially sedimentology were still at the beginning. A lot of his books and papers are meant to be taken as stimulation for further investigations not as final statements. Today, the merits of Johannes Walther for a comparative sedimentology, including its relationship to modern biology, and his innovative position in the history of earth sciences are acknowledged and accepted among experts around the world.

References

- Bülow, K. von, (1962): Johannes Walther, der Begründer der Biogeologie.- Ber. Geol. Ges. DDR, 6: 374-382.
- Franke, H. (1987): Zum Einfluss von Ernst Haeckel auf den wissenschaftlichen Werdegang von Johannes Walther.- Leopoldina, R. 3, 33: 223-235.
- Grumbt, E. (1975): Johannes Walther - ein Begründer der modernen Sedimentforschung.- Z. geol. Wiss., 3: 1255-1263.
- Seibold, I. (1992): Der Weg zur Biogeologie. Johannes Walther (1860-1937). Ein Forscherleben im Wandel der deutschen Universität.- VIII+196 p., Springer, Berlin, Heidelberg, New York.
- Twenhofel, W.H. (1938): Memorial to Johannes Walther.- Proc. Geol. Soc. Amer., 1937: 221-230.
- Weigelt, J. (1930): Der Lebensgang von Johannes Walther.- Leopoldina 6, 2: 3-11.