

musical avocation has brought him into close touch with other optometrists with similar interests. He is married, with a family of one boy and two girls, and is now a grandfather twice over. His very charming wife Eleanor frequently graces the social gatherings of both the School and the professional associations. The hospitality and generosity of the Fishers at the various festive seasons are well remembered by generations of students.

The inauguration of Edward J. Fisher as President of The American Academy of Optometry is a tribute to a man and to his dedication, but in this case it is also something more. Professor Fisher is the first Canadian to lead this learned society of optometrists and visual scientists. His election is a tribute both to Canadian optometry and to an Academy which recognizes that science and learning have no national boundaries and which is able to make a practical demonstration of these principles.

WALWYN S. LONG

ACADEMY

SPECIAL

REPORT

HISTORY OF THE CINEMATIC USES OF COSMETIC CONTACT LENSES*

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ABSTRACT

A brief history of how contact lenses came to be used by the film industry as a form of eye makeup. Some of the technical aspects of fitting this type of contact lens are described as well as the types of theatrical effects made possible. A list of films in which cosmetic contact lenses have been used is presented along with the type of effect achieved.

My father, Reuben Greenspoon, O.D., was one of the pioneers in the contact lens field and he did much to make the public aware of the existence and practicality of contact lenses. A graduate of the Rochester School of Optometry, class of 1921, he practiced in New York for twelve years. During those twelve years he took many courses taught by Dr. William Feinbloom on the fitting of subnormal vision aids. At that time, contact lenses were considered a subnormal vision aid.

In December of 1932, he arrived in California. He took a post-graduate course in optometry at the University of Southern California, passed the State Board examinations, and set up a practice in downtown Los Angeles in the W. P. Story Building, in association with Dr. Arthur E. Hoare, who shared my father's interest in subnormal vision aids. My father has always been fascin-

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ed by the field of contact lenses, partly because of what he learned from Feinbloom, and partly because it allowed him to utilize some of the skills he learned as a dental technician. He was, and still is, a brilliant inventor and innovator. He lectured throughout the state and was instructor in subnormal vision and contact lenses at the Los Angeles School of Optometry from 1935 to 1940.

In 1936 he decided to move his practice out of the congested downtown area into the suburbs. He moved to the California Bank Building on Wilshire Boulevard and Beverly Drive in Beverly Hills. His practice in Beverly Hills thrived, and he became known throughout the state for his work with subnormal vision aids and contact lenses. Contact lens fitting was quite different in the 1930s than it was later to become¹. There were only two types of lenses to choose from, the Müller blown glass lens and the Zeiss ground lens, both manufactured in Germany. My father preferred the Zeiss lens, which was only natural when one considers the advantages and disadvantages of each. The Müller lens, fitted by trial and error only, looked like a glass shell eye with a transparent optic. As the lenses were blown, each scleral portion of each lens was different. A fit that was acceptable was a matter of chance. A good scleral and corneal fit were seldom combined in the same lens. If a good fit was found and then the lens was broken, there was no way of duplicating it, and the whole trial and error process had to be repeated. Moreover, the glass from which the Müller lenses were blown reacted with the tears. Thus, within eight to ten months, the glass became so roughened that the lens became useless.

The Zeiss lens, on the other hand, had many advantages. All the corneal portions were precision ground. The scleral portions were made to conform to accurate spherical curves which differed from one another in a systematic manner and were arranged in trial sets. The glass did not react with the tears or become rough. The only problem was that the scleral curves of human eyes were practically never spherical. It was necessary either to find the eye to fit the lens or regrind the scleral band. I can remember my father spending hours in the evenings in the laboratory he had set up at home laboriously regrinding the scleral sections of Zeiss lenses.

At about this time, Dallos² of Budapest, Hungary, described a method of taking a mold of the human eye with negocoll, a jello-like substance. My father improved the Dallos impression technique to a point where it became feasible for office use. Zeiss agreed to make lenses from my father's molds of the eye. These lenses were a great improvement over the old trial and error method but still left much to be desired. It was impossible to get a perfectly accurate mold of the eye because some eyeballs were found to be soft and large and therefore tended to lose their true shape when the impression shell and material pressed on the eye. Error also crept in because of expansion and contraction of materials and eye movement while the impression was being taken.

In 1939, with war clouds gathering over Europe, it became essential to find a means for producing contact lenses in this country from some material other than glass. The acrylic plastic, Plexiglass, because of its optical properties, workability, and lack of toxicity, seemed admirably suited for contact lens man-

ufacture. It became evident after some experimentation that it was a relatively simple process to produce contact lenses from this material. My father then set about the task of doing a statistical analysis of the scleral curves of several hundred eye impressions which he had made. From this analysis he formulated 85 composite trial lenses. None of the scleral portions were based on geometric curves, but on actual eye curves. After fitting many patients with this large trial set, a statistical analysis was again made, and it was found that 87 per cent of the patients were fitted with but 25 lenses. The other 13 per cent required oddly-shaped lenses. The final plastic trial set contained 25 lenses. Six lenses were symmetrical, five lenses were asymmetrical, seven lenses had the shortest radius vertically, and four lenses had the shortest radius horizontally. Also included was one cataract trial lens, one conical cornea lens, and one very high minus lens. With this trial set an optometrist, following a simple five-point procedure, could fit contact lenses. My father published his findings in the September, 1943, issue of *The American Journal of Optometry and Archives of American Academy of Optometry*³. Countless servicemen were fitted with contact lenses by this method during World War II. It wasn't until eight years later, with the advent of the corneal lens, that any real changes came about in contact lens technology.

Now that we have some background as to the state of the art in the late 1930s and 1940s, we can discuss how the motion picture industry discovered optometry and contact lenses. In 1939 the two producers of "Popular Science Short Subjects," Jerry Fairbanks and Bob Carlisle, at Paramount Studios, asked my father if he would like to do a full-length, color, short subject on contact lenses, showing how an actual patient was fitted before a worldwide movie audience. My father accepted the challenge. This short subject did much to call public attention not only to contact lenses, but to optometry as a profession⁴. This film also alerted movie makeup men to the potential use of contact lenses to achieve certain theatrical effects, such as color changes from blue to brown and brown to blue, illusions of blindness, cataract and age-dimmed eyes, and even the "morning-after look" of bloodshot eyes. The making up of the faces of Hollywood actors and actresses is a procedure of great importance to the success of a film⁵. Any face can be made to look like what the role requires in every detail except the eyes. Old eyes can never look young, and young eyes betray a makeup for old age which is otherwise perfect. To the makeup men, contact lenses seemed to be the answer to their need for perfect makeup, including the eyes. So began an association between the movie industry and optometry which still flourishes today.

The first picture in which contact lenses were utilized was a 1939 Metro-Goldwyn-Mayer picture entitled "Miracles for Sale"⁶. The plot, which was quite complicated, required the main character, played by Henry Hull, to have his natural brown eyes in some scenes and light blue eyes in others. The effect was accomplished by fitting him with Zeiss glass plano trial lenses and then fusing a blue ceramic material to the outside of the corneal section of the lens. The fusing was done in the oven of an East Los Angeles bottle factory while

everyone held his breath hoping that the lenses would not melt or change shape under the extreme heat.

Following is a description, in chronological order, of the various uses of contact lenses in motion pictures:

1940: R.K.O. used contact lenses to change the eye color of Joseph Cotten and Orson Welles for the motion picture, "Citizen Kane."

1941: As a second short subject film, "Popular Science" depicted the fitting of contact lenses and the creation of several eye makeup effects.

1943: In the film, "Jane Eyre," Orson Welles' eyes appeared to be scarred by fire.

1944: In "None Shall Escape," Alexander Knox's left eye was made to appear to pop out like a badly fitted glass eye.

1944: Nils Aster's eyes were aged for the film, "The Man in Half Moon Street."

1945: Herbert Marshall's eyes were made to appear blind in "The Enchanted Cottage."

1946: In "Night Song," Dana Andrews was made to appear blind through most of the picture until his vision was restored by an operation.

1947: In "The Twisted Road," Howard De Silva was made to look blind in the right eye.

1947: Alan Mowbray played the part of a hunchback in the film, "Captain from Castile," whose left eye turned up and out. This effect was accomplished with a cover eye.

1950: Debra Paget's eyes were changed from blue to brown so that she could play the part of an Indian girl in "Broken Arrow."

1951: In "Twenty-Three Paces to Baker Street," Van Johnson played the part of a blind detective.

1952: Allan Reed's eyes were changed from blue to brown so that he could play the part of a Mexican bandit in "Viva Zapata."

1952: Tor Johon was made to appear blind and grotesque for a role in "The Monster."

1954: In "Broken Lance," Elvis Presley's eyes were changed from blue to brown so that he could play the part of a half-breed. His fans didn't like it one bit!

1958: Curt Jurgens' eye color was changed from blue to brown so that he could play the part of a Chinese general in "The Inn of Sixth Happiness."

1960: In "The Story of Ruth," actress Peggy Wood's eyes were changed from blue to brown for the story taken from the Bible.

1963: The eyes of Jose Ferrer and of Diane Baker were changed from blue to dark brown for their roles as Hindus in "Nine Steps to Rama," a story about the assassination of Mahatma Gandhi.

1965: In the monumental George Stevens production about the life of Christ, "The Greatest Story Ever Told," Ed Wynn played the part of Lazerus, the blind man whose sight was restored by Jesus. Contact lenses were used to create the blind effect; they were removed after the miracle.

1968: In "Camelot," actor Laurence Naismith was fitted with half-silvered, mirrored contact lenses to create a most unusual effect for his role as Merlin, the Magician.

1968: In "Wait Until Dark," Audrey Hepburn was fitted with contact lenses to make her appear to be blind. It was quite a subtle effect, but she made maximum use of it and won an Academy Award nomination for her performance.

1968: The motion picture, "Planet of the Apes," required the most extensive makeup job ever done. In addition to face masks and full body makeup for all the principal actors, all those with blue eyes—ten actors in all—were fitted with brown contact lenses. Among those wearing lenses in the movie were veteran actors Roddy McDowell and James Whitmore.

1968: In the film, "The Boston Strangler," Tony Curtis played the part of the famous criminal who had brown eyes; Tony changed from blue to brown eyes for this part.

1969: In "Che Guevera," Omar Shariff will play the Cuban revolutionary who disguises himself with blue contact lenses in order to get into Bolivia undetected.

Clearly, cosmetic contact lens fitting has progressed from an experiment to an important part of the makeup artist's craft. We now use large corneal lenses almost exclusively. The average size is 11.5 mm. We fit slightly steeper than K with pronounced flattening at the periphery to contour the cornea all the way to the limbus. The lenses are designed for cinematic effect and patient comfort during relatively short wearing periods—not to exceed three hours. Rather than have the makeup man or the actor insert and remove the lenses, a procedure which has led to some problems in the past, I maintain a staff of contact lens technicians whom I have trained. One of these technicians is on the set at all times, is under my supervision, and is in charge of the lenses. She inserts and removes the lenses, is responsible for their hygienic condition, and, in the event of a problem, reports directly to me, since I bear the primary responsibility. We have never had a work stoppage on a film due to contact lenses. Since it costs the average company about \$50,000 per day in overhead to make a motion picture, one day's stoppage could be disastrous.

Cosmetic contact lens fitting, while a small facet of the profession of optometry, can be an immensely challenging and rewarding one.

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