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History

Roland Weitzenböck and World War II

In their recent book, *Het Dorp, De Oorlog, De Mensen*, about the village of Laren in World War II, Ineke Hilhorst and Teun Koetsier devote a chapter to the Austrian, Roland Weitzenböck, at that time professor of mathematics at the University of Amsterdam. The chapter was translated by Bas and Tina Jongeling for the NAW and the authors added a note on Weitzenböck's mathematical work.

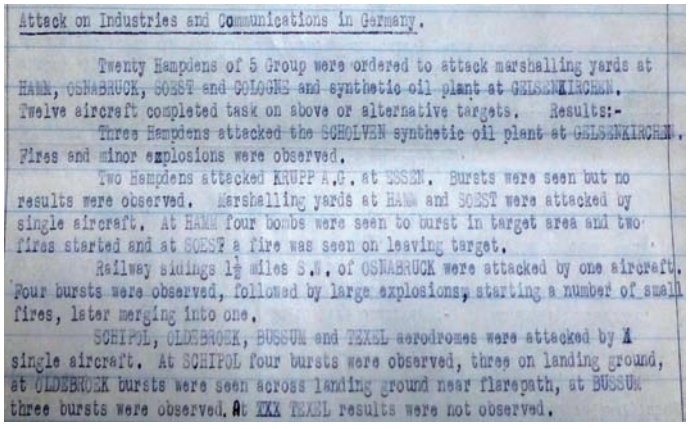
Bombardment in 1940

There is a sickle moon and the sky is overcast. In addition the Netherlands is blacked out. In the night of Saturday 5 to Sunday 6 November 1940 the street lighting is off, as always. No light is allowed to escape from any houses. Early in the night scores of bombers take off from England. Many of them are Hampdens. The Handley Page Hampden is a middle-sized two-engine bomber that can carry four high-explosive bombs of 250 kgs each.

Already in 1940 the Royal Air Force carries out many bombing flights over the continent. Harbours, aerodromes, factories, anything that the German army may use to advance the war is eligible as a target. The Hilversum aerodrome is one of them. One of the Hampdens has, according to the *Royal Air Force Operations Record Book, Bomber Command Operations, 1936–940*, as a target: 'Bussum Airport'. Bussum Airport must be interpreted as Hilversum Airport, as Bussum has no airport.

The navigator who is seated in the nose of the plane, finds it difficult to orient himself. At 23.05 English time, that is 00.05 Dutch time, the navigator drops four bombs. He then sees three explosions. 'Three bursts' the log says. The Hampden briefly circles round and then returns to base. Around that time eye witnesses on the ground observe an English plane over Laren and Blaricum. Around midnight the plane comes into action. It skims over the centre of Laren heading in a north-easterly direction and at the 'Hut van Mie' drops four bombs, in a straight line. The first bomb explodes at the intersection of Melkweg-Kruislaantje, just behind the Hut van Mie. The bomb makes a deep crater and uproots several trees. The second bomb falls close to the garage of the villa ''t Lânhus' at Melkweg 15 in Blaricum, which is badly damaged. The third bomb hits the villa Orion at number 13. The fourth falls in a garden.[1]

There isn't much left of the villa Orion at Melkweg 13. Emergency workers find the principal resident, distraught, next to the debris. By accident he wasn't at home at the time of the bombardment. His wife is found dead under the rubble. His son Richard has been flung out of his bedroom



Attack on Industries and Communications in Germany.

Twenty Hampdens of 5 Group were ordered to attack marshalling yards at HAMM, OSNABRUCK, SOEST and COLOGNE and synthetic oil plant at GELSENKIRCHEN. Twelve aircraft completed task on above or alternative targets. Results:-

Three Hampdens attacked the SCHOLVEN synthetic oil plant at GELSENKIRCHEN. Fires and minor explosions were observed.

Two Hampdens attacked KRUPP A.G. at ESSEN. Bursts were seen but no results were observed. Marshalling yards at HAMM and SOEST were attacked by single aircraft. At HAMM four bombs were seen to burst in target area and two fires started and at SOEST a fire was seen on leaving target.

Railway sidings 1½ miles S.W. of OSNABRUCK were attacked by one aircraft. Four bursts were observed, followed by large explosions, starting a number of small fires, later merging into one.

SCHIPOL, OLDEBROEK, BUSSUM and TEXEL aerodromes were attacked by A single aircraft. At SCHIPOL four bursts were observed, three on landing ground, at OLDEBROEK bursts were seen across landing ground near flarepath, at BUSSUM three bursts were observed. At XXX TEXEL results were not observed.

Source: RAF Operations Record Book, Bomber Command Operations 1936-1940, The National Archives London

The last sentences concern the bombing of 'Bussum aerodrome', 5/6 October 1940

Source: Gerbe van der Woude

Villa Orion after the bombing

and is lying in the woodland with a gaping wound on his head. He can't be saved. The other son, Willy, is in Munich.[2] The maid-servant is unhurt.

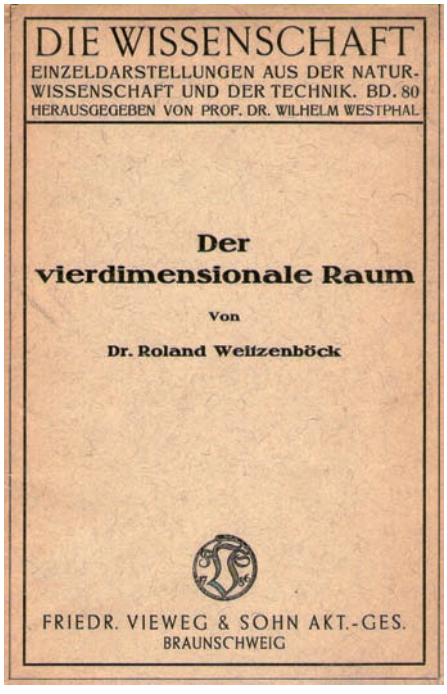
The inhabitant of the villa is Roland Weitzenböck, professor of mathematics at the University of Amsterdam (UvA).

It is overwhelmingly likely that the bomber arrived over Laren and Blaricum by accident as a result of navigational problems. Although precision bombardments were not possible in those days, Weitzenböck is convinced that the bombardment is meant as an intentional attempt at his and his family's life.

The professor and the Laren artists

Since October 1921 Weitzenböck lectures in mathematics at the University of Amsterdam. He commutes daily by steam-tram from Blaricum via Laren to the capital. His most important book on mathematics is published in 1923: *Invariantentheorie* (Theory of Invariants). This theory can be applied in Einstein's general theory of relativity. In the years 1928–1929 Weitzenböck and Einstein are actually corresponding with each other. Many students follow Weitzenböck's lectures. His book is a kind of bible for them.[3] In 1924 he becomes a member of the Koninklijke Academie van Wetenschappen (Royal Academy of Sciences) in Amsterdam.

Weitzenböck is popular and supervises several PhD students. One of the first — and certainly the best-known — is the chess player Max Euwe, who takes his doctorate with him in 1926. In 1929 Weitzenböck publishes *Der Vierdimensionale Raum* (Four-dimensional space).[4] It is a well-written book for a wide audience.



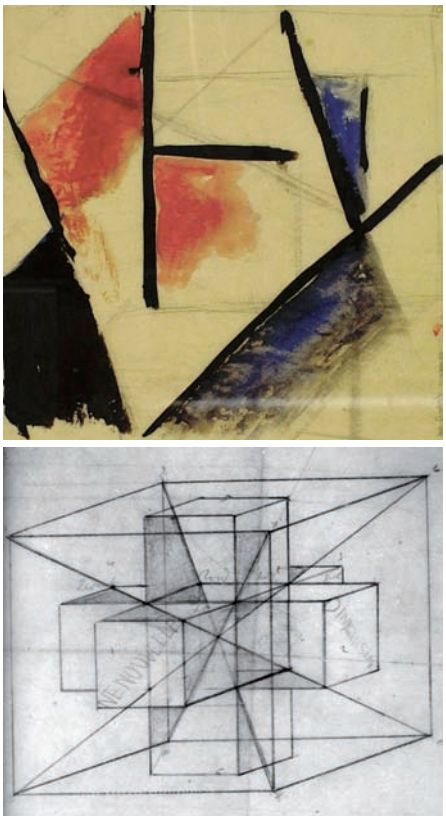
Weitzenböck's book on four-dimensional space from 1929

The idea of a four-dimensional space also appeals to certain artists. Mondrian is staying in Laren because the First World War has prevented him from returning to Paris, and Bart van der Leck[5] also settles in the Gooi area in those years. They are both in contact with the artist, writer and typographer Theo van Doesburg.

After a visit to Mondrian in 1916, Van Doesburg writes to Van der Lek: "Laren seems to be a delightful place for thinking quietly. There are quite a few people living there who occupy themselves with abstract life."[6] Four-dimensional space inspires them in their abstract approach to art. In the magazine *De Stijl*, founded by himself, Mondrian and Bart van der Leck, Van Doesburg writes in 1920: "Life mathematics. What we have to learn from mathematics is the system of extension."[7] And then he compares the development that will be required with the way mathematicians construct four-dimensional space.[8]

The idea of four-dimensional space also plays a role in the realm of ideas of the artists in the Gooi area in a different way. In the first decades of the twentieth century some artists are interested in spiritism, getting into contact with the spirits of the dead. Karel Schmidt,[9] for example, paints "auras, visions, deceased souls, kharmic portraits, astral bodies and also feelings and sounds."[10] Lien Heyting writes about him: "As a painter–preacher–writer and clairvoyant he appealed enormously to the imagination and he was certainly the most peculiar figure ever to walk around in Laren en Blaricum."[11]

Around the turn of the century spiritists entertain the idea that the three-dimensional world might be embedded in a four-dimensional world, in the same way that a two-dimensional flat surface can be part of a three-dimensional space. The spirits that the spiritists believe in might have their being in the four-dimensional space and display wonderful phenomena in our three-dimensional world. One of the people from whom this idea derives is the German Professor Friedrich Zöllner,[12] who has published extensively about it. In his work he is trying to find experimental confirmation



Source: Kröller-Müller Museum

Theo van Doesburg, 'Tesseractic study' 1924–1925 (top), and 'Tesseract in cube' 1925–1929 (bottom). A tesseract is a four-dimensional cube.

for his ideas. To this end he works together with the American medium Henry Slade,[13] who is capable of making spirits write messages on a slate. Zöllner's claims are radically rejected by Weitzenböck. In his book on four-dimensional space he states that Slade is unfortunately a swindler and Zöllner a naïve professor who is all too keen to believe in his own fantasies.

Professionally Weitzenböck is very successful in the thirties. In 1938 he is awarded an honorary doctorate by the University of St. Andrews in Scotland. In May 1940, just before the war starts, he is appointed a corresponding member of the Academy of Sciences in Berlin.

Nieder mit den Franzosen

Weitzenböck is born in Kremsmünster, Austria, on 26 May 1885. He moves to the Netherlands because of his appointment as professor on 11 October 1921. Why Weitzenböck is chosen over other available candidates is not known. Bertus Brouwer,[14] who is living in Blaricum, has the decisive voice in Amsterdam. Although Weitzenböck is a very good mathematician, there are better ones on the market, such as for example Jan Schouten[15] from Delft. Malicious

tongues claim that Brouwer opts for Weitzenböck in order to keep the strong personality of Schouten out of the faculty.[16]

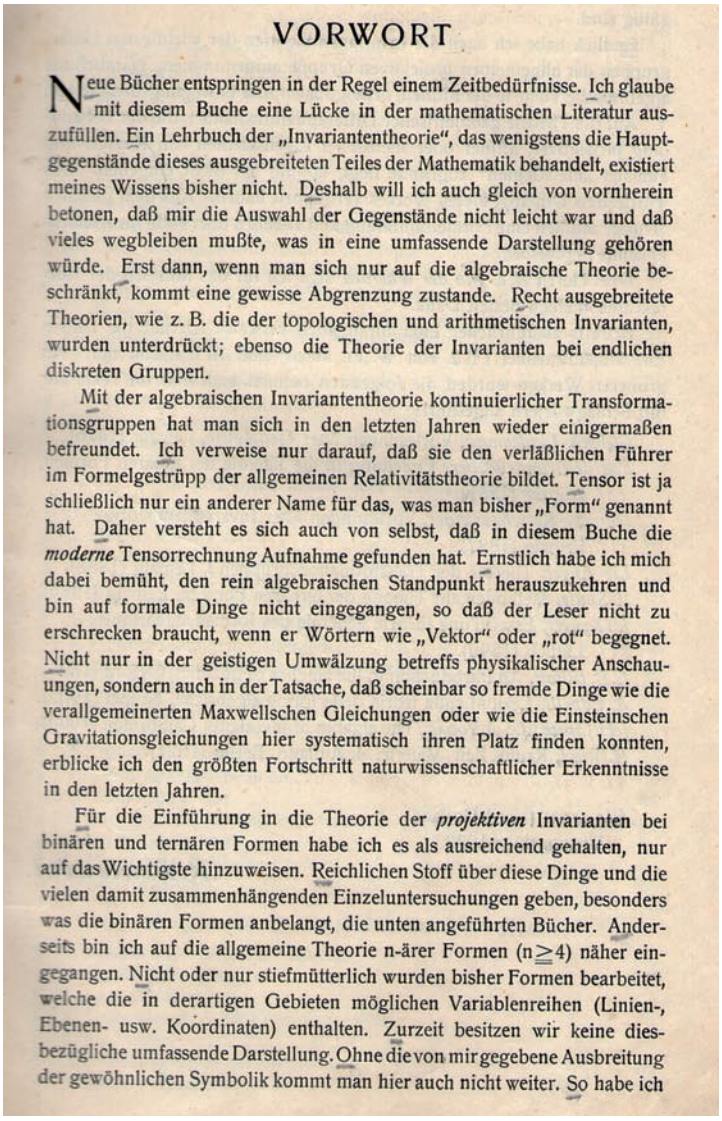
Weitzenböck chooses his domicile in Blaricum from 22 September 1921. His villa at Melkweg is just across the boundary with Laren. He is married and has a daughter, Grete, and two sons, Richard and Willy. All three of them are born in Blaricum. The family strikes roots quickly. Weitzenböck is a member of the Laren Chess Club, of which he becomes president in 1931. The club plays in the society hall of Hotel Hamdorff in Laren. His former PhD student Max Euwe becomes world champion in 1936. Already in the twenties Euwe is by far the best chess player in the Netherlands and he is very well-known. In 1924 he plays simultaneous chess in Laren on 24 boards. Euwe wins on 22 of the 24 boards. Weitzenböck is undoubtedly one of the players, but he is not one the winners.[17]

Weitzenböck is also for some time on the board of governors of the Gooische School, and he is a member of the board of the Public Library Laren-Blaricum. His son Willy, a good swimmer who is an excellent water polo player, is a member of the Laren Swimming Club 'De Kwakers'. In 1937 Weitzenböck's wife, Leopoldine Höfler, dies. He marries again on 21 April 1939.

It seems as if Weitzenböck is not interested in politics, but appearances are deceptive. The first letters of the sentences of the foreword of his book *Invariantentheorie* together form the words "Nieder mit den Franzosen"—"Down with the French". Obviously, with these words Weitzenböck expresses something that he feels very strongly about. It is a sentiment that derives from his experiences in the First World War and its frustrating outcome.

Source: The Laren chess club

The Laren chess club in Hotel Hamdorff, around 1930. Chairman Weitzenböck sitting in the middle.



VORWORT

Neue Bücher entspringen in der Regel einem Zeitbedürfnisse. Ich glaube mit diesem Buche eine Lücke in der mathematischen Literatur auszufüllen. Ein Lehrbuch der „Invariantentheorie", das wenigstens die Hauptgegenstände dieses ausgebreiteten Teiles der Mathematik behandelt, existiert meines Wissens bisher nicht. Deshalb will ich auch gleich von vornherein betonen, daß mir die Auswahl der Gegenstände nicht leicht war und daß vieles wegbleiben mußte, was in eine umfassende Darstellung gehören würde. Erst dann, wenn man sich nur auf die algebraische Theorie beschränkt, kommt eine gewisse Abgrenzung zustande. Recht ausgebreitete Theorien, wie z. B. die der topologischen und arithmetischen Invarianten, wurden unterdrückt; ebenso die Theorie der Invarianten bei endlichen diskreten Gruppen.

Mit der algebraischen Invariantentheorie kontinuierlicher Transformationsgruppen hat man sich in den letzten Jahren wieder einigermaßen befreundet. Ich verweise nur darauf, daß sie den verläßlichen Führer im Formelgestrüpp der allgemeinen Relativitätstheorie bildet. Tensor ist ja schließlich nur ein anderer Name für das, was man bisher „Form" genannt hat. Daher versteht es sich auch von selbst, daß in diesem Buche die *moderne* Tensorrechnung Aufnahme gefunden hat. Ernstlich habe ich mich dabei bemüht, den rein algebraischen Standpunkt herauszukehren und bin auf formale Dinge nicht eingegangen, so daß der Leser nicht zu erschrecken braucht, wenn er Wörtern wie „Vektor" oder „rot" begegnet. Nicht nur in der geistigen Umwälzung betreffs physikalischer Anschauungen, sondern auch in der Tatsache, daß scheinbar so fremde Dinge wie die verallgemeinerten Maxwellschen Gleichungen oder wie die Einsteinschen Gravitationsgleichungen hier systematisch ihren Platz finden konnten, erblicke ich den größten Fortschritt naturwissenschaftlicher Erkenntnisse in den letzten Jahren.

Für die Einführung in die Theorie der *projektiven* Invarianten bei binären und ternären Formen habe ich es als ausreichend gehalten, nur auf das Wichtigste hinzuweisen. Reichlichen Stoff über diese Dinge und die vielen damit zusammenhängenden Einzeluntersuchungen geben, besonders was die binären Formen anbelangt, die unten angeführten Bücher. Anderseits bin ich auf die allgemeine Theorie n-ärer Formen ($n \geq 4$) näher eingegangen. Nicht oder nur stiefmütterlich wurden bisher Formen bearbeitet, welche die in derartigen Gebieten möglichen Variablenreihen (Linien-, Ebenen- usw. Koordinaten) enthalten. Zurzeit besitzen wir keine diesbezügliche umfassende Darstellung. Ohne die von mir gegebene Ausbreitung der gewöhnlichen Symbolik kommt man hier auch nicht weiter. So habe ich

The preface of *Invariantentheorie*. The first letters of the sentences form "Nieder mit den Franzosen".

Weitzenböck in WW I

The occasion for the First World War is the murder of Archduke Franz Ferdinand in Sarajevo, the capital of Bosnia. Franz Ferdinand is shot by the 19-years old Serbian student Gavrilo Prinzip. That deed is a reaction to the annexation of Bosnia by Austria-Hungary, six years before. The murder leads to a chain reaction that plunges Europe into a devastating war. Supported by Germany, Austria-Hungary declares war on Serbia on Tuesday, 28 July. A week later the whole of Europe is aflame. The Russians support the Serbs. As a result Germany declares war on Russia. But first they attack France through

Source: Kriegsarchiv Wien, courtesy of Dr. Gerhard Artl

Weitzenböck (right) on the Serbian front

Source: Kriegsarchiv Wien, courtesy of Dr. Gerhard Artl

Weitzenböck on the Serbian front

Belgium and Luxembourg, because of the French alliance with Russia. Because the British have guaranteed Belgian neutrality, Great Britain declares war on Germany on Tuesday, August 4.

Weitzenböck has personally experienced the fighting of WW I. When Austria-Hungary declares war on Serbia, he serves as a first lieutenant in the 13th engineering battalion (Sappeurbataillon 13). He is then already a mathematician holding a doctorate. The battalion advances to the river Drina, between Serbia and Bosnia. There, from 6 September to 4 October, the Battle on the Drina takes place, which claims 17 500 casualties.[18] After a month of fighting the battle ends in a deadlock and the two parties entrench themselves.

The Austro-Hungarian soldiers take revenge for the assassination of their archduke. Insufficiently restrained by their superiors they commit numerous war crimes. In several Serbian villages unarmed men, women and children are shot or hanged. Soldiers declare later that during that first phase of the war anything is permitted. Buildings, houses and churches may be set on fire, and civilians may be murdered.[19] The involvement of Weitzenböck is unknown. It seems likely that he was aware of the massacres.

After the battle Weitzenböck is promoted to captain. He is transferred from the frontline to the military academy at Mödling to teach. Next he is appointed commander of a company of the 7th Engineering Battalion. The battalion is sent to the Italian front, near the river Isonzo.[20] From 1915 to 1917 twelve battles take place there. In total 300 000 soldiers are killed at the Isonzo front. A couple of days after the beginning of the 12th battle, during the so-called Flitsch-Tolmein breakthrough, Weitzenböck is seriously injured.

The defeat suffered by Germany and Austria in 1918 and the Versailles Treaty that clearly has the intention to punish the defeated adversary, lead to strong anti-French feelings in many Germans and Austrians. One of the clauses in the treaty stipulated that the allies would occupy the Rhineland for fifteen years. The fact that the French deployed thousands of men from their colonial army, amongst them many Senegalese, is experienced as particularly humiliating by the Germans. All this suggests that Weitzenböck also thinks that a great injustice has been done. He considers France to be the villain. With this view he is a representative of the German revanchism that develops after the war. Many nationalist Germans are convinced that the country has to have its revenge, particularly on France. That idea is also vividly present among many Austrians, among them Adolf Hitler. A year after the publication of Weitzenböck's *Invariantentheorie*, Hitler expresses it in *Mein Kampf*: "Der unerbittliche Todfeind des deutschen Volkes ist und bleibt Frankreich" – The implacable mortal enemy of the German people is and will always be France.

Weitzenböck's aversion against the French probably finds additional fuel in the fact that French mathematicians refuse to admit German and Austrian colleagues at the congress of the International Mathematical Union (IMU) in Strassburg. The German philosopher Schopenhauer (1788–1860) writes in his *The Art of Being Offensive* about Europe and the French: "The other continents have monkeys. We have the French. That keeps each other in balance." That is humour, be it German humour. Weitzenböck's "Down with the French" isn't.

Weitzenböck is behind Hitler

Weitzenböck may have felt sympathetic towards the National Socialists as early as 1933. In 1936 he takes the initiative to acquire Dutch citizenship. His colleague Bertus Brouwer thinks that the request to be naturalized is probably made to prevent his sons from being called up to fight in the Austrian army against Germany.[21]

After the 'Anschluss' which incorporates Austria into Germany, Weitzenböck makes it clear that he supports Hitler's policies. When colleagues express their dismay about the annexation of Austria, they are amazed and bewildered to see that Weitzenböck is solidly behind Hitler's ideas. He believes in the ideal of a Greater Germanic Reich, which in his view is the best guarantee against the danger of bolshevism.[22] In 1938 Weitzenböck refuses to shake hands with the Jewish mathematician Walter Ledermann.[23]

His son Willy, who has enrolled in the Dutch air force and is doing his pilot training at the air base of Soesterberg, makes no secret of his sympathy for Hitler. That doesn't make him popular with the other pilots in training. Even before the war Weitzenböck writes to the English mathematician Herbert Turnbull[24] that the British will certainly lose the war, a prospect on which he offers his condolences before the event.[25] The fact that the entire family is behind Hitler leads to their isolation.

Weitzenböck joins the NSB

In May 1940 Weitzenböck is interned in Amsterdam. He is there in the company of Germans, NSBers and others of whom it is suspected that they might collaborate with the Germans. He meets a number of NSBers who make a positive impression on him. After his release he joins the NSB. His son Willy enrols in the SS.

The chess club, of which Weitzenböck has by then been president for nearly ten years, ceases to exist in May 1940, because the members refuse to be in a club with an NSBer.

In September 1940 the Dutch-German Cultural Community is founded. Weitzenböck attends the meeting and encounters the Reich Commissioner, Seys-Inquart, the highest German representative in the country, and Hanns Albin Rauter, the highest SSer in the Netherlands. They are both Austrians. There is one aspect of the occupation that bothers Weitzenböck. The Netherlands has been invaded without an actual declaration of war beforehand. He thinks that was incorrect. He later corresponds with the Reich Commissioner about this point, but he doesn't receive a clear answer.[26] After the war Weitzenböck writes about this point: "Initially this was a most unpleasant surprise to me, but later I had to reconcile myself to the necessity of the attack as part of the campaign against France. At that moment I saw the realization of the German victory as essential for Europe." [27]

When Weitzenböck's house is bombed in 1940, many people don't believe that it happened by accident. There is a rumour that an hour earlier that same evening a meeting had taken place at his home of NSBers and high German officers. That was supposedly the reason for the bombardment. Weitzenböck himself suspects that colleagues of his son, the pilot, who have escaped to England, are behind it. Later he says about the bombardment: "The circumstances under which this happened were such that a mistake was out of the question; obviously the house of the undersigned was intentionally targeted. As a result he was bound to gain the impression that the Dutch Government viewed him as an enemy who had to be killed, even if other inmates of the house would fall victim. Under those circumstances it is perhaps not excusable, but yet understandable that the undersigned, seriously affected as he was, considered the link that had been established by his lengthy sojourn in the Netherlands and by his naturalization as severed." [28]

The villa is rebuilt. On 20 May 1941 the local newspaper *De BEL* reports that the professor has a new telephone number: 3552. In May 1941 Weitzenböck requests an interview with Rauter. During the meeting he applies for German citizenship for his son Willy. He also discusses the release of his neighbour, the engineer Westenenk of Melkweg 15, who has been arrested. Westenenk lives in the villa 't Lânhus, the garage of which has been destroyed in the bombardment. A third request concerns a German Jew who had been awarded the Iron Cross 1st class in WW I. Weitzenböck asks if permission can be granted for the man to migrate to America, to which Rauter reacts saying that Weitzenböck better not get involved with Jews.[29] In September 1941 Weitzenböck resigns his NSB membership.[30] In 1942 he acquires German citizenship, but he doesn't join the NSDAP, the German Nazi party. On at least one occasion he puts out the swastika flag: on Hitler's birthday.

As a reserve captain of the former Austrian army, he is automatically given the same rank in the German army. As a, by now, elderly reserve captain he is attached to a Schützgruppe in Hilversum. This reserve unit limits its activities to exercises and does little else. Weitzenböck does not participates in the exercises.

Source: Nationaal Archief

Captain Roland Weitzenböck in his German uniform

Only in 1944 does the Schützgruppe become active. The group has to expropriate houses on behalf of the Wehrmacht. Dressed in a captain's uniform, including a pistol, Weitzenböck knocks at people's doors. The expropriations make him a figure of hate throughout the Gooi area. The house of the painter Douwe Komter is expropriated several times. Before the war he was a member of the same chess club and at the time he boycotted Weitzenböck. Komter therefore views the expropriations as an act of personal revenge.[31]

Weitzenböck pays a high price for his ideals. His son Willy is killed on 13 February 1944 at the Russian front.

On 30 April 1945 Hitler commits suicide in his bunker in Berlin. The next day the German radio announces that Hitler has died a heroic death in the defence of Berlin, and that he is succeeded as state president and as commander of the armed forces by Admiral Dönitz. To the bitter end Weitzenböck fulfils his duty as an officer in the German army. While on 4 May 1945 it is more than obvious that Germany has lost the war, in the reading room of the public library in Hilversum Weitzenböck swears the oath of allegiance to Dönitz.[32] The next day the Netherlands is liberated.

After the liberation

Weitzenböck is arrested on 19 May 1945.[33] The University of Amsterdam discharges him dishonourably, without the right to a pension. His membership of the Royal Academy of Sciences is also taken from him.[34] Because his possessions have been impounded he has to live on a periodical remittance by the Nederlands Beheersinstituut (Dutch Administration Institute) paid out of his own savings.[35] It seems that he is free for some time during that period, for on 9 March 1946 he is arrested again.[36] On 23 April 1947 he is interned in the camp Prooromo in Naarden. The camp consists of four barracks within the walled town, where hundreds of people are accommodated who are accused of collaboration with the Germans, both men and women. He may have been held there before.

It is the intention that Weitzenböck will be tried in Hilversum. On 27 January 1947 a request arrives there to give the

case priority because it "concerns a man of science with an international reputation." It seems that the court ignores this. On 10 June 1947 he is transferred to Fortress Veldhuis, the Detention and Internment Camp in Uitgeest. Soon after he is moved to Camp Laren. The situation in these internment camps is on the whole very poor. The guards are regularly guilty of assaulting alleged or real traitors. Cases come to light where guards withhold food and water from inmates. On 13 August 1947 Weitzenböck's lawyer, K. Jansma, submits a request that his client be relocated to Fortress Veldhuis. The argument advanced by Jansma is the age of 62-year-old Weitzenböck.

The political investigation service makes the following accusations against Weitzenböck: abandoning his Dutch citizenship at his own request; enlisting in the German army on 1 September 1944; wearing a German uniform and pistol; participating in courses and exercises with anti-tank shells on the Crailo heath; putting out the swastika flag on Hitler's birthday; the expropriation of the houses of L.A. Insinger and D. Komter in Laren on behalf of the Wehrmacht.[37]

During the court case the prosecutor says: "Everybody in Blaricum knew you were a great friend of the Germans! Why did you become, in 1942, an outspoken enemy of the country that had once warmly taken you in? Why did you adopt German citizenship in 1942?" Weitzenböck replies: "I felt attracted to the Greater Germanic idea, but politically I was actually a child. I was of the opinion that political peace and quiet would only be possible in Europe if the political boundaries corresponded with the boundaries between nations."[38]

Weitzenböck adduces the bombardment on his house which he only survived because he happened to be away from home, as another reason to acquire German citizenship. He views it as a personal attack on himself and his family.

Several mathematicians urge a lenient treatment of Weitzenböck. There is a letter from Herbert Turnbull of the University of St. Andrews in Scotland, which had awarded Weitzenböck an honorary doctorate. Turnbull describes him as a 'man of honour' and a great scientist. He appeals for clemency, also in view of his age. Two colleagues from the University of Amsterdam, Bertus Brouwer and Gerrit Mannoury, also plead for a mild sentence. Mannoury describes Weitzenböck "as a man of strict devotion to duty and a highly developed sense of honour, who towards his students (also towards the Jewish students among them) displayed great readiness to help and meticulous impartiality, and that it therefore seems inconceivable to him that Prof. W. would ever have engaged in espionage or other dishonourable acts, but that he thinks it, by contrast, entirely understandable that Prof. W. (who, as far as known to the undersigned, had dual citizenship at the outbreak of the war and therefore still held the rank of German reserve officer) felt obliged, in the conflict between his original fatherland and the Netherlands, to choose the side of the first, that any other attitude would for him have meant treason in the highest, i.e. the moral sense of the word." The chess master Max Euwe also writes a favourable testimony about Weitzenböck.

On 15 December 1948 the cantonal court in Hilversum gives its verdict. It sentences Weitzenböck to:

- Detention for a period equal to the time he has been interned.
- Disfranchisement.
- Deprivation of the right to hold the office of professor.
- Sequestration of his assets, extending to and limited to one tenth of these assets.

The cantonal court also decides that within three months of the sequestration having taken effect the management of Weitzenböck's assets shall come to an end.

The High Authority in Amsterdam considers the sentence too light. On appeal the Cantonal Court in Amsterdam passes sentence on 3 March 1949. The verdict is the same. Weitzenböck, who in the meantime has been transferred to the Internment Camp Vught, is released on 26 April 1948. According to the administration of the registrar's office he takes up residence at Prins Hendriklaan 89 in Bloemendaal on 11 May 1948. On 12 February 1949 he moves to an apartment in Amsterdam-Zuid, at Johannes Verhulststraat 183. When the Free University in Berlin offers him a professorship in 1949, in the context of the Special Jurisdiction that still applies to him, the authorities do not allow Weitzenböck to leave the country.[39]

On 15 May 1951 Weitzenböck moves to Zelhem in the Achterhoek, close to the German border, to the property with cadastral number F116, now Petersdijk 2. For his daughter Grete, who works as a nurse in Germany, it is easier to visit him there.

In May 1955 he finishes work on a revised edition of his book on four-dimensional space. It is not clear whether the printed version has come into his hands. Professor Roland Weitzenböck dies in Zelhem on 25 July 1955 at the age of 70.

A note on Weitzenböck's legacy

The Weitzenböck connection and Weitzenböck spacetime

Weitzenböck was a good mathematician but he worked essentially in an area of mathematics, the theory of invariants, of which the development would soon stagnate.[40] Weitzenböck's *Invariantentheorie* was an excellent textbook, albeit about a theory that had reached its peak. After the twenties the number of publications on invariant theory gradually decreases and after WW II invariant theory had become a dead subject for most mathematicians. At the end of the twentieth century, there was however, a resurgence of the theory.[41]

Yet Weitzenböck's name is not forgotten. In the literature there are Weitzenböck identities, Weitzenböck formulas and there is the Weitzenböck curvature. We haven't found precise references to his work. As for the identities, according to the relevant Wikipedia item it is uncertain whether they ever appeared in Weitzenböck's work.[42] We will not discuss these notions and restrict ourselves to two other examples of Weitzenböck's mathematical work. The first example concerns the general theory of relativity.

Once Einstein had formulated his theory of gravitation as a manifestation of spacetime geometry, he started the search for a unified field theory, the unification of gravitation with Maxwell's theory of electromagnetism.

From the summer of 1928 until the spring of 1931 Einstein worked on an approach in which the notion of distant parallelism (Fernparallelismus), also referred to as absolute or tele-parallelism, is central. Einstein used a field of orthonormal bases of the tangent spaces on the four-dimensional manifold, a tetrad field. The idea was to define the tetrad field in such a way that it would accommodate both gravity and the electromagnetic field. The tetrad field would have to allow the distant comparison of the direction of tangent vectors at different points of the manifold, hence the name distant parallelism.[43] This requires a connection that is such that when a vector issuing from a point A is transported parallel to itself along different routes to a point B the result is the same vector. This particular connection of the parallelization is often called the *Weitzenböck connection*. Its Riemann curvature is zero. And indeed, Weitzenböck presents it in a purely mathematical context in his *Invariantentheorie* of 1923.

It all started with two short notes by Einstein published in June 1928 in the *Sitzungsberichte* of the Prussian Academy.[44] They are original pieces of work written without interaction with other mathematicians or physicists. Einstein thought that he had come up with a completely new geometry of distant parallelism and he asked Max Planck whether mathematicians might be familiar with the notions he was developing. Planck had said then that the physical content was important enough to warrant immediate publication.

However, after the publication of the two notes, several men reacted. One of them was Weitzenböck. On 1 August 1929, he wrote to Einstein: "The connection components that you denote [...] by $\Delta^{\nu}_{\mu\sigma}$ were published first (1921) in my encyclopedia article III E 1 in note 59 with No. 18; more explicitly in my *Invariantentheorie* (1923) (Groningen, Noordhoff), p. 317."[45] In other words: "already in 1921 I discovered this geometry of yours." He also mentioned some other results that might be useful to Einstein and offered to write a note for the Prussian Academy. Einstein reacted immediately on 3 August. In his letter he welcomed the idea that Weitzenböck would write a note. Weitzenböck sent it on 8 August. Einstein presented it to the Academy and it appeared on 28 November 1928.

Elie Cartan, who had already worked on the geometry of distant parallelism in 1922 and 1923, also reacted to Einstein's notes. He mentioned his own papers and he wrote that when Einstein visited Paris in March/April 1922 in order to give a talk at the Collège de France, he, Cartan, had, at Hadamard's place, talked about them and that he had given Einstein a simple example of a Riemannian space with 'Fernparallellismus'.[46]

Einstein seemed to have forgotten the conversation, but in his 10 May 1929 letter to Cartan he admitted Cartan's priority and he excused himself by referring to the fact that Weitzenböck in his note had omitted Cartan among his 14 references as well.[47]

This was not a convincing excuse, because, as Cartan pointed out in his answer to Einstein, one of Weitzenböck's references is a paper by Bortolotti in which Bortolotti refers several times to Cartan.[48] Einstein had forgotten the conversation with Cartan or he had not fully understood Cartan. Yet when he needed distant parallelism the idea surfaced in his mind. We do not know what happened in Weitzenböck's mind. He may have decided consciously not to mention the Frenchman's work, after all "Nieder mit den Franzosen".

Einstein solved the embarrassing situation by asking Cartan to write a historical note on distant parallelism.[49] In his paper Cartan pointed out that he himself in 1921 and Weitzenböck in 1923 had made the same discovery in a purely formal context. These formal operations could not be viewed as the discovery of absolute parallelism from his point of view.[50] The notion of absolute parallelism had only been explicitly introduced by Cartan himself in 1922 and 1923, he wrote. He did not deny though that Weitzenböck's theoretical contributions were valuable.

Although Einstein mentioned Weitzenböck three times in later papers the two men don't seem to have had any further contact. Yet Einstein never fully accepted Cartan's priority claim and continued to mention Weitzenböck as one of the mathematicians who had discovered absolute parallelism before he did.

It seems that Weitzenböck never referred to Cartan,[51] although he must have been aware of the Frenchman's work. For example, Cartan and J.A. Schouten wrote two papers that were presented in 1926 to the Dutch Academy of Sciences in Amsterdam.[52] The title of one of them is 'On Riemannian geometries admitting an absolute parallelism'. The papers were presented by Jan de Vries, Weitzenböck's colleague in Amsterdam.[53] We also know that Weitzenböck read French, because in 1913 he published a (positive) review in *Monatshefte für Mathematik* of a Belgian textbook on determinants written in French. Lluís Bel may be right when he writes: "Weitzenböck is known for disliking Frenchmen in general and E. Cartan in particular."[54]

Weitzenböck's opus magnum *Invariantentheorie* has almost been forgotten, but his name lives on in the literature on relativity theory in the Weitzenböck connection and the Weitzenböck spacetime that is defined by it.[55]

Weitzenböck's inequality

In 1919 Weitzenböck published a nice result in elementary geometry that is called Weitzenböck's inequality.[56] It is worth mentioning. The inequality states that for a triangle with sides having lengths a, b, c and area F, the following inequality holds:

$$a^2+b^2+c^2 \geq 4\sqrt{3}F \quad \text{or} \quad \frac{\sqrt{3}}{4}a^2+\frac{\sqrt{3}}{4}b^2+\frac{\sqrt{3}}{4}c^2 \geq 3F.$$

The second version of the inequality has an elegant geometrical interpretation: the sum of the areas of equilateral triangles erected over the sides of a triangle is greater or equal to three times the area of the original triangle. Equality occurs if and only if the triangle is equilateral. In his paper Weitzenböck gave three analytical proofs. He also gave generalizations to a polygon with n sides and a tetrahedron. The results are less elegant, but they demonstrate Weitzenböck's analytical skills.

For a short analytical proof we refer to Bottema [3, pp. 42–43]. The Wikipedia entry on Weitzenböck's inequality has a nice synthetic proof using the Fermat point of the triangle. There are references to several generalizations.

Notes

1 According to eyewitnesses, the plane returns after 45 minutes, ignites the landing lights briefly and disappears in a westerly direction. Those three quarters of an hour correspond to the log that says the plane is still circling for more than half an hour.
2 At the time of the bombing, his daughter Grete Edda Maria lives in Vienna. See *De BEL* of 11 October 1940, p. 2.
3 Van Dalen [8, p. 643].
4 Weitzenböck [27].
5 Bart van der Leck (1876–1958).
6 Source https://museumtv.nl/bart-van-der-leck, accessed on 7 October 2020.
7 Theo van Doesburg (writing under the name I. K. Bonset), *De Stijl*, August 1920.
8 The original text in Dutch is: "Willen wij van uit het punt-ik een overlichamelijk-uitgebreid ik (R4-ik) construeeren dan moeten wij beginnen ons van punt-ik (een toestand van geheel in zichzelf afgesloten individualisme) tot lijn-ik, van lijn-ik tot vlak-ik, van vlak-ik tot lichaam-ik, van lichaam-ik tot overlichamelijk-uitgebreid-ik, te ontwikkelen. Dit gaat niet zonder dat wij ons voorgaand ik gedurig in liquidatie brengen. Deze mathematische evolutie, deze vermenigvuldiging van levensassen is den modernen mensch noodzakelijk." Van Doesburg makes several works of art stimulated by the idea of four-dimensional space. See Van Doesburg [11, pp. 393–395].
9 Karel Schmidt (1880–1920).
10 Heyting [15, pp. 160–161].
11 Heyting [15, p. 159].
12 Friedrich Zöllner (1834–1882).
13 Henry Slade (1835–1905).
14 Luitzen Egbertus Jan (Bertus) Brouwer (1881–1966).
15 Jan Arnoldus Schouten (1883–1971).
16 Van Dalen [8, p. 351].
17 The players who won against Euwe were Van Groningen (Laren) and Kokje (Blaricum). See the *Algemeen Handelsblad* of 30 March 1924, p. 10.
18 In 1915 Weitzenböck wrote a booklet on the battle with the Serbians [22].
19 Anton Holzer [16, pp. 45–74]. See: www.fotogeschichte.info. Short version: http://www.kakanien-revisited.at/beitr/fallstudie/AHolzer1.pdf
20 The location of the fighting is now in northwestern Slovenia.
21 Van Dalen [8, p. 667]. Weitzenböck later confirmed this during his trial. See *Trouw* of 7 December 1948.
22 Nationaal Archief, Archival item CABR 94347 (PRA Hilversum 4409A).
23 Van Dalen [8, p. 666].
24 Herbert Westren Turnbull (1885–1961).
25 Van Dalen [8, pp. 666–667].
26 Nationaal Archief, Archival item CABR 94347 (PRA Hilversum 4409A).
27 Van Dalen [8, p. 699].
28 Nationaal Archief, Archival item STPD 239 (Amsterdam-Zuid).
29 Nationaal Archief Archival item CABR 94347 (PRA Hilversum 4409A).
30 Nationaal Archief, Archival item STPD 239 (Amsterdam-Zuid).
31 Nationaal Archief, Archival item CABR 94347 (PRA Hilversum 4409A).
32 Van Dalen [8, p. 699].
33 Nationaal Archief Archival item CABR 94347 (PRA Hilversum 4409A).
34 For the details of the procedure we refer to Knegtmans [17, pp. 30–31]. He is not included in the academy's historical membership database. Apparently one must die as a member to be listed there.
35 The Dutch Administration Institute is an institution charged with managing the assets of traitors in the period 1945–1967. The institute also dealt with the assets of Jews who died during the war.
36 Nationaal Archief Archival item CABR 94347 (PRA Hilversum 4409A).
37 Archiefstuk CABR 94347, PRA Hilversum 4409A.
38 *Trouw* of 7 December 1948, p. 3.
39 Van Dalen [8, p. 715].
40 Fisher [13].
41 Rota [19].
42 en.wikipedia.org/wiki/Weitzenböck_identity, accessed on 7 October 2020.
43 Much of this section is based on Sauer [20].
44 Einstein [12]. For an English translation of this paper and the main other papers on distant parallelism from 1928–1930 see Delphenich [10].
45 "Die von Ihnen [...] genannten Zusammenhangskomponenten finden sich zuerst (1921) in meinem Enzyklopädie-Artikel III E 1 in Anmerkung 59 bei No. 18; ausführlicher in meiner Invariantentheorie (1923) (Groningen, Noordhoff), p. 317ff." Weitzenböck to Einstein, 1 August 1929, EA 23-367. Quoted from Sauer [20, p. 410].
46 Goenner [14].
47 See Goenner [14]. Goenner refers to Debever [9].
48 "[...] il indique dans sa bibliographie une note de Bortolotti dans laquelle il se réfère plusieurs fois à mes travaux." Quoted in Goenner [14].
49 Cartan [6]. For an English translation of this paper and the main other papers on distant parallelism from 1928–1930, see Delphenich [10].
50 "Mais on ne peut voir dans cette opération purement formelle la première apparition de la notion de parallélisme absolu."
51 Scholtz [21].
52 Cartan and Schouten [4, 5].
53 Cogliati and Mastrolia [7].
54 Bel [2, p. 1]
55 Ortín [18, p. 19].
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