



JOHANNES HJELMSLEV IN MEMORIAM

1873—1950.

The death of Johannes Hjelmslev is a great loss for mathematical science. Although he reached an old age, 76 years, he had kept the full force of his spirit, and until the very last days of his life he worked continuously and unwearied towards the completion of the mathematical problems which had occupied him throughout his whole life.

Hjelmslev was one of the great geometers of his time, and no one of his contemporaries mastered the extensive field of geometry in all its aspects more fully than he did. To almost all branches of the geometrical science he has given contributions of high value. But above all it was the very foundation of geometry which had his greatest interest and in which the results he achieved were of most fundamental importance.

Already in his younger years he succeeded, in a classical paper "Neue Begründung der ebenen Geometrie", in giving an axiomatic foundation to the

general plane geometry with no assumption whatsoever about continuity or parallelism. This result has justly been characterized as the highest point which modern mathematics has reached beyond Euclid in the foundation of elementary geometry.

Of particular significance, also, are his very original investigations into what he called "The geometry of reality" (Virkelighedsgeometrien) where he tried to bridge the gap from the practical geometry, e.g. of the drawing board with its "real" points, straight lines etc., to the theoretical plane, e.g. the analytical plane where the points are given by their coordinates. To a real point P corresponds an infinite number of arithmetical points (x, y) and to choose one of these as the representative of P is called "fixing" the real point arithmetically. A main purpose in Hjelmslev's investigations was then to prove general theorems like this: In a rectangular triangle in the real plane one may always "fix" the length of each side so that the Pythagorean theorem holds true. Due to their general philosophical character these investigations of Hjelmslev created great interest beyond the sphere of the mathematicians. Naturally different views concerning Hjelmslev's way of argumentation in this most difficult field were brought forward and among them were also rather critical ones. In later years, however, Hjelmslev succeeded in giving a turn to his very deep axiomatic studies, inspired through his analysis of the geometry of reality, which all mathematic circles felt as a most harmonic one. Indeed, in his "General theory of congruence", developed in a series of very important papers in the Danish Academy, he laid the foundation of a new wide-ranging kind of general geometry, the decisive point of which was his recognition of the surprising fact that a great part of geometry could be built up without the axiom of unicity i.e. the axiom that two points determine only one line.

Hjelmslev was the latest of the representatives of the great Danish geometrical school originating from H. G. Zeuthen for whom he held the highest veneration. Like Zeuthen, he was also deeply interested in the ancient mathematics of the Greeks, and he published several interesting historical-mathematical papers among which may be emphasized his last paper concerning the Lemma of Archimedes which appeared only after his death.

Hjelmslev was a thinker of great depth and originality and at the same time he was of a strong classical disposition. Through his clarity, his righteousness and his powerful personality he had as teacher a singular influence on his pupils, both at the Technical High School, where he was professor in his younger

years, and later on at the University of Copenhagen. In the administrative and representative activities of the institutions to which he was attached he also took deep and active interest.

For the Danish mathematicians he stood as the grand old man, highly esteemed and admired by us all. We feel that with his decease a great epoch in Danish mathematics has come to an end.

Harald Bohr.

