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Arthur Schoenflies, promoter of Mineralogy at Frankfurt, one of the explorers of the 230 Space Groups and the later Priority Dispute.

T. Kaemmel
Germany (k25071934@arcor.de)

In 1914 Schoenflies was appointed as Dean of the newly founded University Frankfurt, in order to establish the faculty of natural sciences. He took also care of the appointment of H. E. Boeke as first mineralogist at the University of Frankfurt, the pioneer of application of physical chemistry to petrography. 1915 Schoenflies first determined space groups of crystal structures of minerals, found out by W. L. Bragg. Schoenflies died at Frankfurt in 1928. His grave is at the main cemetery of Frankfurt. A geometric item, the elongated rhombic dodecahedron as forwarded by Fedorov, accentuates the gravestone. 1923 Schoenflies had addressed himself to this item, on the occasion of the second edition of his monograph of crystal structures.

By 1891 both Arthur Schoenflies and Evgraf Fedorov had published the complete list of the 230 space groups of crystal structure. Schoenflies had derived the result by applying the group theory, Fedorov through a system of algebraic equations.

Then 1912 Max von Laue and his team corroborated the theory of Schoenflies, and partly of Fedorov, through the diffraction of x-rays by crystals. 1913 William Henry and Lawrence Bragg developed a radiation spectrometer, applicable to the determination of crystal structures. Their results constituted the basis for the first determinations of space groups in the form as forwarded by Fedorow 1914 and by Schoenflies 1915. This was the very beginning of the modern mineralogy of mineral species.

In 1962, Soviet-Russian colleagues started a dispute of scientific priority, on the occasion of the 50th anniversary of the discovery of x-ray diffraction. They put emphasis on a remark of Schoenflies in his work (Krystallsysteme und Krystallstructur 1891, p. 622), which seemingly granted the priority to Fedorov. This remark had not been exact. The work of Fedorov 1891 (Simmetrija pravilnych figur. - Sapiski St. P. Min. Ob. 28: 1-146), as well as his preprint of 1890, both did contain only 229 space groups! The correction with 230 groups is to be found without paging at the end of the book after the page 556. In March 1891 Fedorov had sent a proof of the corrections to Schoenflies.

The history of the publication of the last groups is complicated, as has been partly revealed in the correspondence of Fedorov and Schoenflies (Burckhardt 1988), and completed later by further details. The tome 28 of Sapiski had been finished at the end of December 1891, after the Schoenflies monograph had been printed in September 1891. It is known, that Fedorov already in autumn 1890 had detected the 230th space groups (220, I$\bar{4}$3d, Td6), but he retracted his statement. He published his result 1891 in Germany (Neues Jb. Mineralogie I: 113-116). In this publication he wrongly counts 230 groups: The cubic 220 is missing and a rhombic item is the odd one out. The exact result of Fedorow has been displayed not before 1892, after Fedorov had published his results in the “Zeitschrift für Kystallographie und Mineralogie”.

Appearing before the public with two varied publications Fedorov did leave the scientists in the dark about the right list. Therefore both papers aren‘t relevant for questions of priority. So the monograph of Schoenflies

1891 has priority concerning printed publication, despite his own statement.

A reprint of the work of Fedorov has been published in 1949. The corrections were incorporated into the text, an according reference is missing. The English translation, published as monograph 7 of the ACA in 1971, did reproduce those failures.

Summing up the complicated genesis of discovery and publication of the last space groups and their total number one may put it clear and brief: Fedorov and Schoenflies proposed the definitive total number of space groups in 1891, both approximately at the same time.