



Editorial

The year 2016 saw the 70th anniversary of the foundation of the Institute of Geotectonics at Berlin in 1946. At the same time, the Academy of Sciences re-opened in Berlin after World War II. Both events are intimately associated with the eminent geologist Hans Stille. He was, therefore, the topic of two successive colloquia, which were held at the 13th of November, 2015 (Leibniz-Sozietät der Wissenschaften zu Berlin e.V. 2015) and the 14th of October, 2016 (Leibniz-Sozietät der Wissenschaften zu Berlin e.V. 2016), and organized by the working group “Geo-, Montan-, Umwelt-, Weltraum- und Astrowissenschaften” of the “Leibniz Sozietät der Wissenschaften” at Berlin (Leibniz Society or LS).

Hans Stille’s lifework represents a certain way and style of doing geology from which the present practitioners of the science and its historians and philosophers can derive significant lessons. His way was to take a theory and make it the basis of all further consideration. He chose the Beaumontian version of the theory of thermal contraction of the earth. He did so because he was discouraged by what was then conceived as the internal inconsistencies in the version that the great tectonician Eduard Suess (1831–1914) had presented in his two fundamental works *Die Entstehung der Alpen* (1875: *The Origin of the Alps*) and *Das Antlitz der Erde* (1883–1909: *The Face of the Earth*). Suess had adapted Constant Prévost’s (1787–1856) version of the contraction theory to his own views introducing considerable changes and additions. These were done using a global database. Stille did not appreciate this because, in the beginning of his career, his experience was confined to the geology of Germany and he was misled by such authors as Emil Tietze (1845–1931) and Ferdinand Löwl (1856–1908). He was a mapping geologist with a strict positivist view of science that was at the time prevalent in the geological world; Suess was regarded as an outsider, despite the immense respect he commanded. As Stille’s most brilliant student Franz Lotze (1903–1971) later remarked, Stille’s initial experience in Germany determined his entire later scientific development. He was intolerant of criticism, because he believed his results to reflect his fieldwork, not noticing that he was bending his observations to fit the Beaumontian version of the contraction theory. Nothing shows this better than his difficulty of recognizing actual crustal stretching in what he came to call the Saxon tectonics. To avoid

recognizing stretching, he devised the most impossible explanations and was finally dragged away from them by his own students, principally by Lotze. His inflexibility towards outside criticism cost him dearly. Another example of his failure because of his adverse reaction to critique is his inability to recognize the density-driven rise of salt masses in the North German Basin. As his biographers pointed out, the controversy he got embroiled in with Richard Lehmann (1885–1916) was certainly not among his best efforts.

Yet Stille was a good geologist: as his one-time student Walther Emil Wilhelm Petraschek (1906–1991) once pointed out ‘he taught fine geological mapping’. His positivist philosophy led him to make sure that only the best geological data were to be considered in any geological interpretation. Like Georges Cuvier, he was adamant that no ‘theory’ should colour any interpretation and, again like him, this made him blind to his own theoretical constraints. He thought he was simply presenting what Nature had laid out for the geologist to observe. Any interpretation he offered, he emphasized, was valid until the opposite is proven. His weakness lay in his inability to accept any but the most obvious refutations. His style of work consisted of collecting data: be it from his own mapping, be it from the literature. However, his data collection had a weakness he had inherited from his doctoral advisor Adolf von Kuenen (1837–1915): his attention was almost entirely confined to sedimentary rocks, particularly to those bearing index fossils, because these alone gave him a control of time and made correlation possible. It is often remarked that Stille’s excursions reached only to the limit of crystalline rocks. At that limit, he turned around. As his area of interest became larger, he became more and more dependent on the literature and more and more detached from field work. But his reading was immense. As his former student Hans-Joachim Martini (1908–1969) remarked, Stille worked the literature by the tonne! If he never reached Suess’ comprehensiveness in his reading, this was not his fault: he lived at a time when the flow of foreign literature into German libraries was greatly restricted by two world wars, by foolish Allied policy of excluding Germans from international scientific exchange after World War I and by political regimes inimical to international intellectual exchange. His interpretations were unsophisticated: it seems that once he be-

lieved he understood what had happened within the upper levels of the earth's crust, he did not care whether his interpretations of it made sense geophysically or geochemically. His ideas on geosynclinal origin or destruction of continents were flatly contradicted at the time by the theory of isostasy. His defense of them was feeble and consisted of unfounded statements about subcrustal movements. What these movements or their causes may have been he never mentioned. He thought that when he named a phenomenon, he had understood it. For example, what he called 'geosynclinal regeneration' remained a mystical phenomenon, albeit for his tectonic scheme it was of critical importance. Stille never bothered to investigate it in any detail, perhaps believing that it was no different from the generation of geosynclines under shortening. Although abundant evidence for an extensional origin of the Alpine geosyncline surfaced during his lifetime, he paid no attention to those observations.

Another characteristic of his style was its neatness. Stille greatly disliked untidy pictures. That is why he preferred to express his ideas in schematic diagrams rather than in elaborate, but more realistic, drawings in the style of those of his contemporary Émile Argand (1879–1940). He liked regularities and believed that Nature was regular, not chaotic. Despite all his failings, the regional syntheses he published, especially in the latter part of his life, were examples of accuracy and precision. As a result, many of his concepts can still be usefully employed today, although their theoretical bases have long proved incorrect. Although Stille made many mistakes, they were mistakes of a great man and as such have useful sides. They spurred many observations and inspired many ideas that overthrew his own. But Stille's lifework remains a useful stepping stone for the progress of geology.

Further aspects of Hans Stille's life and scientific career follow in the present volume, which assembles the major contributions of the colloquia of the Leibniz Society in print. The topics of the contributions are organized in two parts. The first part deals with aspects of Hans Stille's biography and his career, the second part with his scientific achievements and their importance for the geosciences in general.

Hans Stille – Biographic details

Hans Stille, born 1876, grew up and started his academic training at Hannover. Moving to Göttingen, he completed the study of geology and received a Ph.D. degree. After early employment at the Prussian Geological Survey, he became a professor at Hannover in 1908, and a full professor at Göttingen in 1913. Twenty years later, Hans Stille was a full professor at the University of Berlin, a

member of the Prussian Academy of Sciences, and at the centre of political power. Immediately after World War II, he became vice president of the newly re-opened academy, and as such succeeded to establish an institute of geotectonics. Hans Stille retired in 1951 and moved to Hannover, where he died in 1966.

Martin Meschede contributes a **portrait of Hans Stille** by the painter Marianne Meschede. This portrait introduces this issue.

Hans Stille (1876–1966) by Heinz Kautzleben MLS, gives an overview over Stille's life and his academic and scientific achievements. Particular stress is on his important role for the Academy of Sciences at Berlin before and after the war, and his success in founding the institute of geotectonics.

In Hans Stille in Göttingen, Jonas Kley, University of Göttingen, covers the particular Göttingen part of Stille's life, which saw him in his first position as a full professor and his early academic merits.

The Russian Trace of Wilhelm Hans Stille by Irena G. Malakhova, Russian Academy of Sciences, points to a very important and distinctive part of Hans Stille's experiences. His travels in the Soviet Union did much to stimulate his tectonic ideas. It was also essential for his acceptance of the Soviet administration as a science representative at the re-opening of the academy at Berlin in 1946.

Scientific aspects of Hans Stille's Geotectonics

What has remained of Hans Stille's tectonics? by **A. M. Celal Şengör** MLS is the most substantial contribution to the issue. Celâl Şengör calls in his contribution the definition of germanotype and alpinotype tectonics a lasting contribution of Hans Stille. He combines these definitions with modern plate tectonics. In this combined model the regions of germanotype tectonics are extended plate boundary zones. Central Europe and the western United States are examples. The crustal structure of these zones consisting of uplifts and depressions is well known. However, the structure of the mantle lithosphere underneath is still much less known. In recent times seismological investigations revealed also complicated deep inclined structures of the lithosphere-asthenosphere boundary in these regions of germanotype tectonics. This seems to indicate that not only the crust is deformed in the extended plate boundary zones but the entire lithosphere, including its mantle parts. Such observations emphasize the importance of geophysical observations in studying elementary geological questions. Unfortunately, Hans Stille ignored the physics of the Earth, including Alfred Wegener's hypothesis which is essentially based on physics.

Hans Stille (1876–1966) about relationships between global tectonics and magmatism is the topic of Axel Müller MLS. This historical and biographic study by Axel Müller introduces and discusses Stille's ideas and models on the relationships of global tectonics and magmatism. Stille developed these ideas and models during his third and final research period between 1938 and 1950. The period was initiated by a number of publications which represent a considerable change of his research theme. The period coincides with Stille's activity period in Berlin and the reestablishment of the AdW (Academy of Sciences) in the Soviet Zone from 1946 onwards and the foundation of the Geotectonic Institute of the AdW. Stille played a decisive role in the re-establishment of the AdW, mainly due to the trust which the representatives of the SMAD (Soviet Military Administration) in Berlin and Russian colleagues had given him. The trust of the Soviet administration was the reason for extensive financial and administrative support in an otherwise difficult time. The question why Stille enjoyed so much confidence of the SMAD and which consequences his trust had for the AdW is discussed in the first part of Müller's study. In the second part of the study, Stille's models and syntheses on the context of global tectonics and magmatism are presented. In the final third part, possible motivations are discussed on why Stille devoted himself suddenly to the study of global events of magmatism.

The next two contributions provide extended abstracts of the more substantial oral presentations to the colloquia.

Paradigm development in times of political tension 1920–1970 by Hennes Obermeyer MLS, discusses the external problems Stille faced during his lifetime with the numerous political and sociological changes during the first half of the 20th century. Similarly, geoscientific models changed rapidly, and Stille was not always successful to deal with these changes.

Hans Stille's contributions to geotectonics – a discussion by Reinhard O. Greiling MLS, tackles the modern reception of Stille and his models. The study shows Stille as the founder of a “mainstream” within his branch of science, which had initial success and was then superseded by new models. This is discussed as an example for the evolution of scientific thought, which may be applicable to intellectual progress in general.

In the final paper on **A little known publication by Hans Stille, Celâl Şengör** emphasises Stille's insight into the ongoing theoretical progress in geology and its importance.

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