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From Glass to Plastic Prosthetic Eyes: Paul Gougelman Jr. of Chicago

ABSTRACT

While the name “Gougelman” is familiar to many in prosthetic eye restoration, the individual Paul R. Gougelman, Sr. (Paul Sr), second generation of the now-defunct Mager and Gougelman of Chicago, is obscure. With the exception of old items found in antique markets or on curiosity websites, little information remains of this once-influential and historic prosthetic eye pioneer. (Figure 1, see next page) It may be easier to find information regarding the third generation, Paul Gougelman, Jr. (Paul Jr), as a racecar driver in the 1950’s than either’s work in the eye-making business of their founder. (Figure 2, see next page)^{1,2}

Yet, Paul Sr formed the American midwest’s largest provider of ocular prosthetics, hired the first acrylic ocularist, and fostered acrylics as the material of the future. His adventuresome son, Paul R. Gougelman, Jr. (Paul Jr), presided during and after the transition from glass to wholly-acrylic eyes. Paul Jr furthered his father’s foresight and business acumen to help this fledgling field of ocularistry into acceptance. Herein is detail and clarification on the emergence of material and technical challenges that succeeded—and failed—under this namesake. Today’s ocularists and their patients reap the benefits of this legacy, and practitioners should know of it to speak of it.

Introduction

In the 1940’s and 50’s, a quiet and unassuming Paul Gougelman, Jr (Paul Jr) sought the Edge in many things: new businesses, new markets, new people, new materials for prosthetic eyemaking—as well as the fastest in cars and boats. The foundations and relationships he formed helped what has become the American profession of ocularistry.

Perhaps this is best introduced from the First Generation of American Eye-makers: his grandfather.

State-of-the-Art in America, 1850

Eye-makers, like business practitioners of any trade, refined their formulas for a competitive advantage, and guarded these as family trade secrets. For centuries (and nearly the entire 19th Century), the state-of-the-art artificial eye (even those custom-made) was the “shell” eye: a curved diaphragm, edges turned under, with an iris and cornea on the front. This was a reasonable replacement, given the primitive eye surgery of the day.

The 1800s market mastery alternated amongst the mini-factory makers in Europe, primarily between France and Germany. French eye-makers dominated the field internationally in the 1840’s, but by mid-century, the German eye-makers had gained a competitive edge using their engineered secret, “kryolith” glass. Developed over years beginning in 1835, the milky kryolith tubing made “cryolite eyes” decidedly more natural-looking.^{3,4,5}

French techniques, using vitreous enamel and their own glass techniques, were overwhelmed. Unable to discover the technical secret, French and other eye-makers were market-pressured to make cryolite eyes themselves. They were thus tied to German imports from the Lauscha glassworks—at a premium price—for their materials for nearly a century.⁶

Glass eyes are prone to surface etching by the enzymes and pH of the human tearfilm. Even today, a glass prosthesis can be only be worn comfortably for about 18 months; thus requiring regular replacement.

In 1850s America there was an estimated 30,000 people in need of an artificial eye, although there were only 31 stars on the flag. Unless one could sail to Europe regularly for custom eye work, the only option available in the US was a “stock” eye.

Stock glass eyes were pre-made units, imported from France or Germany and kept “in stock” in limited sizes, shapes, and colors by “oculists” and druggists in larger cities. There was no fitting involved: “pick one and pop it in the socket—no waiting!” Even if the color match might be approximate, a poor fit was guaranteed. Even today, the stock eye business model still serves eye-wearers in remote areas at a minimum cost.

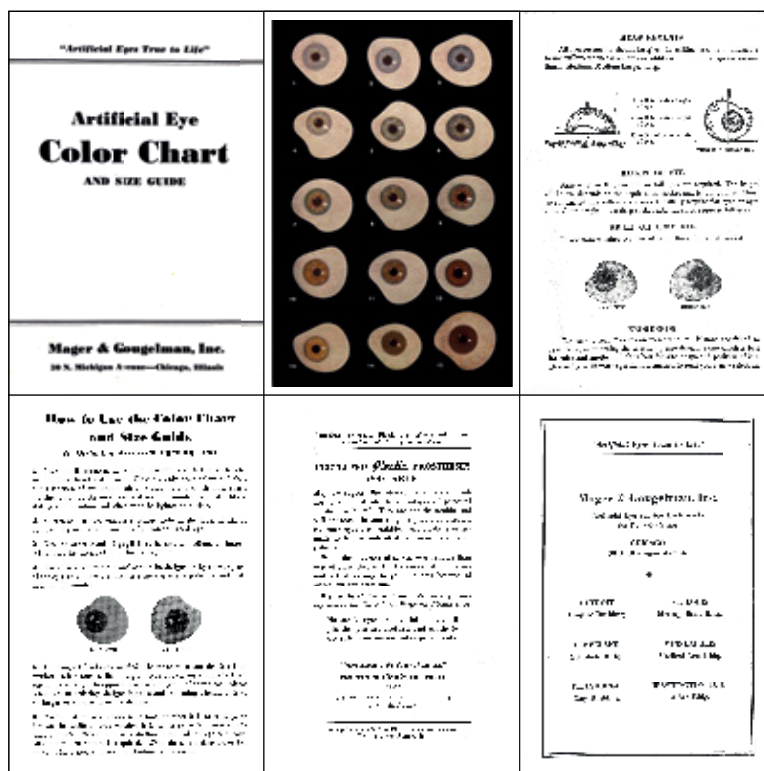


Figure 1. Highly detailed Artificial Eye Color Chart distributed to both professionals and patients. While mostly used for stock glass, Paul Gougelman Company also used these sample charts as plastic ocular prostheses evolved., ca. 1944.

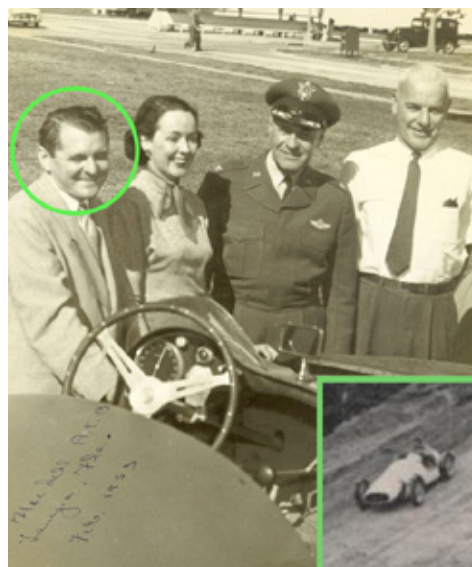


Figure 2. Photograph of Paul Gougelman Jr. far left from 1953. Inset image is his racecar.

When Peter Gougelmann (Peter) sailed from France at age 27 in 1848, he would be the first custom eye-maker to land here. From his native Switzerland, Peter had trained in Paris and had traveled Europe making cryolite eyes for several years. In that day, a custom glass eye-maker individually fit an eye after a “pattern” that was trial-fitted in the patient’s socket, requiring years of experience in “reading the socket” to achieve a comfortable fit and movement, and custom-colored the glass.^{7,8,9,10,11,12,13}

In his first year outside of New York City—even before opening his first office on Broadway in 1851—Peter worked with a glass chemist named Bauch to independently (and, no doubt, expensively) develop his own American blowing glass tubing, which only used American-sourced materials. (Figure 3)

That was the tradition in which Peter trained his sons: material independence and personal service. The firm he established, eventually known as Mager and Gougelman of New York (M&G New York), is one of the oldest, continuously-run family businesses in the US of any kind, and exemplifies the industry.¹⁴

Father to sons

Amongst the family firm in NY, a division of labor developed. The third and youngest son, Paul R. Gougelman, Sr. (Paul Sr), demonstrated ability in management, so, rather than producing eyes, he began promoting the advantages of custom-made glass eyes.

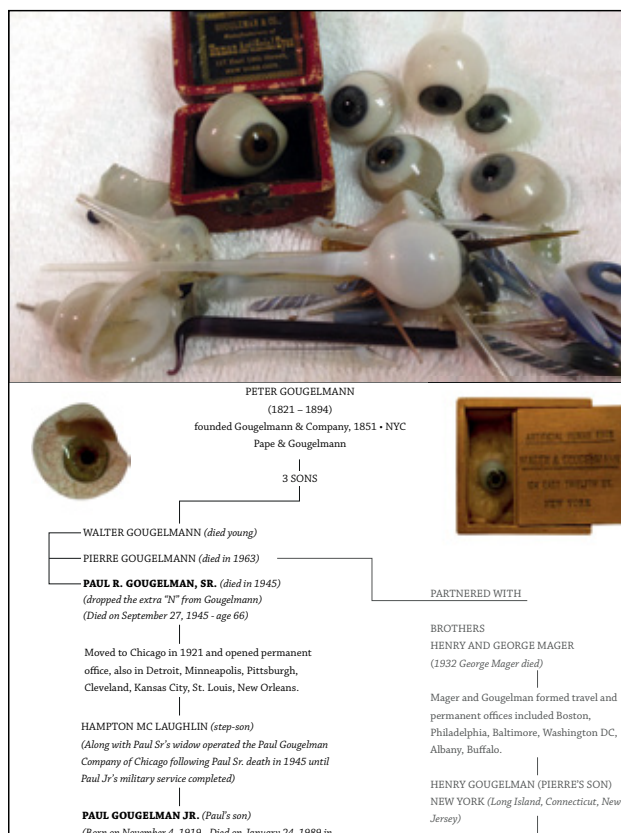
After the firm grew and, after Peter died in 1894, his three sons, Walter, Pierre, and Paul Gougelman (Paul Sr) represented the Second Generation. They felt there were other markets for M&G New York to explore in a big country. Together with trained glass eye technicians, Paul Sr was sent to the Chicago area, settling in 1910. (Figure 4)

Paul Sr was a natural promoter, and advertised the Chicago specialty service and products at a time when such promotions were rare. Though he did not fit eyes himself, he even published several articles regarding prostheses into the medical literature, which remains very rare for a non-physician. This proactive profes-

Figure 4. Family chart shows the chain of ownership of Paul Gougelman, Sr., which originated from his Swiss born father Peter Gougelman. Various offices from 1821–1972, monopolized prosthetic eye service provided in the United States for over one hundred fifty years.



Figure 3. Various Mager & Gougelman items including a six-glass eye fitting case. B. Wooden, single eye container and set of glass ocular implants. C. Pape and Gougelman business card. D. Envelope dated 1909. E. Mager & Gougelman, business card ca. 1930.



sionalism led to collaborative development of orbital implants, which he promoted and sold to surgeons—the second of several lines. (Figure 5)

As the clientele grew, Paul Sr, in turn, felt the need to expand. He opened permanent and satellite-traveling offices in Detroit, Minneapolis, Cleveland, Kansas City, St. Louis, and New Orleans, the number eventually peaking at over forty. (Figure 5)¹⁵

His son, Paul R. Gougelman, Jr. (Paul Jr), started working with his father in 1937 after attending private high schools. Seventy-six years after his grandfather Peter began practice in New York, he represented the third generation of American glass eye-makers. Like his father, Paul Jr was more of a manager and promoter.

Eventually, an instructor at the Kansas City Dental College drew the attention of Paul Sr.

Dental technician Fritz Jardon had emigrated from Germany in 1932 for a teaching job there, and opened his own dental lab in 1935, where he shared office space with M&G's traveling glass eye-makers, Otto Greiner and Fritz Mueller (both émigrés from German eye-making families), on a monthly basis.

One common (but important) story holds that, in 1939, a boy in Kansas City broke his glass eye the day it was made. On returning to the office, he was distraught to find that the circuiting eye-makers from Chicago had already left for the month. Jardon and his associate, Dale Curteman, were in Fritz's lab casting acrylic dentures, and offered to try to salvage the boy's shattered glass treasure.

We can only imagine the youngster's awe, watching as Jardon first made a mold of the temporarily-repaired "piece," then trimmed the glass iris away, and embedded it in a positive acrylic shape, using the (new) dental materials he worked daily. Whatever the result, it must have been wonderful to the boy—who otherwise would have worn a patch for a month. (The origin of the term "eye-tooth" is a different matter entirely.)

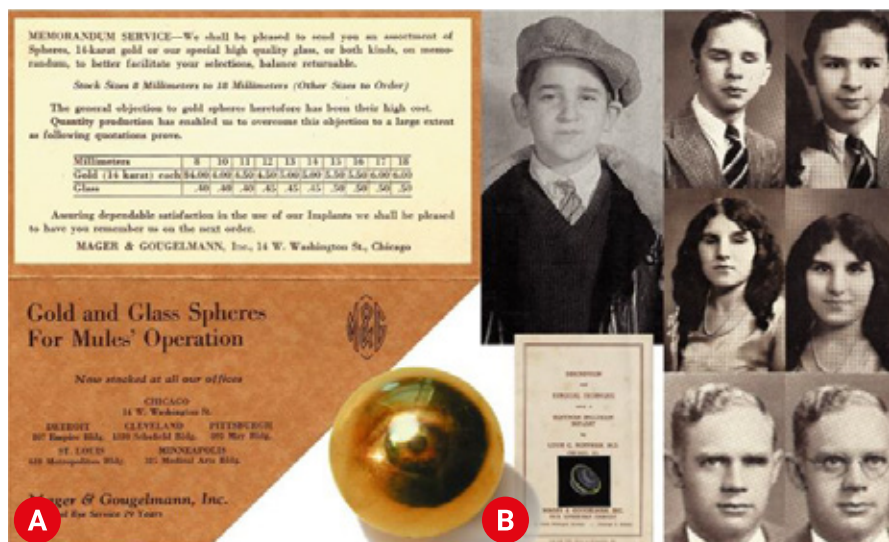


Figure 5. The brochure shown above (A), ca. 1933 was distributed by ocularist Paul Gougelman of Chicago to Midwestern Ophthalmologists. It lists sizes and prices for gold ocular implants. At the time, marketing implants & prosthetics businesses. Photos inside the Gougelman brochure depict patients with bilateral enucleations (man top right, woman center right) before and after receiving gold ocular implants and glass prostheses. The man in glass (bottom right) and boy with cap (center top) are examples of monocular patients wearing gold spheres and glass prosthetic eyes, both in the left eye (OS). The Louis G. Hoffman, M.D., brochure at bottom center (B) shows another implant incorporating gold that Gougelman sold.

Shortly after hearing the excited tale from Paul Jr, Paul Sr hired both Jardon and Curteman to make acrylic eyes (with embedded glass irises) in the central M&G Chicago office. While the embedded irides were admired for their beauty, to the disappointment of many, they often delaminated from the plastic corneas, to appear white or frosted (thus useless for cosmesis), and required a re-set. They represented M&G Chicago's first market failure; Jardon continued to experiment, however, and soon, totally-acrylic eyes would prevail.

Despite conflicting reports on the actual circumstances that produced the very first all-plastic prosthetic eye, a few ocularists regard Jardon's M&G Chicago work as primary. Journal articles published in national ophthalmic, dental, and military periodicals record the pioneering role of the Dental Corps of the US Army and Navy.^{16,17,18,19}

Usually cited as the rationale for acrylic eyes is the scarcity of materials in WWII—and it makes a good (if incomplete) one-sentence story. If this were indeed the sole reason, you will remember (above) that M&G New York had their own formula, devised by Peter and Bauch 80 years earlier, which could have been used to produce American glass materials.

It may better be the massive need for eyes after the outbreak of WWII that pushed the creative buttons of those already working in labs using this material. Paul Sr had recognized and endorsed it earlier. However, since there was no facility to develop eye-makers of any kind for the increased war need; the government had to invent one. Paul Jr was in the middle of it.

The Valley Forge Plastic Artificial Eye Program

“The story of prosthetics would not be so great without the trials of war as the lead antagonist.” (Flasha, 2011)

WWII began furiously, and casualties suffering vision loss, accounting for 2% of all injuries (Zoroya, 2007), arrived state-side from hospitals in the rear to myriad receiving hospitals, with the eventual intent to release them to Veterans Administration (VA) hospitals. However, the Surgeon General remained uncertain that the special needs of the blinded could be addressed in the VA at that time: a new program was needed for these disabled veterans.

So as to minimize costs and exclusive reliance on civilian eye-makers, a parallel program was likewise needed for restorative ocular prosthetics, instituting the new acrylic material as the standard in rehabilitative care for anophthalmic vets—and the training of practitioners to provide these services:

In [March] 1944, General Kirk returned from the European theater where “he was impressed with the achievements of the new plastic artificial eye which had been implemented by Capt. (later Maj.) Stanley F. Erpf, DC at the 30th General Hospital, England.” Many credit Dr. Erpf for standardizing production techniques with two other dental officers who had been experimenting along similar lines [stateside]: Dr. Milton Wirtz and Dr. Victor H. Dietz.

The Ophthalmology Branch...was activated on April 15, 1944. Major M. Elliott Randolph, MC...became the Branch’s first Chief. The functions of the new Branch were to establish procedures in general ophthalmology and care of the blind; to advise assignments of specialists in these fields; to correlate information and consults pertaining to ophthalmology; and to maintain liaison with the Navy, the Veterans’

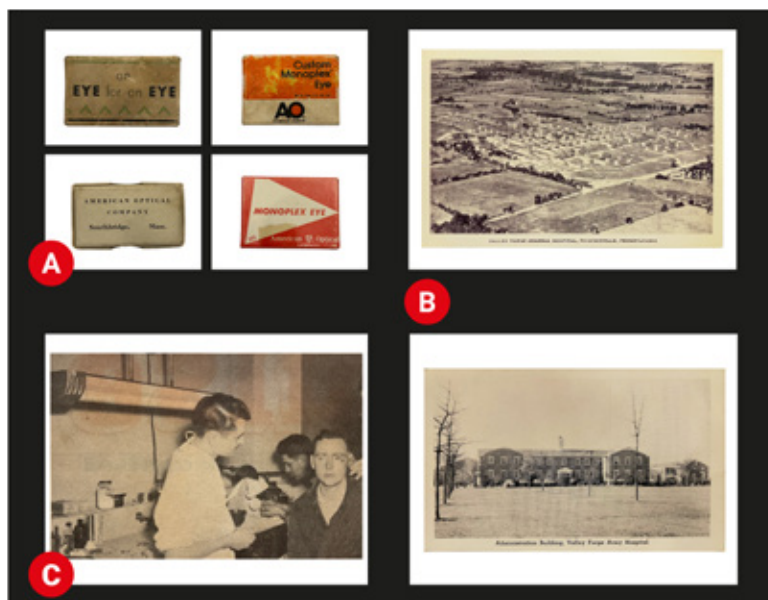


Figure 6. A. American Optical plastic eye prosthesis boxes. B. Two postcards of Valley Forge General Hospital, Phoenixville, Pennsylvania, ca. 1945. Paul Gougelman participated in the training at the Valley Forge Artificial Eye Hospital. C. Army private Paul Gougelman far left, fitting prosthetic eye for a service-connected soldier at Gardiner General Hospital in Chicago, February 1945.

Administration (VA), the Federal Security Agency, and civilian ophthalmologic groups.

Two hospital centers were designated for these blinded soldiers: Valley Forge General Hospital (VFGH) for the East (as yet unbuilt near Phoenixville, Pennsylvania), and Dibble General Hospital of Menlo Park, California for the West. Constructed in a record 12 months, VFGH became the training ground for eye-making at the Valley Forge Plastic Artificial Eye Program (VFPAEP). (Figure 6)

The joint responsibility of the Optical (supply) Branch under Lt. Col. Walter H. Potter (with his assistant, Stanley Rybak, later of M&G Chicago) and the Ophthalmology Branch, the VFPAEP set out to train military dental technicians to fit and make acrylic eyes. These would eventually serve in VA Plastic Artificial Eye Clinics, and train other technicians in turn. Established regionally (in Chicago, New York, Boston, Washington DC, Philadelphia, Atlanta, St. Louis, San Francisco, Los Angeles), these came under the jurisdiction of the Prosthetic and Sensory Aids Service (PSAS). Along with Pharmacy, the PSAS became one of the largest-budget Services in the VA. Little remains of it today, as artificial eyes, while incorporated into the Regional Centers for Prosthetic Rehabilitation as prosthetics in a similar pattern, are also contracted.

Paul Jr was reportedly a visitor at VFGH at another developmental dental lab at a Manhattan hospital. He and other private practitioners introduced the fully-acrylic techniques into the civilian eye-wearing population, even during the late war. It is presumed that they added their expertise to the Service.

When Paul Sr died during Paul Jr's service in 1945, M&G Chicago business development was left to the third generation of eye-makers. Because of the large territory his offices covered, his connections before and during the war, and his VFGH experience, Paul Jr made M&G Chicago influential. (Figure 7)

Transition from glass to plastic at home

The postwar years saw the rapid expansion of stock acrylic artificial eye production, paralleling the earlier stock glass eye market. Several US firms mass-produced thousands of eyes (American Optical, Galeski Optical, and Mager and Gougelman Plastic Manufacturing Company), and shipped stock eyes to medical and optical professionals, pharmacies, and, in some cases, individual patients. (Workman, 2007) While a valid business model in distant areas, these were usually "fitted" by self-trained or optical-fringe individuals. For a less-particular patient who wanted a low price, no travel, no waiting for an ocularist, the stock plastic eyes were (again) sufficient—if mostly in their immediacy.

Surely Paul Jr sold many units as M&G-PMC, knowing that the assumed ease that untrained personnel had in generally modifying stock shapes would satisfy only the bottom of the market and exports, he let M&G Chicago serve the top market for custom work. Meanwhile, M&G Chicago's glass eye producers on staff continued to serve those that preferred their old line. (Figure 8) Acrylic pioneer Jardon soon left to manage the stock eye division of AO and patented the infamous, ill-conceived Cutler orbital implant.

Curiously, Paul Jr found himself in a marketing position similar to that of his father, Paul Sr, 50 years earlier: market a custom-fit, custom-colored eye for otherwise stock-eye wearers—only, now in the new acrylic material. This duality may seem akin to self-competition amidst rampant market pressures, and M&GPMC eventually dropped its stock-eye line. To-



Figure 7. Mager and Gougelman's offices divided into Eastern Divisions and Western Divisions, peaked at over forty offices between 1851–1972.

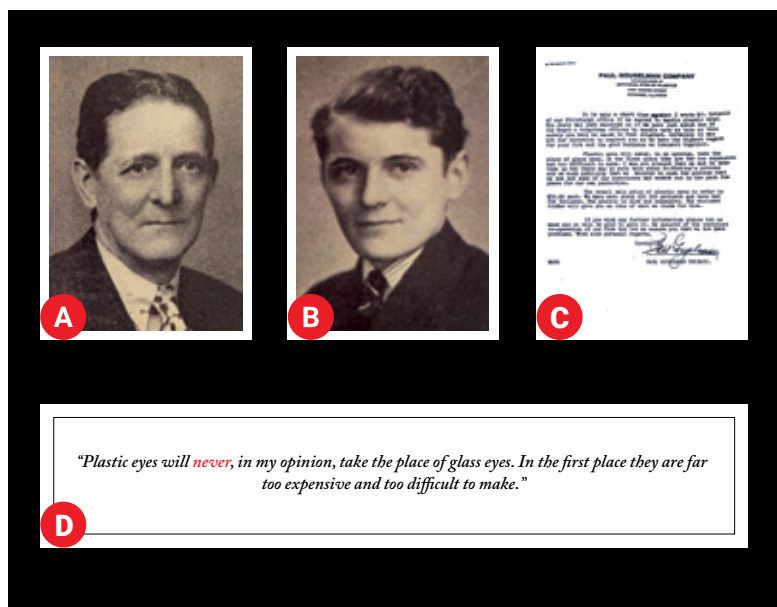


Figure 8. A. Paul R. Gougelman Sr. (1879-1945) B. Paul Gougelman Jr. (1919-1989). C. Promotional letter from Paul Gougelman Company sent to colleagues, ca. 1948. D. Excerpt from Paul Gougelman Company letter indicating prematurely-that the new plastic ocular prosthesis will never replace glass ocular prostheses.

day, the field is seeing new offerings in “stock” iris-corneal buttons, and other material-based challenges.

The 1950s

The limitations of stock prostheses were always evident (as before), and demands accelerated for better fit, color match, motility, and aftercare from patients and physicians. Evolution of eye-removal surgeries (and of the myriad new molded orbital implants) would presumably require greater skill. Thus came an increased need for private ocularists who could accurately custom-produce a custom-fit eye. The now-civilian trainees of VFGH (and theirs in turn) were busy making that available for G.I. Bill eyes made at the peak of the need curve.

The M&G Chicago mini-empire grew in the Midwest, and Paul Jr’s patent was used for marketing in publications and advertisements, both to the professional referral base and directly to potential patients.¹⁴⁻²⁰

More importantly, Paul Jr reveals a deep understanding of his patients’ plight in this excerpt from his 1951 patent application:

If a person can detect a difference between a person’s eyes, the conclusion is immediate that one is artificial and it makes no difference which one is the artificial one. The purpose of having an artificial eye is largely lost both from a physical as well as a psychological viewpoint.

The problem is not so much one of matching colors as it is one of having an artificial eye look like the natural eye after color matching has been accomplished. There is a depth of black to the pupil which must be attained and a marginal appearance to the iris which is soft and well-blended before the natural eye-appeal is approached. There must be a sense to the observer of a depth beyond the iris from which a wearer is looking, rather than the feeling that the iris itself is the thing from which the wearer is looking.

—Gougelman, 1954—

United States District Court, Northern District of Illinois vs Mager & Gougelman, Inc, |
Paul Gougelman Company, Paul Gougelman, Jr, and Stanley W. Rybak

[February 15, 1952]

Judgement Summary:

Stanley Rybak worked with Paul Gougelman Jr. for most of Paul’s career. Mager & Gougelman, Inc. (of New York) and the Paul Gougelman Company (of Chicago) were (family) related companies that produced prosthetic eyes. Those parties entered in three formal agreements starting in 1946, 1947, and 1948 regarding the joint operation of offices in Philadelphia, Boston, and Washington, D.C., as well as agreements with several other individuals. These legal agreements all dealt with the manufacture and sale of prosthetic eyes. No doubt due to the small number of people manufacturing and selling prosthetic eyes in those days, on June 23, 1949, the U.S. Department of Justice filed an anti-trust action based on a federal statute adopted by Congress in 1890, against Mager & Gougelman, Inc., the Paul Gougelman Company, Stanley Rybak, and Paul Gougelman (collectively: the “defendants”). The Department of Justice believed that the agreements stifled competition in the prosthetic eye manufacture and sales market. The case was considered by the federal district court in Illinois serving the Chicago area. Without any admission of wrongdoing or a trial, the Department of Justice and the defendants reached a settlement in the litigation, and the parties asked the federal court to enter an agreed upon judgment, which the court did in February 1952. The judgment terminated any agreements and contracts between the defendants and barred the defendants from working together to fix the price for prosthetic eyes in the free market or to divide the country into exclusive sales markets. Mager & Gougelman, Inc., was ordered to grant anyone requesting a license under the Travers Patent for prosthetic eyes based on competitive terms. The court retained jurisdiction to enforce the judgment, and the U.S. Department of Justice was granted a continuing right to access the defendant’s records in the future to make certain that the judgment was being complied with.

Regards,
Attorney Paul R. Gougelman, III
Weiss Serota Helfman Cole & Bierman
Fort Lauderdale, Florida

(Paul Gougelman Jr., only child born to ex-wife Jayne Henderson) April 18, 2021

As returning veterans molded the postwar era, they infused excitement even into their recreation —what else could be expected? Paul Jr found success off-hours—in speeding sports cars. (Figure 2) He was among the first to import Italian micro-shop racers from Giaur with highly-modified small engines. Beginning with his own Nardi in 1951, he drove four years' events in Class H (wheels fendered, engine under 750cc, weight often under 800 lbs., 45–65 hp). Though most of these tracks were between hay bales at abandoned airports, he also raced some climbs in dirt. Paul Jr was highly-ranked nationally, with top speeds that approached 110 mph. This amateur arena is today occupied by the Formula V class.^{1,2}

Paul Jr and his New York colleagues soon after entered into a new American Society of Ocularists for trade protection and professional development of ocularists.²² Meanwhile, M&G Chicago's original acrylic producer, Fritz Jardon, moved-on to manage American Optical (AO's) stock line. (Figure 6)

This era of prosthetic eye and office growth for Paul Gogleman Jr was not without problems. The U.S. Department of Justice filed an anti-trust action suit against Mager and Gogleman, Inc., the Paul Gogleman Company, Stanley Rybak and Paul Gogleman. (Table 1)²²

The 1960s

The profession of ocularistry was changing as independent eye-makers competed. After a collective business decision with M&G NY—a time for profit-taking, down-sizing, and diversification—the company sold most of the offices to their respective managements. Paul Jr had established an independent company, but left ocularistry and Chicago altogether in 1966, though he was still racing an E-2 class sailboat in Lake Michigan in 1968. His new Florida company ventured into real estate, plastic tile, and talking baby dolls.²¹

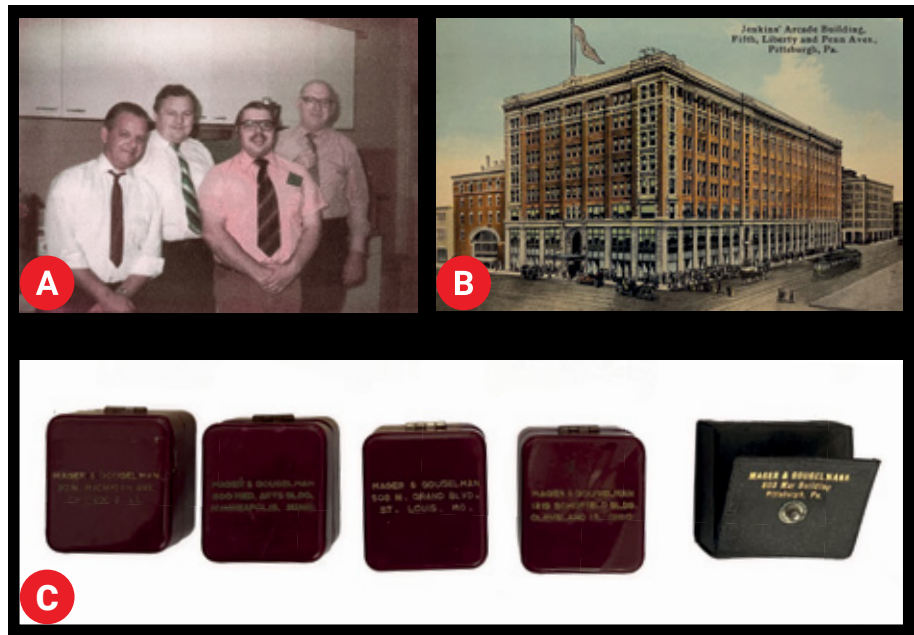


Figure 9. A. Several Paul Gougelman Jr., employees in Chicago, which includes, Ed Kerr, Frank Filipski, Pat Adkins, and Art Johnson, 1970. B. Hugo Leipold worked for Paul Gougelman at the Jenkins Arcade Building in Pittsburgh, Pennsylvania. C. Various prosthetic eye cases for Paul Gougelman's offices.

Alcon Acquires M&G Chicago

While Paul Jr returned to Chicago at times, especially in summer, an independent M&G Chicago was now controlled by two attorneys, with Hampton McLaughlin working as a fitter, and Stanley Rybak as the office manager. (Figure 9)

This group answered a considerable bid by Alcon Pharmaceuticals, and the assets of M&G Chicago were sold in 1972. This Alcon link seems reasonable only if to seed the prosthetic eye market with their new lubricant, Enuclene®.⁶ Purchasing M&G Chicago immediately gave them the single largest list of Midwest eye-wearers. However, by 1988, Alcon had dismantled its association with prosthetics, and the lubricant was discontinued in 2011.(Figure 10)

Although M&G Chicago had over 40 offices at one time, under Alcon it had reduced the number to two small, private-practice offices; Hampton, who continued after purchasing the Chicago office as an independent, finally sold it to retire.²¹ Alternate vendors will always fill an empty market, so very little remains of this dynamic enterprise, once an eye-making force in the Midwest.

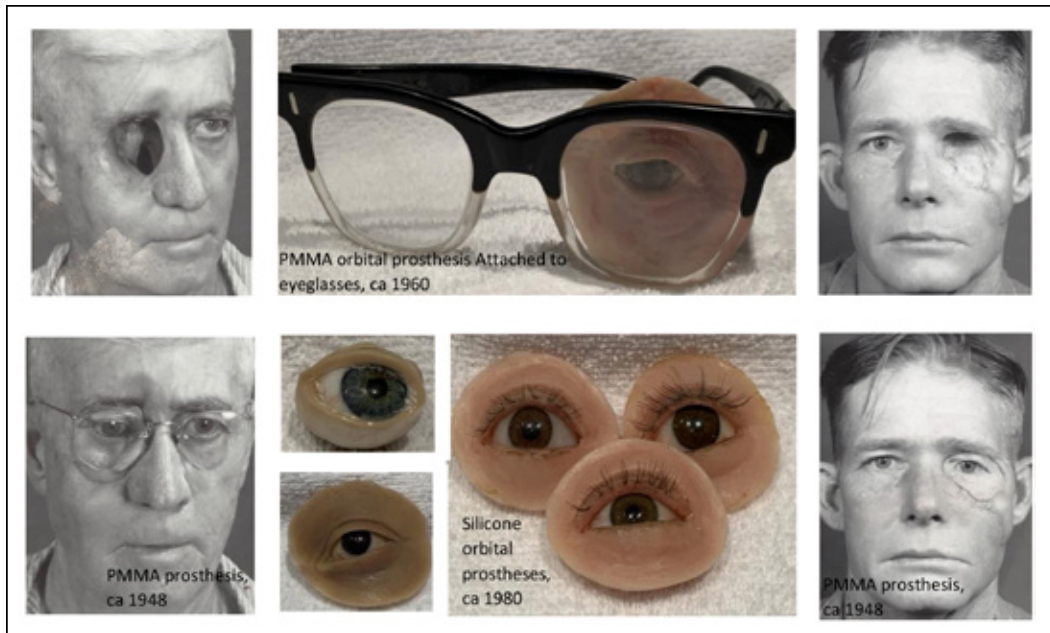


Figure 10. A. Over the counter prosthetic eye lubricant Enuclene, from Alcon Laboratories of Fort Worth, Texas. B. Referral card. C. Mager & Gougelman business card Division Alcon Laboratories, Inc., ca. 1972.

Conclusion

Enterprises of Paul Gougelman, Jr., in a long family tradition, advanced the practice of ophthalmology in the Midwest for thirty years. All current practitioners owe him a debt of gratitude for his promotion of the field, aiding in the acceptance of the specialty.²¹

Acknowledgments

Special thanks to the late Major Stanley Erpf, DDS, USA(R), who provided valuable insight and information (including original documents) of his pioneering work during WWII and at the Valley Forge Artificial Eye training facility in Phoenixville, Pennsylvania (by personal communication before his death in 2000). William “Bill” Dubois of Artificial Eye and Contact Lens Service of Bethesda, Maryland, before he passed on March 26, 1999. Great appreciation is also given to Paul Gougelman III, Robert and Vivian Scott, Dave Bulgarelli, Craig Luce, Henry Gougelman, and Carolyn O’Neill. Additional acknowledgment should be given to Paul Gougelman’s (former) ophthalmologist employees; Charles Workman, Ray Jahrling, and Pat Adkins, who provided valuable information, photographs, and encouragement for this retrospective article.

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ABOUT MICHAEL HUGHES

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Mr. Hughes served with the Veterans Administration in St. Louis and Washington, DC, as Chief of the Artificial Eye and Restorations Clinic before settling into the suburban Washington, D.C. area. Michael Hughes primary office is in Vienna, Virginia. He is the principle ocularist at the University of Virginia and maintains offices in Richmond and Roanoke, Virginia.

Michael Hughes is a Fellow member of the American Society of Ocularists.

A special interest of his is a medical—charitable mission to El Salvador, C.A., with EyeCare International: www.eyecareint.org.