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GIA Gem Instruments: In the Boomtown Tradition

by Sharon E. Thompson

New scientific fields and the businesses they foster can be a little like old-fashioned boom towns. The atmosphere surrounding them is charged with optimism, enthusiasm, and energy. New ideas are plentiful and some truly hit "pay dirt." Like their oil field counterparts, entrepreneurial boom towns attract their share of eccentrics and "wildcatters." These independent risktakers are able to draw together seemingly unrelated fields and discoveries to open new ground. Their energy and imagination can power an industry for years.

After the first flush of activity and success, boom towns usually settle down, becoming established and respectable. If based on a solid foundation, they weather the rough times, attract vigorous new blood, and begin to grow yet again.

GIA GEM Instruments Corporation has been just such a technological boom town. During its 50-plus years of researching, designing, and producing equipment specifically for the jeweler-gemologist, GIA GEM Instruments has enjoyed enormous growth and survived some daunting setbacks. Now, having come of age, it is preparing for the ever-changing future of gemology.

A Freewheeling Start

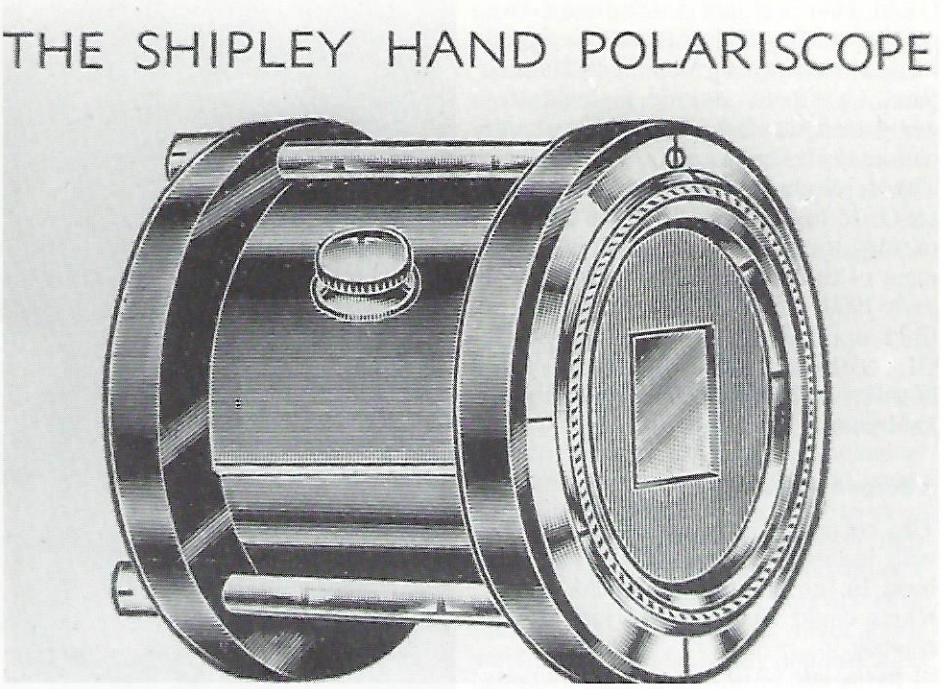
Gemology was in its infancy in the early 1930s. When it came to gemstones, jewelers trusted their instincts, experience, and suppliers, sometimes with embarrassing results. Although a few universities offered rudimentary courses on gems and gem materials, there was no gemological training designed for the jeweler. In addition, many of the instruments we now take for granted were virtually unknown to the jeweler-gemologist. In fact, Robert Shipley, Sr., GIA's founder, claimed that in 1930 only one jewelry firm in the U.S. owned a refractometer.

Most conspicuous by its absence was the gemological microscope. Early gemologists used petrographic microscopes which were designed to examine thin sections of minerals; the lighting was such that it was virtually impossible to see into a cut gemstone to any depth. To add to the frustration, the image from the monocular eyepiece was upside down and backwards.

Some of the most significant developments in gemological instrumentation were made during the late 1930s through the work of Robert Shipley, Jr., the older son of GIA's founder. An independent, creative genius, Shipley, Jr., redesigned the microscope to use darkfield illumination, which allowed light to enter a cut gemstone. He also added stereoscopic binocular magnification so that the image in the microscope would be seen right side up. This not only made the instrument vastly easier to use, but also turned it into an effective sales tool. Coupling

Robert Shipley, Jr., a son of GIA's founder, was one of the geniuses who revolutionized the gemological instrument industry.

THE SHIPLEY HAND POLARISCOPE



Shipley, Jr., utilized the film of the then-new Polariod camera for the gemological polariscope.

low-powered objectives with high-powered eyepieces increased the working distance, making it possible to examine jewelry under magnification and do delicate repair work. (In 1938, Shipley, Jr., received a patent on the new instrument.)

One of the later successes of Shipley, Jr., was the secure stone holder, which allows the gemologist to examine inclusions without the risk of dropping the stone. It also made it much simpler to show stones to a customer.

Shipley, Jr., "wasn't the type to invent the wheel or the telephone," recalls Richard T. Liddicoat, chairman of the board of GIA, "but he could take those and adapt them to the needs of the gemologist in a way no one had thought of before." When Edwin Land (inventor of the Polaroid camera) developed his polarizing film, Shipley, Jr., immediately saw its application to gemology. Using the film in the polariscope, he not only increased the size of its working field significantly, but he also reduced the cost of the instrument.

In the process of turning his ideas into reality, Shipley, Jr., frequently worked with tool and die maker Raoul Francoeur. Until that time, optical instruments were virtually made by hand, which added to the cost. But Shipley, Jr., and Francoeur were able to design equipment with parts that could be die cast and mass-produced, thus lowering the cost and increasing the availability to jewelers.

In addition to advances with the microscope and polariscope, Shipley, Jr., also developed a variety of refractometers, including the polarizing variety. One of his pet projects was the development of a diamond colorimeter. Unfortunately, the instrument was not the panacea for color-grading problems that he had hoped it would be.

After World War II, Shipley, Jr., started his own instrument-manufacturing company. In the early 1950s, however, his interest in gemological instrumentation began to wane. When he gave up his business, two enterprising GIA instructors, Lester Benson and Kenneth Moore, filled the void with their company, B and M Optical.

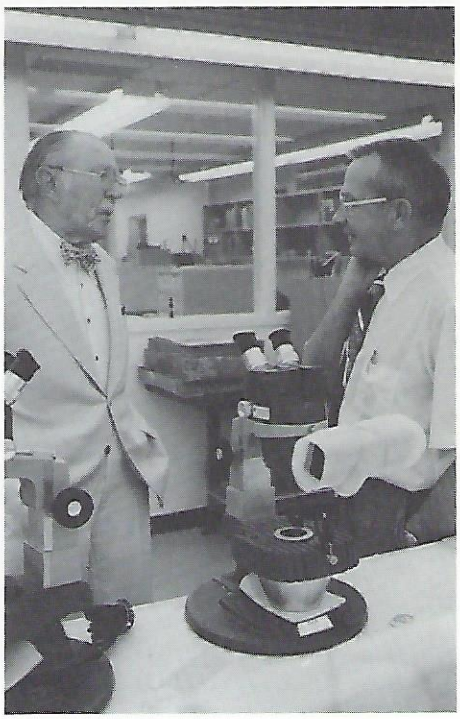
Like Shipley, Jr., Benson saw things from a "different" perspective. While alike in inventive imagination, these two men could not have been more dissimilar in temperament. Shipley, Jr., was all "accelerator and brake," and Benson was calm and charming, with the dashing good looks of a Douglas Fairbanks, Jr. Behind the "matinee idol" exterior, though, was a bright, creative mind.

Benson's contributions to gemology started shortly after he came to work at GIA in 1947, when he developed the current method of taking spot R.I. readings that is indispensable to gemologists today. To take advantage of this new technique, he later designed the first Duplex refractometer.

Benson's other contributions were equally far-ranging. During the late 1940s and 1950s, he designed a pearl-testing X-ray unit, a base for gemological microscopes, an electrical conductometer, a light fixture with multiple baffles that turned fluorescent light into multiple spots, and the Jeweler's Camera. He also did some of the first investigative work into the uses of the spectrophotometer in gem testing. And, he ingeniously designed the spectroscope unit to prevent the stone from heating (which tends to wash out its characteristic spectrum).

From Boom to Steady Growth

Neither a new town nor a new industry can continue expanding indefinitely. As discoveries become less frequent, the emphasis shifts from exploring new frontiers to building on established foundations. This "settling" stage of growth is essential because, without it, sudden changes in fortune can turn a boom town into a ghost town.



Pictured here are Robert Shipley, Sr., founder of GIA (left), and Gale Johnson, former head of Gem Instruments (right).

After Benson's sudden death in 1961, the expanding instrument company entered a consolidation stage. Another GIA instructor, Gale Johnson, joined the business and the name was changed to Marcus McFall, Inc. Although Benson and Moore had worked full-time at GIA and only part-time on instruments, the demand for equipment had become so great that Johnson put all of his energy into manufacturing instruments.

In 1966, GIA bought the firm, thus uniting these two important aspects of the jewelry industry. Moore stayed on as vice-president in charge of sales and Johnson continued as vice-president in charge of manufacturing. (In 1977, the instrument division, a wholly owned subsidiary, was renamed GEM Instruments Corporation.)

Throughout the 1960s and 1970s, GEM Instruments grew steadily. Gemology was now established in the jewelry industry and, as the number of gemologists grew, so did the demands for equipment. GEM Instruments' line of equipment–microscopes, spectroscopes, dichroscope, polariscope, specific gravity liquids, and refractometers–was more than adequate to meet the needs of most jewelers. Hence, it now focused primarily on improving and refining its products.

New inventions were not completely disregarded, however. In 1980, after 18 months of development with outside consultants in a virtually uncharted field, GEM Instruments introduced the revolutionizing ColorMaster, designed from a concept acquired from Thomas Ritzi. The first of its kind, ColorMaster was designed to take the guesswork out of the color assessment of colored stones. The development of ColorMaster also set GEM Instruments firmly on the path to using special electronics in the equipment of the future. The late 1970s and early 1980s also saw the introduction of fiber optic illumination to gemology; GIA GEM Instruments led the way with its series of "FiberLites" and "pinpoint illuminators."

In 1984, GIA Gem Instruments redesigned most of their line to a contemporary white and black body.

A Second "False Boom"

The corporate countryside is littered with industrial boom towns that went bust. In the early 1980s, GEM Instruments could have become just such a tragedy.

In the late 1970s, the jewelry industry was bewildered and concerned by the skyrocketing demand for "investment diamonds." New enrollments at GIA were staggering; applicants for the residence classes waited up to six months for admittance and the number of home study instructors had to be doubled.

GEM Instruments was soon employing over a hundred people as the number of orders for new instruments increased. Then, in the early 1980s, almost overnight, the "investment boom" ended. For Gale Johnson, who had assumed full responsibility for GEM Instruments after Moore's retirement in 1982, it was a dark time of laying off "some of the nicest people in the world." The staff soon shrunk from its peak of over a hundred to less than forty. But the belt-tightening worked. Slowly the slide stopped, business turned up again, and the company survived.

Looking to the Future

After surviving such a blow, an industry usually becomes both wiser and healthier. Under the direction of then-GIA President Glenn Nord and Johnson, many changes and innovations were instituted to keep the company competitive and viable. As one major cost saver, many of the instrument parts are now manufactured overseas. GIA GEM did not relinquish quality control, though. Before any part is made overseas, GEM Instruments designs, develops, and produces the first batches of prototypes. They are then tested and perfected. Complete specifications are given to the overseas manufacturer, right down to the kind of rubber to be used on the instrument's feet! In addition, Dick Agnew, who became managing director after Johnson's retirement in 1984 and is now chief executive officer of GIA GEM Instruments, makes periodic trips to the manufacturers to be sure everything is up to GIA's standards.

Here, Shipley, Jr., and Anna McConnell Beckley, forme offices of GIA.

GIA GEM Instruments is also aware that an instrument's appearance plays almost as vital a role as its usefulness. Even if the jeweler is not using it, the very presence of the equipment is a subtle sales tool, showing the customer that the jeweler is a trained professional. An instrument that looks outdated makes a different impression on a customer than one that looks contemporary and professional. In 1984, GEM Instruments expressed their faith in the future by converting almost the entire line from the familiar gray bodies to contemporary white and black. To further the success of

GIA Research Librarian, are hard at work in the

the line, many of the instruments were redesigned to be more effective, easier, and more convenient to use, based on suggestions from GIA instructors and GIA Gem Trade Laboratory staff members, who use them constantly. This redesign included making them more electronically sophisticated.

Currently, Agnew says, GIA GEM Instruments is conducting research among retail jewelers, the company's strongest market. He hopes to determine better their gemological needs so that GEM Instruments can tailor their products accordingly. He also feels it is particularly important to focus on improving customer relations. Agnew is constantly training his staff so that they can answer questions quickly, and he has established a separate walk-in repair department at their new location across from the GIA educational headquarters. With the better products and services GIA GEM can now offer, Agnew predicts that the company will double its sales within the next five years, well exceeding those of even the "boom" years of the late 1970s. According to GIA President Bill Boyajian, "GIA GEM Instruments is a vital part of the fulfillment of our overall corporate mission; that is, to educate and serve the jewelry industry. We intend to further the rich traditions of the institute by developing and manufacturing the finest gemological instruments available anywhere."

"One percent inspiration. . . "

Well, the boom days and the bad days are over, but the future is just around the corner. Until recently, the gemological instruments at a jeweler's disposal usually have been more than adequate to identify most gemstones. Now, however, they are being pushed to their limits by new synthetics and enhancements that Shipley, Jr., and Benson never knew would exist. These highly sophisticated products pose a big challenge to GIA GEM Instruments. To help meet the future challenges of gemologists worldwide, Boyajian created GIA's Technical Development Department, headed by Robert Kammerling and John Koivula.

Essentially, Kammerling and Koivula are initiating a second period of gemological "wildcatting"–one that will be more systematic and perhaps more "high tech" than the first. Working with GIA educators, Research Department personnel, and GIA Gem Trade Lab staff, they research and develop new equipment and methods, and devise new testing techniques that can be used with standard gemological equipment. And, GIA GEM is always looking for new ideas from students or members of the trade, some of whom, such as Harold Oates, continually present new concepts.

Recently, GIA GEM, Kammerling, and Koivula consulted with specialists in gemology, optic engineering, and design, to create a new type of base-mounted diffraction-grating spectroscope. Developed from an idea originated by Nick Michailidis, the new unit, the Digital Scanning Diffraction-Grating Spectroscope (DISCAN), comes with a digital read-out wavelength scale. Some of their other projects involve developing and adapting research equipment that can establish consistent ways to detect synthesis or treatment; then they hope to modify these methods and equipment for the jeweler-gemologist.

To this end, they appear to be applying Thomas Edison's maxim: "Genius is one percent inspiration and ninety-nine percent perspiration." They are exploring the gemological potential of equipment now used in such unrelated fields as medicine, engineering, and parts fabrication as well as those with a more obvious connection to gemology, such as geology. For nondestructive but precise testing, they are particularly intrigued by the testing potential of various wavelengths of visible and infrared light.

The DISCAN, a digital spectroscope, is the latest instrument produced by GIA GEM Instruments.

In addition, the Department of Technical Development is the "court of last appeal" for new instruments and innovations. Before GIA GEM Instruments begins to market or manufacture a new piece of equipment, Kammerling and Koivula test it, evaluate it, and suggest changes if necessary.

The field of gemological instrument development grew out of an almost desperate need for reliable methods of gem testing. Although it has had a relatively short, tumultuous history, GIA GEM Instruments has been fortunate to have innovative, creative minds to give it a solid start. With the continuance of the "wildcatting" tradition, it promises to grow to meet the challenges of the future.

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