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Vereinsnachrichten: Othmar H. Ammann (1879 - 1965)

1. Othmar H. Ammann (1879 – 1965)

For the past two years the Technorama Foundation of Switzerland together with the Swiss Federal Institute of Technology, Zurich, has been occupied with assembling the records of this famous Swiss bridge builder in the USA. After a part of the family archives arrived in Switzerland in 1977 the material was worked on, and on the occasion of his 100th birthday a memorial exhibition was assembled in Ammann's home town, Schaffhausen, representing the life and work of this great fellow countryman.
The exhibition will be shown in the main building of the Swiss Federal Institute of Technology in Zurich, concurrently with the IABSE Symposium on BRIDGES, Zurich, 20 – 22 September 1979.

"Mr Ammann grew up in the Swiss Village of Schaffhausen. His grandfather had been a painter of landscapes and his father was a manufacturer of hats". Thus began the New York Times' 1929 biography of Ammann. After a thorough study at the Institute of Technology and early practising years in Switzerland and Germany, Ammann took the advice of his Professor for Hydraulic Engineering Karl Emil Hilgard, to go to America.

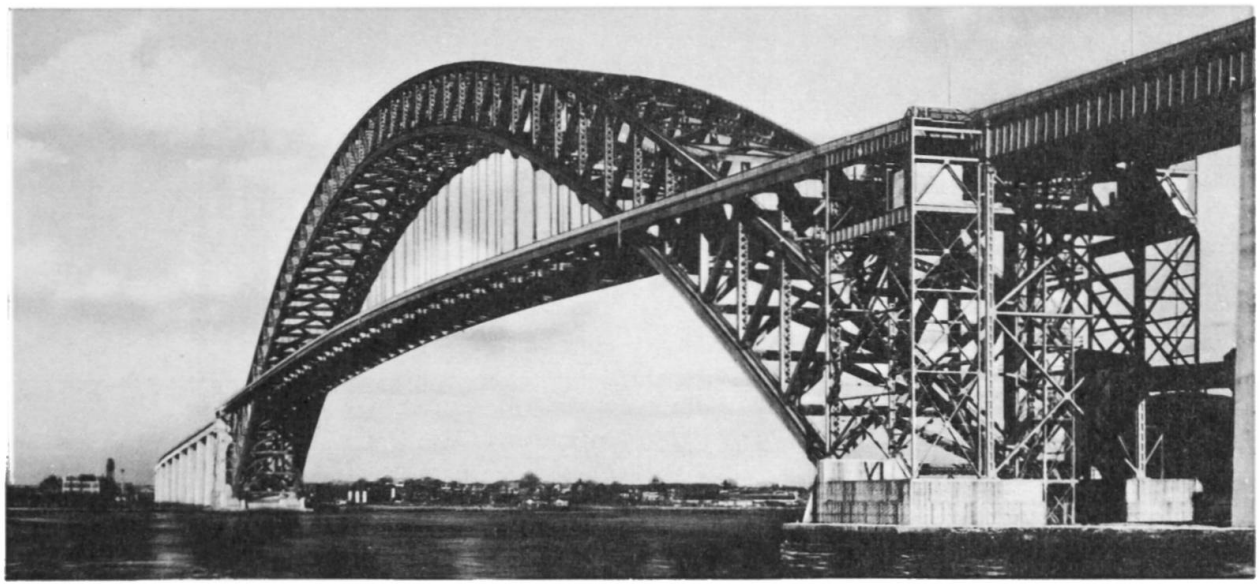
In 1904 the first subway line in New York was built. At that time the 25 year old Ammann came to the United States. It is told that he was advised simply to look up the engineering offices on Broadway and ask for work. To his complete surprise he quickly found work with Joseph Mayer No. 1 Broadway. Here the young engineer collaborated on projects and constructions of various railway bridges. The desperate need, brought on by the growing automobile traffic, to bridge the Hudson was the major topic among the engineers. Ammann listened with great interest to the discussions of Mayer with William Hildenbrand, the former assistant of Roebling, who in 1883 had built the Brooklyn Bridge in New York. Not only had Mayer himself while he was still head of the Union Bridge Company, executed large-scale projects, so too had the Austrian born American bridge construction engineer Gustav Lindenthal.

Ammann himself later described that time as follows: "My first serious interest in the problem of bridging the Hudson was awakened shortly after my arrival in New York". A visit to the top of Palisades cliffs from where I obtained a splendid view of the majestic River. For the first time I could envisage the bold undertaking, the spanning the broad waterway with a single leap of 3000 feet from shore to shore nearly twice the longest span then in existence. This visit came at that time as near to a dream to see the ambitious effort materialized. Nevertheless for a young engineer it was a thrill to contemplate its possibility and from that moment as my interest in great bridges grew I followed all developments with respect to the bridging of the Hudson River with keenest interest".

A year later in 1906 Ammann, wishing to gain experience in the problems of contract work, found a position with the Pennsylvania Steel Co. in Harrisburg. When on 29th August 1907 the massive bridge over the St. Lawrence River in Quebec collapsed, his superior at the Pennsylvania Steel Co., Frederick C. Kunz, recommended to C.C. Schneider, the engineer appointed to carry out the investigation, that he enlist the services of Othmar Ammann – Ammann out of pure interest immediately accepted the assignment, regardless of whether or not he would be paid. In an astonishingly short time the investigation report, which came to be regarded as a model example, was prepared.
After this period of construction activity Ammann returned to the field of project engineering and on 1st July 1912 we read in his diary:
"O.H. A. Started position with Gustav Lindenthal. Mr Lindenthal stated: I estimate an Engineer 1/3 by his character, 1/3 by his ability and 1/3 by his experience."

It was in the offices of this the leading bridge engineer of America at that time that the 4-track railway bridge over the East River, the Hell Gate Bridge, a steel girder arch with a record span of almost 300 m was planned.
After the general mobilisation in autumn 1914 called Ammann back to his homeland he served for some months as a lieutenant in the Swiss Army, returning at the end of the year to the USA. A letter written him on 1st January 1916 by a fellow soldier and found among the family archives testifies to his strong ties with his homeland, a bond he was to prove again and again with brief or extended visits until his death.
When in April 1917 the works on the Hell Gate Bridge were finished, Lindenthal had to give Ammann to understand that he should look around for a new job. For some years he was manager of a clay quarry in New Jersey and, despite the many hinderances – strikes, introduction of the 9 hour day (as opposed to the previous 10-hour) at the same salary etc. – managed to prove his organizing abilities.

Towards the end of the decade Ammann returned to Lindenthal's office which had recently begun to occupy itself with the project of bridging the Hudson. It was universally agreed that New York needed a connexion with New Jersey where sufficient room for expansion was available. The 2-track Holland Tunnel then under construction and the 17 ferry lines could no longer satisfy the ever increasing traffic. On the points of the location and the size of the bridge however the views of the two engineers did not agree. It was Lindenthal's view that a 2-storey connexion from 57th Street (the heart of New York) to new Jersey with 20 vehicular lanes and 12 railway tracks was necessary. Ammann feared the high costs of over 200 million dollars for the bridge alone not to mention the approach constructions, and he saw above all immense problems with the absorption of the outpouring traffic in Manhattan. For his part he proposed a project at Manhattan's 179th Street, exactly level with the Palisade Cliffs where he envisaged a light suspension bridge with provision for later additions, having a span of 3500 feet and for the time being only one deck of 6 lanes. Lindenthal accused Ammann of timidity and shortsightedness whilst he himself was, he said, looking ahead to the next 1000 years.



Bayonne Bridge, New York, built 1928 - 1931; Span 510 m

Finding no ear with his employer, Ammann now turned to the politicians and gained the interest of Governor Silzer of New Jersey and Governor Smith of New York. This action however angered Lindenthal who now accused his employee of disloyalty. Ammann therefore refused to accept any further salary payments from Lindenthal. Then in 1923 Ammann was given support by Swiss friends who made office space available for him.

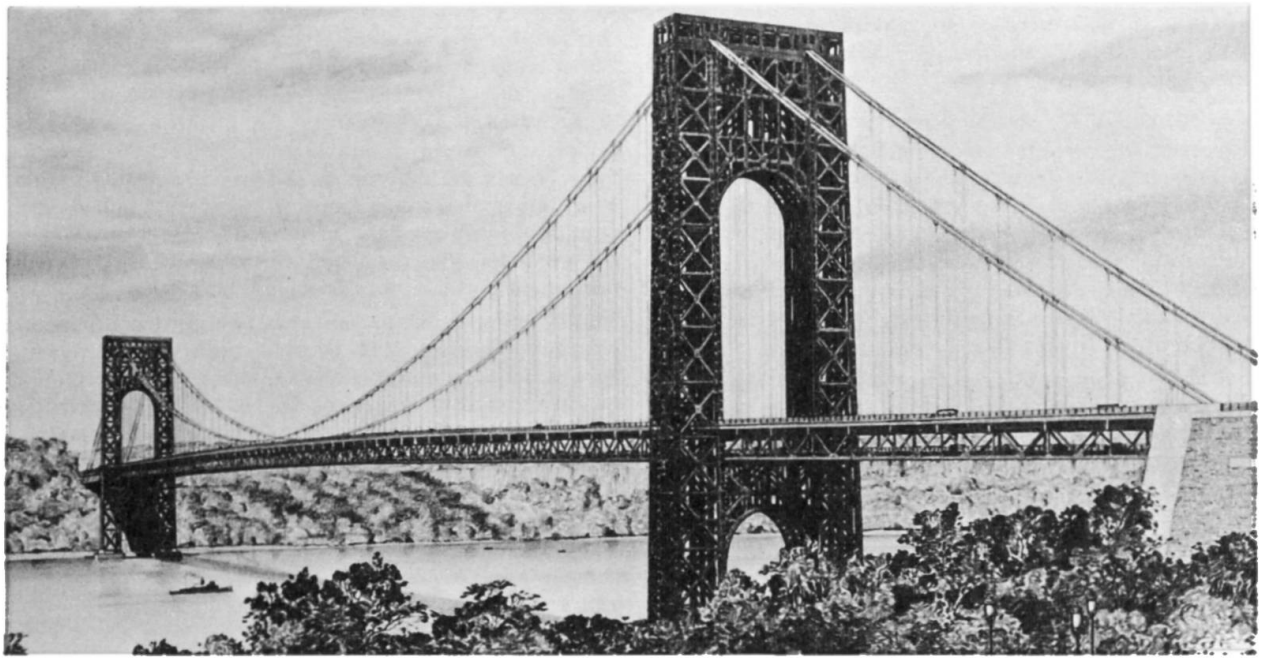
In addition to the day-time planning work, Ammann, otherwise a retiring man, now spent the evenings campaigning his bridge idea to various committees. The breakthrough came at the beginning of 1925 when both the US Congress and the two States of New Jersey and New York passed the relative Bills thus empowering the Port of New York Authority to build a bridge over the Hudson at 179th Street. The decade-long struggle was over.

On 1st July 1925 the 46 year old Ammann who had one year earlier become an American citizen, was appointed as Bridge Engineer of the Port Authority. A few years later he saw his dream materialized. The principal stages are in chronological order:

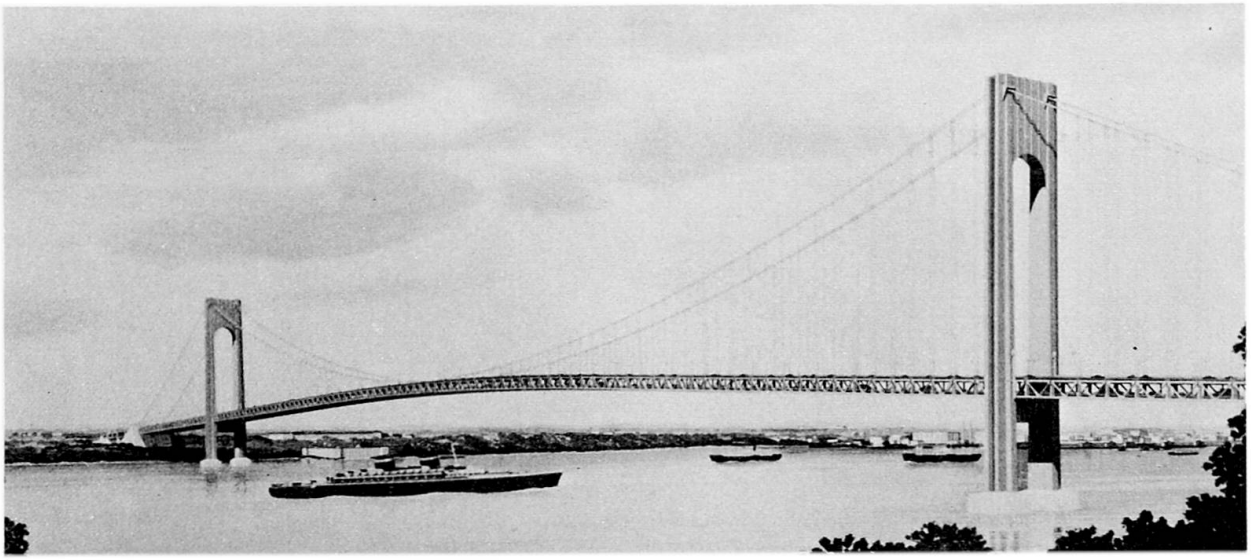
1927: Ground Breaking Ceremonies for Outerbridge Crossing and Goethals Bridge as well as, on 21st September, for the George Washington Bridge.

1928: Opening of the 2 lattice bridges connecting Staten Island with New Jersey – Outbridge Crossing and Goethals Bridge. Ground-breaking ceremony for the Bayonne Bridge.

1931: Within 3 weeks of each other the opening of the George Washington Bridge – a suspension bridge with a central span of 1067 m, more than twice as long as the longest suspension bridge built until then, and the Bayonne Bridge, a steel girder arch with a span of more than 500 m, 200 m longer than Lindenthal's Hell Gate Bridge.



George Washington Bridge, New York, built 1927 - 1931; Construction underdeck 1962; Span 1067 m



Verrazano Narrows Bridge, New York, built 1959 - 1964; Span 1298 m

These two bridge undertakings alone would have been sufficient to justify Ammann's reputation as the most significant bridge engineer of the twentieth century. In the following words Franklin Delano Roosevelt, the then Governor of New York and later US President from 1933 - 1945, honoured the Swiss engineer on the occasion of the completion of these constructions:
"Certainly a great tribute is due O.H. Ammann, bridge engineer and chief engineer of the Port of New York Authority. Responsible not only for the design of these great structures but also for their rapid and successful execution, his work marks a new high standard in public service".

In 1934 the Triborough Bridge Authority, which at that time was under the direction of Robert Moses, the most powerful man in New York after the mayor, succeeded in obtaining Ammann's services. Until 1939 Ammann was thus the chief engineer of both bodies and, with his bridge constructions, left his distinct mark on the outline of the city architecture of New York.
Thus in 1936 the Triborough Bridge was erected, a suspension bridge with a 420 m span and in 1937 the Lincoln Tunnel was completed.

From 1931 to 1937, Ammann collaborated as consulting engineer on the construction of the Golden Gate Bridge in San Francisco. It is a matter of conjecture as to what extent Ammann was directly involved with the design of this suspension bridge which, with a span of 1280 m, was at that time the longest suspension bridge in existence. Without doubt the George Washington Bridge project and its related technical developments strongly influenced the construction of the Golden Gate Bridge.

In 1939 at the age of 60 and after 14 years of intense activity for the Port Authority and the Triborough Authority, Ammann retired; it was however only natural that a man of his vigour could not just take it easy.
Ammann's immediate goal in independent work was as an adviser in the construction of suspension bridges alone. He was called into this work straight away in 1940 even if it was in a negative sense. 4 months after its opening, the Tacoma Narrows Bridge in Washington State collapsed. This suspension bridge designed by Leon Moiseff was, with a span of 850 m, the 3rd longest of its kind after the Golden Gate and the George Washington Bridge. However under wind velocities of 65 km/hour the bridge started to sway, inclining the deck to an angle of 45 °, and after one hour tumbling into the ocean. The relevant federal authorities commissioned Othmar Ammann, together with the engineer Woodruff, aerodynamics expert at Karman, with the investigation into the collapse.

In 1946 Ammann joined with the American concrete engineer Whitney to form a larger office into which his son Werner was later taken. Space does not permit the listing here of all the constructions carried out by the office of Ammann and Whitney. Of special note however were the *Walt Whitmann Bridge* in Philadelphia completed in 1957, the *Throggs Neck Bridge,* in New York built in 1961 in anticipation of the World Fair, and the addition in 1962 of a 6-lane underdeck to the *George Washington Bridge.*
With this extension the George Washington Bridge now has 14 lanes and the greatest vehicle capacity of any bridge — in 1977 roughly 18 million vehicles or 10 vehicles per minute per lane.
Ammann's crowning achievement is however the Verrazano Narrows Bridge opened on 21st November 1964. With this 2-level bridge of 12 lanes various records were broken. Its 1298 m long central span exceeds that of the Golden Gate Bridge by 18 m. O.H. Ammann said of this bridge that its planning and construction represented a great challange to the engineers and that the realization was a demonstration of successful cooperation between private and public organizations as well as of the tremendous progress that science and technology had made and without which its construction would not have been possible.

Othmar Ammann had already been awarded many honours but on 8th February 1965 when he received the National Medal of Science from President Lyndon B. Johnson, he became the first structural engineer to hold this award. The inscription ran: "For half a century of distinguished leadership in the design of great bridges which combine beauty and utility with bold engineering concept and method".

Seven months later at the age of 86 1/2 this eminent bridge constructor passed away. Many great bridge constructions in New York and its surroundings bear witness for future generations to his successful accomplishments.

(Urs Widmer, Civ.Eng., Mayor of Winterthur, CH)