What do we know About Stefan Cohn-Vossen?

He was born on May 28, 1902 as the son of the lawyer and *Justizrat* Emanuel Cohn. His mother, Hedwig (née Vossen) was born on November 11, 1864 in Cologne. Her 150th birthday will be next week and we have just heard the musical birthday greeting of her son.
Stefan Cohn-Vossen had two brothers, Gerhart and Friedel. Friedel took his own life at the beginning of the Nazi regime. Gerhart fled with his wife Sophie to Spain. They had two children, a son and a daughter. The daughter, Nine, is no longer living, but her son, Stefan born in 1943, a nephew of our mathematician of the same name is also here today with his wife. Since he lives in Barcelona, he is called Esteban Cohn-Vossen. Our mathematician, Stefan Cohn-Vossen and his wife, Elfriede, had a son. We will speak about him later. We are most pleased that he, too, can be here today, especially since the railway strike almost prevented his visit.

In Breslau Stefan Cohn-Vossen was a member of the youth organisation “Blau-Weiss”, a Jewish youth movement that also organized trips to Palestine. As a teenager he began to compose; later we will hear another of his musical pieces.

Retrospectively Stefan Cohn-Vossen reports the following about his studies:
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“In Göttingen, where I spent 1921 as a young student, I experienced no aftermath from the war in scientific life, except perhaps in a positive way. The very intensive and stimulating working relationship that bound the people there together and also attracted numerous foreigners, was perhaps a reaction to the research stagnation caused by the war in which almost all of the younger generation of professors had participated.
As for geometry, at that point an important period (linked to the name, F[elix] Klein) had reached its end. Geometry received a completely different impulse from physics. D[avid] Hilbert and his students, especially my teacher, R[ichard] Courant were among those who worked through physical differential equations and variational problems towards a geometric and clear core in a very new way. This brought many different areas of research into focus. In questions of conformal mappings it was topology, in integral equations it was the geometry of quadratic forms, in the

reduction of differential equations to difference equations point lattices. But more than anything else differential geometry emerged as the most prominent subject, i.e. the investigation of general curves and surfaces in space.
During this time the first volume of Wilhelm Blaschke's textbook appeared, whose notation is still used today by the majority of differential geometers in the entire world as the formal basis for their own research.

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In Breslau [Wroclaw], where I continued my studies, I met the distinguished and recently deceased geometer F[riedrich] Schur. Here geometry was not as if it had begun anew as in Göttingen, but rather carried on in the spirit of rich but strict tradition that found one of its last highpoints in the research of W.Reyes. It is characteristic of this type of geometry that it seems to draw its great wealth of concrete questions and methods from itself. For my own academic development the contact with a particular paper was **crucial**. In complete contrast it emanates from truly existing, complicated illustrative material and masters it geometrically. This was H[enri] Poincaré's mémoire concerning families of curves that arise from differential equations. Since then I have only studied more closely those questions that belong to "differential geometry on the large". The initial motivation in this direction as well as the contact with the mentioned paper, I owe to G[uido] Hoheisel; he was beginning his academic career at that time in Breslau as a student of A[dolf] Kneser" [and he, Hoheisel, taught in Cologne from 1939 to 1962].

In 1924 a Cohn-Vossen received his doctoral degree in Breslau under Adolf Kneser. The subject of the dissertation was "Singular points of a family of curves with a given differential equation". Unfortunately we have not been able to locate a copy of the dissertation. In the Cohn-Vossen Room there is a list of all other publications and a copy of each. Afterwards you will be able to take a look at them.

"Through E[rhardt] Schmidt and K[arel] Loewner [who taught in Cologne 1928-30] Stefan Cohn-Vossen was introduced to completely different aspects of geometry:

the general theory of point sets and the theory of continuous groups. That was in 1925. Remembering those lectures, I have become aware of what great progress science had made in these areas.

In 1927 in GÖTTINGEN I found mathematical life at a higher level than where I had left it in 1922. The Courant school had been fully developed. This was reflected in the book of Courant and Hilbert, “Methods of Mathematical Physics”, since then widely used. A large circle of young mathematicians were involved to a greater or lesser extent in the development of this book.”

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In 1929 his habilitation took place in Göttingen. The habilitation thesis “Non-rigid closed surfaces” was made available to us in facsimile by Richard Cohn-Vossen. On October 10, 1930 he became privatdocent for “geometry and geometrical analysis” at the University of Cologne.

On December 12, 1931 “your Magnificence, the rector” was notified of his marriage to Elfriede Ranft. She was the daughter of a protestant pastor from Saxony and a prospective physician. Thus it came to the founding of a small “Society for Christian-Jewish Cooperation”.

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In 1932 the book “Geometry and the Imagination” by D. Hilbert and S. Cohn-Vossen was published (in German “Anschauliche Geometrie”).

The book was based on lectures that Cohn-Vossen had heard in Göttingen in 1920 and had exhaustively revised and elaborated. At that time mathematical publications were allowed to mature; the appreciation of detail with which the book was written is still apparent today. The book was extremely successful, was translated into many languages and is still sold today.

In the foreword of the book we read:

“… it is true, generally speaking, that mathematics is not a popular subject, even though its importance my be generally conceded. The reason for this is to be found in the common superstition that mathematics is but a continuation, a further development, of the fine art of arithmetic, of juggling with numbers.
Our book aims to combat that superstition by offering, instead of formulas, figures … making it easier for the reader to penetrate the essence of mathematics without having to weight himself down under a laborious course of studies.”

For example, in the section “Eleven Properties of the Sphere” there are the following photos and the accompanying text: “The sphere has constant width and girth. The term constant width denotes the property, of a solid, that the distance between any pair of parallel tangent planes is constant. Thus a sphere can be rolled arbitrarily between two parallel tangent planes. It would seem plausible that the sphere is uniquely defined by this property. In actual fact, however, there are numerous other closed convex surfaces, some of them without any singularities, whose width is also constant and which therefore can also be rotated between two fixed parallel plates to which they remain tangent throughout. Fig. 228 illustrates two different positions of such a surface.”

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In mathematics the geometric form that we see here is called a Meissner body. Thus we are justified in formulating the mathematical theorem: the Meissner body has the same width from all sides. (This conclusion, of course, does not refer to cardinal Meisner from Cologne.)

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The experiment we have seen in the video can also be carried out with Meissner bodies (show experiment)

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On February 22, 1932, he held his inaugural lecture “Convex Surfaces” in the main auditorium of the university.

Now he had truly arrived in Cologne. He had started his family, written a book and established a home. At that time he lived at Theresienstr. 20, near the intersection of Gleueler Str.

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On May 2, 1933 he received a telegram from the minister, dated April 29, 1933 that Dr. Cohn-Vossen would be put on leave with immediate effect. Without students he had lost his income from his academic appointment and was thus de facto unemployed.
Today we are speechless when we read this. But back then it was not only politically correct but also legal. The law removing Jews from civil service was at least formally and democratically legitimate. It is painful to recognise this, but should serve as a constant reminder that not everything that today is politically correct and legal is also acceptable. We must never forget to what extremes ostensibly civilised nations are capable.

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It was clear to him that he would not be able to pursue an academic career anywhere in Germany, and he was urgently advised to look for something abroad. First he went to Switzerland. From there on October 6, 1933 he wrote from Locarno-Orselina, Villa Prato Allegro:

“To the Board of Trustees of the University of Cologne:
Recently in several newspapers a list of dismissed faculty members has appeared that includes the name Stefan Cohn. I assume, that I am meant.
Therefore I sincerely request notification as to whether **and how** my position falls under the law of April 7, 1933.
Until further notice, my address is as given above. My domicile remains Cologne.
Respectfully,

Dr Stefan Cohn-Vossen”

The response from October 11: “The notification of the board of trustees, which had been sent to you at your domicile at Theresienstr. 20, (p) was returned as undeliverable and will be included as attachment.”

The attachment consisted of a letter from the Prussian minister dated September 2, 1933 and addressed to Cohn-Vossen, Theresienstr. 20: “On the basis of §3 of the Law for the Restoration of the Professional Civil Service I rescind your academic license to teach at the University of Cologne.”

In spite of his hopeless situation Stefan Cohn-Vossen continued his mathematical research. We know this from correspondence with Heinz Hopf, who had high regard for him, and sought a position for him in the USA, France and England. Incidentally, Hopf and Cohn-Vossen had both attended high school in Breslau [Wroclaw], however they were not in the same school.

On September 9, 1934 his son, David Hans Richard Cohn-Vossen was born in Zurich.

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In 1934 he became a professor at the Academy of Sciences in the USSR in Leningrad and Moscow.
The appointment was made possible through the intercession of Heinz Hopf and Pavel Sergeevich Alexandrov. The latter lived from 1896 to 1982; he visited Göttingen in 1923/1924 and did NOT meet Cohn-Vossen, who was then studying in Breslau and Berlin. Alexandrov spent a year together with Hopf in Princeton where they wrote one of the first textbooks about topology.

The photo shows participants in an international topology conference in Moscow in September, 1935. In the first row from the left we see Kuratowski, Schauder and then, as the third, we see Cohn-Vossen, at the extreme right we see Pavel Alexandrov and second from right, Heinz Hopf.

Cohn-Vossen was welcomed into the circle of his colleagues and felt much at ease there. During this period he was extraordinarily academically productive; he wrote many papers and according to reports from his wife he was often in a sort of mathematical trance or research mode, familiar to us mathematicians. My wife tends to **describe this** as mathematizing. For us, that is a wonderful state in which all day-to-day things tend to retreat into the background.

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As a result of pneumonia Stefan Cohn-Vossen died on June 25, 1936 in Moscow. He had caught the infection during a train trip and at that time there were no appropriate antibiotics available.
The translation of the caption is: With great regret the Editorial Board of the Matem. Sbornik reports the untimely death of the outstanding geometer Stefan Cohn-Vossen, who passed away on June 25, 1936 after a long and serious illness.

The death was also made public in the West. In the paper “Existence of shortest paths” that Cohn-Vossen had submitted for publication to the journal “Compositio Mathematica” on June 27, 1935, there is a footnote: “Stefan Cohn-Vossen died at the age of 34 on June 25, 1936. The name of this colleague will live on in our journal especially because of the extraordinary progress which his theorems concerning the shape of geodesics and total curvature of open surfaces … contribute to geometry in the large.”

In March, 1946 the offer was made for him to return to the University of Cologne. I will read from the letter of March 11, 1946.

“Dear Colleague,
Since the Nazi-regime has been removed, all directives have become invalid by which faculty members had been ELIMINATED for racist or ideological reasons. I have been authorised by the Philosophical Faculty of the University of Cologne to request that you return to our University and take up the position that you once had.

Indeed, it is a difficult task to return to Cologne, an almost completely destroyed city, and to start a new life.
As intensive as our efforts are to re-establish our University, we will also do as much as is in our power to help you to resettle in Cologne.

With best regards,
Yours,
Prof. Peter Russow
Dean of the Philosophical Faculty

Handwritten as undated addendum:
According to information from Prof. Hamburger: Cohn-Vossen †"

For me, personally, the language of this letter seems almost cynical: not colleagues, but rather regulations drove Cohn-Vossen away and the return is not difficult because of the injustice he suffered, but rather because Cologne was in such a destroyed state.

In 1947, 11 years after his death, a 33-page article by Aleksandr Danilovich Alexandrov "On the works of S.E. Cohn-Vossen" was published in Russian, in a sense an academic epitaph.

We Colonians are much obliged to the editors of the Upekhi Matematicheskich Nauk, in particular Viktor Buchstaber, for the permission to put an English version of this article into the Internet. The translation was generously made available by Andrei Iacob, who was for a long time translator for the Mathematical Reviews. The approval for the publication of the English version was made possible by the help of Ari Leptev, Director of the Mittag-Leffler Institute in Stockholm.

Aleksandr Danilovich Alexandrov was a differential geometer and lived from 1912 to 1999. (One can certainly count him among the students of Cohn-Vossen, since after his doctoral thesis on weak convergence of sequences he swung to the field of geometry.) Among the students of Alexandrov were Perelman (who refused the

Fields medal), Bakelman, Burago and Zalgaller. Alexandrov's article about Stefan Cohn-Vossen represents a very impressive commendation of his work.

At the end of my talk I would like to thank my colleague, Prof. Dombrowski and Mr Richard Cohn-Vossen that they have readily made their material available to me. I hope that I have not forgotten anything important, in which case, Mr Richard Cohn-Vossen, you will now have the opportunity to retrieve what is lacking.