



Einstein's Protege

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With his high button shoes and matching vests, 80-year-old Max Herzberger radiates Old World charm, but there is always a slightly disheveled air about him that reminds one of that childlike quality so often associated with his former teacher and friend Albert Einstein. Max's pockets are usually stuffed with books and his neckties are always askew.

Max, as everyone affectionately calls him, is in his own right one of this century's foremost scientists. He can look back over a long and fruitful career in the fields of optics and physics—with highlights such as the winning of the Cressy Morrison Award of the New York Academy of Science in 1945, the Ives Medal of the Optical Society of America in 1962, and, capping almost 30 years of research and hard work, the invention of the Superachromat camera lens after he came to the University of New Orleans in the late 60's. That lens is destined to revolutionize the future of color photography.

The personification of the absent-minded professor, Max Herzberger is famous for his mumbled introductions, simply because he can never remember names. Although he can memorize the most complicated formulas, recite Shakespeare, Plato, and Goethe by heart, and remember the most involved moves of championship chess games, he readily admits he has always had a terrible memory for everyday things. He even sheepishly confesses that he once walked home for miles in a blizzard because he had forgotten where he had parked his car.

The three Herzberger children—Ruth, Ursula, and Hans—laughingly relate how they grew up scrambling around floors in what came to be the family game—the daily “Treasure Hunt

for Papa's missing pens, keys, eyeglasses ad infinitum.”

A resident of New Orleans since 1968, when he was invited to join the Physics Department at UNO as consulting professor, Herzberger was born in Berlin in 1899.

Even as a young boy, he showed remarkable facility in mathematics, learning everything so quickly that the school allowed him to “play hookey” with its blessing, as long as he presented himself for final exams.

“I used to spend most of that off-time taking long walks and reading,” Herzberger reminisces. “For a while, however, no one could understand why I would come home everyday with my pockets ripped off, until they found out that, since I always had my face in a book, I'd usually keep myself from losing my way by brushing along the fenceposts or trees as I walked.” (This passion for peripathetic reading soon became a way of life. When Max was living in Rochester, New York, years later, he was regarded as a cherished local institution, and traffic lined up daily on Lake Avenue to let the professor read his way to work.)

So insatiable was Max's thirst for knowledge that his bewildered parents has misgivings about his budding genius. In desperation, they went so far as to burn all his scientific books and notes. “They feared I might become too high strung and my health would be affected,” explains Max. “When I was finally old enough to go to college, my father wanted me to be a lawyer, since he was convinced that mathematics was a ‘breadless study.’ As for me, however, I hated law, so we finally compromised, and I studied chemistry that first

semester. It interested me greatly, but I certainly broke a pile of test-tubes,” laughs Max, who confesses he is as clumsy with his hands as he is agile with his mind.

It was at the University of Berlin, where he graduated magna cum laude with a Ph.D. in Mathematics and Physics in 1923, that Herzberger became a student of Albert Einstein, who was later to become his friend and advisor.

“In my senior year I participated in a theoretical seminar in which we students had to give lectures on controversial themes, each guided by one of our professors. It was my good fortune to select a subject—statistical mechanics—which interested Einstein, so I went to his home several times to discuss the theme and spent many a pleasant hour accompanying him on his daily walks. How I enjoyed those talks we'd have, as we strolled across the countryside together. Also, he invited me to attend some of the chamber music concerts he sometimes held in his home, in which he himself participated. After I graduated, we stayed in contact with each other, and Einstein continued to follow my development with interest.

“When Hitler came to power in Germany in 1934, my professorship at the University of Jena and my contract with the Zeiss Optics Company were suddenly cancelled, so within that same week, my wife Edith and I, with our three young children—ages two, three, and five—decided to get out of Germany. We boarded the train with a total of \$10 in our pockets.

“Meanwhile, Einstein, who was already in the United States, urged me to accept a position he had arranged for me as head of Kodak's optical research laboratories in Rochester. I have never

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regretted following his advice. Thanks to him, I spent a happy 30 years at Kodak until my retirement in 1965, and my family and I have been U.S. citizens since 1940."

Once Herzberger was in New York, he visited Einstein many times, and their friendship grew closer over the years. On several occasions Max even arranged for leaves-of-absence to go to Princetown Institute For Advanced Studies to spend time there with his ex-teacher so he could exchange ideas and do research with him.

Max's memories of Einstein are many. "Not only did I learn a great deal from him as a scientist, but as a man. There was a warmth about him—an almost childlike charm—which enabled one to make contact with him immediately. He was always completely relaxed, never caring much about appearance. He especially enjoyed the beauties of nature. Formality and pretense of any form annoyed him. I remember once how he had to choose between attending a dinner party given in his honor by the Duke of Windsor or going to a special meal prepared for him by a gardener he had met by accident that day, and he chose the latter. He had no car. His house was more modest than most people of similar means would have had, with all the rooms filled with books and a study of Spartan simplicity. As a rule, he'd retire early. Around 9 p.m. his housekeeper or his step-daughter Margot would appear with a 'glass of milk for the Doctor' and ask you what you preferred to drink. That, of course, was really a discreet signal that it was getting near the Professor's bedtime."

The impact of Einstein's personality and his attitude towards science in general made an indelible impression on Herzberger. "He taught that one should question even what is written in books and study a problem over and over again from different angles. He believed a man should look for achievement rather than just success, and not worry if some of his ideas might be attacked along the way."

It was probably this approach which helped Herzberger invent his Superachromat camera lens and thus solve the problem of color distortion in glass, which had been stumping experts for over 300 years. The idea first came to Max in the mid-1940's and by 1954 he was finally able to demonstrate with mathematical equations that what the world had thought impossible was indeed theoretically possible. As far back as the 17th Century Isaac Newton had carried out the first recorded studies of color distortion in glass, but on the basis of the two known glasses available to him at that time, he had erroneously concluded it was not possible to make any color corrections at all.

Although from 80 to 300 glasses gradually became available commercially from the latter part of the 19th Century on, top men in the optical field still believed it would take one glass to correct each color—that is, if you wanted to correct 10 colors, you needed 10 glasses to reproduce each one faithfully, which consequently involved a system so complicated that other more serious problems were created. Not only did Herzberger solve the correction for color distortion with a

combination of only three glasses or lens, but in so doing, he also improved the accuracy for all visible colors to such a degree that the films of the 1950's and 60's were incapable of reproducing them. Kodak, therefore, hailed him for his sensational breakthrough, but felt that such a lens would be too expensive and impractical for the market at that time.

After his retirement from Kodak in 1965, Max spent a busy three years in Zurich, Switzerland, helping establish a graduate institute for optics in that country. It was not until three years later, in 1968, when he came to New Orleans that he was able to tackle the Superachromat theory again. With the help of physicist George Ioup and the UNO computer, Herzberger proceeded to wade through the approximate 30 million combinations of the more than 300 commercially available glasses, taken three at a time, in order to arrive at the most practical combinations for his triplet lens.

Meanwhile, as the photographic field developed and the quality of film and equipment improved, more precision was demanded and something as fine as Max's Superachromat lens became more desirable. Finally, in the early 1970's Hasselblad of Sweden—manufacturers of the primary camera used in space by the early astronauts—became the first company to put the Superachromat lens on the market. At the moment one of the principal uses of this lens is in high-resolution aerial photography, where sharp, true color pictures are required in order to spot details that would otherwise not be perceived. Actually, it is the photographic field which has had to grow into the perfection that the Herzberger lens offers.

Since his retirement two years ago from UNO, Max has been devoting much of his time to the development of a unified theory for all fields of physics—a problem that Einstein himself was working on during the last years of his life.

But, while not working, Max's favorite pastimes are preparing special gourmet recipes, taking leisurely rides through the country to contemplate nature, and reading poetry or plays aloud, which he does with a delightful flair for the dramatic. Also, as an expert chess player, he has kept as many as 38 games going at once. After one tournament at UNO, in which he had played 18 games simultaneously, one of his admiring opponents commented that the greatest strain seemed to have been more on Max's feet than on his mind. ♣