

Biographical Notes

Harold E. Edgerton

Harold E. Edgerton is, perhaps, best known for his invention of the stroboscope in 1931 which resulted from his studies of the transient oscillations of synchronous machines. Combined with photography, the strobe lighting system has extended the limits of the visible world far beyond the old horizons. The bullet going through the pack of playing cards, the flutter of a hummingbird's wings, the swing of a golf club as it hits the ball, bats in flight and other wonders of the unseen world have been seen so often by most of us that they are now almost commonplace. Aside from his invention of the stroboscope, Dr. Edgerton's activities and inventions in all phases of cinematography — in the air, under water and even in the human bloodstream ("Cinematography of Blood Flow in Man" (with Wells, Schildkraut and Teicher) in the August 1964 issue of the *Journal*) — have greatly advanced research and exploration in many disciplines.

Dr. Edgerton was born in 1903 in Fremont, Nebraska, and raised in Aurora, Nebraska. He was graduated from the University of Nebraska in 1925 with the B.S. degree in Electrical Engineering. He holds the M.S. degree and the Sc.D. degree from the Massachusetts Institute of Technology and the honorary degree of Doctor of Engineering from the University of Nebraska. He has also received honorary degrees from the University of South Carolina and Doane College, Crete, Nebraska.

Although his activities relating to high-speed photography and cinematography have ranged throughout the world, most of his career has been spent within an academic setting — Massachusetts Institute of Technology where, for many years, he was Professor of Electrical Engineering and is now Institute Professor Emeritus. He is also one of the founding partners of the firm of Edgerton, Germeshausen and Grier (now EG&G, Inc.) of which he is now Honorary Chairman of the Board.

In 1939 Dr. Edgerton and his associates at MIT adapted the stroboscope for use in night aerial reconnaissance photography and in 1944 Dr. Edgerton went to Italy and England to direct the use of his equipment by the Allied military forces. Strobe cameras, used for various purposes throughout World War II were used the night before D-Day when aerial photographs were taken of Normandy by piercing the clouds and the darkness with flashes of intense light.

In 1953 Dr. Edgerton took up underwater research under the sponsorship of the Research Committee of the National Geographic Society. He designed an electronic flashlamp and underwater camera capable of operating in the deepest parts of the ocean where the pressure is eight and one-half tons per square inch. Other underwater devices were perfected, such as the pinger and the boomer which use sound



Strobe lights surround Prof. Harold Edgerton in his Strobe Lab at MIT. The large reflectors were used for aerial photography where 40,000-W/s were discharged into xenon flashlamps. He holds a small experimental flashlamp that has an exposure time of less than a microsecond. A descendant of this lamp is used for the photography of bullets in flight. Part of a deep-sea camera is shown at the left. The camera and strobe, designed for a depth of 36,000 ft, are at the Smithsonian Institution, Washington, D.C.

waves instead of light to probe the ocean floor and beneath it.

Dr. Edgerton became a member of the Society in 1946. He was made a Fellow in 1948 and he is now (since 1968) an Honorary Member of the Society. He has served on and was Chairman of the Instrumentation and High-Speed Photography Committee and he was a member of the Board of Editors from 1956 until May 1970 when he resigned because of many undertakings which have increased in number and importance over the years.

He has contributed to the various International Congresses on High-Speed Photography. At the Third Congress (in London) he was Chairman of the Session on Flashlight sources and presented an outstanding popular lecture to Third Congress delegates and families. At the Fifth International Congress (Washington, D.C.) he was a member of the Committee of Honor and a Session Chairman. He presented two papers, "Holdover in Xenon Flashlamps" (with David A. Cahlander) and "Sub-microsecond Flash Sources" (with John Tredwell and Kenneth W. Cooper, Jr.). The papers appear in the Fifth Congress *Proceedings* and in the *Journal* (January 1961 and March 1961).

He has published extensively in scientific journals. He is the author or co-author of 13 *Journal* papers, among them "Electrical Flash Photography" (March 1949, Pt. II, a special issue on High-Speed Photography)

and (with R. S. Carlson) "The Stroboscope" (July 1950). Later papers include (with Lloyd D. Hoadley) "Cameras and Lights for Underwater Use" (July 1955) and "Photography of Very Early States of Nuclear Explosions" (Feb. 1959).

He is the author of two books. *Flash, Seeing the Unseen* (co-author, James R. Killian, Jr.) was published in 1939 and revised in 1954 (Bradford Press, Newton, Mass.). It contains numerous examples of high-speed photography and is often cited as a basic reference source for classical photographs of golf, nature, sports, etc. *Electronic Flash, Strobe*, a technical book published in April, 1970, by McGraw-Hill, New York, gives numerous details of the specialized circuits of high-speed photography and describes many applications.

The list of honors and awards for his work is extensive. He has received two SMPTE awards, the Progress Award (1959) and the E. I. du Pont Gold Medal Award (1962). A few of the other awards he has received include the Medal (1936) and the Silver Progress Medal (1964) Awards of the Royal Photographic Society of London, the Potts Medal of the Franklin Institute (1941), the Franklin L. Burr Prize (1953) and the La Gorce Medal (1968) of the National Geographic Society, the Morris E. Leeds Award of the Institute of Electrical and Electronic Engineers (1965) and the Richardson Medal of the Optical Society of America (1968).

Ben Schlanger

Ben Schlanger has achieved international recognition as one of the most important contemporary influences on the development of cinema and theater architecture. The cinema-addict or dedicated moviegoer — and there are more of them and they demand more than was the case 10 or 20 years ago — can, in most modern theaters, sit in comfort with plenty of leg room, can watch the screen without eyestrain and no matter where they sit — back row, front row or at the side — can have an unobstructed view of the screen. Probably few of the vast motion-picture audience have heard of Ben Schlanger, but legs, eyes and other parts of the anatomy owe him a vote of thanks as, indeed, does the total moviegoer who, through Mr. Schlanger's efforts, can participate fully in a dramatic and artistic experience.

Ben Schlanger has reached the age of semi-retirement but he continues to work with the creative imagination and the energy that have been his since the beginning of his career. A mere listing of his notable achievements and publications would extend far beyond the limits of a brief Biographical Note, so only a few of his activities can be noted here.

He was born in New York City on November 20, 1904, and was educated at Columbia University and the Beaux-Arts Institute of Design (now the National Institute of Architectural Education). A few of the projects on which he has been the original architect or consultant include the United Nations General Assembly Hall and Conference Rooms; Metropolitan Opera and New York State Theater, Lincoln Center; Cinema I and Cinema II, New York; Kennedy Cultural Centre, Washington, D.C.; the Shiela Theatre 70 in New Delhi (India's first 70mm theater); and the Twin Theaters at Williamsburg in Virginia. He has received two Ford Foundation grants for research in theater design.

Mr. Schlanger is a Life Fellow of the Society and he has participated actively in Society affairs since he became a member in 1931. He is the author of 18 papers that have appeared in the *Journal* beginning with a "revolutionary" paper entitled "Reversing the Form and Inclination of the Motion Picture Theater Floor for Improving Vision," in the August 1931 issue of the *Journal*.

This is an important paper, not only for its historical interest, but also because it explains in broad as well as explicit terms one facet of the problem toward the solution of which Mr. Schlanger has worked for 40 years. In that paper he said, "In the motion-picture theater, vision must be more delicately dealt with than ever because the screen performance is a thing of sheer light. Audibility must be more meticulously cared for because the sounds of the screen are greatly amplified sound . . . good acoustics and good vision contribute to the patron's comfort as much as do well-upholstered seats and ample ventilation."

In 1931 stage performances were frequently combined with motion-picture programs. (New York's famous Rockettes are among the few (perhaps the only) exponents of this hoary tradition.) One of the listeners who took part in the discussion following the presentation of the paper



Ben Schlanger and the Mayor of Delhi, Hansraj Gupta, at a reception in New Delhi given in honor of Mr. Schlanger by D. C. Kaushish, owner of Shiela Theatre 70.

raised some objections. "In the type of theater which Mr. Schlanger has described," he said, "it would be practically impossible to have the 'flesh show' which has appeared to be necessary in the deluxe houses. In fact, even second-rate houses have been putting on 'flesh shows' to stimulate attendance. I believe that a house of 1700 seats would never require a large screen . . ."

Another of the audience feared that Mr. Schlanger was proposing a "radical departure," although he noted that "this is a serious attempt to build a theater around the optics of the motion picture . . ."

It is interesting to note the contrast between the "oriental voluptuousness" of theater decoration in the 30s (of which there are very few remaining examples) and the motion-picture theaters of today which embody the "radical departures" proposed by Mr. Schlanger 40 years ago.

A more recent paper by Mr. Schlanger appeared in the September 1961 issue of the *Journal*. "Motion-Picture System From Camera to Viewer" describes the twin theaters of Colonial Williamsburg, now regarded as a milestone in modern motion-picture presentation. The paper appeared with a paper by Arthur L. Smith, "Planning for the Film Presentation," which describes the overall approach to the project and the problems to which solutions were found. In his paper, Mr. Smith said, "It was Mr. Schlanger who, from the outset, insisted that, properly, the conception of a film, its production and its exhibition are all one continuous and related process."

The honors that have accrued to Mr. Schlanger over the years make an impressive list. Only a few months ago he visited India during a round-the-world trip and while in New Delhi he visited Shiela Theatre 70 which he designed some 10 years ago. While in New Delhi, a reception was given in his honor by Mr. and Mrs. D. C. Kaushish at which he was warmly welcomed by Indian officials, representatives of the Indian press and personages of the motion-picture world.

At present he is acting as consultant in the construction of the Sydney Opera House in Sydney, Australia, which will house a modern cinema theater. This new theater will be the visible expression of an entirely new approach to the production

and exhibition of motion pictures, Mr. Schlanger said. He added that the new system will result (for the viewer) in an experience that can in no way be compared to home TV viewing.

Raymond W. Gast

Raymond W. Gast, who was called "Mr. Television" by his confreres upon the occasion of his retirement from the Bell System in June 1969, joined Bell (New York Telephone Company) in 1926, following his graduation from Stevens Institute of Technology. His career in communications has been singularly consistent; during his early teens he became actively interested in radio and while at Stevens Institute he divided his time between studying engineering and operating his amateur radio station. During school vacation he served as radio operator on merchant ships. He still has an amateur radio license (call W2WG).



At the New York Telephone Company, Mr. Gast served in various technical and administrative positions until the outset of World War II when he joined Bell Telephone Laboratories to participate in an intensive program to develop military electronics devices. In 1945 he returned to New York Telephone. At that time commercial television was in its infancy and Mr. Gast joined a small group pioneering in the art of video transmission over telephone cables and microwave. Regular telephone lines with special amplifiers every mile were made to carry many of the early TV programs.

One of Ray Gast's early projects was the original microwave terminal on the Empire State Building which soon became a major pickup location serving all the broadcasters. Mr. Gast recalls that the large Plexiglas housings over the antennas were jokingly called Ray-Domes, but he says modestly that the idea had been used before.

From 1962 until his retirement he had the post of Data Services Engineer (wide-band, TV and radio) with responsibility for facilities for broadcasters and educational and industrial users. He also directed engineering work for CATV distribution, data transmission and Picture-phone.

He was a member (1962-1969) of the Network Transmission Committee composed of representatives of three broadcasting networks and the Bell System. The group prepared a booklet, *TV Signal Analysis*, and other reports. The group

was also concerned with VITS (vertical interval test signals). Mr. Gast participated with this group in regional meetings throughout the United States and he also participated in AT&T-Ford Foundation meetings on satellite proposals.

He was a participant in a panel discussion on Network Transmission Coordination in the United States and Canada at the Society's Technical Conference in Montreal on November 4, 1965. A transcript of the discussion was published in the May 1967 issue of the *Journal* (pp. 468-480). Mr. Gast described "Provision of Pickup Facilities of Special Events," presenting details of broadcasting arrangements for the visit of Pope Paul to New York in October 1965.

Among Mr. Gast's published papers is "Interconnection of Studios for Videotape Recording," which appeared in the December 1959 issue of the *Journal*. He has been a member of the Society since 1959. He is a senior member of the Institute of Electrical and Electronic Engineers. He resides at 192 Midland Ave., Glen Ridge, NJ 07028.

F. Alton Everest

F. Alton Everest is now stationed in Kowloon, Hong Kong, as Senior Lecturer at Hong Kong Baptist College (224 Waterloo Road, Dept. of Communication), following retirement from Moody Institute of Science where he had spent 25 years and where he served as Director of Science and Production. He received his Bachelor of Science degree from Oregon State University and a degree in Electrical Engineering from Stan-



ford University. He also did graduate work in Physics at the University of California at Los Angeles.

In 1936 he returned to Oregon State University where he served as Assistant Professor of Electrical Engineering. During World War II he directed research for the U.S. Navy under a University of California contract at San Diego. This research embraced the fields of sound transmission in the sea, ambient noises of the sea and psychophysics of hearing desired sounds in the presence of undesired sounds.

In 1945 he joined with Dr. Irwin A. Moon in the founding of Moody Institute of Science in Los Angeles. He has been an active figure in the production of the Moody science films and in the development of the special photographic and scientific equipment.

Dr. Everest became a member of the Society in 1952 and was made a Fellow in 1963. He has made a number of contributions to the *Journal*, including a paper on multiple-camera control (with Irwin A. Moon) which appeared in the September

1955 issue of the *Journal* (pp. 485-490). Two of his most recent papers on scientific subjects are "Time-Lapse Cinematography" (with Irwin A. Moon) in the February 1967 issue of the *Journal* and "The Efficient Use of Light in Macrocinematography" (September 1962). This paper is especially interesting in that it describes the technical work of the Moody Institute of Science on the famous film, *City of the Bees*. This was a 10-year project during the course of which many apparently insoluble photographic problems were solved. As Dr. Everest said, "In particular, the demand for greater depth of field and for light sources that do not cook the bees encouraged a re-thinking of optical and illumination systems . . ." This film was screened for the Hollywood Section and twice at the Society's Conference in Boston in 1963.

Dr. Everest has received a number of academic honors including membership in Sigma Xi (national research society), Eta Kappa Nu (electrical engineering honorary) and an honorary Doctor of Science degree from Wheaton College. He has published over forty papers on radio, television, cinematography and acoustics. He was one of the founding members of the American Scientific Affiliation in 1941 and served as its president for ten years. He has recently completed four years of service on the Board of Managers of the Hollywood Section of the SMPTE.

"Exciting things are happening in Asia," he recently reported. "Training Asians in the mass media has great strategic importance, especially for the moral and spiritual development of a third of the world's people." His plans include the establishment of a new motion-picture production curriculum at the college.