A History of Arthroscopy

Robert W. Jackson, M.D., F.R.C.S.C.

Over the centuries, humans have shown an insatiable desire to look into body cavities, starting with looking down throats and peering up rectums. This curiosity can be traced back to the early days of Pompeii. However, "closed" cavities posed a specific problem, with the necessity to introduce light into the cavity in order to see. The earliest known instrument designed specifically to look into the bladder was called a “lichtleiter” and was presented by Bozzini to the Rome Academy of Science in 1806. Although it was deemed “of interest,” it was not regarded as anything of significance.

Almost 50 years later, Desormaux developed his “gazogene cystoscope,” which provided light by the combustion of gasoline and turpentine that was reflected into the bladder by a mirror. This instrument has historically been considered to mark the beginning of endoscopy. The next significant advance in endoscopic instrumentation came about in 1879, when Edison developed the incandescent light bulb. A few years later, in 1886, the first cystoscope with an incandescent bulb for illumination was developed by Leiter and Nitze in Germany.

In 1910 a Swedish physician named Hans Christian Jacobaeus designed an endoscopic instrument with an incandescent light for diagnostic use in the abdomen; it was later used in the thorax for the treatment of pleural adhesions caused by tuberculosis and was named the “laparo-thoracoscope.” Two major subsequent improvements in endoscopes were the development of fiber, or “cold,” light in 1955 to provide illumination and, in 1960, the rod lens optical system for viewing. Both of these were developed by an English physicist named Hopkins and are now used in almost all endoscopes.

Cameras with photographic film recorded the early images seen in endoscopic procedures. Then, a major breakthrough in imaging occurred when television became a reality. (Television was the result of the efforts of many researchers in many countries and cannot be attributed to any single individual.) In the latter half of the century, color television cameras became so small that they could be incorporated into the lens system of an arthroscope and thus enable all personnel in the operating room to play an informed role in any procedure.

THE EARLY ARTHROSCOPISTS

Severin Nordentoft, M.D. (1866-1922)

Dr. Nordentoft (Fig 1) was a Danish surgeon from Aarhus, who made his own endoscope, similar in design to the Jacobaeus laparo-thoracoscope. His instrument had a trocar 5 mm in diameter, and he reported on its use in suprapubic cystoscopy, laparoscopy, and knee arthroscopy. He presented his work in 1912 at the 41st Congress of the German Society of Surgeons in Berlin, which was attended by 1,200 surgeons from Europe, Scandinavia, and Russia. Most of the papers presented at that meeting dealt with fractures, sepsis, and tuberculosis (which in those days was a rampant and lethal disease throughout the civilized world); his paper was the only one dealing with endoscopy, and his contribution was soon forgotten. However, his manuscript, in which he first used the term “arthroscopy,” was published in the proceedings of the society and leaves little doubt that, despite the limitations of his instrument with its poor optics and questionable illumination, he was the first individual to apply endoscopic techniques to a knee joint.

Kenji Takagi, M.D. (1888-1963)

Professor Kenji Takagi (Fig 2) from Tokyo is credited with, in 1918, using a cystoscope on patients to examine tuberculous knees, which was a very prevalent problem in Japan and one that had social as well
as physical complications in the squatting and kneeling culture of the Japanese. He believed that an early diagnosis of knee joint tuberculosis might lead to better treatment and prevention of the common long-term complication of ankylosis. His first arthroscope was completed in 1920, but the optical cannula with a diameter of 7.3 mm made it unsuitable for practical use. In 1931 Takagi presented his first practical arthroscope, which was 3.5 mm in diameter, and also discussed distention of the knee with saline solution to increase the size of the joint cavity and enable better visualization. Over the next few years, he developed and tested several modifications of his original arthroscope. By 1938, he was on his 12th design, having gone from small to large trocar diameters, both with and without lenses. Undoubtedly, he was the first true innovator and developer of arthroscopy.

Eugen Bircher, M.D. (1882-1956)

Meanwhile, in 1921, on the other side of the world, Dr. Eugen Bircher (Fig 3), a famous Swiss surgeon and politician, published his experience with the use of an arthroscope in an attempt to diagnose meniscal pathology of the knee joint. He used a modified Jacobaeus laparo-thoracoscope made by the Wolf Company of Berlin and called the technique “arthroendoscopy.” His publication on the first 60 patients was the first to describe arthroscopy as a diagnostic tool in the treatment of actual patients. He would follow the diagnostic arthroscopy by an arthrotomy and the appropriate surgery of that period. He also commented that private patients seemed to do better postoperatively than patients who were receiving some form of Workers’ Compensation. Unfortunately, like all of the early arthroscopes, his instrument had a limited field of vision (90° to the side) and
relatively poor illumination. After a few years, Bircher stopped doing arthroscopy and concentrated on developing the technique of arthrography, which he believed would provide a more accurate diagnosis of meniscal pathology.  

**Phillip Heinrich Kreuscher, M.D. (1883-1943)**

The first U.S. arthroscopist, Phillip Kreuscher (Fig 4), was born in Nebraska to German immigrant parents and attended Northwestern University Medical School. He graduated at age 26, interned in Chicago, and then completed a year as a surgical resident at the John B. Murphy Institute in Chicago. In 1912 he traveled to Germany for a further year of surgical training at Heidelberg University. That was the same year that Severin Nordentoft presented the first description of endoscopy of the knee joint at the surgical meeting in Berlin. Although it is possible that Kreuscher was at the meeting and thus gained insight into the potential of arthroscopy after hearing Nordentoft’s paper, records have not been able to confirm his attendance.

On his return to Chicago in 1913, Kreuscher worked for a further 3 years at the Murphy Institute, primarily experimenting with the revolutionary “collapsed lung” treatment for pulmonary tuberculosis. However, from 1917 onward, his interests seemed to change, and most of his subsequent academic contributions dealt with athletic injuries and, in particular, injuries to the semilunar cartilages of the knee. He was also the team physician for the 1919 Chicago White Sox, who became infamous as the “Black Sox” in the wake of a gambling scandal that rocked the baseball World Series that year.

In 1925 Kreuscher published an article entitled “Semilunar Cartilage Disease—A Plea for the Early Recognition by Means of the Arthroscope” and thus became the American pioneer of arthroscopy. However, optical and lighting problems associated with his early instrument created disillusionment and frustration. His article did not describe the type of arthroscope he used, but most likely, it was a Jacobaeus arthroscope, because one of his surgical colleagues (O. Nadeau) published on the use of the Jacobaeus laparo-thoracoscope in the abdomen in the same year.

Also, in a letter to Michael Burman, dated September 11, 1931, Kreuscher noted that he used his arthroscope in “... not more than 25 or 30 cases ... and ... in the last year I have not used it at all because I have found no cases in which its use was definitely indicated.” He went on to state that “... success in connection with the arthroscope depends on a clear field and good distension” and described the various experiments he did, which involved distention of the joint using nitrogen, oxygen, and formaldehyde solutions. After inspecting some of his cases by arthroscopy, he would inject them with lipiodol and take radiographs, thus becoming one of the pioneers of arthrography. Like Bircher, this man of foresight saw his “plea” for arthroscopy fall on deaf ears, and his frustration because of the imperfect technology of the era eventually led him down a different path.

**Michael Burman, M.D. (1896-1974)**

Before 1931, while working at the Hospital for Joint Diseases in New York, Dr. Michael Burman (Fig 5) had begun to explore the use of an arthroscope in the anatomy laboratory using a special 4-mm-diameter endoscopic instrument designed for him by Reinhold Wappler, the founder of a fledgling company that later became known as ACMI (American Cystoscope Makers Inc). The results of his investigations were published in an article entitled “Arthroscopy or the Direct Visualization of Joints.”

In the spring of 1931, Burman sailed to Europe on a scholarship to continue his studies under the renowned pathologist Professor George Schmorl, Direct-
tor of the Institute of Pathology in Dresden, Germany. While in Germany, he studied the effect of various dyes injected into the joint cavity on degenerative cartilage. Later, he continued this study with clinical trials of arthroscopy on live patients and, along with his colleagues Finkelstein, Sutro, and Mayer, he published several classic articles on arthroscopy of the knee joint. He also printed 20 colored aquarelles of endoscopy findings in different joints that were painted by Mrs. Frieda Erfurt, the medical artist of the Dresden Institute. These were the first images of arthroscopic findings ever published.

Burman worked for the rest of his life as an orthopaedic surgeon at the Hospital for Joint Diseases in New York City, and during the 1950s, he collected material for an atlas of arthroscopy. Unfortunately, this was never published because he could not find an editor who appreciated the significance of his work. However, several visitors who did appreciate his pioneering work included Masaki Watanabe in 1957, Hiroshi Ikeuchi in 1961, and Robert Jackson in 1969.

OTHER ARTHROSCOPIC PIONEERS

During the late 1920s and 1930s, several other physicians were obviously interested in endoscopy of the knee joint. Publications by E. S. Geist (Lancet, 1926), S. Iino (Japan, 1939), and R. Sommer (1937) and E. Vaubel (1938) in Germany were noted in the surgical and rheumatology literature. The advent of the Second World War (1939-1945) disrupted and suspended all scientific activity in the development of arthroscopy.

The first publications dealing with endoscopy in the early postwar period were by P. Vercchione (1947) and A. Santacroce (1950), who published in the Italian literature. These were soon followed by articles by E. Hunter (1955) and R. Imbert (1956) in French, as well as a presentation and film of knee arthroscopy by Masaki Watanabe at an International Society of Orthopaedic Surgery and Traumatology (SICOT) meeting in Spain in 1957.

Masaki Watanabe, M.D. (1911-1994)

After the Second World War, Dr. Masaki Watanabe (Fig 6) returned from duty spent as an intelligence officer in the Japanese army and resumed his medical career at the University of Tokyo. He resolved to pursue the development of arthroscopy from the point reached by his professor and mentor, Dr. Takagi, who had previously worked on 12 different designs of arthroscopes in his search for a useful instrument. Watanabe moved from Tokyo University to become Chief at the Tokyo Teishin (Postal) Hospital and, in 1954, with the help of the emerging optics and electronics industries in Japan, developed the 13th and 14th arthroscopes. With the number 14 arthroscope...
plus a supplemental light source introduced through a separate portal, he was able to obtain the first color photographs of the inside of a knee joint. In 1957 he presented a color movie at the SICOT Congress in Barcelona, which attracted the attention of very few people. After the Congress, he showed the film to several major clinics in England and Europe and then traveled to America and showed the film in New York (while visiting Dr. Burman), in Philadelphia, at the Mayo Clinic in Rochester, and in Los Angeles. Though disappointed at the lack of positive response, he returned to Japan undaunted and continued his pioneering work.15

Watanabe’s efforts over the next few years were directed at producing a better arthroscope that would consist of the same telescope as that of the number 14 arthroscope but with a light guide that could be introduced through the same sheath. Arthroscope numbers 15, 16, 17, and 18 were not considered practical and were never used. Number 19 was in use for only a short period of time.

In 1958 Watanabe developed the Watanabe number 21 arthroscope. Although the sheath was 6 mm in diameter, the best part of this instrument was a magnificent lens with a field of vision of 101° (almost equal to the human eye) and a depth of focus from 1 mm to infinity. Each lens was hand-ground by a craftsman named Tsunekichi Fukuyo. Watanabe then enlisted the aid of a newly emerging Japanese optics and electronics company (the Kamiya Tsusan Kaisha Company), and the number 21 arthroscope became the world’s first production arthroscope. He used this arthroscope for several years, and a moderate number were sold around the world. The number 21 arthroscope was the last arthroscope to use an incandescent light source, and this bulb would frequently break inside the joint (Fig 7A).

In 1967 Watanabe introduced the number 22 arthroscope, which incorporated fiber light (or “cold light”) for illumination, and in 1970 he introduced number 25, the first ultrathin fiberoptic endoscope, which had a 2-mm-diameter sheath and a single “selfoc” fiber (1.7 mm in diameter) to transmit the image to the eye. (It later formed the basis of the Dyonics “Needle-scope.”)

Watanabe also was the first to develop the concept of “triangulation,” which involved bringing instruments into the knee from different portals to treat the pathology that was seen. In 1955 he performed the first recorded operative procedure under arthroscopic control—the removal of a solitary giant cell tumor from a knee joint (Fig 7B). In 1961 he removed a loose body, and in 1962 he performed the first partial meniscectomy under endoscopic control. In this work, he was ably assisted by Hiroshi Ikeuchi, M.D., and Sakae Takeda, M.D.

Watanabe wrote the first Atlas of Arthroscopy, which was published in English in 1957 and was beautifully illustrated by an artist named Fujihashi. His second Atlas of Arthroscopy was published in 1969 and was illustrated with color photographs of the interior of the knee joint. Watanabe was a true scientist and a great teacher. He freely gave his knowledge to whomever was interested. Dr. Ikeuchi has continued his great work to this day.
Robert W. Jackson, M.D., F.R.C.S.C.

In 1964 Dr. Jackson (Fig 8) went to Tokyo on a traveling scholarship from the University of Toronto in Canada. His main purpose was to study tissue culture techniques at the University of Tokyo. His mentor in research from Toronto, Dr. Ian Macnab, had heard a paper on knee joint arthroscopy presented at the 1957 meeting of SICOT in Spain, given by a Japanese surgeon (whose name he could not remember). It took many enquiries before Jackson found Dr. Masaki Watanabe at the Tokyo Teishin Hospital, because his work was virtually unknown even in his own country. Dr. Jackson was the first foreign doctor to visit Watanabe and was warmly received. Twice weekly, for several months, Jackson watched and learned the technique of arthroscopy and in return spent many hours teaching Watanabe English.16

Recognizing the potential importance of arthroscopy in the diagnosis and treatment of joint problems, Jackson requested permission from the professor of orthopaedics at the University of Toronto to purchase an arthroscope (original price, $675.00). On his return to the University of Toronto in 1965, Jackson used the number 21 arthroscope on only 25 cases in the first year, ably assisted by his research fellow, Dr. Isao Abe. He was generally met with criticism and ridicule by his colleagues. On several occasions, the arthroscope was inadvertently autoclaved by the nurses instead of gas sterilized (the optical and electric components of the arthroscope were not meant to withstand high heat levels) and had to be sent back to Japan for repairs. Progress was therefore slow at first, but in 1966, 70 cases were accomplished and the volume steadily grew from that point on (Fig 9). Other surgeons in North America were also becoming aware of the importance of arthroscopy, and in 1967...
Drs. John Joyce, Jack McGinty, and Ward Casscells were among many visitors to Toronto.

In 1968 Jackson gave the first of 7 annual instructional courses on arthroscopy at the American Academy of Orthopaedic Surgeons (AAOS). In 1973 he invited Dr. Richard O’Connor, who had visited Watanabe in 1971 and 1972, to join him in these instructional courses. At every meeting, the early pioneers of arthroscopy would get together and enthusiastically compare notes on techniques and pathologies that they had seen, many of which had never before been appreciated. For example, partial tears of the anterior cruciate ligament and pathologic medial plicae were now becoming recognized as pathologic lesions.

During these early years, Jackson was significantly involved in one-on-one teaching and lecturing at courses on arthroscopy. To cope with the volume of visitors to his operating room, he arranged what were probably the first arthroscopy learning “labs” on a regular basis. In 1976 Jackson published the first textbook in English on arthroscopy of the knee, with Dr. David Dandy as coauthor. He was a Founding Father of the International Arthroscopy Association (IAA) in 1974 and the Arthroscopy Association of North America (AANA) in 1982 and subsequently became president of both these organizations.

Richard L. O’Connor, M.D. (1933-1980)

Dick O’Connor (Fig 10) was a free-thinking spirit who frequently went barefoot in the operating room, because there was no easy way to control the spillage of normal saline solution used in arthroscopic cases and leather shoes were soon ruined by constant soaking in saline solution. He had visited Watanabe in 1971 to learn about arthroscopy and made a return visit a year later. He monitored the rising importance of arthroscopy by recording the increasing number of doctors who personally had a torn meniscus and were specifically coming to him to have arthroscopic partial meniscectomies (the first of which he performed in 1974). He was indeed the pioneer in North America of partial meniscectomy and, with the collaboration of the Richard Wolf Company in Chicago, developed special cutting tools designed by his innovative technician, Chuck Ericksen, to remove torn meniscal fragments. He also developed the first operating arthroscope with an offset eye piece and a long direct operating channel.

In 1975 the first meeting of the IAA was held in Copenhagen, Denmark, in association with the SICOT meeting. The 1-day meeting with Professor Watanabe as Chairman was highlighted by the diversity of papers that were presented. Richard O’Connor, M.D., who was the first treasurer of the young association, had brought with him all of the funds paid as dues by the 80 “founding members” ($50 each). He had converted (probably illegally) the $4,000 into gold coins (mostly South African Krugerrands), even though there was a moratorium in the United States at that time on the private ownership of gold. O’Connor carried the 30 pounds of gold coins in a money belt around his waist on his flight to Copenhagen. After the meeting, he went to Switzerland, opened a numbered Swiss account, and deposited the gold coins. This was in April of 1975, and the $4,000 in gold represented the total assets of the association at that time.

Eight months later, the value of gold was unpegged internationally and rapidly rose from $42 an ounce to more than $600 an ounce. The executives of the IAA elected to sell their gold in 1977 when it was valued at almost $800 an ounce. The profit thus realized was approximately $60,000, which enabled the IAA to hire its first Executive Director, Mr. Tom Nelson. A superb administrator, Nelson established a strong organization and head office over the next 7 years. He was lost to the IAA when recruited to become the executive director of the AAOS in 1985. Dr. O’Connor, a heavy smoker, is best remembered for the excellent instructional courses he arranged in Hawaii, under the aegis of the University of California, Los Angeles. These popular courses were continued in his memory after his premature death from lung cancer in 1980.
John J. Joyce III, M.D. (1914-1991)

Born in Philadelphia, Dr. Joyce (Fig 11) spent all of his professional life there, with a 4-year period spent in the U.S. Navy on a destroyer in the Pacific. He made numerous trips to the Middle East (Jordan, Israel, Algeria, Lebanon, and Tunisia) as a member of “Medico” and “Orthopedics Overseas.” In 1967 he visited Robert Jackson in Toronto and became avidly involved in the arthroscopic anatomy of the knee, as well as the photographic and television possibilities of this emerging subspecialty. With his good friend Dr. Michael Harty, Professor of Anatomy at the University of Pennsylvania, he organized the first course in arthroscopy in 1973. He organized a second course in 1974, which resulted in the incorporation of the IAA and his appointment as the first president of the North American Chapter of the IAA.

In 1981 Joyce donated a large sum of money to be given as a prize to the author of the best paper presented at the future triennial meetings of the IAA. (Now the award is presented at the biennial meetings of the International Society of Arthroscopy, Knee Surgery & Orthopaedic Sports Medicine [ISAKOS].)

S. Ward Casscells, M.D. (1915-1996)

Born in New York City, Dr. Casscells (Fig 12) attended college and medical school at the University of Virginia, graduating in 1939. He served as a Captain in the U.S. Army during World War II and saw action in Africa and Italy. After the war, he completed his orthopaedic training in Virginia, and he moved to Wilmington, Delaware, in 1949, where he practiced for the next 35 years.

Dr. Casscells developed a special interest in chondromalacia patella and in 1966 noticed a comment in a journal that a Japanese surgeon (Dr. Masaki Watanabe) was doing arthroscopy. Thinking that this might be of value in his studies on chondromalacia, he visited Dr. Jackson in Toronto in 1967. He watched a case and recognized the tremendous potential of the technique. He then contacted Watanabe by mail and ordered a number 21 arthroscope. Initially, progress was slow because he had no one to instruct him. He persevered, however, scoping knees that he intended to open by arthrotomy, and he soon gathered enough experience to begin talking about the subject at orthopaedic meetings. He commented that his presentations were usually received with marked indifference and often antagonism. In 1971 he published the first clinical paper in English on the subject, and in 1974 he became one of the Founding Fathers and the first secretary of the IAA. In 1985 the journal Arthroscopy...
was established, and Ward Casscells took on the huge responsibility of being the editor of a fledgling journal. Under his guidance, the journal thrived, and at this time, it is one of the biggest subspecialty journals in the world. His interest in research and education never faltered, and it is a fitting honor and tribute to his career that a chaired professorship in his name has been established at the Department of Orthopaedic Surgery at the University of Virginia.


Bob Metcalf (Fig 13) spent his professional life in Utah, except for a 2-year stint in the U.S. Army. He was team physician for more than 10 years at Brigham Young University, when sports medicine was just beginning to be recognized as a subspecialty. In 1983 he was named “Mr. Sports Medicine” by the American Society of Sports Medicine. His interest in arthroscopy started in the mid-1970s and was greatly influenced by his good friend Dick O’Connor. He developed a freestanding surgical center for arthroscopic surgery that became the model for those that came later by showing how this new type of “minimally invasive” surgery could be done efficiently and economically. He is fondly remembered as a master educator, who for 26 years conducted annual seminars on arthroscopy and arthroscopic surgery, attracting and training thousands of surgeons. Bob was a prime force behind the creation of the Arthroscopy journal. He served as president of the AANA in 1984-1985.21

John B. McGinty, M.D.

Educated and trained in Boston, Jack McGinty (Fig 14) rose to become the Chief of Orthopaedics at Tufts University. In 1967 he visited Jackson in Toronto and soon was a strong advocate and practitioner of arthroscopy. When the IAA was started in 1974, McGinty was elected to the Board of Directors. He displayed a passion and a flair for television and the visual aspects of arthroscopy, and in 1975 he was the chairman of the first AAOS-sponsored course on the subject of arthroscopy. He was a prolific contributor to the literature and served on the faculty of almost all of the arthroscopy courses organized by the IAA or the AAOS. When AANA was formed in 1982, he became its first president. In 1984 he moved from Boston to become Professor of Orthopaedics at the Medical University of South Carolina. Over the next few years, he became nationally recognized for his contributions to education. In 1990 he was elected president of the AAOS and in that capacity was significantly responsible for the development of the Orthopaedic Learning Center in Rosemont, Illinois. He was also the chief editor of a book entitled

Figure 13. Robert W. Metcalf (1936-1991).

Figure 14. John B. McGinty.
Operative Arthroscopy, which is now in its third edition. On retiring from active practice, he continued to hold various executive and committee positions with AANA.

**Lanny L. Johnson, M.D.**

After attending the first AAOS instructional course on arthroscopy given by Jackson in 1968, Dr. Johnson (Fig 15) quickly became one of the leading practitioners and innovators of arthroscopy in North America. Initially, he used the Needlescope, a small-diameter arthroscope developed by Dyonics, and promoted the concept of multiple punctures of the knee to explore all regions of the joint. He was a superb technician and teacher and was soon exploring all the diarthrodial joints of the body, such as the shoulder, the elbow, and even the great toe. He also explored the arthroscope’s use in closed and tight spaces such as fascial planes of the leg and nonunions of fractures. His innovative and inventive mind led to the development of many devices for use in arthroscopy, most notably the motorized suction shaver, but also items such as the “golden retriever”—a thin rod with a magnet at the tip designed to retrieve small metal fragments that, in the early days, frequently resulted from scalpel blades or basket forceps breaking inside the knee joint. He was one of the first surgeons to routinely videotape all his cases, which was of great value when he was able to obtain “second looks” inside a joint and therefore could assess the progress of a disease process or the effectiveness of a treatment method. Dr. Johnson was also one of the first to apply endoscopic surgical techniques to the treatment of degenerative joint disease (osteoarthritis) and explored the concept of “abrasion arthroplasty” and other aspects of cartilage repair.

**Other Notable Contributors (1965-1985)**

**James F. Guhl, M.D.** (1928-2008), was the third president of AANA, in 1983-1984. He was noted for his pioneering work in the ankle and for his textbook on ankle surgery.

**Larry Crane, M.D.,** was an early organizer of arthroscopy courses in the late 1970s and early 1980s and was the fourth president of AANA, in 1985-1986.

**Richard B. Caspari, M.D.** (1942-2000), was an early student of Lanny Johnson and the first of a new generation of arthroscopists who never looked through an arthroscope but worked entirely off a television monitor. He became known for his pioneering work in the shoulder and his efforts to develop a method to perform a unicompartmental arthroplasty using arthroscopic techniques. He was president of AANA from 1990 to 1991.

**Other Pioneers Around the World**

**Harold R. Eikelaar, M.D.,** in 1975, was the first person to achieve a Ph.D. degree in arthroscopy (University of Groningen in The Netherlands). Without any prior instruction, he worked in isolation, developing techniques and instruments to better see and work inside a joint. For example, with the Storz Company in Germany, he developed the first 30° forward oblique arthroscope, which provided a greater field of vision when rotated within the joint. For many years, he traveled and lectured extensively and was the last president of the IAA, from 1993 to 1995.

**Ejnar Eriksson, M.D.,** became the first professor of sports traumatology at the Karolinska Institute in Stockholm, Sweden, and was an early educator in arthroscopy. He was also the founding father of the European Society of Sports Traumatology, Knee Surgery and Arthroscopy (ESSKA), Europe’s equivalent of AANA.

**Jan Gillquist, M.D.,** was a pioneer from Sweden who in 1973 promoted the “central” approach to the knee, through the patellar tendon. He lectured and wrote extensively on the subject for many years before establishing a research institute devoted primarily to the study of knee problems. He was president of the IAA from 1987 to 1989.
David J. Dandy, F.R.C.S., was the president of the IAA from 1989 to 1991 and coauthored the first textbook on arthroscopy. An excellent teacher, he pioneered the development of arthroscopic surgery in England and was also president of the British Orthopaedic Association.

David Marshall, M.D., was the pioneer of arthroscopy in Australia and president of the IAA from 1991 to 1993. He and David Dandy from England and Peter Fowler from Canada were the primary planners in combining arthroscopy, knee surgery, and sports medicine into one major international organization (ISAKOS).

Hiroshi Ikeuchi, M.D., was Masaki Watanabe’s youngest partner at Tokyo Teishin Hospital and has since continued his mentor’s work. Specifically, he has continued to research the pathochemistry of joints and to travel and teach arthroscopy in underdeveloped countries around the world.

Others who made early contributions were M. Aignan and H. Dorfmann (France), J. Lysholm (Sweden), G. Ohnsorge and O. Wruhs (Germany), H.-R. Henche (Switzerland), J. Sakakibara and S. Mizumachi (Japan), M. Jason and A. Dixon (England), and J. Robles-Gil and G. Katona (Mexico).

THE DEVELOPMENT OF VARIOUS ARTHROSCOPY ASSOCIATIONS

International Arthroscopy Association (IAA)

At the 1968 academy meeting in Las Vegas, a small group gathered in Dr. Robert W. Jackson’s hotel room and talked about forming an arthroscopic association. However, it was not until 1973, when John Joyce, M.D., arranged the first private course in arthroscopy to be held in Philadelphia, that plans were made to form the IAA at a second course to be held the following year.

The founding fathers included Masaki Watanabe, M.D.; Robert Jackson, M.D.; Ward Casscells, M.D.; John Joyce, M.D.; Ralph Lidge, M.D.; Allan Bass, M.D.; James Guhl, M.D.; and Maurice Aignan, M.D. These men met in a restaurant on April 25, 1974, and along with 2 solicitors, named Seabring and Cline, formally established the IAA. Masaki Watanabe, M.D., was elected president; Robert Jackson, M.D., became vice president; Dr. Casscells was secretary; and Dr. O’Connor became treasurer. The original Board of Directors included Drs. Jack McGinty, Ralph Lidge, Ken DeHaven, Lanny Johnson, Alan Bass, and Michele Aignan.

The objective of the association was “to foster by means of arthroscopy, the development and dissemination of knowledge in the fields of orthopaedics and medicine in order to improve the diagnosis and treatment of joint disorders.” The original concept of the IAA was to have “chapters” in every developed country, each running its own organization and holding its own meetings. Every 3 years, the best papers from around the world would be presented at an IAA meeting held jointly with SICOT.

The logo for the IAA was based on a concept put forth by Robert Bechtol, M.D., from California and designed by a Canadian graphics designer named Peter Robinson. It included the 2 hemispheres of the world, the Watanabe number 21 arthroscope, and the orthopaedic tree used by Nicholas Andre.

Originally, there were only 2 chapters of the IAA, Japan and North America, but any country that had 10 or more practicing arthroscopists could form a “chapter” of the IAA. Soon, other chapters were developed in Brazil, India, and Australia. The next meeting of the IAA was in Kyoto in 1978 with Dr. Watanabe as president and 70 members present. It was a magnificent meeting both scientifically and socially.

An executive meeting was held in 1980 to “fine tune” the bylaws of the association. This meeting was memorable because it was conducted under the intense surveillance of several Secret Service agents who were suspicious of a group of young men gathered in a room in the same Philadelphia hotel that President Jimmy Carter was visiting on official business. The group was locked in the room for approximately 6 hours until the President departed.

The third meeting was held in Rio de Janeiro in 1981, with Dr. Jackson as president. By this time, the IAA membership had grown to more than 200. It was rapidly becoming apparent that this radical new concept called “endoscopic surgery” or “minimally invasive surgery,” which had been introduced by the private sector of medicine and largely shunned as “unlikely to succeed” by the academic community, was actually something significant. Arthroscopy was now becoming accepted, and new techniques of arthroscopic surgery were being rapidly developed.

The fourth meeting was held in 1984 in London, in association with SICOT and with Isao Abe as president. The fifth meeting, in 1987, was a trial “combined meeting” with the International Society of the Knee (ISK) and was held in Sydney, Australia. Jack McGinty was president. Subsequently, “combined meetings” of both the IAA and the ISK were held every 2 years. The president for the following combined meeting in Rome (1989) was Jan Gillquist, and
the next meeting in Toronto (1991) had David Dandy as president. In 1993 the combined meeting was in Copenhagen with David Marshall as president.

The last president of the IAA was Harold Eikelaar, who presided at the final combined meeting in Hong Kong in 1995. ISAKOS then became the official English-speaking international organization to represent arthroscopy, knee surgery, and sports medicine.

**Arthroscopy Association of North America (AANA)**

By 1982, it had become apparent that a different type of association was needed in America to meet the educational needs of the rapidly increasing numbers of orthopaedic surgeons practicing arthroscopy. This would primarily involve annual meetings (instead of the triennial meetings held with SICOT), instructional courses, and possibly even a journal. The North American chapter of the IAA was legally converted into the “Arthroscopy Association of North America,” and all of the current North American “chapter” members became the “founding members” of AANA. It was decided that the new executives would be President, John McGinty; Vice President, James Guhl; Treasurer, Ralph Lidge; and Secretary, Alan Bass; the existing board of directors of the North American Chapter of the IAA became the new AANA Board of Directors. The new organization would hold meetings yearly and continue to relate to the IAA but develop its own autonomy, both administratively and financially. A modification of the IAA logo, showing only the North American continent, was adopted by AANA. The subsequent history is fully recorded in the history section of AANA’s Web site (www.aana.org).

**European Society of Sports Traumatology, Knee Surgery and Arthroscopy (ESSKA)**

In 1982 a group of knee surgeons and arthroscopists met in Berlin and discussed the formation of a European society similar to AANA to cover these exciting new fields of surgery. In 1984 a conference was held in Berlin, and the European Society for Knee Surgery and Arthroscopy (ESKA) was officially formed. Werner Müller became president; Lorden Trickey, vice president; Ejnar Eriksson, secretary; and Peter Hertel, treasurer. The organization grew rapidly and held meetings every 2 years. At the fifth conference, in 1992, with interest in sports trauma growing worldwide, it was decided to add another “S” to the society’s logo, and the society thus became the European Society of Sports Traumatology, Knee Surgery and Arthroscopy (ESSKA). The driving force behind ESSKA was Professor Ejnar Eriksson, the first professor of Sports Traumatology at the Karolinska Institute in Stockholm and the founding editor of ESSKA’s highly successful journal, *Knee Surgery, Sports Traumatology, Arthroscopy*. He was also President of the Society from 1988 to 1992 (www.esska.org).

**International Society of Arthroscopy, Knee Surgery & Orthopaedic Sports Medicine (ISAKOS)**

With the increasing proliferation of organizations and meetings, all with a general theme of early, accurate, and minimally invasive treatment of musculoskeletal injuries, it was decided to combine the IAA and ISK into a single organization. This plan was originally put forth by Drs. Peter Fowler, David Marshall, and David Dandy (past presidents of the ISK and IAA). The new organization was called ISAKOS. The first meeting of this new society was held in Buenos Aires in 1997, with Dr. Fowler as its first president, and has since become an extremely successful organization (www.isakos.com).

**THE TEACHING OF ARTHROSCOPY**

Initially, all teaching was one-on-one, with a teacher, a student, and a patient. Early on, this was facilitated by “beam-splitting” devices so that the student could see what the instructor was looking at. The problem, however, was that the student, in holding the device and peering down it, would often move the arthroscope slightly away from the field of vision the teacher was trying to display, thereby frustrating both of them. The development of flexible teaching attachments (initially fiberoptic and then multi-jointed prismatic devices) greatly facilitated this method of teaching. Soon, 35-mm slides and videos were used to demonstrate techniques and pathology. Models of the knee, made of plastic and rubber, provided an early opportunity to practice the movement of instruments within the joint. Eventually, cadaver parts became the gold standard for demonstrating and practicing surgical procedures. Scientific advancements in the field were appropriately recorded in the peer-reviewed *Arthroscopy: The Journal of Arthroscopic and Related Surgery*, which began publication in 1985.
THE IMPACT OF ARTHROSCOPY

Although the time frame from a historical viewpoint is quite short, there is little doubt about the impact that arthroscopic surgery has had on the whole spectrum of surgical treatment. Accuracy of diagnosis, definitive operative treatment with minimal further tissue damage (through keyhole incisions), shorter rehabilitation times, fewer complications, and greater economy are undeniable benefits that are now being sought after by all branches of surgery. The impetus and catalyst for this significant revolution in surgery have undoubtedly come from the results observed in high-profile professional athletes, where the principles of sports medicine were applied through arthroscopic surgery.

REFERENCES