Chapter 8

Prof. Ishikawa and Quality Control

8.1 Contribution to the Quality Enhancement of Japanese Industrial Products

Professor Ishikawa's greatest achievement was in the dissemination and development of quality control.

Quality control techniques were introduced into Japan from the United States of America just after the end of World War II. Through the activities described below, Professor Ishikawa worked to disseminate quality control to Japanese industry, together with like-minded quality control specialists, Professors Shigeru Mizuno, Tetsuichi Asaka and Masao Kogure. He conducted research into developing a quality control system that would be better suited to Japanese industry. He originated the idea of Total Quality Control (TQC), a system of company-wide quality control in which all the company members participate, from the top management to the workers on the actual work place. By this system, he brought an innovative change to business management philosophy and styles of operation.

Just after World War II up to these days, the quality of Japanese industrial products has made dramatic improvement. Nobody can deny the fact that quality control activities have been greatly contributing to this improvement. Japanese quality control is now attracting not only developing countries but also developed countries of the West.

In the autumn of 1948, the Union of Japanese Scientists and Engineers (JUSE) set up a quality control research group. Upon the request of the Economic Stability Board, the group started investigation and research into statistical quality control. Based on the results by this research group, the first Quality Control Basic Course (BC) was held in September 1949. With the start of the Seminar, a monthly meeting came to be held to prepare the materials and exercises for it. The meetings were not only concerned with the Seminar, but they also discussed the reconstruction of Japanese industry through the practice of quality control, based on the idea that quality control should be researched more deeply, analyzed and presented in such a way to disseminate it throughout the Japanese industry. Thus around the autumn of that year, those people who were gathered

to these meetings are called the Quality Control Research Group (QCRG). Professor Ishikawa participated and dedicated his effort into investigating and researching statistical quality control that was introduced from the United States of America. His philosophy was that corporate quality control activities should be undertaken not only by a small group of specialists but also by all classes and departments. Based on that idea, Professor Ishikawa vigorously engaged in a very wide range of activities with fellow of the QCRG.

Professor Ishikawa offered the Union of Japanese Scientists and Engineers to hold diverse seminars on quality control. He realized the seminars, and moreover he served as a chairman of the most of QC seminars, as a member of the administration, or as a lecturer. He showed his ability to build the TQC philosophy and its realization. Professor Ishikawa taught courses on quality control for the Chemical Society of Japan, Nihon Shortwave Broadcasting, NHK Radio, and NHK Educational TV (See Chapter 9).

Furthermore, in the process of realizing TQC, Professor Ishikawa proposed the formation of QC Circle in order to educate the workers of the front line. He served as a chief editor of *Genba To QC-magazine* (Foremen and QC) (changed the title to *FQC*, then *QC Circle*) from the first edition in 1962 until his death. He made immense contribution to the dissemination of TQC (See Chapter 10).

In order to disseminate quality control, Professor Ishikawa was the chief editor from 1952 to 1978 of *Hinshitsu Kanri* (Statistical Quality Control), which is a monthly magazine published by JUSE since 1950. Through this periodical, he dedicated himself to the diffusion of quality control. The journal's circulation has reached approximately 10,000 copies each.

To commemorate the contribution and friendship of Dr. W. E. Deming in lasting way and to promote the continued development of the quality control in Japan, the Deming Prize was established to award individuals and companies that have demonstrated outstanding quality control in Japan in 1951. In order to administer the Prize, Deming Prize Committee was organized and JUSE was engaged as its Secretariat. Professor Ishikawa served as the vice chairman of the Deming Application Prize Subcommittee along with Professor Shigeru Mizuno for a long time (Mizuno until 1980, Ishikawa 1985). While the chairman is the head of Agency of Industrial Science and Technology of Ministry of International Trade and Industry, the vice chairmen is responsible for the committee's management and administration. Both professors took the leadership to install a suitable examination system and made great exertions to

award such companies that achieved outstanding performance in quality control. Their work has made a huge contribution to the quality improvement of Japanese companies.

Professor Ishikawa thought that the mutual enlightenment among industry, government and academia was important for the dissemination of quality control. Since 1951, he organized quality control conferences sponsored by JUSE, including the QC Conference (now the QC Conference for Mangers and Staffs), the QC Spring Conference, QC Conference for Foremen (now the QC Conference for Managers and Supervisors), QC Conference for Top Management, and the All Japan QC Circle Conference. Notably, he served as a conference chairman from the 1st QC Conference to the 11th QC Conference.

He proposed also to have the Quality Month every November, co-sponsored by JUSE, Japan Standards Association and the Japan Chamber of Commerce and Industry. Ever since the first Quality Month in 1960, as a chairman of the Quality Month Committee, he devoted his energy to organizing and holding the monthly special events, with the support of the Science and Technology Agency, the Ministry of Trade and Industry, and other relevant government agencies,

In 1965, he proposed the hosting of the Quality Control Symposium as a common forum for research discussion for public, private and academic sectors. He worked to organize the event and served on the organizing committee until 1978 alongside both Professor Shigeru Mizuno and Professor Tetsuichi Asaka. The Symposium has been held each year since its inception and is contributing greatly to improve quality control levels in Japan.

In 1971, he was an active member of the preparatory committee for the founding of the Japanese Society for Quality Control. From 1971 to 1974, he was the Vice Chairman and from 1974 to 1975 he was elected to be the President, serving the society to build its foundation. For his contributions, he was given an honorary member of the society in 1982.

In 1980, he was appointed the Chairman of MITI's Nuclear Power Plant Quality Assurance Review Committee. In this role, he contributed to improving the availability of a nuclear power generation in Japan.

Professor Ishikawa also engaged in a wide range of research concerning quality control. He published his findings in many books and papers. His books have received many awards. For *Sampling in Manufacturing Plants* and three other publications, he received the Nikkei Quality Control Literature Prize from Nikkei Inc. For *What is Total Quality Control? The Japanese Way* (JUSE Press, 1981), he received the Management Book Award from the Nippon Omni-Management Association (See Chapter 15,

chronology at end of chapter).

He contributed to the promotion of sampling research (Chapter 13) and the promotion of industrial technology (Chapter 14) as the infrastructure of quality control.

In addition to all these successful activities in Japan, he was also very active in the world (See Chapters 11 and12).

In 1952, he was awarded the Deming Prize for Individuals by the Deming Prize Committee for his early achievements as a QC Research Group member.

Note: This section is an edited version of Professor Ishikawa's profile given in his medal award celebration program (Chairman, Prof. Hitoshi Kume). We are indebted to Mr. Eizo Watanabe for his valuable comments that assisted us in preparing this edited profile.

The True Value of Dr. Kaoru Ishikawa†

J. M. Juran

My encounter with Dr. Ishikawa was in the summer of 1954, when I visited Japan for the first time at the invitation of the Japan Business Federation (Keidanren) and the Union of Japanese Scientists and Engineers (JUSE). At the time, Dr. Ishikawa was a member of the QC Research Group of JUSE, engaging in research and dissemination activities such as making educational materials and operating training courses for the purpose of building quality of Japan being competitive in the world. The Research Group was very cooperative, translating lecture materials I had sent in advance, planning and managing the lectures, and also assisting me in my providing guidance to companies.

For 35 years since 1954, I had the opportunity to meet and work with Dr. Ishikawa not only in Japan but also in various countries around the world. During this time, Dr. Ishikawa progressed greatly as the designer of Japan's quality revolution. Dr. Ishikawa became the leader of quality improvement through his dedication to the mission of improving Japanese quality, and later, quality around the world. His dedication brought amazing results.

Dr. Ishikawa wrote and edited a wide range of publications. These include valuable books and papers on quality control. A huge number of translations of these have been published.

† This article has been translated from the Japanese version back into English, as the original one written in English is missing.

Dr. Ishikawa contributed widely to the education of two generations of Japanese managers, engineers, workers and even managers outside Japan. Both in Japan and internationally, he left great achievements in the activities of standardization committees.

In addition, Dr. Ishikawa gave us many innovative ideas including the philosophy of QC Circle and the cause and effect diagram.

For these contributions, Dr. Ishikawa is known internationally as the distinguished Japanese quality plenipotentiary. There are a lot of things to learn from his study like how Dr. Ishikawa managed so many things during his life. In my opinion, he did it with an exact way by applying his natural gift. He was dedicated to serving society rather than serving himself. His manner was so modest that many people cooperated with him. He followed his own way to teach by confirming the facts and analyzing them strictly. He was very serious, that's why everybody trusted him completely.

I would like to share my sorrow with the Japanese people at the death of Dr. Ishikawa. I liked working with him. I am proud of being his friend during his time. I want to express my deepest respect to Dr. Ishikawa for many contributions to quality around the world and for the dedication he showed towards our society.

(Honorary Chairman, Juran Institute, Inc.)

What I Learned from Prof. Ishikawa

Yutaka Kume

It is universally recognized that Dr. Ishikawa was, by far, a great person. He was also an unforgettable person for Nissan Motors, and for me. Recalling, my first meeting with Dr. Ishikawa was long time back.

In 1959, our company decided to challenge the Deming Prize through introduction of Company-wide Quality Control; in order to overcome issues of trade liberalization and exports having shifted into full swing to the U.S.A., and further to establish a strong constitution for the future. At that time, I was based in the headquarter plant (currently, Yokohama Plant) as the schedule section manager, in the production department. I was assigned by our President Kawamata, the role of the promoter of this journey, for which I received guidance directly from Dr. Ishikawa. As one of the memories, I still remember that Dr. Ishikawa told me, "You'd better not to do it, if it is for the sake of the Deming Prize." Afterwards, we received guidance from time to time, and especially recently, we are very thankful of his guidance as to the planning to implementation of

the in-house quality control training programs of the executives and senior managers.

For this reason, there are a large number of people who have directly met Dr. Ishikawa for real in the company. I would like to tell you something how we make use of Dr. Ishikawa's doctrine these days.

I established the corporate philosophy a few years ago. The purpose of which, was to change the mindset of all employees, and to enhance the centripetal force. The outline is "customer satisfaction is always of primary importance." While it is exactly the essence of QC, which Dr. Ishikawa repeatedly taught us, I reflect that it took a long time to take root. By thoroughly extending this philosophy into each level of the company across all departments, I was often told, by external people, "Nissan has changed" these days. I think our QC is becoming real.

I have recalled part of my memories of Dr. Ishikawa above. We hope to, further strive, as the leading company, by taking advantage of his teachings.

(President, Nissan Motor Corp.)

Thinking of Prof. Kaoru Ishikawa

Shoichiro Toyoda

I would like to convey my sincere condolences on the sudden demise of Professor Ishikawa. This New Year, we were all able to celebrate together the award of the Order of the Sacred Treasures, Second Class to Professor Ishikawa. He looked happy and well on that occasion but this became the last time I saw him.

At the celebration, I was given his book, *Introduction to Quality Control*. The Foreword carries his assertion, what he always used to tell us: "The new system of quality control is an ideological revolution of management. If the new system of quality control can be implemented throughout the company, we can achieve an improvement of company constitution…" Professor Ishikawa left great achievements by following this belief, dedicating himself to the development of Japanese quality control. This goes without saying, but he had an active approach to Japanese quality control. He was aware of the issues and he taught and guided us as occasion demanded. Looking back on this great leadership that he showed, I am steeped in sorrow that we have no further opportunity to benefit from his wisdom.

The companies that received his guidance have succeeded in improving their companies' constitution by practicing quality control, thereby strengthening the international competitiveness of their products and firming up the infrastructure of

Japan's present-day economy. His achievements are the focus of attention of companies not only of Japan but also of the world over. Professor Ishikawa stressed the "implementation" of quality control in the education and training he gave. This emphasis is being embraced worldwide.

"QC starts and ends with education." This is what he taught us. We must not forget this in our effort to further the development of quality control.

With a prayer that his soul may rest in peace, I conclude this tribute.

(President, Toyota Motor Corporation)

The TQC Advice of Prof. Ishikawa Made the Bridgestone Corp. of Today

Kanichiro Ishibashi

Japan today has the most excellent industrial technology in the world. However, in around 1950, the standard of technology well and far lagged behind the world. The products we manufactured were random in quality and utterly shoddy.

All these products broke down quickly when put to use and no one would repair them.

Even so, the Japanese somehow had to build up their country in strength, despite lacking natural resources.

At that time, Professor Ishikawa not only took the lead in introducing the methods of total quality control (TQC) that originated in the United States as the very means of rescuing Japan but he also created and devoted himself to disseminate a superior system of quality control that Americans could not compete with. The QC Circle system is particularly well known. I believe this was the brainchild of Professor Ishikawa. This became a tremendous impetus.

In 1964, I was 43 years old. As the president, I introduced TQC into my company at Professor Ishikawa's strong recommendation, in order to unify ideas within my company and to focus our drive towards success. This is how we managed to arrive at the Bridgestone of today. I am truly grateful.

(Director and Honorary Chairman, Bridgestone Corporation)

"QC Fails Unless the Company President Takes the Lead"

Ichiro Shinji

It seems quite recent that Professor Ishikawa gave us his guidance, but in fact it is a quarter of a century ago. How fast months and years flying by!

Going back to the period, the JUSE Quality Month slogan one year was to the effect, "Improve product quality and massively increase export." Japan was short of foreign currency then. It was being said, "When America sneezes, Japan catches cold." The JUSE slogan was a straightforward encapsulation of the simple goal of those who worked in quality control: if we can produce high quality goods, people around the world will buy them – but how do we turn this theoretical truth into reality? What held the key was this: we had to put our heads together and work hard.

"QC will only succeed when the president himself takes the lead and starts by deciding to study it himself, not just delegating it to the staff in charge."

This is what Professor Ishikawa said to me when I met him for the first time. As the Quality Control Division Manger I had my eye on the Deming Prize and wanted to bring QC into my company.

I later took part in the 5QCT (QC Team) led by Dr. Mizuno and spent forty days visiting top American and European companies. I had the opportunity to visit these companies and to hold discussions. All the companies we visited were the world's leading giants. However, we could not see any trace of the concept of TQC that Professor Ishikawa had spoken of.

Today, Japan is a global economic superpower. It is in trade friction with the developed countries of the West. How far Japan has come! I strongly feel this is due to Japanese companies practicing what Professor Ishikawa and his colleagues had created, "QC led by the president," and "QC that is a company-wide effort, that everyone works for."

(Special Honorary Member, former Chairman, JVC)

8.2 Prof. Kaoru Ishikawa and the JUSE Group

As mentioned in Section 8.1, the relationship between Professor Ishikawa and the JUSE Group began when Professor Ishikawa participated in a QC Research Group (QCRG) activity.

In 1952, the Deming Prize for individuals was awarded to 8 QCRG members, including Professor Ishikawa. The reason for awarding these individuals was described as below, as well as the background behind the formation of quality control activities in Japan based on QCRG activities.

> "From 1948 onward, these eight people: Shigeru Mizuno, Tetsuichi Asaka, Masao Goto, Hidehiko Higashi, Kaoru Ishikawa, Masao Kogure, Shin Miura, and Eizo Watanabe worked together to research and study Statistical Quality Control. Their efforts led to the establishment of a quality control educational curriculum that firmly spread these theories and techniques and made a vital contribution to the introduction of Statistical Quality Control to major industries in Japan. Although it was very difficult to obtain written materials about quality control in 1948, some members of this Group were able to complete a translation of American standards, a matter of great importance to the field of quality control in Japan. Then, from the first time JUSE held quality control seminars in 1949, led by Shigeru Mizuno, the Group cooperated as a team, using time off from their regular duties to teach others. Without question, this seminar still remains to this day the foremost authority in the field of quality control education in Japan and it is widely recognized that people who have been through this seminar are now leading the implementation of these quality control principles in today's industries. Needless to say, the resulting achievements are due to the efforts made by this Group.
>
> This Group carried out activities over a period of more than three years, over a wide range of fields. It would not be an exaggeration to say that through these JUSE training courses, there was no one in Japan in any field that had some connection to quality control, whether it be academia, industry, specific businesses, universities or government institutions, who did not either directly or indirectly undergo their instruction.
>
> This Group is the main editing committee for the monthly journal *Hinshitsu Kanri* (Statistical Quality Control), the only journal of its kind, which provides guidance in quality control. In the near future, *Courses on Quality Control* will be made available to the public.
>
> Statistical quality control covers a broad range of fields, branching out into many areas, so no matter how great the scholar or engineer may be, it is impossible for one person to devise ways to implement all of it on his own. It was only through this Group led by Shigeru Mizuno, made up of experts from various different fields and their close-knit cooperation, that they were able to produce

such great achievements."

Professor Ishikawa strove to promote the awareness, spread and development of quality control to support the growth of industry, pouring his unflagging efforts into the promotion of QC activities. In the end, he succeeded in creating a unique Japanese approach to quality control. When writing about Professor Ishikawa, the words must not be limited to describing him as an expert in quality control techniques, but rather, should describe him as an organizer who developed a national quality control movement that involved many people throughout a wide range of disciplines.

Professor Ishikawa's achievements as a member of the JUSE Group are shown below:

1. Cultivation of QC colleagues and the training of instructors: committee activities carrying out QC Basic Course, continuation of the co-teaching system
2. Utilization of QC methods: Basic Course (BC) Small Group Workplaces, QC counseling to companies
3. Seminars held for different levels: Basic Course → QC Seminar for Managers → QC Seminar for Executives → QC Seminar for Senior Management → QC Seminar for Foremen
4. Horizontal expansion of education and training: QC Seminar for Sales/Purchasing Divisions.
5. Spreading awareness among companies: *Hinshitsu Kanri* (Statistical Quality Control), *Genba To QC-magazine* (Job Site and Quality Control journal), Quality Month events, publications, *Reports of Statistical Application Research, JUSE,* lectures
6. Self-development / Mutual development QC Circle activities, QC Circle Symposium, each of various QC conference for Manager and Staff, QC Circle Cruising Seminar
7. Qualitative improvement of QC, Responding to change: Quality Control Symposium
8. Expansion of QC methods: Seminar on Design of Experiments, Introductory course for DOE
9. Award system: Deming Prize, Japan Quality Control Medal, Ishikawa Award, SQC Award, FQC Award (currently called the QC Circle Kaoru Ishikawa Award), Nikkei QC Literature Prize
10. International Cooperation: Overseas mission teams, overseas trainee seminars,

lectures, ICQC (International Conference on Quality Control), ICQCC (International Convention on QC Circle)

11. Ishikawa Prize: member of the examination committee
12. Cooperation with publishers: Author, chief editor, chairman of editing committee, advisor

Moreover, Professor Ishikawa provided his guidance and cooperation as a Director of JUSE from June 1971 and a member of the Board of Directors for JUSE Press, Ltd. from February 1976, serving in both positions until he passed away.

(Yoshihito Soma)

Prof. Kaoru Ishikawa and JUSE

Kohei Suzue

I would like to describe the relationship between Dr. Kaoru Ishikawa and JUSE, as, presumably, many people will contribute articles about his grand achievements and footsteps, in the field of Quality Control.

Dr. Ishikawa assumed the post of the Board director at JUSE for over 16 years, till he passed away. His father, Dr. Ichiro Ishikawa also had continued to serve as the chairman from the time of establishment of JUSE in May 1946 to 1970, until he deceased. The relationship between JUSE and the Ishikawas are long, and we owe them great obligations over two generations. JUSE, with consent of the Ishikawa family, established the Ishikawa Prize, in commemoration of Dr. Ichiro Ishikawa, to award ingenuity in the field of management engineering, for the development and modernization of the industry, which has already extended for over 19 years.

As is widely known, Dr. Kaoru Ishikawa's major at University was fuel engineering. Dr. Kaoru Ishikawa first encountered quality control from a story that his father started at JUSE. Mr. Yujiro Katsuta, the 4th President and CEO of JUSE, told me that Dr. Ichiro Ishikawa requested to let Dr. Kaoru Ishikawa, join the Quality Control Research Group. In 1952, Dr. Kaoru Ishikawa was awarded the Deming Prize for Individuals, along with Dr. Mizuno and others. It is widely known that he contributed largely to the development of Quality Control from then on. We, at JUSE, are more than thankful for his dedicated efforts as the founder and responsible head of many businesses, including the QC Circle, the QC Seminar Senior Management Course in Karuizawa, the *QC Circle-monthly magazine*, etc. Dr. Kaoru Ishikawa worked

extensively as an international man and had many acquaintances even in overseas. JUSE owes largely to Dr. Kaoru Ishikawa for the successes of ICQC and ICQCC and other programs that have been conducted by JUSE.

Although it was a great loss for JUSE that Dr. Kaoru Ishikawa passed away, it is our responsibility to further develop the path he opened up and cultivated, from now.

(President and CEO, JUSE)

8.3 Incubator of *Hinshitsu Kanri* (Statistical Quality Control)

The *Hinshitsu Kanri* (Statistical Quality Control) magazine was published by JUSE in March of 1950 as Statistical Quality Control, Vol. 1, No. 1, with Prof. Masao Goto as the chairman of the editing committee, and it is still widely used today as a journal that provides pertinent information about TQC. As mentioned in Section 9.1 (1), the predecessor to this journal was the Monthly Report of QC Basic Course of JUSE that started from September of 1949. It is the only journal by which we can examine the evolving history of Japanese QC, from its enlightenment period and its development responding to the changes of the times. In 1952, two years after the first edition, Professor Ishikawa took on the important responsibility of the chairman of the editing committee and he remained in this post for 26 years, until 1978. Later on, he provided guidance from a broad perspective as editing advisor (please see Section 9.1 (1)).

At the time the first edition of this journal was published, the editing team included leader: Ichiro Ishikawa; editing advisors; Harushige Inoue (the first secretary of the Agency of Industrial Science and Technology of the Ministry of International Trade and Industry); Hyoe Ouchi (Professor Emeritus of the University of Tokyo, Chairman of the Statistics Committee of the Prime Minister's Office); Naoto Kameyama (Professor of The University of Tokyo, President of the Science Council of Japan); Takeo Kato (Director, Mitsubishi Electric); Koji Kobayashi (Director, NEC); Jiro Yamauchi (Professor of The University of Tokyo); and others. Members of the editing committee included: Saburo Ohkita (Economic Stabilization Board, Secretariat Investigation Section Chief); Tatsuo Kawata (Professor at Tokyo Institute of Technology); Takeshi Kayano (Ministry of Posts and Telecommunications, Communications Research Laboratory, Applied Equipment and Materials, Control Section Chief); Toshio Kitagawa (Professor of Kyushu University); Masao Kogure (Associate Professor at Tokyo Institute of Technology); Motosaburo Masuyama (Ministry of Transport Engineering Official, Lecturer at the University of Tokyo); and Sigeiti Moriguti (Associate Professor

of the University of Tokyo). The executive head was Masao Goto (Administration Office for the Statistics Committee of the Prime Minister's Office, No. 2 Investigations Section Chief), with managers under him including Shigeru Mizuno (Associate Professor at Tokyo Institute of Technology); Shin Miura (Mitsui Chemical Industry, Research Division); Heihachi Sakamoto (Kobe University); Eizaburo Nishibori (JUSE Councilor); Hidehiko Higashi (Ministry of International Trade and Industry, Industrial Technology Bureau); Eizo Watanabe (Ohira Mining Laboratory, No. 1 Metals Section Chief); and others. From today's perspective, these groups were a gathering of prominent people from government, academia, and industry, many of who were the leaders of their field in Japan. Professor Ishikawa was a member of this prominent group, working as the deputy head of the publication.

The following is a list of "Preface to the First Number" by the JUSE Chairman, Ichiro Ishikawa, (Professor Kaoru Ishikawa's father and Chairman of Keidanren (Japanese Business Federation) at the time).

"1. The building of a peace-loving, civilized and democratic nation is the steadfast guideline for rebuilding our country and it is also our national policy.
2. We must improve the qualitative level of our country's products so that they will gradually be able to withstand the competition in the world's markets.
3. From the aspect of statistical and technical quality control in the production process, it is most effective to promote the reduction of consumption rate, improvement of quality and sustainment of the uniformity.
4. Due to the cooperation from almost all of the pioneering experts in government, private, and academic sectors, there has been a tremendous number of applicants for the seminar related to quality control we started and this journal is being printed for the purpose of addressing that popularity."

Along with these words spoken with respect to the origins of the journal, he also spoke about editing policy:

"5. Thus, with this journal, I hope to build a foundation for the fundamental streamlining of enterprises by gradually raising manager, engineer, as well as employee interest in quality control, through not just the basic premise of interpreting high level theories, but also through our mission of raising

awareness about quality control and providing actual guidance so that from the standpoint of executing this theory, we first start with areas close at hand where we can actually put quality control theory into practice."

Furthermore, he also made the following comments on the way of Quality Control based on the voices from participants while the process of the First QC Basic Course was implemented.

"6. In introducing quality control, we should consider human factors and develop a system with a Japanese style of approach."

It is thought that the underlying philosophy behind the founding of the *Hinshitsu Kanri* (Statistical Quality Control) magazine, its editing policy and ideals for the future of quality control later determined the directions taken in the development of quality control. If we look at the editing of the journal later on, we see that:

1. As quality control developed, the *Hinshitsu Kanri* (Statistical Quality Control) made constant efforts to provide people involved in quality control with the latest information.
2. Work progressed based on a partnership between industry and academia.
3. Rather than just combining it with theory, practical application was aimed at areas that would truly be useful.
4. Efforts were made to attract the interest of not just quality control experts, but also of top management, managers, general engineers and also workers on site. In particular, as shown below, the journal became the basis of Quality Control Circle toward work places.

The journal has moved forward mainly in line with these policies. Also, when looking at quality control in Japan up to now and its future development, there is a focus on creating a Japanese essence within the approaches and we can see that today we have firmly reached a point where a Japanese style of quality control has been achieved and that these policies have largely been adhered to. If a bold inference may be forgiven, we could even say that Professor Kaoru Ishikawa constantly had the above policies in mind as he moved forward with activities later on.

After assuming the position of Chairman of the editing committee from Masao Goto in 1952, Professor Ishikawa poured his efforts into ensuring that the journal took the lead in the field of quality control in Japan. For example, the issue of promoting free trade had taken on considerable importance in Japan at the end of 1950s, so under the famous slogan of "Use quality control to liberalize trade," efforts were made to take a

positive stance in the face of what seemed a more defensive stance on the part of industry. Again in 1960, with the publishing of the TQC lecture series "Quality Control Carried Out by Everyone," the journal took the initiative in moving from statistical quality control (SQC) to TQC, exhibiting leadership in pushing in this direction.

In addition to his role as the Chairman of the editing committee, Professor Ishikawa also contributed 262 papers to the journal over a span of 38 years, including papers related to methodology, such as sampling, production process analysis, and control charts, as well as papers about quality assurance, the shaping of QC approaches for each era, ideal QC approaches in response to changing times, QC Circle activities, problems of globalization, and consumer problems. Professor Ishikawa's ideas and philosophy about QC were introduced through the journal, influencing the field of quality control in Japan.

Based on the idea that even if management and engineers know about quality control, it will not be successful unless workers at the job site also understand it, Professor Ishikawa aggressively pursued this idea in the 1960's through the publication of a text aimed at job sites and articles about round table discussions aimed at the job site. Upon seeing the strong reaction to these efforts, Professor Ishikawa said, "If workers at the job sites are this interested, let's make a publication for them," and the *Hinshitsu Kanri* (Statistical Quality Control) editing committee members immediately decided to publish a quarterly journal called *Genba To QC-magazine* (*Foremen and QC*, currently called *QC Circle-monthly magazine*), starting in April 1962. Thus, spawned by *Hinshitsu Kanri* (Statistical Quality Control), *Genba To QC* became the base for QC Circle activities (please see Section 10.1 and 10.2)

Today, although the *Hinshitsu Kanri* (Statistical Quality Control) has grown from being called a statistical quality control (SQC) journal to one that is called a TQC journal, this can be seen as a result of the strong efforts made by quality control leaders whose base can be found in the editing committee members led by Professor Ishikawa.

Furthermore, as the Chairman of the editing committee, Professor Ishikawa did not restrict himself to merely filling the role of the person responsible for issuing a journal; he also helped develop many excellent leaders in QC through the editing, planning and committee discussions, a valuable achievement that we cannot forget.

(Ikuro Kusaba, Kozo Koura, Noriaki Kano)

When *Hinshitsu Kanri* Was Born

Masao Goto

The eight people who pioneered the promotion of quality control in Japan (Shigeru Mizuno, Tetsuichi Asaka, Kaoru Ishikawa, Masao Kogure, Masao Goto, Hidehiko Higashi, Shin Miura, and Eizo Watanabe) took action in 1949 based on their beliefs that, because of its lack of natural resources, in order to survive Japan would need to successfully compete with other countries on the basis of quality. Thus, working from their base at JUSE in the summer of that year, they were beginning the preparations for the initiation of the SQC basic course seminar (QC Basic Course). The President of JUSE at that time was Mr. Ichiro Ishikawa, who was the president of Showa Electric and Chairman of the Council for Japanese Industry (a forerunner of the current Keidanren (Japan Business Federation), in Japanese, it was Nihon Sangyo Kyogikai and often abbreviated to Nissankyo). Mr. Ishikawa had enormous expectations for quality control and he was delighted that his son Kaoru was participating in the research group.

Very soon after the start of the Basic Course, we began studying the possibility of publishing a monthly journal called "*Hinshitsu Kanri* (Statistical Quality Control)." A lively discussion ensued, with some voicing very cautious views, wondering if such an undertaking could withstand operating risks, but with managing director Kenichi Koyanagi at the lead, we in the research group aggressively pushed forward with this idea. I became the first editing committee chairman and together with Kaoru Ishikawa and Shigeru Mizuno, the research group came together as a team to work on preparations for the journal. At the time, Mr. Ishikawa, who would later become the second chairman of the editing committee and serve for many years, made especially strong efforts to ensure that the papers, reports and other items printed in the *Hinshitsu Kanri* (Statistical Quality Control) would be of the highest quality, and he became the driving force behind the implementation of this project.

As chairman of the editing committee, I had to ensure that the quality of the journal was suitable to its "*Hinshitsu Kanri* (Statistical Quality Control)" name. For this reason, we decided on the policy of creating a journal with an overall design that people would not be tired of even after 5 or 10 years. Hence, we used the highest quality paper, ensured that in principle, it did not include advertisements, even if that meant a higher price, and made sure of a consistent usage of modern kana orthography.

However, it took much more time and effort than we had imagined to accomplish these goals and in a freezing room on the third floor of the Osaka Shosen Building, I, as Chairman, along with Mr. Ishikawa, the rest of the research group, and Shoichiro Niki,

from the administration office continued to work well past 9:00 pm for days. Soon Haruko Mitsuaki, whose editing experience helped speed up our work considerably, joined us. It truly was very hard work, but the times we spent eating special orders of hot curry rice brought from a nearby shop helped us forget our fatigue, as everyone gathered to talk about our dreams, we were entrusting ourselves to the growth of quality control. I still remember the spirited passion of Mr. Ishikawa at that time and the inspiration he was to us all.

Hinshitsu Kanri (Statistical Quality Control) was first published with the target of obtaining 1,000 subscribers, but at that time we only had around 500. In addition to the policy of no advertising and corresponding lack of advertising income, the use of high quality paper naturally increased cost as well and the 200-yen price was a heavy burden for the average salaried worker's pay level. Thus, we had to rely on companies as our main subscribers, but because at that time, there were still few companies with interest in quality control, it took quite a long time to reach our target of 1,000 subscribers.

I believe that the internationally high economic level that we enjoy in Japan today can be traced to the new hopes and goals that company-wide quality control provided to the management of companies and many managers of various organizations. Including the *Hinshitsu Kanri* (Statistical Quality Control), we wrote or compiled many publications related to quality control, and as I recall the struggles to establish the *Hinshitsu Kanri* (Statistical Quality Control) that we went through during that time, I would like to express the heartfelt gratitude I feel towards the towering achievements of Kaoru Ishikawa, and the incredible passion he always showed towards the promotion of company-wide quality control.

(Member of the House of Councilors, former Minister of Justice)

When *Hinshitsu Kanri* (Statistical Quality Control) Was First Published

Shin Miura

The monthly journal *Hinshitsu Kanri* (Statistical Quality Control) was first published in March of 1950.

Mr. Kenichi Koyanagi, President of JUSE at the time, was able to reach this point after struggling mightily with the project since 1949. This was the time when JUSE was located on the third floor of the Osaka Shosen Building at Tokyo Station's Yaesu exit.

When Mr. Harushige Inoue, Head of the Industrial Technology Bureau at the Ministry of International Trade and Industry was invited to JUSE for an explanation about the idea of starting a monthly journal, he did not agree, stating that it was too early for such an undertaking. However, we pushed ahead under the decisive guidance of President Koyanagi and the first edition was issued in March. The chief editor was Masao Goto (Administration Office for the Statistical Committee of the Prime Minister's Office, No. 2 Investigations Section Chief) and the deputy head was Kaoru Ishikawa and it was at this time that I began working together with Mr. Ishikawa on the QC journal.

Opening the first number, we can see that it was a brilliant start, including the "Comments on the Establishment of the Journal" (Ichiro Ishikawa), "On the Occasion of the Publication of the First Edition" (Hyoe Ouchi), "Industry Management and QC" (Kenichi Koyanagi), "The Ideal Engineer of the Future" (Eizaburo Nishibori), as well as a case study by Seikichi Miyagi, "QC for Ammonium Sulfate" (Shinji Nakai, Mitsubishi Kasei), and QC lectures (Eizo Watanabe, Shin Miura, Shigeru Mizuno, and others). This was when I began my long association with Professor Ishikawa that lasted 40 years until his death in 1989. I had thought that our long association would continue much longer into the future and I am saddened that this will not be so.

I have so many memories of times spent with Professor Ishikawa on overseas trips, study trips in Japan, working on research, his guidance, and playing golf together.

When considering the order of our ages, I feel that we have lost someone who should have been around much longer.

(Former Professor of Tamagawa University)

8.4 Exhibiting Leadership in the Development of the Deming Prize

To commemorate the contribution and friendship of Dr. W. E. Deming in lasting way and to promote the continued development of the quality control in Japan, the Deming Prize was established to award individuals and companies that have demonstrated outstanding quality control in Japan in 1951.

The Deming Prize:

"The Deming Prize for Individuals, which is given to individuals who have made outstanding contributions to the study of Company-wide Quality Control or statistical methods used for Company-wide Quality Control, or those who have made outstanding contributions in the dissemination of Company-wide Quality

Control; The Deming Application Prize which is given to organizations or divisions of organizations that have achieved distinctive performance improvement through the application of Company-wide Quality Control utilizing statistical and other methods; and the Quality Control Award for Factory by Deming Prize Committee which is given to an operations unit of an organization that has achieved distinctive performance improvement through the application of quality control/management in the pursuit of Company-wide Quality Control." (From the Deming Prize Guide)

Apart from these, the Deming Prize committee also oversees the Japan Quality Control Medal and the Nikkei Quality Control Literature Prize.

As one of the 8 members of a QC research group, Professor Ishikawa was awarded the Deming Prize for Individuals in 1952. The Nikkei Quality Control Literature Prize, awarded by the Deming Prize committee in cooperation with Nikkei Inc., was presented for the first time in 1954 and it was awarded to Professor Ishikawa for his *Sampling in the Factory* (published by Maruzen). Altogether, Professor Ishikawa won this award four times.

The history of the Deming Prize initiation is recorded in the following excerpt from a Deming Committee report made at the time the Prize was established.

"Dr. W. Edwards Deming, Advisor to the American Budget Office, came to Japan as a consultant for GHQ ESS (The Economic and Scientific Section of General Headquarters in then occupied Japan) to provide assistance for a preliminary sampling survey being carried out in July – September 1950 for the Japanese Census. Accepting an invitation from JUSE, he began a series of lectures at the Auditorium of the Japan Medical Association in Kanda starting from August 13, in what came to be called the "Eight-Day Course on Quality Control." These lectures had a revolutionary impact on the discipline of quality control in Japan. The transcript of the eight-day course, *Dr. Deming's Lectures on Statistical Control of Quality*, was compiled from stenographic records in both English and Japanese and distributed for a charge, but Dr. Deming donated his royalties to the managing director of JUSE, Kenichi Koyanagi. In appreciation of Dr. Deming's generosity, Mr. Koyanagi, proposed to JUSE's board of directors that they use the donated royalties and profits to fund a prize, and the establishment of the Deming Prize was announced. In brief, the JUSE Board's resolution stated that:

1. In commemoration of Dr. W. Edwards Deming's generosity and achievements,
2. And in order to promote the development of quality control in Japan,

3. Persons who have made outstanding contributions to statistical quality control theory, practical application studies, and education will be selected annually and presented with an award.
4. In addition, an application prize shall also be established, which is given to a company or plant chosen from candidates who have achieved distinctive performance improvement through the application of statistical quality control methods."

Owing to the efforts of Ichiro Ishikawa (Professor Kaoru Ishikawa's father), who was both Chairman of Keidanren (Japan Business Federation) and JUSE at the time, and with the approval of the economic community and the support of the Ministry of International Trade and Industry (MITI), the media and others, the Deming Prize was established and has continued to operate through the voluntary cooperation of experts from academia and industry. As one of these members, Professor Kaoru Ishikawa worked on the Deming Prize committee over a span of 39 years, from the time the prize was being formulated in preparatory discussions until 1989, enhancing the reputation of the Prize and in order to preserve its authority, constantly assumed a role of guiding and instructing industry in the dissemination and promotion of quality control, as well as establishing a firm examination system and together with the efforts made to improve and develop examination committee members, he also made dedicated efforts to award companies who achieved distinctive performance related to quality control. These actions significantly affected the level of quality control in Japanese companies.

It can be said that the level of quality control in Japan has been enhanced by the companies who have won the Japan Quality Control Medal, the Deming Application Prize, or the Quality Control Award for Factory by Deming Prize Committee. The Deming Prize system is still relevant today and has been able to maintain its high reputation due to both the diligent study of the examination committee members, which has been handed down in the spirit and technical skill of the examination process and the planned development of younger examination committee members. These activities have mainly revolved around the application prize sub-committee. Although it is customary to ask the head of the Agency of Industrial Science and Technology in the Ministry of International Trade and Industry to take on the position of Chairman of this sub-committee, the substantive operation of the committee centers are processed by the deputy chairman. Together with Professor Shigeru Mizuno (1951–82), Professor Tetsuichi Asaka (1951–84), and Professor Ikuro Kusaba (1956–89), Professor Ishikawa worked on the application prize sub-committee for 35 years, from its inception in 1951 until his retirement from the committee in 1985 at the age of 70, with 24 of those years

spent as deputy chairman of the committee (1962–85). During that time, Professor Ishikawa made profound contributions not only to the establishment of the Deming Application Prize for Small Enterprise (1958), the Deming Prize for company divisions (1966), the Quality Control Award for Factory by Deming Prize Committee (1973) and the Japan Quality Medal (1970), but also to the administration of these awards later on.

Further, starting with the examinations for these prizes, he also actively participated in the QC diagnosis by the Deming Prize committee member (established in 1971), and through the examinations and quality diagnoses of the candidate companies, he not only provided pertinent advice in the examination opinion report and diagnosis report for the purpose of improving company performance, but also implemented on the job training for committee members by indicating model examples. Younger committee members accompanying him to examinations were advised that whether it was an examination or a quality diagnosis, it must be done for the benefit of the company. "Do not simply write words of praise, rather you must write about what can be done to make the company even better," he would add.

Professor Ishikawa helped make improvements through his many proposals and comments about the Deming Prize system, the way in which examinations were conducted and other issues. His other accomplishments include the introduction of a system for examination committee member retirement at the age of 70 (1980) and the revision of the checklist used in the application prize examination process (1984).

In 1981, as part of the opening up of the Japanese economy, Professor Ishikawa also suggested that there was a need for an open door policy for Deming Prize applications from overseas companies. Initially, many in the sub-committee and in administration expressed negative opinions, but in the end, people were swayed by what could be called Professor Ishikawa's tenacity and his determination, leading to the establishment of a sub-working group on overseas issues and in 1984, the regulations for accepting applications from overseas organizations were formulated and work on an international guide began.

Professor Ishikawa's dream was realized in 1989, when Florida Power and Light Company became the first overseas company to win the Deming application prize, followed by Philips Taiwan who won the prize in 1991. I would also like to mention as a sequel to this, that I heard from the committee member in charge of the historic examination of the first overseas applicants that he made a report in front of Professor Ishikawa's grave about the excellent exchange that occurred between the two countries of Japan and the US through the examination process.

Moreover, just before he retired, Professor Ishikawa published "On QC Counseling

to Companies" (1985) and "Attitude Necessary for Members of the Application Prize Sub-committee" (1985), which offer a crystallized view of his 35 years of experience on the Deming Prize Examination Committee and these books are still used as important guidelines by members of the same sub-committee even today.

Professor Ishikawa also made significant contributions to the growth and development of the entire Deming Prize Committee, in addition to his position as Deputy Chairman of the Application Prize Sub-committee, he also served successively as a member of the Deming Prize for Individuals for Individuals sub-committee, a member of the Prize System sub-committee, and Chairman of the Nikkei Quality Control Literature Prize sub-committee.

Furthermore, even in overseas there has been a quiet boom in establishing prizes modeled after the Deming Prize. One such prize is the Malcolm Baldrige National Quality Award in the United States. Deliberation in Congress about this award began in 1986 with Dr. Joseph Juran and John J. Hudiburg (Chairman of Florida Power and Light at that time) being asked to speak at a public hearing. Both gentlemen emphasized the role played by the Deming Prize in promoting quality control and stated opinions that a prize like the Deming Prize was necessary for the US. As a result, such a law was passed in the lower House in August of 1987 and enacted in 1988. The award was named after Malcolm Baldrige, the Secretary of Commerce who was a strong supporter of free trade and suddenly passed away in 1987.

Thinking of Prof. Ishikawa

Saburo Ohnishi

Great Achievements

Professor Ishikawa, Japan has recovered from the suffering and devastation of its defeat in the war and grown into the economic superpower that it is today. The passion that you poured into quality control contributed hugely to this phenomenal growth, which was nothing short of miraculous. Since the first Deming Prizes was awarded in 1951, the number of companies (including small and medium-sized businesses) winning the Deming Prize has grown to over 100 companies. These companies have turned in a performance of 44 trillion yen in combined sales and ordinary profits far exceeding 2 trillion yen in FY1988. This amazing success is blooming today as a result of the seeds planted through the strong efforts of your younger days and spanning long years thereafter. It is difficult to properly express the contributions you have made and I am

filled with deep respect and gratitude towards you.

New Product Development

New product development is an area that you focused on more than any other. The Special Rubber ZP (hydrogenated nitrile rubber) developed by our company is unmatched anywhere else in the world and it was born and completed under the direct guidance from you. At the time, you were giving us strict, thorough instructions in upstream management and our company's engineering team was impressed with the essence of TQC. Our specialized rubber product called ZP became a core product of our company and with production plants now in Japan, Europe and the US, we are the top producer in the world. Last April, I was in England observing one of our plants when I was stunned to hear the news of Professor Ishikawa's death. My dream of showing Professor Ishikawa, the father of our success, the plants we had built in each region was shattered with that news. I could only stand dumbfounded and bow in prayer for him. Thank you so much Professor Ishikawa.

Memories

Professor Ishikawa, I have endless memories of you.

"Just your presence calmed us."

"Just your presence stimulated us."

"Just your presence drew out lively exchanges of opinion."

That is the kind of teacher you were to us…

"Don't start off by saying you can't. Think about how you can." I will always value this teaching from you.

But now, we will no longer be able to see your kind face or hear your characteristic hoarse voice. Professor Ishikawa, your ideas and your QC legacy will live on. Please rest in peace.

Thank you so very, very much.

(Chairman of Board of Directors, Nippon Zeon)

"The Deming Prize Is Not the Goal"

Keizo Saji

Once, sometime around 1985 when our company first started TQC activities, we had a meeting for a QC Diagnosis by the President and we were told, "Suntory has no

TQC plan to speak of." We didn't even have the "P" of the PDCA cycle and when Professor Ishikawa said this, I wondered what on earth would be in store for us.

I say this because, in fact, at the end of the 1950's, sometime after we had begun seriously taking up a scientific quality control approach in our Production Division, we asked Professor Ishikawa for guidance in our efforts. However, we decided to create our own QC system and even before we could reach the stage where we could begin to soak up knowledge from the environment created by Professor Ishikawa, we had already distanced ourselves from his teachings.

Years later, as we entered the 1980's, we decided to take up TQC once again and upon consulting with Professor Ishikawa, he once again readily agreed to help. Then, just as we were getting started, he uttered the words I mentioned a moment ago. It was difficult for us to hear those words, but at the same time, I also keenly felt that Professor Ishikawa had said this out of his conviction that we should "once again drill ourselves in the basics and start again."

Then, on December 16, 1987, a day that I will never forget, I accompanied Professor Ishikawa on a diagnosis of the Musashino Brewery. We were in the midst of preparing for the examination for the Deming Prize and Professor Ishikawa offered strong words of encouragement to our nervous members, telling them to have confidence and do their best. This was the last QC Diagnosis that we ever had from Professor Ishikawa.

In the following year of 1988, the Musashino Brewery became the first company in the food industry to win the Deming Prize and Professor Ishikawa shared our joy at winning the prize. Our Yamanashi Winery was the first agriculturally related business to win the prize in 1990 and I regret that we could not report this directly to Professor Ishikawa.

Professor Ishikawa often said that winning the Deming Prize was not the goal. I believe that our TQC program is still only halfway there. Through our TQC activities, we will continue to develop and grow even further based on the ideas we learned from Professor Ishikawa. (Chairman of the Suntory Board of Directors)

8.5 Working Hard for the Development of QC Conferences

Today, "QC Conference" is annually held in November as an event to summarize the year's activities in quality control, and is attended by a total of about 4,000 people.

This Conference started with an event held at the Osaka Chamber of Commerce

Lecture Hall on September 22, 1951, which was planned as an event where quality control activities taken up at the work place could be presented and participants could learn from each other. It only lasted for one day, but it was the first Quality Control Conference ever held. As an activity that paralleled with the recovery in Japan after the war, it was the first step taken in creating Japanese product quality.

Based on the response in Osaka, the content was further refined and from 1952 onward, the conference was held every year in November. Later on, the "Quality Month" was created and this event became a central part of the Conference that is still carried out today. Professor Ishikawa took command as Chairman from the first to the 11th conference and after that, continued to participate in planning and setting the path to follow from a broader perspective as chairman of the Quality Month committee.

During this time, the conference was called the Quality Control Conference until 1963 when it was changed to the Quality Control Conference (Staff) from 1964, Quality Control Conference (Staff/Managers) from 1968, changing again to QC Conference for Manager and Staff from 1978, and finally in 1991, to the Manager/Staff Quality Control Conference (held over 3 and a half days).

From 1957 onward, a second conference was added to spread quality control practices to local regions, and this Spring Quality Control Conference (3 days) is held sometime in May or June each year at a venue in a major city other than Tokyo.

Along with the growing interest in quality control activities, the Quality Control Conference for Foremen was held in 1962 (called the Quality Control Conference for Management since 1990 (3 days)) and in the following year of 1963, the Top Management Quality Control Conference (half day) was established. With the introduction of quality control into the service industry, the Service Industry Quality Control Conference was established in 1985 (2 days) and it continues to this day.

For the past ten years, the conference style has been standardized, but in the beginning, there was no set style or pattern upon which the conference was based, rather, it was organized with Professor Ishikawa at the top and the cooperation of many people. The rules were based on Professor Ishikawa's belief in the infinite potential of human beings, including his ideas of "Don't say you can't, think about how you can," "Do it and then think about it," and "Think on your own, an improvement is something that you want to present to others," with the conference coming together under his dynamic behavior that at times, he could be like a bulldozer. He was able to extract the knowledge of committee members and get them to take action, and in order to pull things together, Professor Ishikawa did not just rely on his gentle nature, but delegated issues, and in a manner that could seem forceful at times, exhibited strong leadership in

critical matters such as scheduling related to the Conference or seminar meetings. At planning meetings, there was an authoritative atmosphere, which created the feeling that if Professor Ishikawa said it, it must be followed. This was rooted in his basic rules of conduct that if you said something, you must carry it out and the understanding that for any meetings that were called, absence was not an option. I was deeply struck by both his kindness and the strong sense of responsibility he felt towards himself, committee members and society at large, which were reflected in his actions.

Although quality control activity levels will improve with continuous implementation of a company's kaizen activities, relying on internal formulaic approaches and methods tends to cause people to become stuck in a rut of imitative and overused approaches. At some point, external stimulation is necessary to keep up this continuous implementation. At the same time, in order to ensure universality of a new method taking root, running trials at many companies will be necessary to hone and polish it. The Quality Control Conference has not only provided the opportunity to present a company's improvement activities, exchange opinions, and stimulate participants; it has also contributed to the development of many ideas and methods. Furthermore, because all of the presentation papers from this meeting are published in a special edition of the *Hinshitsu Kanri* (Statistical Quality Control) journal, they are read by many people who did not attend the Conference, doubling the results of spreading practical applications of new approaches and methods, which goes hand in hand with the holding of this Conference.

For example, at the Matsuyama Conference held in 1964, the presentations and panel discussions about "control points" had a significant impact on later thinking about control. At the 1972 Fukuoka Conference, the presentation by Mitsubishi Heavy Industries Kobe Shipyard and Machinery Works introducing the "Quality Table" was later adopted by many other companies to the point where today it is an indispensable technique in quality and quality function deployment for new product development and it is now used in the US and other countries around the world as QFD (Quality Function Deployment). In this way, the holding of these Conferences on a regular basis like this is a special feature of national quality control activities in Japan.

At the same time, for quality control researchers, the special edition of the journal is an important reference material when conducting research about Japanese quality control.

During Professor Ishikawa's lifetime, i.e. up until 1988, the number of papers presented at the Manager/Staff Quality Control Conference totaled 4,375.

(Teruo Okubo, Manager of JUSE Division 3)

8.6 Implementation of Quality Month

It was during the time when "cheap but inferior quality" was synonymous with Japanese exports. Since improvement in product quality was not possible without public understanding, Professor Kaoru Ishikawa had the idea of creating an event that would plead the case for the importance of quality and raise quality awareness. So in 1960, the Quality Month committee was established with Professor Ishikawa as its Chairman and members from industry, government, and academia who were active in the field of quality control. It was decided that November of that year would be "Quality Month" and the preparations began.

This event was sponsored and run by three organizations: the Union of Japanese Scientists and Engineers (JUSE), the Japan Standards Association (JSA), and the Japanese Chamber of Commerce and Industry. Activities were widely being implemented nationwide under the sponsorship of these institutions and organizations as the Science and Technology Agency, Economic Planning Agency, Ministry of Welfare, Ministry of Agriculture, Forestry, and Fisheries, Ministry of International Trade and Industry's Agency of Industrial Science and Technology, Ministry of Transport, Ministry of Posts and Telecommunications, the Tokyo Metropolitan Government, the Japan Productivity Center (JPC), the Japan Management Association (JMA), and the Japan Broadcasting Corporation (NHK) (participation in later years: Japan Consumers' Association and the Japan Society for Quality Control).

It was determined that the first jobs of the Quality Month committee would be to establish the "Q flag" which became a symbol of the Quality Month and was put on sale, the holding of regional public lectures in 11 regions, the preparation and sale of Quality Month text materials, and the making and sale of Quality Month posters. Later on, the addition of the solicitation for, preparation of and sale of ideas for the Quality Month slogan completed the list of events for the Quality Month, which are still being carried out today.

From 1969, with the aim of arousing consumer interest in quality problems and quality control, lectures for consumers were held, which provide free education and training for consumer groups and housewives of individual households, and events to present the results of research done by groups are also held. These lectures were also the result of a suggestion from Professor Ishikawa.

In line with his strong belief that the wisdoms and actions of each individual were necessary for the recovery and growth of Japan and that this philosophy needed to be spread widely among the people, Professor Ishikawa himself made an appeal about the

Quality Month to the reporters in the press pool at the Chamber of Commerce and requested their cooperation. In the Quality Month committee, he was always speaking of quality, presenting a clear view that with this country's reliance on exports to develop and grow the economy, problems with quality were critical problems for Japan and he took the initiative to raise awareness about this. In the meantime, his superb sense of timing allowed him to always be on top of the issues of the times such as globalization and environmental changes, and lead the way in taking action. I think that for people living in those times, the question of what Japan's recovery should be based on was a crucial issue, but it was the idea of using quality control ideas to improve quality in order to help Japan grow and develop that we JUSE members were always hearing from Professor Ishikawa.

As a leader, Professor Ishikawa was always instilling in the committee members the importance of not hiding within a shell and maintaining a spirit of acceptance, utilizing good ideas without fixed or preconceived ideas. This was indeed the spirit of the Quality Month and I believe that it is an important code of conduct that we should perpetuate.

The Quality Month system has also been adopted by some countries overseas, including the United States. Professor Ishikawa's idea has been recognized internationally (please see Section 12.1 (4)). (Teruo Okubo)

8.7 Supporting QC Symposiums

JUSE proposed that an International Conference on Quality Control be held in Tokyo in the autumn of 1965 to commemorate the 15th anniversary of the Deming Prize. To prepare for the undertaking, top experts in quality control from the fields of academia, government and industry gathered at Hakone from August 28–30 in 1964 (for 2 days and three nights) to attend preparatory meetings and exchange opinions. These preparatory meetings lasted late into the night with lively exchange of opinions and discussions, creating an opportunity for mutual development. Unfortunately, due to various circumstances (see Section 11.4), the planned international conference was not held in 1965, but because of the meaningful exchanges participants experienced in the preparatory meetings, three professors, Shigeru Mizuno, Tetsuichi Asaka, and Kaoru Ishikawa formed the QCS (QC Symposium) organizing committee and in June of 1965, the first QC Symposium (QCS) was held at the Hakone Hotel Kowaki-en. Professor Ishikawa strongly advocated the holding of this Symposium. Because of the history

described above, the meetings that were first held in 1964 are commonly known as "The 0^{th} QCS".

The theme of the first symposium was "Introducing, Promoting and Establishing Quality Control" and 43 people from universities, government agencies and industry participated. The following is an excerpt from the preface to the symposium Proceedings, which was jointly written under the names of the three professors and explained the intent in holding the symposium. The reader of these sentences will feel the passion towards QC that the professors felt at the time.

> "…although on the one hand we see the base expanding, unfortunately there is still inadequate effort being put into seeking higher summits to scale. To my regret, the effort for developing the present problems of QC to the new direction with the investigation of implementation and method is not enough. Thus, when we recognized this issue and thought that it would be desirable to renew our study of quality control, the decision JUSE made to bear the high expense that comes with holding a Quality Control Symposium has given us great courage by providing a strong driving force in the field of quality control in Japan…"

Since then, the biannual QC Symposium has been held 53 times (as of December 1991), with each one providing opportunities for lively discussions.

Professor Ishikawa was a QCS organizing committee member from the first time it was held until the 24th one in 1977, continuing his cooperation as an advisor after that. During this time, he worked as the main committee member in charge 4 times, gave presentations 7 times and he never missed attending a single symposium from the first to the 46th one. Of the hundreds of people who have attended this symposium in the past, Professor Ishikawa is the only one to attend every single one while he was alive. It could be said that this fact is a vivid example of one side of Professor Ishikawa, which was his belief that except in the case of extraordinary circumstances, once a decision is made, it should not be changed; that a promise made must always be kept.

Professor Ishikawa emphasized the value of participating in the QCS and for every QCS that was held, he would carefully compare the list of invited guests with the list of attending guests from the day of the symposium, checking for people who had been invited but did not show up, who were late, who left in the middle, or who canceled at the last minute. Professor Ishikawa's QCS memo is still the stuff of legend today and has been kept on file by the administration office. This principle lives on today in the unwritten rule that when an invited guest misses the symposium three times in a row, he or she is not invited back.

At the QCS, after the presentations and discussions during the day and the small group discussion meetings in the evening, it was customary to get together for a drink and conversation, and Professor Ishikawa was at the center of this. It was said that this was how QC colleagues came together. Now practiced widely around the world, the practice of *nomunication* (communication through drinking = compound word made from the Japanese word "*nomu*" (to drink) and "communication") was born at the QCS. (Tatsuo Sugimoto in Section 5.2)

Scene from past *nomunication* event: The person naked to the waist is Prof. Ishikawa.

Steeped in such an atmosphere, the QC Symposium has contributed immeasurably to the forming of a consensus among quality control experts, particularly for those at the advisor or instructor level, with respect to technical innovations and various environmental changes. Although the US has many great quality control experts, many of them tend to be lone wolves and it is often pointed out that the US does not have a quality system based on common concepts. It is thought that a significant factor in this is the lack of an opportunity to exchange and share views like the one provided by the QCS.

It should be added however, that although the common concepts of TQC in Japan are on firm ground, if we look at the procedures, we find that they have not been clearly documented and it has been said that transferring techniques is difficult. With this realization, it was suggested many times in the past that something like a guideline should be made, but no actions about this have ever been taken and this problem still remains today. With regard to this point, it was Professor Ishikawa's belief that quality control was not something that would produce good effects simply by following a

manual, in that the background and circumstances will differ in each case and therefore, each company would need to devise the best ways to fit its circumstances, otherwise, people become trapped in preconceived formalities. For this reason, Professor Ishikawa had a negative view about making manuals and it is true that we cannot deny that this had some braking effect on any efforts in this area. This is a point of deep interest as we wait to see how this will unfold with the advancement of globalization in the future.

I would like to remember Professor Ishikawa by publishing a photo of him as he was at the QCS. (Masami Mita, JUSE No. 1 Division Manager)

Note: This section was compiled by referring to valuable insight provided by Ikuro Kusaba, Professor Emeritus of the Nagoya Institute of Technology.

A Teacher of "*Kisama*"† (Memories of the Quality Control Symposium)

Akira Harada

When Professor Ishikawa was a member of the QCS (Quality Control Symposium) organizing committee, after the formal discussions had ended, it was customary for people seeking further discourse to voluntarily gather in Professor Ishikawa's room, relaxing in cotton kimonos (yukata) and freely discussing a wide range of topics. Held twice a year, the next QCS will be the 52nd symposium and these traditions still live on. However, the heated, red-faced arguments that took place in Professor Ishikawa's room and the passion that seemed to ignite from them now seems to be of a bygone era.

For people connected with quality control who experienced the overnight stays for the QCS or Quality Control Circle, the free discussions that went on late at night in Professor Ishikawa's room are the most nostalgic and worthwhile memories we have of the younger days of the quality control movement.

In the beginning, Professor Ishikawa would sit quietly in his yukata (cotton kimono) with a cup of *Sake* in his hand, listening to people freely speaking their minds. However, eventually he would say, "*Kisama* (You idiot), there is something wrong with that opinion!" for Professor Ishikawa was never one to accept half-baked compromises. Suddenly stripping his yukata to the waist in making a point, he was a genius at igniting

† *Kisama* ("貴様" in Japanese Kanji, the pronoun "kisama") means "you" in English. *Kisama* is a formal expression used by officers of the Imperial Japanese Navy addressing each other. Outside the Navy it was considered a very rough but friendly expression, therefore seldom used. Prof. Ishikawa favored the use of this word among friends even outside the Navy.

an atmosphere of passion and excitement.

Whether a QC veteran or a younger participant, whether a university professor or member of private industry, he was content to let people speak their minds freely, and at the same time, he himself had an air of childlike naiveté as he strove to make his points with youthful passion. Even with someone like me from the private business sector who was an outsider with no teacher-student relationship with him, he approached our interchanges impartially. He truly was a professor who possessed both fairness and humanity.

These free-wheeling discussions often ran way past midnight and there were often times when even though we yearned to retire to our own rooms to sleep, we would be caught up in the moment and Professor Ishikawa's desire to thoroughly pick apart the subject until there was nothing left to discuss. Looking back on it now, I suppose that Professor Ishikawa and the rest of us were young enough in spirit to last through discussions that lasted almost the entire night. Even now, sometimes out of nowhere I feel as if I can hear Professor Ishikawa's hoarse voice saying "*Kisama* (You idiot…!)"

The wonderful thing about Professor Ishikawa was that in each and every situation, he would always look the other person in the eye and speak with sincerity. He always listened to what others said and began discussions with the belief that what they said was true, holding the view that humans are inherently good, discussing with warmth and taking enough time to discuss it, and I think that this is the reason so many people, not just in the field of QC, but in a wide range of fields, were so willing to follow his leadership.

From now on, it will be up to us to choose the actions we feel sure that Professor Ishikawa would have taken had he been here, sharing the responsibility to grow and develop TQC activities in Japan. (President, Ohken Associates)

8.8 Contribution to the Establishment and Development of the Japanese Society for Quality Control (JSQC)

The need to establish an academic society that would become the core of quality control research in Japan was recognized early on. As deputy head of the first QC team (Japan Productivity Center, Delegation Head, Mr. Yamaguchi) in 1958, Professor Ishikawa visited the US and upon his return, offered the following advice in his summary report of the visit. "The activities and ability of the American Society for Quality Control (ASQC) to spread QC principles within the US are remarkable. We

should establish a quality control society of our own in Japan as soon as possible."

However, with the energetic efforts of the Union of Japanese Scientists and Engineers (JUSE) and the Japan Standards Association (JSA) to spread awareness and research also being based in these organizations, the establishment of an academic society was not a compelling or immediate demand. The presentation of research was also carried out at quality control conferences held by these organizations, so needs were almost all being met.

The time was finally ripe for this type of society in 1969 and the first meeting of the committee in charge of preparing for the establishment of a society was held on May 24th. Attended by 44 people, Professor Mizuno of the Tokyo Institute of Technology was made chairman of the committee and preparations for the founding of the society moved forward. Professor Ishikawa was a member of this founding committee.

In the following year of 1970, 49 people gathered on February 7th at the JUSE Lecture Hall to hold a founder's meeting and the founding executive committee was formed. Eighteen committee members were chosen with Professor Mizuno as Chairman and Professor Ishikawa as Deputy Chairman. On November 18th of the same year, the Inaugural Meeting was held at the Hibiya Public Hall.

The next year, on April 24th of 1971, the first general meeting was held with 383 people attending (including proxies) where society regulations were approved and the society officially began its activities.

From the time the society was founded, Professor Ishikawa was involved in its operation from various aspects as one of its prominent members. He held the position of Deputy Chairman for the first three years (April 1971–September 1974) and the position of Chairman during the fourth year (October 1974–September 1975). He was also a trustee in the 5th, 6th, 10th and 11th years of the organization.

At the 12th general meeting on October 18, 1982, a recommendation was made to make Professors Asaka, Kogure, Mizuno, and Yamaguchi honorary members.

Professor Ishikawa gave a lecture entitled "The Ideal Status of Quality Control in the Future" at the First Special Public Lecture (April 22, 1972) and another lecture entitled "Rapidly Changing QC" at the First Public University Lecture (June 1, 1974). It was typical of Professor Ishikawa that his turn would come about at the first holding of these events. Later on, he gave a Special Public Lecture entitled "Getting through Turbulent Times with Quality Control" at the fourth annual society meeting (November 8, 1974), a lecture entitled "Quality Control Trends Overseas" (July 22, 1978) for the 6th Public University Lecture, and a special presentation entitled "Is Japanese Quality Control (CWQC) a Concept Revolution for Management?" at the 17th Research

Presentation Conference (April 25, 1980), presenting highly stimulating lectures for society members from the standpoint of a leading expert in quality control and urging them on in their work. (Shinsuke Furuya)

JSQC: "What Counts Is Quality Not Quantity"

Kenichiro Imai

It has been said that Dr. Ishikawa is looked up as one of the four greatest gurus of QC in the world. He should be valued highly for his achievement of proving the effectiveness of TQC as a management tool.

Japan' TQC is the amazing achievement of the cooperation between father and son, and the industry and academia rarely seen in the world. Dr. Ishikawa's father had founded the Japan Business Federation and Union of Japanese Scientists and Engineers.

As a professor for applied chemistry at the University of Tokyo, Dr. Ishikawa turned his attention to a theme apart from his profession. He focused on quality, the foundation of onsite manufacturing. He picked this theme in engineering, formed it into a control technique for achieving actual improvement. Furthermore, he developed it into management techniques such as quality circle and TQC.

Dr. Ishikawa was one year senior to me in Tokyo High School, and his younger brother Kiyoshi was my classmate. As a great senior of mine, I think he had known me casually by sight.

I began to receive Dr. Ishikawa's guidance more around the time the Aerospace Business Group of Ishikawajima Harima Heavy Industries Co. Ltd. was awarded the Deming Application Prize in 1976.

When we asked for Dr. Ishikawa's counsel during his golden years, I could see from his body that he had strained himself to come. He expressed his opinion on reinforcing our members. He stated quite strongly, it's the quality, not numbers. This left deep impression on me.

In recent years, the quality of educational institutions such as universities in the United States of America has come into question, and introduction of TQM (the Japanese TQC) has been proposed to improve the quality of education in the USA. Furthermore, it seems that the USA has decided to treat TQM as the key tool for the recovery of its international competitiveness. In Japan, I learnt that Dr. Ishikawa also tried to use TQM as an approach for recovering Japan's international competitiveness. I am recalling anew the magnitude of his foresights.

(Vice President, Japanese Society for Engineering Education,
Former Managing Director, Ishikawajima Harima Heavy Industry Co., Ltd,
Former President, Japanese Society for Quality Control)

8.9 Dr. Kaoru Ishikawa and JUSE Press, Ltd.

Publication activities began at the same time the Union of Japanese Scientists and Engineers (JUSE) was founded in May of 1946, but activities did not begin in earnest until June of 1955, when JUSE Press Ltd. was formed by splitting up the JUSE editing and publication divisions forming separate independent entities.

The significance of establishing a publishing company lay in the role that it played in publicizing the various activities of JUSE. The editing of the JUSE Bulletin called *Engineer Club* (currently: *ENGINEERS*), and the creation of various seminar text materials and documents formed the core of the JUSE Press activities, with the company releasing more than 7–8 new publications annually.

On the other hand, the work on journals such as the *Hinshitsu Kanri* (Statistical Quality Control) was done through each of the various committees, all the way from the production of the journal to its sale, as they were inheriting work from the initial JUSE era. Because the various works related to QC Circle was started by the initiative of the editing committee of the journal, all of the working level activities starting with editing related to the *Genba To QC-magazine* journal (currently: *QC Circle-monthly magazine*) were the responsibility of JUSE Press. Upon entering the year 1965, reorganization of JUSE moved forward and with the needs to create an independent publication entity, projects outside the realm of publishing were gradually returned to JUSE, although sales aspects were left with JUSE Press. During this time, the relationship between the publication company and Professor Ishikawa went far beyond the cooperation of an external advisor, as he was like an internal member of JUSE Press.

Professor Ishikawa used to say, “Make books that will provide steady sales” and “That will lead to the development of Japanese enterprises...”

When he retired from the University of Tokyo, he assumed the post of part-time Director for the publishing company, providing guidance for all management related areas until his death. (Katsuharu Arai)

Memories of Publishing "Introduction to Quality Control"

Katsuharu Arai

Introduction to Quality Control, Prof. Ishikawa's representative literary work, first published on 15 May, 1954, was merely a 109-page-long booklet which cost 180 yen. Many people studied with this booklet as there was little comprehensive literature, with regard to quality control, at that time. It was Mr. Kenichi Koyanagi, Managing Director at JUSE (Deceased in January, 1965) who appointed me, the newly-arrived, and introduced me to Prof. Ishikawa as the editor of this publication.

Prof. Ishikawa was young, in his late 30's and an associate professor at the University of Tokyo, at that time. I had the impression of a young officer who was fearless and dependable, as he sedately made rebuttal to Mr. Koyanagi, who was so vehement and tried to debate about QC.

This publication, which was planned as a part of the QC textbook series, and followed by Prof. Asaka's *Introduction to Sampling Inspection* etc., played a significant role in promoting and disseminating QC, as educational textbooks, in a variety of fields.

This book was well-received, parts of which were incorporated into *What is Quality Control* (1960), *Introduction to Quality Control (A)* (2nd Edition) (1964) and *Introduction to Quality Control (B)* (2nd Edition) (1966). Maybe it was fated, however I was involved in the third edition of this book, as the editor in chief. It was on 30 January, 1989 when the mighty work, *Introduction to Quality Control* (3rd Edition) was published, with a volume of 424 pages, which was nearly 4 times as long as the first edition.

When I visited Prof. Ishikawa at Saint Luke's International Hospital, with Prof. Hitoshi Kume from the University of Tokyo, at the end of 1988, I was requested to think of a way to have the book in time, for his conferment party, held at the Hotel Okura on 31 January, as a commemorative gift. I was able to get credit and have the special-edited version, with his autograph ready as requested, by shortening the emendation process, on very short notice.

A number of memories crossed my mind, when I think of this book which will never be revised, owing to Prof. Ishikawa's passing, and I recollect the image of his thirty plus years at the first meeting, which will not fade away, forever.

(Director, Editing Department, JUSE Press, Ltd.)

8.10 Prof. Kaoru Ishikawa and Quality Assurance Activities

The Nuclear Power Plant Quality Assurance Review Committee, MITI

Kunio Inoue

The Three Mile Island nuclear power plant accident that occurred on March 28, 1979 in the United States had a significant impact on people involved in the nuclear power industry in Japan. What is more, several accidents occurred after that at Japanese nuclear power plants. The results of the investigations into the causes of these accidents showed that there were inadequacies in the quality control at nuclear power plants. Thus, recognizing the need to raise the level of quality assurance in domestic nuclear power plants, the Ministry of International Trade and Industry (MITI) set up the Nuclear Power Plant Quality Assurance Review Committee to study this issue.

Professor Ishikawa was asked to chair this board, which was made up of members from electric companies, heavy electric machinery manufacturers, and people with experience or academic standing. The Board was inaugurated in January of 1980 and issued its report in September of 1981. During this time, a fact-finding trip was made to Europe and the United States in February of 1981.

Along with the analysis of accidents and equipment failures, the Board also investigated the actual state of quality assurance activities in the industry at each of the following stages:

1. the manufacturing of plant component elements stage at heavy electric machinery manufacturers and others,
2. the building construction and plant installation stage at nuclear power plant construction sites, and
3. the operational stage after the nuclear power plant was completed.

The Board then studied what the desired quality assurance system should be in light of this.

The results of these studies showed that while in general, the nuclear power plant quality assurance was appropriate, to ensure an even more comprehensive approach, the plants needed several improvement measures for better organizational strength. These improvement measures included the establishment of systems involving company management executives and managers, supplier control and individual quality assurance

activities such as education and training.

This advice had a tremendous impact on later improvements in the area of quality assurance for nuclear power related industries, as it led people in the industry, including top management in such industries as electric power and heavy electric equipment manufacturing, to gain a better awareness of quality assurance as it related to nuclear power plants and along with the individual improvement activities in quality assurance, it also provided the opportunity for actions that would upgrade the status of quality assurance divisions as more and more companies began taking up TQC in earnest.

Until the establishment of this Board, nuclear power plant problems in areas such as safety and reliability were mainly reviewed by people from the nuclear power industry or with experience or academic backgrounds in nuclear power, but in a number of the case studies involving accidents or equipment failure, MITI recognized that the quality control problems were not peculiar to the nuclear power industry, rather they were general quality control problems and Professor Ishikawa was asked to chair the review board. Professor Ishikawa himself also seemed to hold the same view, indicating a strong desire to introduce quality assurance philosophy to the nuclear power industry.

Professor Ishikawa aggressively addressed the issues involved, introducing us to Professor Hajime Makabe and Professor Hitoshi Kume, experienced academic professionals in the field of quality assurance and visiting the Fukushima Nuclear Power Plant himself in the survey of that plant. His philosophy on TQC and the way in which he addressed quality assurance had a tremendous effect on the people involved with nuclear power plants.

(At that time: MITI Agency of Natural Resources and Energy, Public Utilities Department, Nuclear Power Plant Section, Nuclear Power Plant specialist
Currently: MITI Agency of Industrial Science and Technology, Standards Department, International Standards Office, Director)

Prof. Ishikawa and Reliability

Hiroshi Shiomi

From the time I joined the Electrical Testing Laboratory in 1952, I began research on AGREE (Advisory Group on Reliability of Electronic Equipment), which was well known in the United States. Weibull's paper had been presented in 1951 and was being further developed by Professor Kao and his colleagues at Cornell University at that time, and this is when they began research on Weibull probability paper. One group I was

involved with was the sub-committee on Reliable Tube Testing Methods at the Institute of Electrical Engineers of Japan, but in order to study statistical methods, a colleague at the Electrical Testing Laboratory, Hideo Yoshikawa, introduced me to the 14th QC Basic Course, where I took on the role of note-taken in 1957. It was this opportunity that proved to be the starting point for my relationship with JUSE. Later on, I studied in the Statistical Methods Committee and the Sampling Committee, of which Professor Ishikawa was Chairman, where I introduced a paper related to reliability. At that time, the materials were in mimeograph form.

When Professor Ishikawa went on a study mission to the United States in 1958, he brought back a souvenir: the just published AGREE report (June 1957). "Study this," he said as he handed it over to me. It was a fat, orange jacketed document about 3 cm thick. I remember sitting under a mosquito net just before the summer started, working on an abridged translation of the document. The report became known as the bible of reliability and the systematic reliability engineering theories discussed in that document proved to be eye opening for me. The First and Second abridged translations were presented to the Sampling Committee in January of 1959 as Ishikawa Committee Document No. 59-3 and No. 59-4.

Meanwhile, the JUSE Reliability Study Group (T committee) had its first meeting in September of 1958, under the stewardship of Professor Noboru Takagi as Chairman and Professor Hajime Karatsu as Executive Secretary. I think I attended this group for the first time at their fourth meeting (January 1959). I submitted the above-mentioned materials to the fifth meeting (February 1959) of the T committee and gave an explanation. (This was summarized in the T committee document No. 7 for the seventh meeting in May of 1959.)

The following is an itemized list of examples where Professor Ishikawa played an active role in pioneering the field of reliability:

1. Lecturer for "Quality Control and Reliability" based on effects from the Reliability Study Group at the short seminar in reliability at the 1st JUSE Industrial Production Conference held in Japan (September 1960). He continued to give talks after this as well.
2. Lectured in "Quality Control and Reliability Problems" at the short seminar in reliability at the first Seminar on Design and Reliability in Industrial Production held in the Chubu area of Japan by the Central Japan Industries Association (January 1964).
3. Through the strong efforts of Professor Ishikawa, we were able to have a glossary of reliability terms (21 entries), which had been compiled and

reviewed by the T committee since 1962, included as a reference at the back of the 1963 JIS Z 8101 Quality Control Glossary of Terms. Later on, he participated as a member of an expert panel that drafted the JIS Z 8115 Reliability Glossary of Terms (established in 1970 and revised in 1981). I still remember well his admonition to "use Japanese words wherever possible" (rather than relying on imported foreign language terms).

4. As the person primarily responsible for the organizing committee of the 7th JUSE Quality Control Symposium in 1967, he took up the topic of "Quality Assurance and Reliability."
5. From the first time it was held in 1971, he took on the role of Deputy Chairman of the Organizing Committee for the JUSE Reliability Symposium (the name was changed to Reliability and Maintainability Symposium from the 4th Symposium held in 1974).
6. In 1970, he addressed "Reliability" in *Hinshitsu Kanri* (Statistical Quality Control) magazine lecture series, editing and compiling the lecture series manuscripts, which were published as *Reliability Activities in Companies* in 1971.
7. As a member of the committee (chaired by Professor Takagi) for the Ishikawa Prize named after his father and established in 1970, he worked hard for the "modernization of management and improvement of product and service quality" (upon his death, Kiyoshi Ishikawa succeeded him).

A man with a wide ranging, inclusive vision and the ability to get things done, Professor Ishikawa was a major force behind the creation and further development of the connection between quality control and reliability and I am once again filled with gratitude towards him.

(Chuo University Professor,
Faculty of Science and Technology, Industrial Engineering Department)