Mamoru Kawaguchi

Reden bei der Akademischen Feier aus Anlaß der Verleihung der Ehrendoktorwürde (Dr.-Ing.E.h.) an Prof.Dr.-Eng. Mamoru Kawaguchi durch die Universität Stuttgart am 24.Oktober 1997

Reden und Aufsätze 59

Reden und Aufsätze
herausgegeben im Auftrag des Rektorats der Universität Stuttgart
von Ulrich Sieber

Postfach 104941, D-70043 Stuttgart
Telefon (0711) 121-2222; Telefax 121-3502
Satz und Druck: Offizin Chr.Scheufele, Stuttgart
ISSN 0940-0710
ISBN 3-926269-26-X

Inhalt

Vorwort

Es ist eine alte, sehr schöne Tradition, daß Universitäten die wissenschaftlichen Leistungen, die Werke und das Wirken herausragender Persönlichkeiten in besonderer Weise würdigen. Die Universität Stuttgart nimmt diese akademische Tradition sehr ernst und pflegt sie in entsprechend zurückhaltender Weise unter Anlegung strenger Kriterien. So stellt die Verleihung der Würde eines Ehrendoktors ein ganz besonderes Ereignis im akademischen Leben dar.

Mit Professor Dr.-Eng. Mamoru Kawaguchi wird ein international hochangesehener Mann geehrt, der einer der kreativsten Ingenieure unserer Zeit ist, der fundiertes Wissen und Intuition in außergewöhnlicher Weise miteinander verknüpft. Seine herausragenden weitgespannten Tragwerke – von Hängebrücken und -dächern über Schalen bis zu Pneu-Konstruktionen – zeugen weltweit von seiner genialen Vielfalt in Formgebung und Materialeinsatz.

Die Universität Stuttgart ist stolz darauf, diesen großen Ingenieur ehren zu dürfen und damit die engen, guten Beziehungen zu Japan zu festigen.

Prof. Dr.-Ing. Dr.-Ing. E.h. Gerhard Heimerl
Vorsitzender der Ehrungskommission der
Fakultät Bauingenieur- und Vermessungswesen
der Universität Stuttgart

Günter Pritschow*

Begrüßung zur akademischen Feier anläßlich der Verleihung der Würde eines Dr.-Ing. Ehren halber an Herrn Prof. Dr.-Eng. Mamoru Kawaguchi, o.Prof.em. der Hosei Universität, Tokio, Japan

Sehr verehrter Herr Kawaguchi,
sehr geehrte Ehrensenatoren und -doktoren,
dear guests and friends of Professor Kawaguchi as well as of our university,

I am very happy and proud to welcome you at the University of Stuttgart tonight in order to honor a scientist who needs to be paid attention to not only because of his very special qualifications but also because of his personal integrity.
Since both, the celebrant and his friends, have had to travel all the long way from Japan to Germany I am especially happy that you have gathered here so numerously to give to Prof. Mamoru Kawaguchi the highest honor our university has to offer:
the honorary doctorate.
Since I was told that Prof. Kawaguchi understands the German language well, I would like to switch to German now for the rest of my little speech, but not before I have given you all a warm welcome at the University of Stuttgart again!

An Ehrungen wie der heutigen nimmt durch die Form des Verfahrens bei uns die gesamte Hochschule teil, denn im Gegensatz zu Hochschulen, die ihre Ehrenwürden allein durch die Fakultäten verleihen lassen, kann bei uns eine Fakultät lediglich einen Antrag auf Verleihung eines akademischen Ehrentitels an das höchste Gremium unserer Universität – den Senat – stellen, bevor die Auszeichnung letztendlich in einem feierlichen Akt wie dem heutigen im Namen der gesamten Universität überreicht werden kann. Wie Ihnen bekannt ist, verfährt die Universität Stuttgart nicht eben großzügig mit der Vergabe von Ehrentiteln, sondern läßt diese Ehre nur ganz herausragenden Persönlichkeiten zuteil werden.
Sie ehrt dabei Persönlichkeiten aus dem In- und Ausland. Bislang zählen zu unseren Ehrendoktoren Vertreter von vier Kontinenten. Es sind dies Europa, Amerika, Asien und Afrika. Einzig Australien ist in der Reihe unserer Ehrenwürdenträger bislang noch nicht vertreten.
Mit der Ehrung großartiger Persönlichkeiten aus Japan hat die Universität Stuttgart bereits vor 25 Jahren begonnen mit Kenzo Tange, den die bauwissenschaftlichen Fakultäten in ihre Reihen aufgenommen haben. Mit Professor Dr.-Eng. Hideaki Kudo von der Yokohama National University
kam 1987 ein weiterer Kollege aus Japan hinzu, diesmal in der Fakultät für Konstruktions- und Fertigungstechnik. Mit Mamoru Kawaguchi und Hideo Nakamura gewann 1997 die Universität Stuttgart zwei weitere Vertreter aus dem bauwissenschaftlichen Bereich.

Professor Kawaguchi gehört heute der kleinen Gruppe der weltweit führenden genialen Entwurfsingenieure an. Er hatte das große Glück, in der Umgebung zweier großer Meister seine ersten Entwurfsschritte gehen zu können. Zusammen mit Kenzo Tange als Architekt und Zenkatsu Tsuboi als Bauingenieur arbeitete er an der Planung des Daches und der Tribüne des Olympiastadions in Tokio mit. Das Tragwerk vereinigt Konstruktionsprinzipien der Hängebrücke mit denen des Hängedachs, wofür es bis heute berühmt und vorbildlich ist. Für Professor Kawaguchi, der später (1992) eigenständig mit dem Olympiadach in Barcelona hervorgetreten ist, war die frühe Zusammenarbeit mit Tange und Tsuboi wegbestimmend. Nach Abschluß seines Studiums des Bauingenieurwesens sowie seiner Promotion wurde er 1960 als Lecturer an die Hosei-Universität in Tokio berufen. Neben der Lehre an dieser privaten Hochschule begann er gleichzeitig als freiberuflicher Ingenieur zu arbeiten und gründete kurz darauf ein eigenes Ingenieurbüro. 1962 wurde er zum Associate Professor bestellt, und seit 1972 ist er dort als ordentlicher Professor tätig. Er hat weltweit Pneu- und Membrankonstruktionen sowie die verschiedensten mutigen Schalenformen entworfen. In der Forschung sind Formfindung für räumliche Strukturen und geeignete Fertigungs- und Montageabläufe für derartige Strukturen sein Spezialgebiet. Herr Kollege Schäfer wird Ihnen dies sicher nachher am Beispiel der ringförmigen Stahlfachwerk-Halbschalenkonstruktion des Olympiadachs in Barcelona näher erläutern.

Prof. Kawaguchi ist Träger zahlreicher Preise, unter anderem wurde ihm 1992 der Tsuboi-Preis von der International Association for Space and Shell Structures verliehen. Als Hochschullehrer hat er eine ganze Generation von Studierenden in das faszinierende Gebiet der vorgespannten und Hängekonstruktionen eingeführt und gleichzeitig eine Schule von Nachwuchswissenschaftlern begründet, die heute an verschiedenen renommierten Universitäten Japans als Wissenschaftler tätig sind.

Und so lautet folgerichtig der Antrag unserer Fakultät Bauingenieur- und Vermessungswesen an den Senat der Universität Stuttgart, man möge Herrn Prof. Dr.-Eng. Mamoru Kawaguchi, o. Professor der Hosei University, Tokio, „in Würdigung seiner herausragenden Beiträge zum Entwurf, zur Formfindung und zur Analyse weit spannender Tragwerke“ die Würde eines Dr.-Ing. E.h. verleihen. Dieser Antrag wurde auf einstimmige Empfehlung der Ehrungskommission von der Fakultät Bauingenieur- und Vermessungswesen am 22.01.1997 und vom Senat der Universität Stuttgart am 4.06.1997 einstimmig beschlossen. Professor Alexander Scordelis von der University of California schätzt Prof. Kawaguchi als „one of the great active structural engineers on a worldwide basis…I would rank him among a few at the top that I have known in terms of overall performance, personality and qualifications in the areas I believe are important to engineering and society…Also he is truly a gentleman and a scholar.“

Wir schließen uns diesem Urteil gerne an.

Wir sind stolz, Sie, Herr Kawaguchi, nun zu den Mitgliedern unserer Universität zählen zu dürfen!

Mit Mamoru Kawaguchi ehren wir heute einen hochrangigen, international sehr renommierten Wissenschaftler, dessen berufliches Wirken insbesondere durch starken Praxisbezug geprägt ist und der seit vielen Jahren die Verbindung zur

Universität Stuttgart pflegt. Mehr über das fachliche Wirken Kawaguchis werden Sie nun von unserem Kollegen Schäfer erfahren, den ich Ihnen jetzt als Laudator ankündigen darf. Herr Schäfer spricht heute abend stellvertretend für Herrn Schlaich, der leider kurzfristig erkrankt ist und dem wir von hier aus unsere besten Genesungswünsche übermitteln. Herr Schlaich pflegt seine Freundschaft mit Professor Kawaguchi seit nunmehr 30 Jahren. Somit ist er in besonderer Weise berufen, unseren Ehren halber zu Promovierenden zu würdigen.

Ich darf nun Herrn Kollegen Schäfer bitten, mit der Laudatio zu beginnen.

* Prof. Dr.-Ing. Dr.-Ing.h.c.Günter Pritschow, Rektor der Universität Stuttgart

Jörg Schlaich* (vertreten durch Kurt Schäfer)

Laudatio für Prof. Dr.-Eng. Mamoru Kawaguchi, Tokio

Mamoru Kawaguchi
Honorary Doctor (Dr.-Ing. E.h.) by University of Stuttgart

October 24, 1997
Laudatio by Jörg Schlaich

Dear colleague Mamoru Kawaguchi, Magnificence Pritschow, dear colleagues and friends of Mamoru Kawaguchi!

Could there be a more pleasant task for a university professor than praising a highly esteemed colleague and, as I may say, friend! In fact, we have been known each other now for exactly thirty years when we met for the first time at the Symposium of the International Association for Shells and Spatial Structures in Leningrad, now again called St. Petersburg, in 1966. I was kindly sent there by my teacher and employer Leonhardt with a tiny paper on shells for television towers – it was in fact the first international conference I attended – with open eyes and mouth. You came together with the Japanese structural celebrity Professor Yoshikatsu Tsuboi and both of you presented there one of the most beautiful, fascinating and interesting structures built during the last decades:
The arenas for the 1968 Tokyo Olympics, of which Kenzo Tange was the architect (I am sure you are aware that you are the first Japanese structural engineer to receive an honorary doctor's degree from this University and only the second after this Kenzo Tange from a building faculty and – together with Hideo Nakamura – the fourth Japanese at all).
Could I imagine that many years later you, Ekkehard Ramm and I independently would receive the Prize commemorating Yoshikatsu Tsuboi which stresses his motto: "A structure's beauty can be found near its rationality". I learnt the true meaning of this from him and you at just this conference in Leningrad when Tsuboi and you explained that with graphs and photos and why you agreed to "correct" the pure and rational hanging shape of your Olympic roofs by adding some "irrational" bending stiffness to please the architect and – that is important – not only him but you yourself, the engineer as well. I learnt from him and you that a structural designer, though he will first of all strive to develop his form or shape from function and flow of forces, may ultimately rely on his sense for beauty, even if he argues only near to rationality.
Do you remember that we happened to choose the same post-conference tour – at that time the only way to travel in the former Soviet Union – which

ultimately brought us to a remote restaurant near Tbilissi, where these “Georgian barbarians” made us, including Professor Tsuboi, drink liters of sparkling wine and vodka and when you tried to protect your master by drinking the stuff yourself or by pouring it under the table.
Who else, receiving an honorary degree, came with such a splendid gift:
Japanese live music?
Indeed, one of your most striking characteristics is your consideration or attentiveness. When some years later Professor Tsuboi took over the presidency of the International Association for Shells and Spatial Structures (IASS) at an age when it already caused him some pain, you stood behind him like a rock and took over at any time with this, for us Europeans so typical Japanese hierarchical attitude, but efficiency as well, that the IASS, founded in 1959 by the great Spanish shell designer Torroja, is today strongly influenced by Japanese engineers and more important by the multitude and variety of their light and long-span structures, with Mamoru Kawaguchi as their most outstanding representative. Could we imagine in 1966 that in 1991, a quarter of a century later, you would invite me to be the guest speaker at the first Tsuboi-Memorial-Seminar in Tokyo?

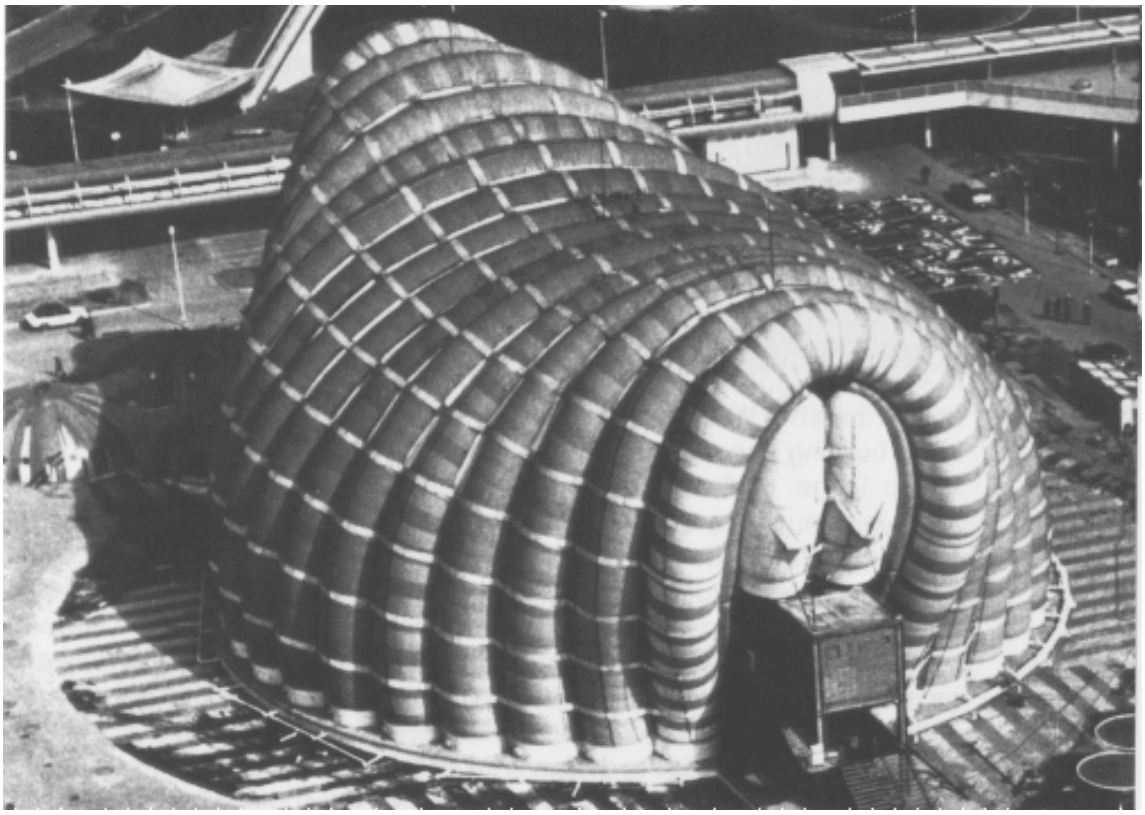
1. Yoyogi Indoor Stadium: suspension roofs by Tsuboi & Tange, the first major structure in which Mamoru Kawaguchi was involved.

Maybe it was our similar, typical Japanese and German fate, when born in the first part of the thirties, before the Second World War, which made us think and feel alike:
Mamoru Kawaguchi was born in Fukui City, Japan, on October 21, 1932. Located central west of Japan, Fukui is a small city close to the Sea of Japan. He had three older sisters, a younger brother and three younger sisters. His parents were both sincere Buddhists, and every member of the family was educated to be a Buddhist. Japan was still strongly feudalistic, and he was trained at home as the eldest son to be mentally prepared to become the heir to his father. Today after marrying in 1961 – unfortunately due to health reasons his wife cannot be here – he himself is the father of four children, three sons and a daughter. The eldest son, Ken'ichi, is a structural researcher, he and Yoko, his wife, are here. The second son is an electronic engineer and the third a system engineer. The daughter is a pharmacist. They are now all married, and he is so far blessed with four grandchildren.

2. Festival Plaza for Expo '70: Space frame roof with extensive use of big cast steel joints and transparent pneumatic roof panels; with Tsuboi & Tange.

Back in the early thirties, the first half of his boyhood was happy and peaceful. In 1939 he entered an elementary school at the age of six. Pupils were often taken out to the seashore or to the mountain to enjoy life in nature. He liked swimming in the sea and rivers.
In the meantime the world was moving towards the war. Daily necessities began to become scarce and the living-standard of people began to get worse. In 1941, when he was nine years old, Japan rushed into the war against

America. The Government appealed to the people to endure hard lives to win the war. School boys were trained to become soldiers and to be prepared to die for their country. The people found themselves lacking even in daily food, especially rice, which was the principal staple. In such a situation young boys were educated to believe that Japan might win the war some day. American long-distance bombers began to come into the mainland of Japan, and many cities were severely bombed by them. On July 19, 1945, only half a month before the end of the war, Fukui, his town, was bombed completely. Thousands of people were killed, but the family was lucky enough to survive, and they moved to a village in the mountains which was the native place of his father. He himself had to stay in the city to continue his studies. This literally sounds like my own biography!



3. Fuji Group Pavilion for Expo ’70: Air-inflated structure; with Y.Murata.

On August 6, 1945, when he came back to his lodging from the entrance examination of the military academy which he had taken, he found that the war had ended. He was twelve years old. Big confusion arose in the radical change from war to peace, from feudalism to democracy, from totalitarianism to individualism, from controlled economy to free markets. In this confusion reconstruction of the city proceeded step by step. His house was rebuilt, although it was much simpler than the original one.
On June 26, 1948, when he was fifteen years old, a destructive earthquake attacked Fukui. Everything was destroyed. He lost his house again. The family

was lucky enough to survive. He learned how frightening it was to be attacked by a strong earthquake. This experience of being struck by a destructive earthquake might have been at least one of the reasons which motivated him towards the field of structural engineering at a later time and it certainly stimulated him to do research in earthquake engineering recently. His father had to rebuild his house again for the family. He suffered two extraordinary disasters – the air-raid and the earthquake – in only three years. He died on November 16, 1950, shortly after he built his third house. Mamoru was then eighteen years old, the age to take an entrance examination to a university. He wished to try a university in Tokyo, but his situation as the eldest son did not allow him to do so. He had no other choice than to try Fukui University, and he entered it in April 1951.

Mamoru tells that he was lucky enough to meet an exceptionally distinguished professor at Fukui University. That was Professor Hirohiko Yoshida who was not only a very talented research engineer, but possessed great sense of beauty. He started his career as a researcher at Technical University of Karlsruhe, doing experimental research on elastic behaviours of concrete there. But he was also good at playing piano and at sketching

4. Pavilions for the World Conference on Orchid, Tokyo: Transparent pneumatic envelopes; with architect Y.Murata.

as to hold exhibitions from time to time. Professor Yoshida regularly taught students structural mechanics, but he also appeared often in the classes of sketch and sculpture. He talked to his students about the importance of ethnic culture, explained the meaning of the words in the old folk songs and even showed how to sing them in class. As we could hear yesterday Mamoru was influenced by the way of thinking and feeling of Professor Yoshida and also has been very fond of Japanese folk songs ever since.

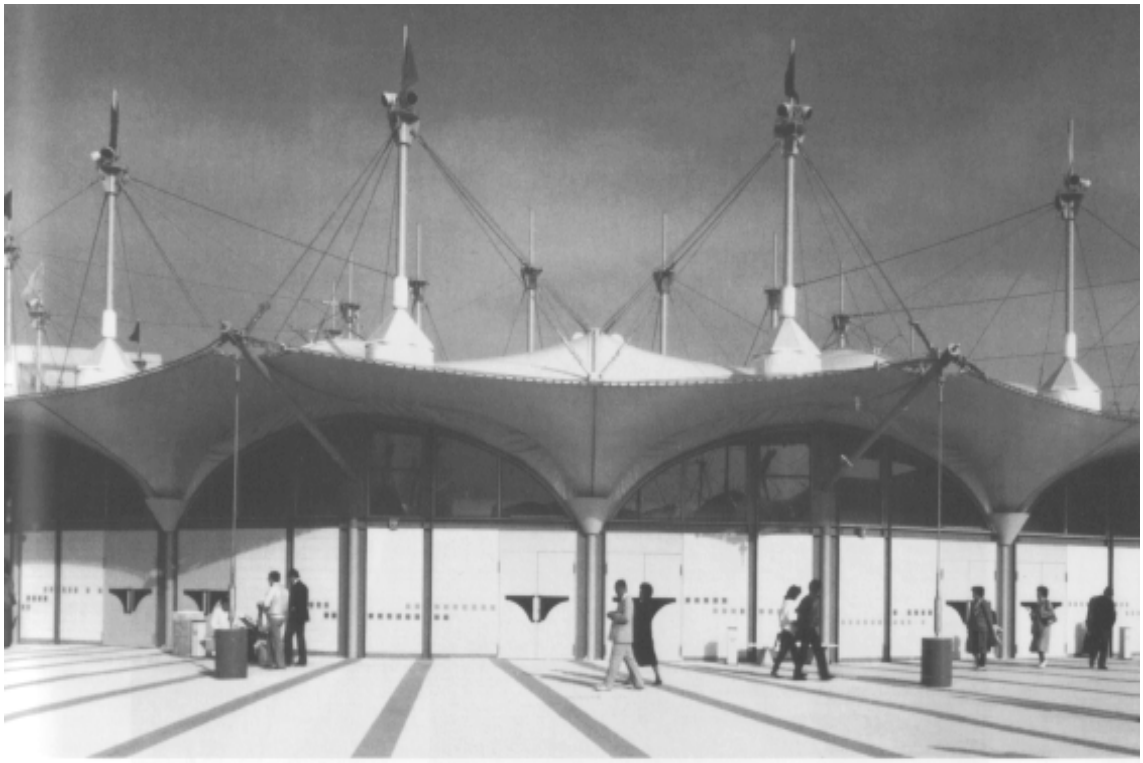
In 1955, Mamoru entered the graduate school of the University of Tokyo at the age of 22 and became a student of Professor Yoshikatsu Tsuboi following the suggestion of Professor Yoshida. Concrete shell structures were at their zenith in that period. Professor Tsuboi, who was then under fifty, had been building important shell structures, in cooperation with the architect Kenzo Tange. Professor Tsuboi was a famous applied mathematician and liked very much the elegance of purely analytical treatments. At the same time he realized that analytical methods are not enough to understand the behaviors of real structures, especially when they are loaded beyond elastic limits, and tried to carry out model tests parallel to design works. He was very much interested in the relationship between structural rationality and architectural aesthetics as we have heard already. He sympathized with the philosophy of Eduardo Toroja and respected him very much. Through discussion and cooperation in design works Mamoru was deeply influenced by Professor Tsuboi's way of thinking. We clearly recognize in his work this sense of experimenting, this readyness to try new things, this curiosity paired with knowledge and skill.

The most impressive work he was involved in together with Professor Tsuboi was – as mentioned already – the suspension roof structure for the Tokyo Olympics. He designed two structures in cooperation with the architect Yutaka Murata who applied pneumatic principles extensively in his designs. The other major structures which Mamoru designed for Murata were an air dome for Fuji Group Pavilion for Expo 80 in Kobe and two air domes for the World Orchid Conference in Tokyo.

It appears that, besides space frames, pneumatic structures especially caught his attention resulting in very innovative proposals such as on "The Shallowest Possible Pneumatic Forms" published in 1977 or on "Metal-Membrane Tension Structures", published in 1979, which both, I remember very well, immediately caught my attention at that time. This also is the place to mention that besides at least five books (of which I know) Mamoru Kawaguchi wrote an unknown number, of say at least 50, papers, which are always not only scientifically sound and innovative, but clearly understandable and always resulting in a practical outcome, in later years with an increasing trend towards design philosophy. So no wonder, he became, after graduating from Tokyo university in 1957, an associate professor already in 1962 and in 1972 a full professor at Hosei University. It goes too far here to mention all his academic or professional memberships and academic activities which show that Mamoru Kawaguchi has an outspoken sense of responsibility towards society which demands much of his time.

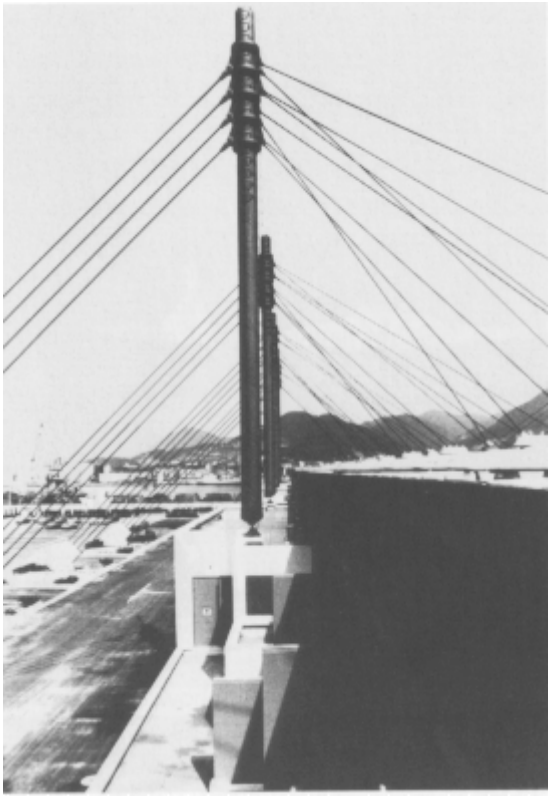
Though beyond that, of course we mainly honour here the creative and imaginative engineer Mamoru Kawaguchi, I can further be brief on that, since you were fortunate enough to hear his personal report on "Structural Design for Architecture" yesterday evening. Let me mention only that he has realized more

than 70 major structures on his own or in collaboration with famous architects such as Arata Isozaki.



5. Foreign Countries Pavilion in Tsukuba Expo: Membrane structure; with F.Maki.
6. Benten-cho Swimming Center in Osaka: Permanent membrane structure; with Showa Sekkei.

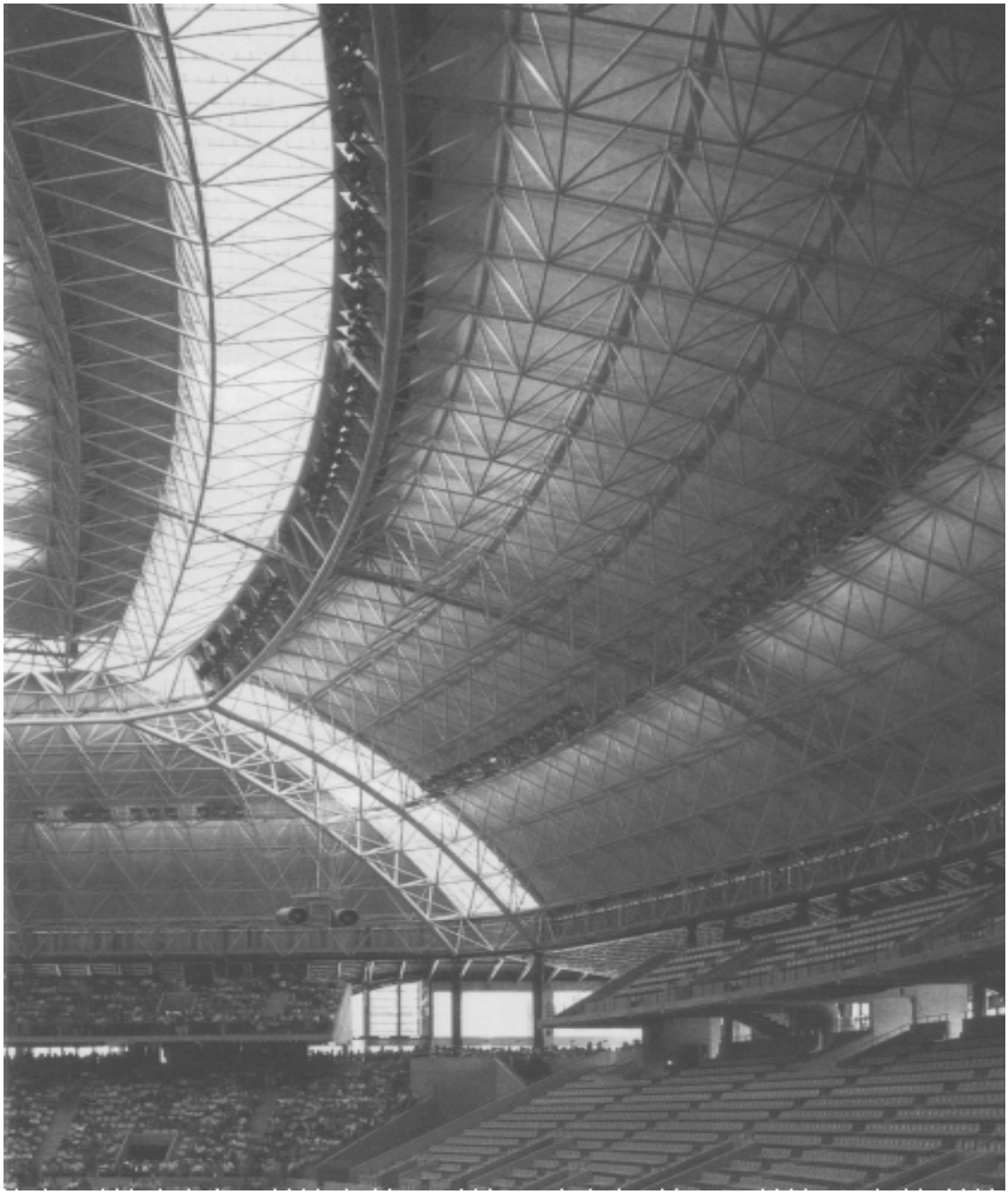
Amongst the works he did with Isozaki were: The West Japan Exhibition Hall in Kokura, Global Tower in Beppu and San Jordi Sports Palace for the Olympics in Barcelona in 1992. The Sports Palace was designed as a Pantadome System which had been developed by Mamoru for the more rational construction of dome structures. This is probably his most significant recent achievement.



7. West Japan Exhibition Center: Cable stayed roof; with A. Isozaki.

The principle of the Pantadome System is to make a dome or a conical space frame kinematic unstable for a period of construction so that it is “foldable” during its erection. This can be done by temporarily taking out the members which lie on a hoop circle. Then the dome is given a “mechanism”, like a 3-D version of a parallel crank or a “pantograph” which is generally applied to a drawing instrument.
Since the movement of a Pantadome during erection is a “controlled one” with only one degree of freedom, no means of preventing lateral movement of the dome such as staying cables or bracing members are necessary during its erection.
Since such a dome is assembled in a folded shape near the ground level and the entire height of the dome during assembly work is very low compared with that after completion, the assembly work can be done safely and economically, and the quality of work can be assured more easily than in conventional erection systems. Not only the structural frame but also the exterior and interior finishings, electricity and mechanical facilities are fixed and installed at this stage. The dome is then lifted up. Lifting can be achieved either by blowing air

inside the dome to raise the internal air pressure or by pushing up the periphery of the upper dome by means of hydraulic jacks. When the dome has taken the final shape, the hoop members which have been temporarily taken away during the erection are fixed to their proper positions to complete the dome structure. The lifting means such as air pressure of hydraulic jacks can be then removed, and the dome is completed.



8. Sant Jordi Sports Palace for Barcelona Olympics (interior): Another Example of Pantadome System; with Architect A Isozaki

9. Namihaya Sports hall: Space frame of Pantadome System, lifted in non-vertical direction in 8,5 hours; with Showa Sekkei.

For an observer of structural engineering it must be fascinating to see that innovations are usually a combination of earlier experience – in this case Mamoru's earlier work on space frames and pneumatic structures – and fantasy with the readiness to accept a certain amount of risk. The pantadome system became very successful and frequently repeated.
Besides San Jordi Sports Palace other buildings for which Pantadome System has been adopted are: World Memorial Hall in Kobe (architects: Showa Sekkei Co.), Singapore, Indoor Stadium (architect: Kenzo Tange), Sun-Dome Fukui (for World Championship of Athletics, architect: S.Okazaki), Namihaya-Dome in Osaka (for National Athletic Games 1998, architects: Showa Sekkei Co.) and Nara City Hall (under construction, architect: A. Isezaki).
Besides his major work in light and wide span roofs, which I could not at all completely cover, think of his "suspendome" proposal, a combination of a single-layer truss dome with a cable system, Mamoru Kawaguchi has been – typical for a creative engineer – curious about all kinds of structures and all kinds of possible structural materials, as shown by the following two examples: Inachus Bridge is a footbridge constructed in Beppu City, Kyushu. For the deck of this bridge he chose natural stone (granite) blocks prestressed in the longitudinal direction. The stone deck is lightly curved to form a lenticulated shape together with a chained steel lower cord. He adopted this Chinese granite stone, not only because it is very strong but because the stone is produced near Yentai City, a sister city of Beppu in China, and had been imported from Yentai to be used for pavement of streets in Beppu.
Some years ago Mamoru was consulted by a small town to realize a jumbo fabric carp of 100 m in length so that it would fly like a kite. He very much – like a child – enjoyed this problem as a realistic exercise of aerodynamics, dimensional analysis and pneumatic membrane technology. The project was successful, and the flying performance of the jumbo carp became an important annual event of the town.

So it is more than fully justified that this university honours Mamoru Kawaguchi. We are of course not the ones who discovered him, he received many important awards around the world. But we are sure he will not mind to take ours as well, especially since he is welcomed here by many personal and old friends; some came even from far away such as the Mungans from Istanbul, Heinz Isler and his wife Maria from Bern and Zoltan Agocs and Josef Postulka from Bratislava, just to name a few.
Getting older we are more and more able to consider such events as a chance to meet and refresh long-lasting friendships – I assume Mamoru fully agrees on that with me and we therefore really miss his wife. I will end in extending my heartiest congratulations to you, Mamoru. I am more than happy and proud that you are now belonging to Stuttgart University.

* Prof. Dr.-Ing. Drs. h. c. Jörg Schlaich, vertreten durch Prof. Dr.-Ing. Kurt Schäfer

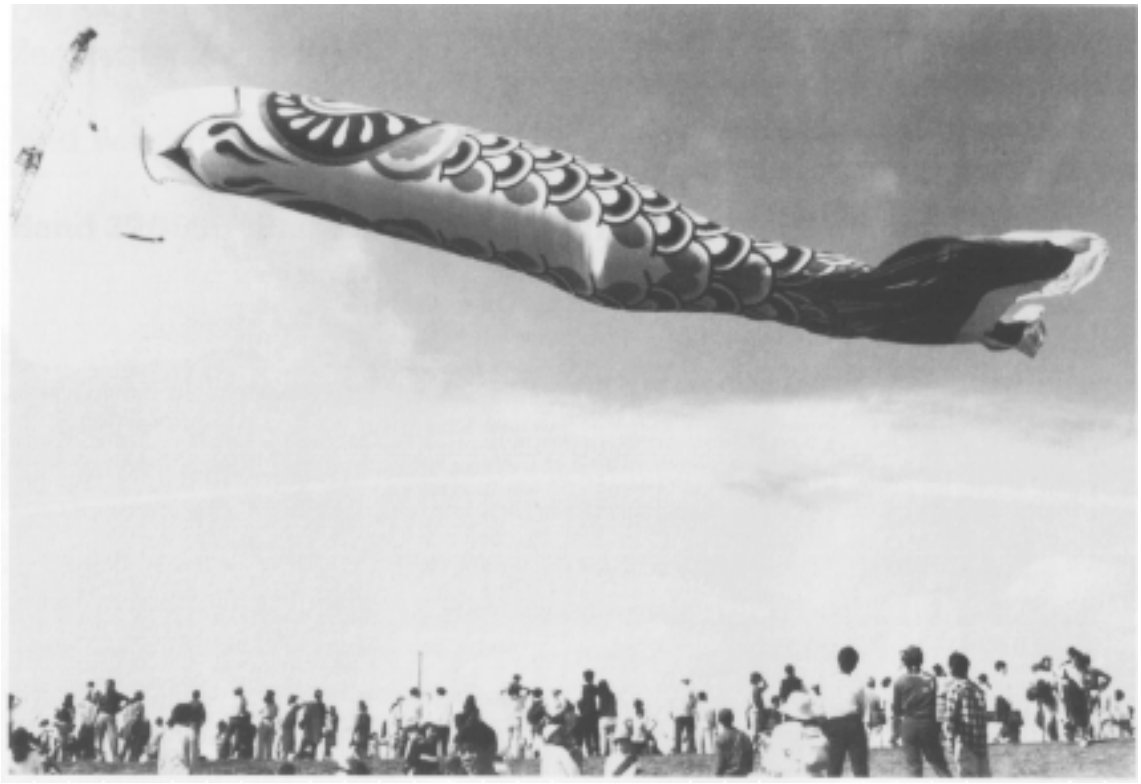
Response by M.Kawaguchi

It is a great honor to me to be chosen as an awardee of Dr.-Ing. E.h. by the University of Stuttgart. I am very much grateful to the University, represented by the Rector, Prof. Pritschow. I would like to thank Prof. Heimerl, Chairman of the selecting committee, and other members of the committee. My special thanks are to my colleague Prof. Jörg Schlaich, my Laudator, who was kind enough to recommend me for the degree to the University.
I feel very happy to note that my little work has been recognized by the University of Stuttgart which is one of the most famous universities in the world in the field of structural engineering. I remember that in September of 1966 I visited the university for the first time. I came to the Department of Architecture of the University (Technische Hochschule at that time) to meet Prof. Curt Siegel to discuss some problems which had occurred when I had been translating his book “Strukturformen der modernen Architektur” into Japanese. (My ability of the German language was not bad at that time, at least such as to understand a philosophical book on structure and architecture. Sorry to say, I lost that ability almost completely in those thirty years.)
Just before I came to Stuttgart, I attented the IASS Congress held in Leningrad (St.Petersburg) with Prof. Tsuboi to present our work on the structure of Yoyogi Indoor Swimming Pools. There I met Jörg Schlaich, and we talked to each other for the first time. So, in double meaning my connection to the University of Stuttgart has a history of more than thirty years.

10. Singapore Indoor Stadium: Pantadome System; with K. Tange.

Being honored with Dr.-Ing. E.h., I have a feeling of rendering my sincere thanks to my parents. The period in which my parents lived was by no means a pleasant one. They had to experience a miserable war which brought them hunger and poverty and made their houses to ruins. But they stood it admirably and brought up their eight children all sound. Three years after the end of the war they met a destructive earthquake, and lost their house again. The sequence of distress shortened the life of my father, and he died just after he rebuilt his house for the family at the age of fifty eight when I was eighteen years old. I think I owe a great part of my honor today to my dear parents who passed away many years ago.

I think I was lucky enough to meet Prof. H.Yoshida at Fukui University. He was around fifty when I studied there as his student. He was not only a very talented researcher, but possessed an exceptionally high sense of beauty. Officially he taught us structural mechanics, but he also appeared often in the classes of sketch and sculpture to give individual suggestions to the students. He was very fond of Japanese traditional folk songs which were no more popular in modern daily life at that time. He talked to his students about the importance of ethnic culture, explained the meaning of the words of the old folk songs, and even showed how to sing them in the class. I was very much influenced by his way of enjoying cultural life and his way of holistic thinking and became very much fond of Japanese ethnic songs ever since.



11. Jumbo Flying Carp; 100m long flying carp of cotton fabric.

As a graduate student at the University of Tokyo, I was again lucky enough to meet a great teacher, Prof. Y.Tsuboi, there. He was then creating new forms of concrete shell structures in cooperation with the architect Kenzo Tange. I was very much impressed by his way of “dual evaluation”. Very often he showed us that, when one was confronted with two things which were both important, he should not easily choose between the two, but should pursue both of them. He showed this idea when he was facing the problems of, for instance, analytical and numerical solutions, structure and architecture, theory and practical design, domestic and international judgments, etc.

I would like to express my sincere gratitude to my great teachers, Professors Yoshida and Tsuboi, for their warm and sound influences on my thought.I am also grateful to many of my contemporaries. They are my colleagues, domestic and international, working in the field of structural engineering. Most important among them are my colleagues doing creative works here at the University of Stuttgart. Besides them are those working actively in other parts of Europe, America and Asia.

I also think I owe my present honor to many of those architects with whom I have worked for creating structures of various kinds. Among them are Kenzo Tange, the late Yutaka Murata, Arata Isozaki and Shiro Mitsumune.

In ending, I would again like to express my sincere thanks to the University of Stuttgart for awarding me such a great honor, and I hope we will be able to develop our good relationships in the future.

12. Inachus Bridge: Pedestrian bridge of natural granite stone; Kawaguchi played the role of architect, too.

Die Bände 1 bis 38 der Schriftenreihe „Reden und Aufsätze“ erschienen im Zeitraum 1924 bis 1971.

1991 wurde die Reihe fortgeführt:

Band 39/1995 Prof. Dr.-Ing. Karl-Heinz Hunken. Prof. Dr. rer. nat. Hartmut Zwicker. Prof. Dr. rer. nat. Franz Effenberger. Ihre Rektorate in Reden und Würdigungen. Hrsg. von Ulrich Sieber

Band 40/1991 Jürgen Giesecke: Umweltforschung mit Schwerpunkt Wasserwirtschaft an der Universität Stuttgart

Band 41/1991 125 Jahre Institut für Kunstgeschichte.
Universität Stuttgart. Hrsg. von Johannes Zahlten

Band 42/1992 Beiträge zur Zeit. Vorträge, gehalten am 8.November 1991 aus Anlaß des 65. Geburtstages von August Nitschke. Hrsg. von Herwarth Röttgen

Band 43/1993 Käte Hamburger. Reden bei der Akademischen Gedenkfeier der Universität Stuttgart für Frau Prof. Dr. phil. habil. Käte Hamburger am 8.Dezember 1992. Hrsg. von Jürgen Hering

Band 44/1993 Baukultur und Technikfolgen. Vorträge, gehalten beim Fakultätsabend der Fakultät Bauingenieur- und Vermessungswesen aus Anlaß des 70. Geburtstages von Prof.Dr.-Ing. Volker Hahn. Hrsg. von Jürgen Hering

Band 45/1993 Erstes Stuttgarter Bildungsforum.
Reden bei der Veranstaltung der Universität Stuttgart am 18. Juni 1993. Hrsg. von Andreas Reuter

Band 46/1994 Jürgen Joedicke: Architekturlehre in Stuttgart.
Von der Real- und Gewerbeschule zur Universität

Band 47/1994 Hans L. Merkle. Reden bei der Festveranstaltung aus Anlaß der Ernennung von Prof.Dr.h.c.Hans L.Merkle zum Ehrenbürger der Universität Stuttgart. 4.Februar 1994. Hrsg. von Heide Ziegler

Band 49/1995 Artur Fischer. Reden beim Symposium aus Anlaß der Verleihung der Ehrendoktorwürde (Dr.-Ing.E.h.) an Senator E.h.Prof.Dr.phil.h.c. Artur Fischer durch die Universität Stuttgart am 9.Dezember 1994. Hrsg. von Jürgen Hering

Band 51/1995 Zweites Stuttgarter Bildungsforum. Orientierungswissen versus Verfügungswissen: Die Rolle der Geisteswissenschaften in einer technologisch orientierten Gesellschaft. Reden bei der Veranstaltung der Universität Stuttgart am 27. Juni 1994. Hrsg. von Ulrich Engler

Band 52/1996 Richard von Weizsäcker. Reden bei der Festveranstaltung aus Anlaß der Ernennung von Dr. Richard von Weizsäcker zum Ehrenbürger der Universität Stuttgart. 18. Dezember 1995. Hrsg. von Heide Ziegler

Band 53/1996 Richard Döcker (1894–1968). Ein Kolloquium zum 100.Geburtstag. Hrsg. von Dieter Kimpel und Dietrich Worbs

Band 54/1996 Mäzene, Stifter und Sponsoren. Symposion anläßlich des 70. Geburtstags von Dr.Dr. h.c. Marcus Bierich. Reden bei der Veranstaltung der Universität Stuttgart am 3.Mai 1996. Hrsg. von Heide Ziegler

Band 55/1996 Christian Menn. Reden bei der Akademischen Feier aus Anlaß der Verleihung der Ehrendoktorwürde (Dr.-Ing.E.h.) an Prof.Dr.sc.techn.Christian Menn durch die Universität Stuttgart am 2.Februar 1996. Hrsg. von Jürgen Hering

Band 57/1998 Prof. Dr.-Ing. Dr.h.c. Günter Pritschow. Reden zur Amtseinführung als Rektor der Universität Stuttgart am 6.November 1996. Hrsg. von Ulrich Sieber

Band 58/1998 Hideo Nakamura. Reden bei der Akademischen Feier aus Anlaß der Verleihung der Ehrendoktorwürde (Dr.Ing.E.h.) an Prof.Dr.-Eng.Hideo Nakamura durch die Universität Stuttgart am 24.Oktober 1997

Band 59/1998 Mamoru Kawaguchi. Reden bei der Akademischen Feier aus Anlaß der Verleihung der Ehrendoktorwürde (Dr.Ing.E.h.) an Prof.Dr.-Eng.Mamoru Kawaguchi durch die Universität Stuttgart am 24.Oktober 1997