

Feb. 8, 1927.

1,616,736

W. BAUERSFELD

DEVICE FOR PROJECTING STARS

Filed Oct. 13, 1923

4 Sheets-Sheet 1

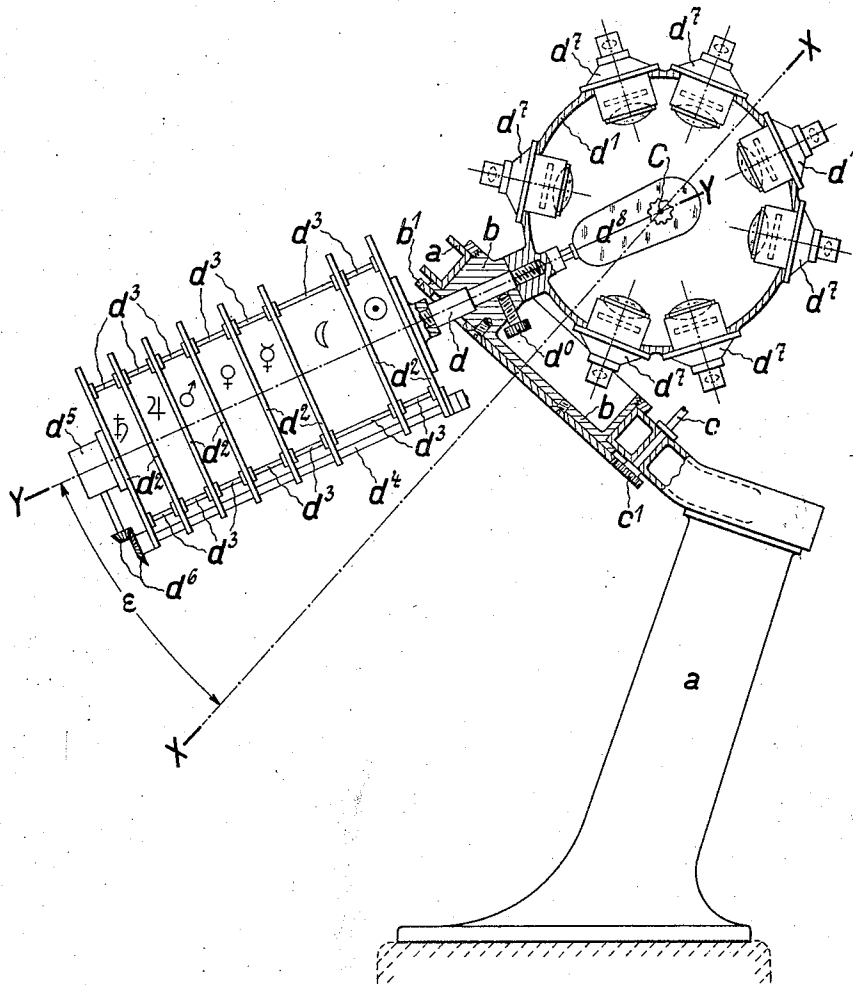


Fig. 1

Inventor:

Walter Bauersfeld.

Opening page of the US patent issued for the "Device for Projecting Stars." Public record from the United States Patent and Trademark Office. Additional images from the same source on page 52.

# Tracing paths of history

## *Rudolf Straubel, Walter Bauersfeld, and the projection planetarium*



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### Part 1

As the 100th anniversary (February 24, 1914) of the invention of the concept for the projection planetarium approaches, we take this opportunity to revisit the history of this milestone event, and to explore the leading contributions made to the invention. While the name of Walther Bauersfeld (1879-1959) is widely known in connection with the planetarium's invention, another lesser-known name is also of significance - that of Rudolf Straubel (1864-1943).

This article will highlight the persona of Rudolf Straubel, his life, and career at Zeiss. Based in large part on documents found in the archives of the Deutsches Museum in Munich and supplemented by published accounts of Franz Fuchs and Bauersfeld, both of whom were participants at the crucial event cited above, it will show in detail the relationships between Zeiss and the museum under Straubel's leadership at Zeiss, along with Straubel's personal impact on the development of the projection planetarium.

Using documents from the family archive of Straubel relative Linda Langer Snook, the article will further tell the story of Straubel's retirement from Zeiss in 1933, his final years, and the fate of his family. Finally, we will explore why his name, his contributions to the development of the planetarium concept, and his fate, have remained largely unknown.

Since the first projection planetarium was built by Zeiss for the Deutsches Museum, in order to better understand the nature of the

relationship between these two entities we need to take a short trip back in time to their beginnings, especially of Zeiss.

### **Beginnings of the Zeiss company Carl Zeiss and Ernst Abbe: Optical workshop joins with physical sciences**

Carl Zeiss founded the Zeiss Optical Co. in Jena, Germany in 1846. The company manufactured microscopes and lenses in an empirical (trial and error) process. Not satisfied with his production methods, in 1866 Carl Zeiss approached Ernst Abbe to join the company as research director.

At the time, Abbe was a lecturer in physics and mathematics at Jena University, where he became a professor in 1870. Abbe succeeded in perfecting a scientific approach for microscope and lens manufacturing, leading to more accurate, predictable and economical products at the Zeiss workshop.

As a reward, in 1876 Zeiss made Abbe a partner in his business. In 1878, Abbe likewise became director of the astronomical and meteorological observatories in Jena.

Finally, in 1879, chemist and glassmaker Otto Schott (1851-1935) joined Abbe and Zeiss. His firm, Schott & Genossen Glass Works of Jena, founded in 1884, went on to produce the glass used exclusively in the Carl Zeiss microscopes.

### **Ernst Abbe and the Carl Zeiss Foundation**

When Carl Zeiss died in 1888, his son Roderick Zeiss sold all assets of the Zeiss Optical Co.



Rudolf Straubel

to Ernst Abbe. Not having an interest in a sustained private ownership of the company, in 1889 Abbe created the Carl-Zeiss-Stiftung.

This for-profit foundation/trust was ruled by an elaborate set of statutes and principles which included:

- no private ownership of the Zeiss Company;
- its assets deeded largely to the University of Jena;
- management of the company to be handled by four directors on an equal basis;
- balance of the estate donated to the employees of Carl Zeiss.

The statutes also prescribe benefits for the employees, including paid vacations, sick pay, eight-hour work day, invalid and old age pensions for workers and their families, representation to management, banishment of discrimination based on race, religion, politics, and others.

The Stiftung was a business and social experiment that, in its content and scope, was way ahead of the times. Important in the context of this article is the Stiftung's principle which aims to "support science and technology outside as well as within the enterprises, and the participation in projects that served the general good." (10 Gale Directory of Com-

Peter Volz (born 1950) is a grandson of Zeiss optical physicist Ernst Wandersleb (1879-1963), whose family had close ties to the Straubel and Langer families. During his childhood in Germany Volz met the two Straubel sons Heinz and Harald. It was only after more recently contacting Straubel's great-nephew Gerhard Langer in the US that Volz became interested in the persona of Rudolf Straubel. This then led to a visit to the archives of the Deutsches Museum in Munich and further research. Volz wrote the article on the suggestion of planetarium historian Jordan Marché, a former editor of the *Planetarian*.

pany Histories: Carl Zeiss AG; see also: 2 Auerbach)

**Transition from Abbe to the next generation: Rudolf Straubel joins the firm**

Abbe had hired, in 1884, the young optical physicist Siegfried Czapski (1861-1907) to be his assistant, who then became a close associate. Another “person of interest” for Abbe was Rudolf Straubel. Here is a short account of his early life and career before joining Zeiss.

Straubel was born on June 16, 1864 in southern Thuringia, the son of a protestant pastor. After attending high school in Gotha and Coburg, he studied in Jena and Berlin, with majors in physics and mathematics and minors in mineralogy and physical chemistry. He first came into contact with Abbe and Otto Schott in 1885. In the summer of 1888, Straubel received his PhD in Jena, with a dissertation on an optical problem suggested by Prof. Ernst Abbe.

From 1889 until 1901, Straubel pursued a university career in Jena, first as assistant at the Physics Institute until 1896, from 1893 on as adjunct professor; then from 1897 on as full professor. He gave lectures and performed research in numerous areas of physics, in particular optical physics, but also physical chemistry, geophysics, geodesy, crystal physics, thermodynamics and electrotechnics. (13Jentzsch, p. 216)

During these years, Abbe consistently kept an eye on the young scientist. In the late 1880s and early 1890s he tried to persuade Straubel to come to work for Zeiss. But at that time Straubel declined, preferring instead to be involved in academia rather than industry.

In 1894, Straubel married Marie Kern (b. 1865), the daughter of a Jewish industrialist.

The couple had four sons: Heinz (b. 1895), Werner (b. 1897), Wolfgang (b. 1899), and Harald (b. 1905).

In 1901, feeling that his strength was waning, Abbe again approached Rudolf Straubel. This time, Straubel agreed and joined Zeiss in the role of scientific consultant. An anecdote reports Abbe as saying “A weight is off my shoulders, now that Straubel has agreed to join.” (26 Wandersleb) Important for Abbe were Straubel’s scientific and managerial talents.

When Abbe resigned from actively leading Zeiss on September 24, 1903, he named Straubel “scientific director for life” on the four-member management team. The other members were Siegfried Czapski (who also became “bevollmächtigter,” or power of attorney of the Carl-Zeiss-Stiftung following Abbe’s resignation), Max Fischer, and Otto Schott.

Ernst Abbe died on January 14, 1905. Rudolf Straubel was Abbe’s hand-picked successor, continuing the role of scientific head of Zeiss as established by Abbe.

**Introducing Meyer and Bauersfeld**

Two other persons need to be introduced as they would become important figures in the planetarium story: Franz Meyer and Walther Bauersfeld.

On July 1, 1903, Franz Meyer (1868-1933) joined Zeiss, the first engineer with a university degree hired by the dynamically growing optical company. The choice of Meyer was intended to aid with the construction of large astronomical instruments that Zeiss had just added to its product palette.

According to an anecdote, Straubel told Abbe that, in the near future, Zeiss would need

to hire eight to twelve more engineers. Abbe appears to have remained skeptical vis-à-vis Straubel’s prophecy which, however, soon was going to become reality. (20 Schomerus p. 130)

From August 1905 to June 1907, Walther Bauersfeld also worked for Zeiss as an engineer. Bauersfeld had attracted Straubel’s attention because of his exceptional mathematical and engineering/construction skills. (20 Schomerus p. 171)

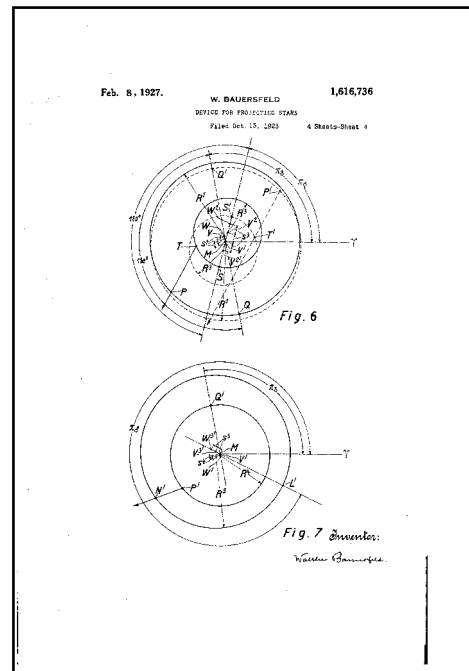
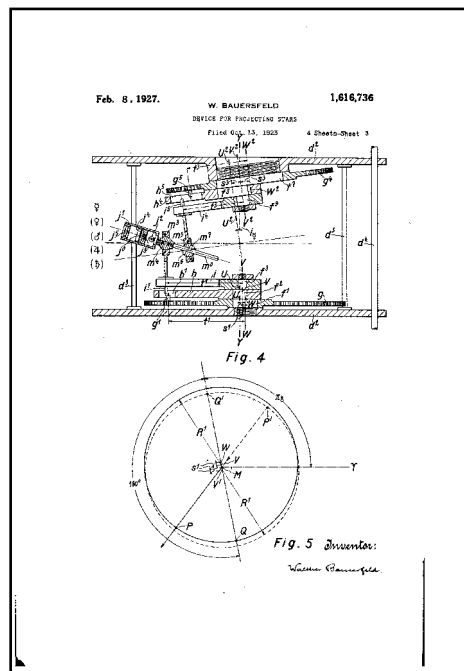
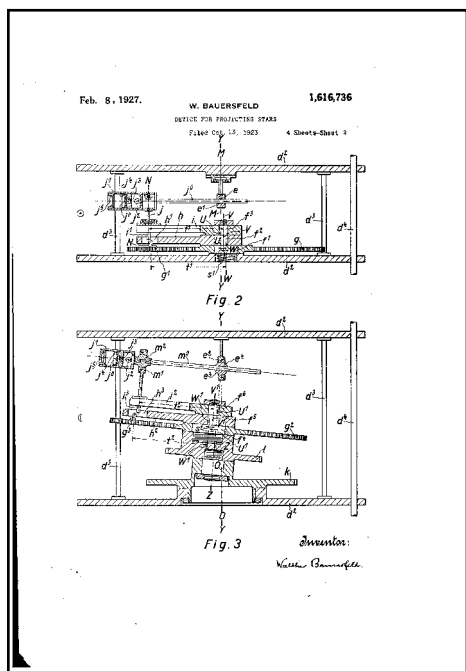
On April 1, 1908, Straubel succeeded in his effort to have Bauersfeld rejoin Zeiss as the leading engineer, and also to join the Zeiss management team, replacing Czapski, who had died on June 29, 1907.

**The Carl Zeiss Company and the Deutsches Museum**

In 1904, the Bavarian entrepreneur and engineer Oskar von Miller (1855-1934) founded the “Museum of scientific and technical master works” in Munich, Germany. His purpose was “to portray scientific research in its various development phases, and to show the effects that mutually stimulate science and industry from ancient times until today, in a manner as instructive and as easily understandable for the common people as possible.” (9 Fuchs pp. 8-9)

For the astronomy department, von Miller thought to present an historic developmental series of instruments and artifacts; demonstrations of the movements of the stars and celestial bodies; and a functioning observatory. (9 Fuchs p. 38)

The cooperation between Zeiss and the Deutsches Museum began during the year of the museum’s inception. In a letter dated July 16, 1904, Prof. Czapski of Zeiss accepted



his election as member to the presidium board of the museum ("Vorstandsrat"), and he received a letter of thanks from von Miller on July 28, 1904. Four months later, in a telegram dated November 22, 1904, Czapski also accepted to lead the section "technical optics" at the museum. (1 Archive DM)

During its initial phase (1904-1905), the museum solicited to observatories all across the country a list of articles desired by its astronomy department, receiving a generally warm response. Among the respondents was Rudolf Straubel's brother-in-law, Otto Knopf, professor for astronomy and head of the university observatory in Jena. Prof. Knopf, who was married to Prof. Straubel's sister Hedwig, sent an enthusiastic response, but his observatory was too poorly funded he was unable to donate any desired items. (9 Fuchs p.11)

### The museum finds assistance

The Zeiss Optical Co. in Jena, being in better financial shape, was able to assist the new museum in its goals. On April 4, 1906, Czapski announced that Zeiss would furnish one model each of the most modern reflector and refractor telescopes as exhibits to the museum's astronomy collection. The telescopes were delivered to the museum in August 1908 and November 1909, respectively. (9 Fuchs p. 32)

While the donation of the exhibition telescopes for the museum's instrument collection was significant, Zeiss's later contribution to the planned observatory, and particularly the construction of the Zeiss planetarium, were to become of much greater importance.

Donation of a telescope for the museum's west dome observatory by Zeiss

On August 12, 1912, in a letter to Zeiss, the museum wrote: ". . . In the large West dome of the Museum we plan to install a telescope particularly suited for demonstrations to the public, and we wish we could obtain from you such an instrument, as your company has a special reputation for construction of newer type lens- and reflector-telescopes." (9 Fuchs p. 40)

Concurrently with the request for the telescope by the museum, von Miller had also invited Prof. Straubel to become a member of its presidium board (as Prof. Czapski was before him) and to take part at the annual meeting of that board (October 2 and 3, 1912); and moreover, to become one of three secretaries of that board. On September 29, 1912, two handwritten letters were sent from Zeiss to the museum, both in Straubel's handwriting. The first letter is signed "Prof. Dr. Straubel", the second letter is signed "Carl Zeiss."

From the first letter: "I sincerely regret to



Rudolf in his front yard with his solar mirror. Historical photos courtesy of the Linda Langer-Snook family archive, used with permission.

have to inform you that I am still recovering from an illness and that therefore I am unable to attend the annual meeting of the Deutsches Museum. I regret this even more because I would have liked to thank in person for the honor bestowed upon me, and to personally have given you the news that the Carl Zeiss firm agrees to donate to the museum a telescope for the large West dome. Respectfully Prof. Dr. Straubel." (1 Archive DM)

The second letter: "In response to your letter from Aug. 12 we happily agree that we will gladly donate for the large West dome of the museum a telescope, built according to our special construction methods, and suited particularly well for demonstrations to the public. We hope to soon be able to send you drawings and description. Respectfully Carl Zeiss." (1 Archive DM; 9 Fuchs p. 40)

On November 25, 1912, Zeiss sent drawings and specifications of the refractor telescope to the museum. Oskar von Miller was said to be "full of joy." (9 Fuchs p. 40)

Slightly before this, on October 23, 1912, a letter was sent to Prof. Straubel. "Your Excellence! This is to let you know that, during the meeting of the presidium board and the committee on October 2 and 3, you have been unanimously elected member of the presidium board, and simultaneously to its secretary. We express our particular delight that you hereby join the leading members of the pre-

sidium board, and we hope that you will continue to give us your advice and cooperation as you have done in the past. We thank you for your already expressed acceptance of your election, and sign with assurance of our exceptional respect. Deutsches Museum, Dr. Osk. v. Miller, Dr. W. v. Dyck, Dr. C. v. Linde." (1 Archive DM)

It is important to state here that, in his 1955 article, Franz Fuchs mentions the donation of the telescope by Zeiss, and quotes the letter signed "Carl Zeiss." However, he does not mention Straubel by name. In Fuchs's article, Straubel is mentioned only once, in connection with Zeiss's acceptance of the planetarium projects in October 1913. In turn, Straubel's membership on the presidium board is never mentioned by Fuchs. These are omissions to which we will come back later on in this article.

### The planetarium projects

In order to demonstrate the movements of the stars and celestial bodies, von Miller envisioned two mechanical devices, one heliocentric (or "Copernican"), the other geocentric (or "Ptolemaic"). Already in 1905, the Sendtner Instrument Company of Munich had fabricated one table-top-sized model for each of these "planetaria" according to von Miller's specifications. But by the summer of 1912, von Miller had drawn up plans for a room-size Copernican planetarium with an electric motor engine, in which, similar to a clockwork, the planets Mercury, Venus, and Earth revolved around the sun, simulated by a light bulb in the center of the device.

Detailed plans were sent to mechanical and clockmaker shops in Munich and other parts of Germany, and were also published in six large-volume specialty periodicals. Several firms and individuals responded with proposals, but all were rejected by von Miller. (9 Fuchs pp. 54-56) Initially the Zeiss firm was not considered, possibly because it was specializing in optical products.

When asking for assistance in finding companies having the know-how necessary for executing his plans for the Copernican planetarium, on May 15 and May 20, 1913 von Miller wrote letters to Kurt Sorge, engineer and director of the Grusonwerke in Magdeburg (a Krupp subsidiary). On May 23, 1913, Kurt Sorge responded, naming three companies, in which the first on the list was "Carl Zeiss in Jena." (1 Archive DM)

This could have been the cause for a letter to the Zeiss firm on July 22, 1913, asking if Zeiss could take on the Copernican planetarium project. But the response from Zeiss, dated July 30, 1913, and signed by Dr. Max Pauly of the astronomy department, was negative,

stating that the project was “not in our scope of work.” It remains unknown whether Prof. Straubel was involved in this response or aware of the request.

Von Miller’s plans for the Ptolemaic planetarium were described on October 1, 1912:

“In addition to the true movements of the planets as in the Copernican system, in a second planetarium we want to demonstrate the rotation of the sky and the movements of the Sun, Moon and planets as they appear in the sky when seen from Earth, according to the Ptolemaic system. To this purpose, the fixed stars are to be shown transparently on a sphere of about 7m diameter. In the center of the sphere the observer stands on a platform. The sphere signifying the sky is rotating once daily around its axis which is parallel to the world’s axis. This will allow that the fixed stars which are visible above the horizon in Munich can be positioned properly for any hour on any date. Furthermore, the Sun, the Moon and the planets are attached to movable arms, so that the apparent movements of these celestial bodies underneath the fixed stars can be executed in their corresponding times, which will allow the demonstration of the various conjunctions of the planets.” (1 Archive DM)

### Discussing projection techniques

In the summer of 1913, the instrument company Sendtner in Munich again built a model according to this description by von Miller. But, back in 1912, the first notions of using optical projection techniques to demonstrate the movements of celestial bodies in a geocentric model had been discussed. One such idea involved using a film to project the movements of the sun, moon and planets.

A more significant projection idea originated from Swiss educator Eduard Hindermann, who used “shadow”-like projections of the motions of the planets, to demonstrate their ribbon-like movements when seen from Earth.

Hindermann wrote in a letter to von Miller, dated February 4, 1913: “The idea of using light projection can of course be applied and used with advantage when simulating the view of the world according to the Ptolemaic system, as I will gladly discuss with you.” Fuchs, von Miller’s deputy, wrote: “Von Miller wants to preserve the priority and remarks: ‘Fuchs, write down exactly when we received this letter, and when the drawings showing the movement of (the planet) Mercury have been shown to us.’” (9 Fuchs p. 58)

### Oskar von Miller discusses planetarium plans with Straubel

The tenth annual meeting of the presidium board and committee of the Deutsches Museum took place on October 1, 1913 in the audi-

torium of the Royal Bavarian Academy of Sciences in Munich. Prof. Straubel’s presence is documented in the proceedings, and his role as one of three secretaries is publicly mentioned there for the first time. Von Miller had already met Straubel the day before and extensively discussed the planetarium projects with him. Here is an excerpt from the proceedings of the annual meeting:

“...Strangely, and despite multiple efforts on our part, no firm could be found that was willing to take on the manufacturing of these large, complex and completely new constructs (the planetaria). Then, yesterday, we succeeded to convince Herr Professor Straubel that this project would be a task particularly well suited for the Zeiss works which command over excellent scientific and technical resources, as well as over the best mechanical facilities. Furthermore, taking on this task would be completely in the spirit of the founders of the company, Zeiss and Abbe. Herr Professor Straubel has expressed the support of his firm in the construction of the giant planetaria, and I therefore have no longer any doubt that we can expect superb results with these museum objects as well.” (1 Archive DM VB 1912-1913 p. 32)

On October 3, 1913, two days after the annual meeting, the museum wrote to Zeiss: “In reference to the talks between your Herr Professor Dr. Straubel and our president, Herr Dr. Oskar von Miller, we would like to express one more time our delight over the fact that you are willing to construct the two planetaria according to Copernicus and Ptolemy for the new building of our museum.” (1 Archive DM)

This, in fact, meant that Straubel accepted to take on both the Copernican and the Ptolemaic planetariums on Zeiss’s behalf.

That Straubel was able to commit Zeiss’s resources on such a short notice, without prior internal discussions at the firm, speaks for his enormous influence within the company at that time; for his conviction of how important he considered the work of the Deutsches Museum and Zeiss’s support of it to be, in the spirit of Abbe as expressed in the Zeiss-Stiftung principles; and lastly, how important he personally considered the planetarium projects to be.

Of course, having the name of the Zeiss works and their scientific and technological prowess displayed so prominently at this new museum could also reap tremendous long-term public relations benefits. This would have been an important factor in his decision as well.

### From acceptance of the plans to the projection planetarium concept

On October 7, 1913, less than a week after the announcement by von Miller, Zeiss engineer Franz Meyer was sent to Munich to study

the designs proposed by the museum and to view the intended locations in the new building of the museum. Now that von Miller finally had a partner in his plans for the planetariums, he felt a sense of urgency to press on with the project. The construction plans for the new museum building needed completion.

In a letter dated January 15, 1914, von Miller wrote: “In reference to the talks between your Herr Professor Dr. Straubel and the signed president, as well as to our letter from Oct. 3, we respectfully are inquiring about your progress in the preliminary work on the two planetaria. With utmost respect, Oskar von Miller.” (1 Archive DM)

Not receiving a timely response, a telegram was sent to Zeiss on February 21, 1914: “Since decision over planetaria is very urgent because of completion of building construction, we are asking for response via telegram if Dr. Fuchs can obtain the necessary information in Jena this coming Tuesday. [signed] Deutsches Museum.” (1 Archive DM)

On the same day (February 21), Zeiss responded: “Dr. Fuchs welcome anytime. [signed] Zeiss works.” (1 Archive DM)

### A momentous meeting

The result of this exchange of telegrams was the momentous meeting on February 24, 1914 in Jena, with these participants: Prof. Dr. Straubel, Dr. Walther Bauersfeld, Oberingenieur (chief engineer) Franz Meyer, all from Zeiss, and Dr. Franz Fuchs as envoy of the Deutsches Museum (9 Fuchs p. 61; 3 Bauersfeld p. 75). Note that Oskar von Miller himself was absent from the meeting.

Fuchs later described the results of the meeting with these words: “In Jena I was readily shown the plans for their intended designs. For the Copernican planetarium, they wished to increase the room height, however this wish could not be granted because of our large concrete structures. With respect to the Ptolemaic planetarium, thoughts were presented to project the sky onto a white, fixed dome using high-quality optics, instead of constructing the rotating metal sphere.” (9 Fuchs pp. 61-62)

However, a more in-depth description of this meeting originates from Walther Bauersfeld, in an article published in 1957:

“The author, who had been a member of the Board of Management in the Zeiss works since 1908, attended a meeting at Jena between Oskar von Miller and the chief engineer [Meyer] of the astronomical department of the firm. On this occasion much was discussed about the difficulties of the construction, which appeared insurmountable. In this situation I asked the question: ‘Why do you want to make such complicated and heavy machinery? I think a much better way would

*(Continues on Page 82)*

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*Rudolf Straubel, continued from Page 54*

be gained by optically projecting the pictures of the heavenly bodies on the interior surface of the sphere. In this case all the complicated mechanical machinery could be replaced by a fairly small arrangement of optical apparatus in the midst of the sphere.'

"Immediately after I had spoken these words, my colleague in the Board of Management, Professor Straubel, who also had attended the meeting, exclaimed: "Then of course, also the fixed stars should be projected from the central apparatus." This was the moment in which the Zeiss-Planetarium was born. Oskar von Miller and all members of the meeting were very happy about this solution which, moreover, allowed enlargement of the dimensions of the spherical dome so that many more visitors could see the artificial sky simultaneously, and the astronomical department was charged with designing the apparatus in this form." (3 Bauersfeld p. 75)

We will discuss the Bauersfeld article and particularly the "birth moment" in a separate section below.

When informed by Dr. Fuchs about the new design idea for the Ptolemaic planetarium, Oskar von Miller was very pleased. In a letter dated March 20, 1914 he reflected on the new design. Beginning in April, he personally travelled to Zeiss in Jena, and upon his return to Munich, in a letter dated April 6, 1914, he summed up his discussions in Jena with an endorsement of the new plans. (9 Fuchs p. 61)

### **Projection planetarium: From concept to reality**

After this endorsement of the new plans by von Miller, the actual work on the planetariums began at Zeiss. But because World War I broke out less than four months later, on July 28, 1914, the preoccupation with war production at Zeiss slowed the work on the planetariums down to a crawl. Nevertheless, the cooperation continued.

Chief engineer Meyer was put in charge of the actual work on the planetariums and on occasion was sent to Munich, to take part in discussions and decisions concerning the building of the domes where the Zeiss planetariums and the Zeiss telescope were to be housed. (9 Fuchs pp. 47-48)

The correspondence between Zeiss and the museum also continued. Letters from the museum to Zeiss usually are addressed to "Prof. Dr. Straubel, Direktor der Zeisswerke." Letters from Zeiss to the museum typically are signed by Dr. Walter Villiger, now head of the astronomy department at Zeiss, though some of them additionally show Straubel's initials ("Str"). (1 Archive DM)

Despite the war, von Miller continued to push for advancement of the projects. The

museum archive contains the proceedings of a meeting at Zeiss in Jena on July 7, 1917. Present were Prof. Straubel, Dr. Bauersfeld, Wieland, Becker (all Zeiss), and Oskar von Miller (DM). On the agenda were the current state of the work on the planetarium projects, and planning of detailed steps to advance the projects.

Franz Meyer was unable to attend the meeting, but was sent to Munich shortly thereafter to continue the discussions on site. (1 written report, Archive DM)

### **Work on projector can resume**

After the end of World War I on November 11, 1918, following the end of war production and amidst a considerably decrease in civilian production at Zeiss due to a sharp decrease in exports, the work on the planetariums could now be resumed with increased effort.

The next event of crucial significance occurred in March 1919. Franz Meyer, who was then in charge of the project, had prepared a letter to the museum, dated March 21, 1919, in which he suggested abandonment of the projection of the fixed stars due to what he believed to be insurmountable difficulties, and to return to the original mechanical design of a rotating metal sphere.

His proposed change did not affect projection of the planets, sun and moon.

Bauersfeld, who found this letter on his desk for approval, intercepted it and prevented it from being sent. (17 Ludwig Meier pp. 91-92)

According to Bauersfeld himself, on March 24, 1919, just three days after finding Franz

Meyer's letter, he proposed a solution for the difficulties encountered by Meyer of projecting the stars. In addition, he now took over from Franz Meyer the task of designing and building the Ptolemaic planetarium projector.

The following comment, dated September 29, 1942, and signed "Bfd" for Bauersfeld, was found handwritten on the side of a typed copy of Meyer's letter: "This letter was routed to me by the author before it could be mailed; therefore I was able to prevent it from being sent. It gave me reason to take on myself the construction of the projection planetarium since I was no longer convinced that the projection idea which originated with me could be realized without my continual assistance." (17 Meier pp. 91-92)

The events of March 1919, and the following stages in the construction of the apparatus, have been described by others, especially in much historical and technical detail by Ludwig Meier. (17 Meier) Therefore, we only mention the main events from here on.

Franz Meyer continued work on the Copernican planetarium, while Walther Bauersfeld was now in charge of the projection planetarium. On October 17, 1922, Zeiss sent in the patent request for the planetarium projector. From July to September 1923, trial runs of the new device were performed in Jena, in a dome constructed on top of a Zeiss factory roof.

Significant participation by Bauersfeld in the correspondence with the Deutsches Museum started on September 17, 1923, following von Miller's request to have the projector shipped to Munich for demonstrations to the

presidium board during its annual meeting. Only after von Miller had travelled to Jena in person did Bauersfeld reluctantly grant his wish.

## Demonstrating the device

Demonstrations were held in Munich from October to December 1923, and then the device was returned to Jena for final work. On April 3, 1924, the patent for the projector was granted, issued to Walther Bauersfeld.

Much to the dismay of von Miller, who wanted to retain the novelty aspect of the planetarium for its intended location at the museum, public demonstrations of the projector were held in Jena on the factory rooftop from August to October 1924.

Finally, on May 7, 1925, the new collections building of the Deutsches Museum in Munich was officially opened in a ceremony. Simultaneously on that day, the projection planetarium, using the Zeiss Model I projector, and the Copernican planetarium, also built by Zeiss, were opened to the public.

On the day of the opening, the Deutsches Museum honored a significant number of persons with its highest honor, the "Goldene Ehrenring" (golden ring of honor). Among the recipients were two persons from Zeiss, recognized for their contributions in building up the astronomy department of the museum: Prof. Dr. Rudolf Straubel and chief engineer Franz Meyer. (8 Archive DM)

While the honoring of Franz Meyer by the museum has been cited in the literature (20 Schomerus p. 131), mention of Rudolf Straubel also receiving this honor has not been found.

Straubel's membership on the museum's presidium board continued throughout World War I and is documented until at least January 1920. Noteworthy is a telegram sent to von Miller on May 24, 1918, in which Straubel announced the donation by Zeiss of fifty thousand mark for the construction of the museum's library building. (1 Archive DM)

## Discussion: The lack of credit given to Straubel by Franz Fuchs

In his 1955 article "Aufbau der Astronomie im Deutschen Museum," Franz Fuchs, a long-term division chairman there, mentions Straubel only once (12 Fuchs p. 59), with these words: "Despite the previous rejection by Zeiss, on Oct. 3, 1913 von Miller thoroughly discussed this matter which he felt so strongly about with Prof. Straubel who was a member of Zeiss management." (Note that the correct date of the discussion was September 30, 1913)

Given the consistently courteous and reverent attitude towards Straubel found in the museum's correspondence, the lack of Straubel's mention by Fuchs appears surprising. In his article, photos are included of the

signatures of Zeiss management members Czapski (9 p. 32) and Bauersfeld (9 p. 63), but Straubel's signature is not shown.

Furthermore, the singular statement shown above seems quite curt. Fuchs mentions Straubel's membership on Zeiss's board of management, but omits his role as scientific director of Zeiss. This is all the more astonishing since Fuchs was von Miller's right-hand man, from 1904 throughout the entire period of the planetarium projects and beyond.

Straubel's donation of the Zeiss telescope for the observatory, his significance in Zeiss taking on the planetarium projects, and his membership in the presidium board of the museum all must have been known to Fuchs. In fact, Fuchs must have had personal contact with Straubel on various occasions, such as at the crucial meeting on February 24, 1914 in Jena. In light of these facts, Fuchs appears to show a decided reluctance towards mentioning Straubel by name.

Fuchs's intimate familiarity with the history of the development of the Deutsches Museum, particularly with its astronomy department, is the reason why his article from 1955 has been so widely used as a key reference in the history of the projection planetarium, and rightfully so.

In turn, Fuchs's lack of mentioning Straubel could help to explain why Straubel's contribution to the planetariums has not been recognized in so many other accounts. The fact that Fuchs does not directly mention that Straubel was present at the annual meeting in 1913, for example, caused planetarium historian Ludwig Meier to invent a fictional telephone conversation between von Miller and Straubel, and to mainly credit von Miller's irresistible persuasiveness with Zeiss's acceptance of the planetarium projects. (17 Meier pp. 85-86)

Although it is not known with certainty why Fuchs did not give Straubel the warranted credit for his contributions, we will offer a possible explanation at the end of this article. Fortunately, the archive at the Deutsches Museum has the documents to complement Fuchs's otherwise excellent historical account of the planetarium history with accounts crediting Straubel's contribution.

**Will continue in the next issue.**

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