A taste of the late '40s through the early '60s found in amateur stereo slides

by Mark Willke

Vacation Stereos

I always enjoy road trips—they usually seem to offer many opportunities for making stereo views along the way. I also enjoy stereo slides taken on vacations in the 1950s and 60s. Such views allow me to accompany other families on their own road trips decades ago. (I especially enjoy finding vacation slides from that era showing destinations I have visited myself, so that I can compare them with my own slides and see what has changed!)

Our first slide this time shows the Mo’Mart Motel (or at least its sign and pool area). There are some notes on the slide mount, but unfortunately they do not include any clues about the motel’s location—just the names of some of the vacationers in the photo. The hills in the background appear very dry and brown, so I’m guessing it’s hot there. Shot on some sort of non-archival film like Anscochrome, this slide has faded to mostly magenta overall, and is mounted in a cardboard “Visumount”. Our second view is mounted in a cardboard Kodak Kodachrome mount, which is stamped July of ’65. “World’s Fair 1939” is hand-written on the mount, but obviously this is not a photo from 1939, so I had guessed that maybe the fairgrounds from that original event still existed in 1965. However, our editor and world’s fair scholar John Dennis informed me that this view is from the ’64-65 New York World’s Fair, Flushing Meadows, NY, which was held on the site of the ’39-40 World’s Fair. While the location was the same, he tells me that all the exhibits for the ’64-65 fair were new or completely rebuilt—and few survived, just like in the 1940s.

The area shown appears to have had quite an automotive flavor, with the Sinclair building on the left and the (hysterically funny, in my mind!) U.S. Royal Tires ferris wheel on the right. “Ride the U.S. Royal Giant Tire and get a bird’s eye view of the fair” reads the sign at its base. I wish I could have!

This column combines a love of stereo photography with a fondness for 1950s-era styling, design and decor by sharing amateur stereo slides shot in the “golden age” of the Stereo Realist—the late 1940s through the early 1960s. From clothing and hairstyles to home decor to modes of transportation, these frozen moments of time show what things were really like in the middle of the twentieth century. If you’ve found a classic ’50s-era slide that you would like to share through this column, please send it to: Fifties Flavored Finds, 5610 SE 71st, Portland, OR 97206.

As space allows, we will select a couple of images to reproduce in each issue. This is not a contest—just a place to share and enjoy. Please limit your submission to a single slide. If the subject, date, location, photographer or other details are known, please send that along too, but we’ll understand if it’s not available. Please include return postage with your slide. Slides will be returned within 6 to 14 weeks, and while we’ll treat your slide as carefully as our own, Stereo World and the NSA assume no responsibility for its safety.
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Coming Soon to a Stereo World Near You...

Front Cover:
The late T.K. Treadwell examines potential additions to his collection of views while room hopping at the 1997 NSA convention in Bellevue, WA. More about his amazing life and the many contributions to the NSA by this founding member appears in our memorial to him in this issue.

Back Cover:
George W. Baldwin, "O.S. Phelp's Adirondack Guide." This legendary Adirondack guide was a favorite among artists and writers who were attracted to the wild beauty of Keene Valley, NY. For several more views of the area and the story of this skilled stereographer, see the feature by Guenther Bauer, "George W. Baldwin's Gems of the Adirondacks."
That Missing NSA Survey...

A mix-up in communications with the mailing service left the promised NSA Stereo Survey out of the previous issue. This time, you should find it inserted in the envelope. As we said before, please help us better respond to the needs of our membership by answering as many questions as possible and returning the form by early September.

Tex

Tex Treadwell is no doubt the only founding member of the NSA whose life story required clearance from the CIA before publication. Our memorial to Tex in this issue draws heavily on the detailed autobiography he wrote and published in a private edition in 1993-94. It's not that there was too little to talk about concerning his years with the NSA, but it seemed only fitting that the general membership get at least an overview of the astounding life he documented in such detail for those he thought would be most interested.

The choice of just which details to include in a memorial was more delicate in this case than than most others. Tex withheld very little in documenting everything from youthful misadventures to the most intimate details of his adult life. The fact that the latter was often combined with intelligence work during his international oceanographic travels only made it more crucial to avoid anything that might in any way resemble a tabloid approach to some readers. (Although Tex would probably enjoy the thought).

As it stands, the memorial attempts to touch on all aspects of Tex's life. To completely ignore some would be just as much an injustice as to sensationalize them. Tex was always very direct in his dealings with people, and it's in that spirit that the tribute to him is presented.

Upcoming Stereo Conventions

2003
- PSA International Conference of Photography: September 1-6, 2003, Adam’s Mark Hotel, Houston, Texas www.psa-photo.org

2004
- NSA: July 8-12, 2004 The 30th annual NSA Convention! Doubletree Jantzen Beach Hotel, Portland, Oregon. Contact Diane

2005
- ISU: September 7-11, 2005 Eastbourne, UK http://stereoscopy.com/isu/

2006
- NSA: July 2006, Miami, Florida.

2007
- NSA/ISU: July 10-15, 2007 (Possible additional days on the 16th and 17th for field trips). Boise, Idaho; contact David W. Kesner, drdave@ddpphotography.com

Coming Soon to a Stereo World Near You...

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to update images when necessary. Due to the extremely high security and my need to enter Ellis Island by way of the Federal Bridge, I was in need of the official ID shown here—of which I am very proud!

Gary and I plan to produce a 3-D slide show for the 2004 NSA Convention, a Stereo World feature article, and other projects.

Long Buried German 3-D Films

As a follow-up to our feature on the history of Zeiss Ikon stereo cameras (Vol. 29 No. 2), Zeiss Ikon and Stereo Cinematography will describe the development of various 3-D film systems by the company in the 1930s, including sam-
About two years ago I was lucky to obtain a glimpse of the "South Side" of Ellis Island. This was arranged by Ellis Island employee, Eric Byron, of the Museum Division/Exhibits Department. Eric is also a member of the New York Stereo Society and the NSA. The South Side comprises 29 of the 32 buildings of Ellis Island. They include the Hospital Complex, the Ferry Building, Psychopathic Ward, Measles Wards, Isolation Wards, Surgeon's home, Morgue, Nurses Residence, etc. In 1954, when Ellis Island closed, all the buildings were left to decay and deteriorate. In the 1990s, three of the buildings were restored including what is now the Ellis Island Immigration Museum—the only building open to the public. The rest of the buildings continue to deteriorate and, for safety and security reasons, are off limits to the public.

When I viewed these decaying conditions I told Eric of the importance of 3-D documentation for Ellis Island's vast archives. Eric, who understands the value of 3-D, agreed—but things move slowly in government bureaucracy. A few months later my friend and NSA member Gary Schacker was visiting New York City from his home in San Diego, California. Eric was kind enough to arrange for Gary and I to see the South Side for a few minutes. We again discussed the value and importance of 3-D documentation. A few months after that, at a New York Stereo Society meeting, Eric told me that there was a possibility of being granted approval of my proposal. Over the next few weeks I attended a few meetings at Ellis Island to discuss details of the proposed documentation—and approval was granted! I knew this was not a "one man" job—so I invited Gary Schacker, an excellent stereographer, to work on this project with me. Despite living 3,000 miles away, Gary immediately agreed.

The financial cost of this venture was substantial, so I applied for an NSA Grant. Both the NSA and Ellis Island provided generous funds to help defray our out of pocket costs. Gary and I started photographing this spring. After a week of 10 hour days, and over 100 rolls of film, we completed our 3-D photographic documentation. The timing was perfect, as the South Side has been declared one of the "world's most threatened culturally significant sites" and "one of America's most endangered historic places"—leading to funds from Federal and State agencies for the current stabilization and restoration. One of the most important historical sites in America is now documented in 3-D and will soon be part of the Ellis Island archives—available to all—including the descendants of the 12 million immigrants who passed through its doors from 1892-1954. I continue to meet with Deputy Superintendent Cynthia Garrett, Eric, and others at Ellis Island to discuss exhibit possibilities, presentations, fund raising, etc. as well as...

(Continued on previous page)
A Tex Memorial
T.K. Treadwell 1920–2003

There are those whose biographies can too easily persuade most of the rest of us that somewhere along the line, we missed not just the boat but the train, the plane, the bus and who knows how many other opportunities for a far more interesting and exciting life. When Thurman Kelso Treadwell died at age 82 on April 1, 2003, the world unquestionably lost one of those people, with that particular date adding a final ironic hint (as if needed) that his had been the sort of life a fiction writer would have found in need of serious editing to fit it all into a plausible narrative.

Early on in my affiliation with the NSA, I realized the organization was made up of individuals from an astonishing variety of backgrounds in the sciences, medicine, the military, academia and the arts. Some groups of collectors and enthusiasts evidently exist to alleviate the boredom of otherwise desperate people, but conversations at NSA conventions can effortlessly drift into intriguing subjects far from stereography that can be just as enlightening as the 3-D chatter. T.K. Treadwell was an extraordinary example of the rich variety of knowledge and experience to be found within the NSA. I know that without our shared interest in stereo I would never have met anyone remotely like him—or even have imagined that anyone of the sort existed.

Just one hint of the range of his expertise and experience can be found in the fact that "Tex" Treadwell, as he was known to anyone who had known him for more than two minutes, actually received awards from two NSAs—the National Stereoscopic Association and the National Security Agency. That this is just one minor detail buried in the story of a very busy life attests to its global complexity that can barely be touched upon here.

In 1993, with the private publication of the first installment of his multi-volume "Unauthorized Autobiography", Tex included these instructions in the cover letter: "I send it to you so that when it comes time for you to write my obit for Stereo World all you'll have..."
to do is put them in a large iron kettle, boil them down for a week or so, and take out the residual short paragraph of worthwhile data."

It took a little longer than a week—the challenge being to boil hundreds of pages of stories based on his faithfully kept diaries down to something more than a paragraph but less than a book. It hardly helps that accounts of his high school and college days and of his many years in the Navy can make him seem like some unlikely fusion of Tom Swift, Henry Miller and James Bond. Growing up smart and resourceful in the small Oklahoma town of Ada allowed him to mature early and perfect an ability to quickly put nearly any- one he met at ease. He described it as simply "a gift of gab", but it would eventually open the world to him.

Tex received his first camera at the age of 12 in 1932 and remained an active photographer for most of his life. By high school he had progressed to the point of processing his own film & shooting everything from scenics to nudes. His work would eventually be published in national magazines and receive several PSA awards, as well as lavishly illustrate his autobiography.

His early jobs included work in local cafes and newspaper delivery on his bike around Ada, which brought him into contact with some of the women who later posed for him. Riskier was his stint at capturing rattlesnakes for a lab but less than a book. It hard-

Fred had just had lunch with Pretty Boy Floyd and Wilma. Proof was offered the skeptical teenager when a sack of cash was lifted from among several guns on the floor of the car and a twenty-handled him as a souvenir. After a quick agreement that Tex hadn't seen anybody, the couple roared off, about a year before Floyd was to be gunned down by the FBI in Ohio.

Pretty Boy Floyd wasn't the only "celebrity" Tex was to meet during geological field work. While at East Central State Teachers College, one of the visiting geologists he guided around the Ada area was Bill Darrar, who he would meet again years later after both had become interested in collecting stereoviews!

Tex graduated from Horace Mann High School in Ada, an institution that was virtually a part of East Central State Teachers College with an unusually qualified faculty. His small class in this intensive educational environment developed into an elite group of bohemians whose outlook on sex, drinking, and life in general would have been more at home in the California of the 1960s than in the Oklahoma of the 1930s. After graduation, much of the same group made the easy transition to East Central State Teachers College.

Hoping to get into the Army Air Corps, Tex took Civilian Pilot training courses in 1941. During a final examination flight, the instructor ordered him to fly upside down, but the over eager student had forgotten to fasten his
The Tex Treadwell Award would be presented at annual conventions for the best exhibition of stereo view cards. (Stereo by Bill C. Walton)

As if once weren't enough, Tex again fell from a moving aircraft some years later when doing survey photography. He hadn't yet fastened his safety line when the pilot of the helicopter tilted it toward the open door, dumping Tex out. Fortunately, he landed in dense forest canopy foliage about 15 feet below and was winched back into the chopper before slipping through the canopy. In all, he survived four helicopter crashes as a passenger but went on to earn his wings in both fixed-wing aircraft and helicopters.

His actual service in World War II was in the Navy, which led him from geology into oceanography and marine cartography. Although awarded medals for his marine acoustics research and three combat cruises as an officer aboard submarines in the western Pacific (receiving a Purple Heart), he jumped at the opportunity to join the Navy Hydrographic Office in 1945. Field survey work with this team would take him to Mexico, Labrador, Greenland, the Caribbean islands, Latin America and the arctic as well as to graduate study at the Scripps Institution of Oceanography. He had by this time married his college sweetheart Nell McNeely and started a family.

In the early 1950s he was contacted by Naval Intelligence and the CIA to collect information, first on scientific matters, later on political and military topics, in the various countries his surveying and

T.K. Treadwell Honors and Awards

American Association of University Professors, 1976, Award for Contributions to Development of Women in Education
Boy Scouts of America, 1936, Eagle Scout
Brazil, 1969, Presidential Medal of Merit
Canada, 1957, Arctic Exploration Medal
Central Intelligence Agency, 1970, Distinguished Service Award
Chile, 1974, O'Higgins Medal for Scientific Research
Denmark, 1951, Distinguished Scientific Research Award
Department of Defense, 1966, Letter of Commendation
Department of Interior, 1962, Diploma of Appreciation
Explorers Club, 1963, Distinguished Achievement Award
Haiti, 1960, Dessalines Medal of Military Honor
Iran, 1962, Medal for Arts and Sciences
Marine Technology Society, 1964, Medal for Innovation in Marine Technology
Maryland, 1967, Governor's Award for Environmental Research
Mexico, 1949, Lopez Lira Scientific Service Medal
National Association for the Advancement of Colored People, 1966, Medal for Outstanding Service
National Geographic Society, 1965, Certificate of Contribution
National Science Foundation, 1988, Distinguished Service Award
National Security Agency, 1968, Distinguished Service Award
Navy, 1942-1968, Navy Cross, Distinguished Service Medal, Purple Heart Medal, Antarctic Service medal
Saudi Arabia, 1953, Medal of Scientific Achievement, Order of the Falcon
Soviet Union Academy of Science, 1968, Diploma of Appreciation
Soviet Union Institute of Marine Fisheries, 1967, Diploma of Appreciation
Soviet Union Institute of Oceanology, 1966, Honorary Staff Scientist
Texas, 1977, Governor's Distinguished Service Award
Texas A&M University, 1973, Minnie Piper Stevens Award for Teaching Innovation
Texas A&M University, 1978, Regents' Citation for Distinguished Research
Texas A&M University, 1984, Chancellor's Award for Teaching Excellence
Turkey, 1953, Presidential Diploma of Appreciation
Venezuela, 1948, Diploma of Scientific Contribution
oceanography assignments sent him. As Tex explained:

From their point of view I was perfect, having both an entrée and a plausible cover story. I had to be in foreign countries to do my work, and it was taken for granted that I’d be in touch with my peers in a variety of situations. My assignments expanded from adventitious windfalls of information into seeking out pieces of desired data, or carrying out specific tasks. Over the years these dealings became every bit as time-consuming as my nominal work but I didn’t really mind; they indeed provided a welcome change from my usual administrative drudgery.

Just how much of a change that would be became evident in 1959 when, after asking to be assigned as Naval Attaché in Venezuela, he was instead sent to Haiti as Chief of the U.S. Navy Mission there. His cover was a training mission for the Haitian Coast Guard, but his real assignment was to make contact with the small Cuban diplomatic office in Haiti. The hope was that through informal, secret contacts, an opening for more U.S. communication with, and influence over, the new Castro government might be initiated.

Tex’s main Cuban contact was Señora Martinez (a cousin of Fidel!), with whom international relations soon became very close, even if the proposed U.S. trade deals in exchange for Cuba abandoning Soviet support never got much attention outside Port-au-Prince. Tex concluded, “Castro felt (and I think astutely) that regardless of what we promised, America wouldn’t support a socialist or communist-type government for very long; we’d play along and then jerk the rug out from under him at the first opportunity.”

As Tex makes clear at several points, his wife Nell was completely aware of his extramarital activities over the years, and neither had any doubts about their enduring feelings for each other. Whatever the nature of their commitment, their marriage lasted through absence and illness until Nell’s death in 1992.

Thanks to his oceanographic contacts with several Soviet scientists through UNESCO and other international groups, Tex was picked by Naval Intelligence to participate in the first exchange of marine scientists between Russia and the U.S. in 1964. The fact that he was being sent to gather intelligence as much as share marine science was hardly a secret, as part of

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**T.K. Treadwell Books and Monographs**

**Books**

- *Stereographers of the World*, T.K. Treadwell & W. C. Darrah, 2 vols., 8½" x 14", 1994. Annotated check-list of all reported stereo makers world-wide, over 13,000 entries; categorized by country or state.
- *The Masters of English Genre*, T.K. Treadwell, The Institute for Photographic Research, 94 pp., 103 color illustrations, practically all in full-sized stereoview format; lists almost 1,500 titles of English classic genre stereos by 18 identified photographers & 9 anon. makers.
- *Stolen Stereoviews: The pirating of images*; T.K. Treadwell, The Institute for Photographic Research, 32 pp., 48 illustrations in full-sized stereo format; analysis of the practice of illegal copying of stereoviews with many examples.

**Monographs**

(In-depth biographical information, plus listings and examples of all known stereoviews by a photographer or company.)

- London Stereoscopic Co.'s "North American Series"
- George Stacy of New York City
- John Heywood of Massachusetts
- John Soule of Boston
- The Kilburn Brothers of Littleton, NH
- The Anthony Co.
- G. W. Wilson (Scotland)
- F.G. Weller (NH)

Tex also assembled 35 Stereoview Lists compiled primarily from those known in collections. Most of the lists have examples of the photographer's work and include a brief biography.

For details about particular publications, their prices and availability, contact the NSA Book Service, 23575 C.R. 77, Calhan, CO 80808.
the agreement was that a Soviet naval officer would likewise be on the team coming to the U.S. The two naval officers, in fact, were allowed to start their respective visits a month ahead of the scientific teams—a measure of how much more easily the two intelligence and military communities could relate to each other than could the politicians.

The openness of the arrangement perfectly suited Tex's personality and pragmatic political outlook. In fact, he got along with most of the Russian scientists, security and military people better than with the others in his own visiting group. As a known spy (although he never worked directly for Naval intelligence or the CIA), Tex was assigned guides for the various parts of the USSR where he would visit marine science facilities. All were of course KGB agents, and all were attractive young women. Within hours of meeting them, Tex was able to learn what their KGB instructions regarding him were, and he related in turn what he had learned about them from his contact at the U.S. Embassy. The general idea was of course the classic effort to "compromise" the American officer to gain some influence over him.

With the knowledge and cautious approval of the embassy, Tex simply went ahead and enjoyed the attentions of the young women in the hope that more information would eventually be shared with a "compromised" agent than with one who remained intractably proper. He was equally open about this strategy itself, and later allowed the "secret" filming of one romantic encounter when he learned that the film would be used to train future KGB agents in the art of seduction. He then actually talked his way into the first screening of the finished film at KGB headquarters. Not only was he given a "Visitor" badge to Building 127 (which most Soviet officials couldn't even enter), but just before the screening a high ranking KGB official handed him a KGB insignia watch as "a personal memento of our organization."

While touring marine research facilities around the USSR, Tex managed to do some actual spying by simply walking into the often adjacent naval bases and looking around. After an especially bold stroll through the nuclear submarine base at Murmansk, he returned to the lunch room through the same side door that led into the base and told the Russian security man what he had just done. After a brief conversation about arrest and expulsion or jail, Tex convinced the uneasy man that his best course was to further his career by warning his superiors of the potential for such a security breech rather than admitting that it had actually happened.

Remembering Tex Treadwell

It was the summer of 1983 when I first met Tex Treadwell. Previous to that, my contacts with him had been through correspondence concerning stereo photographs in the National Anthropological Archives. I was the photo specialist but until then, stereos were just one of many important formats that were part of my job in the archives, but for which I did not have any special personal interest. That was to change after just one meeting with him. Since he was in Washington, D.C. for the NSA convention, Tex arranged for some of the DC stereo people to have a little party at the Cosmos Club and he included me in that kind invitation. It was a small, but truly inspired and dedicated group that met that evening and I lost no time in accepting his invitation to attend the convention in the now demolished Twin Bridges Marriott hotel. After all, it was only 10 minutes away from the mall—I had nothing to lose and potentially tons to gain.

The next day I wandered over. Absolutely amazing. Bill Darrah was lecturing, more stereo photos than one could ever imagine were being offered for sale at the same time, and there was a constant buzz of friends enjoying what they were doing. Tex had introduced me to an entirely new world and I was hooked. Even though I was a professional photo historian, there are always "ropes" to learn and he taught me a great deal of them. He also introduced me to many wonderful people—too many to name here—who each contributed to my learning curve and who I now count as dear friends.

Not that I needed any pressure, but Tex always made sure I was planning on attending the annual conventions. Soon we were working on sorting out thorny attribution
Using tactics that would leave James Bond either blushing or aghast, Tex made a number of visits to Russia setting up more reciprocal marine research programs—each time nudging science, military and government people from both sides a little closer to rationality. As one U.S. Embassy official put it, "You're either the slickest damn operator I ever ran across or the luckiest. But if this project does cool things down a little, you deserve a lot of the credit."

By 1968, Tex had wound down his international travels and found himself at about the highest position an oceanographer could reach—as the White House Senior Staff Scientist for Oceanography, Executive Office of the President. As dull as a stateside desk job may have been, it didn't inhibit his independent personality or opinions. When he accepted a speaking offer from the State University of New York's Stony Brook Long Island campus, the very radical, anti-war student body was skeptical of nearly anything a Navy officer might have to say. "It was at the height of the Vietnam protests; the students were on strike and milling around on campus, chanting and raising harmless hell. I could've gone in civilian clothes and avoided problems, but decided to turn out in full uniform and rattle the cage a little, just for fun."

He was surprised to find a standing room only crowd that was, "attentive, inquisitive, and considerate. When I finished they asked a bunch of intelligent questions and applauded long and loud. One scruffy came to the podium, shook hands, and presented me with a small baggie of home-made joints as his token of appreciation." Once outside the hall, Tex sat down, lit a joint, and started a discussion group with some students in which he made clear his disgust with the Vietnam War. In 1969, Tex joined the academic world full time, becoming Professor and Head of the Department of Oceanography at Texas A&M University. In 1987 he became Dean of the College of Geosciences, retiring as Professor Emeritus in 1989.

The history and collection of stereoviews had been his growing interest for some time, and in 1974 Tex helped found the National Stereoscopic Association, writing the cover article for the first issue of Stereo World. Besides writing several historical articles and book reviews, Tex profiled early stereo-view collectors, some of whom had been active as early as the 1940's. An expertise in organization brought him into the day to day running of the NSA when he assumed the presidency in 1980. He served for eight years—the longest presidency in NSA history. He also served on the board of

(Continued on page 19)
This was the fourth Stereoscopic Displays and Applications conference that I have attended. The more of these you attend the WOW factor diminishes (possibly due to the fact that you’re more up-to-date with the latest developments) but the conference seems to run smoother every year. Despite the lackluster economy this year, this appeared to be the most widely attended of all the stereoscopic display conferences, held January 21-23, 2003 in Santa Clara, CA. The room was larger than usual but it was packed and extra chairs had to be put in. I would guess that at one time or another over 300 professionals interested in stereo imaging were present.

**History**

This year I decided to include a little of the history of the conference. I gleaned most of this from the CD that they offer at [www.stereoscopic.org](http://www.stereoscopic.org) which includes papers from 21 SPIE/IS&T 3D conferences over the period 1977-2000.

These conferences on stereoscopic displays have been going on in some form or another for 26 years. Although the Stereoscopic Displays and Applications conference has been held since 1990 there were many SPIE conferences on the subject of stereoscopic displays in the 1970s and 1980s. The proceedings of these conferences document the rich modern history of stereoscopic display developments.

John Merritt and Scott Fisher started the series in Santa Clara, CA in its present incarnation with the encouragement of Woodrow E. Robbins. The following year it moved to San Jose, where it has been until this year when it moved back to Santa Clara. Generally it is now part of the very successful Electronic Imaging Symposium (formerly part of Photonics West). The conference is the longest running and most widely attended technical conference worldwide dedicated to the topics of stereoscopic displays, stereoscopic imaging, and applications of stereoscopic systems. The most popular topic during this period has undoubtedly been autostereoscopic (no special eyewear) displays, but this is just one of many topics, which include:

- Human factors issues in stereoscopic display systems;
- Design, development, analysis, and evaluation of stereoscopic displays, cameras, and recording technologies;
- Digital stereoscopic imaging, including image compression, stereoscopic image synthesis, and methods for computer-based stereoscopic imaging;
- Applications of these technologies to scientific visualization, teleoperation, telerobotics, telepresence, augmented reality, medical imaging, telesurgery, industrial inspection, communications, entertainment, broadcast/cable television, training, CAD/CAM, molecular modeling, and advertising.

**Technical Papers**

The scientific "meat" of these conferences is the presentation of the technical papers.

Of particular note was the inclusion of a large number of papers on integral imaging applications. This is an old technology which involves synthesizing or photographing images with a multi-lensed camera and viewing them with a multi-lensed stereoscopic display. To me it seemed similar to lenticular viewing on a computer but with lenses divided on both axes not just the horizontal axis. In other words integral images contain many multiple views from many different points of view—horizontally and vertically. For example pictures taken with an integral camera may resemble the view of a compound lens eye of a fly. The images are then used to reconstruct a 3-D view.

**Digital three-dimensional object reconstruction and correlation based on integral imaging, Y. Frauel, Univ. Nacional Autónoma de México; B. Javidi, Univ. of Connecticut**

This paper went into some detail about the reconstruction of integral images and how users can improve recognition of a scene by using the resulting 3-D imagery. They tested users and found that they were able to better discriminate amongst images in 3-D space rather than 2-D. Integral images were used to extract longitudinal information from a scene via a computer reconstruction. This was achieved through the use of a
micro-array lens followed by a focusing lens and camera.

Computer generation of integral 3D images with maximum effective viewing angle. J. Ren, A. Aggoun, M. McCormick, De Montfort Univ. (UK)

This further fleshed out improvement in integral imaging techniques and demonstrated that furthering the view angle improved the viewability of the images. They found that by increasing the size of the image behind the micro-boundaries they were able to limit the size of the transition zone between images and achieve more useful image field.

Integral 3D imaging that has an enhanced viewing-angle along full direction with no mechanical movement. S. Jung, J. Park, H. Choi, B. Lee, Seoul National Univ. (Korea) [5006-09]

In this paper active polarization was added along with the microlens array to reduce crosstalk in integral displays. The polarization mask worked by employing a chessboard like on/off system. By switching the polarization states alternately they were able to increase viewing angles along the horizontal and vertical axes. They were also able to eliminate most ghosting effects.

A sampling of other papers presented this year

Screenless 3D television, C. Moller, O. S. Cossairt, MIT Media Lab.; A. R. Travis, Univ. of Cambridge (UK); S. A. Benton, MIT Media Lab.

This was sort of a fantasy presentation which went over the possibility of creating a refractive index gradient in the air to allow a three dimensional image to be projected in space. This would be similar to the viewing of projected images in the movie Star Wars. In order for this to work correctly a density gradient is needed to be sustained in air. They discussed two possible ways to do it—ultrasonic pressure or heat. Basically this is like creating a synthetic mirage to bend projected light. They found some success but the energy required and the ability to form a stable environment for the gradient to be maintained difficult to achieve.

Desktop autostereoscopic display using compact LED projector, H. Kaneko, T. Ohshima, O. Ebina, A. Arimoto, Hitachi, Ltd. (Japan)

The novel idea of projecting an autostereoscopic display from an ordinary desktop computer was the topic of this presentation. Small LED projectors which use a minimum of power can be taken advantage of and inserted into the keyboards of desktop computers. These projectors are less than 65mm wide which make them small enough for decent stereoscopic images. The images can then be projected on displays that the user would be able to view (but not other unwanted viewers). The display would include mirrors and a diffuser to make it autostereoscopic.

Full-time full-resolution dual stereoscopic/autostereoscopic display or rock solid 3D on a flat screen: with glasses or without! P. Kleinberger, I. Kleinberger, H. Goldberg, Y. Y. Mantinband, 3ality Ltd. (Israel); J. L. Johnson, USAREUR and V Corps Science Advisor; J. C. Kirsch, B. K. Jones, U.S. Army Aviation & Missile Command

Enthusiastically presented, this paper went over a display system which could project 3-D images using a single video projector or computer screen and seen by viewers using passive polarized glasses. The technology involved a back lit set of dual LCDs each equipped with an active polarizer. This would allow full resolution stereoscopic images to be displayed. When inactive the LCDs and the polarizers would be transparent.

Synthesizing stereo 3D views from focus cues in monoscopic 2D images, S. Aguirre Valencia, R. M. Rodriguez-Dagnino, Instituto Tecnologico y de Estudios Superiores (Mexico)

This was a very interesting paper where a depth map was created by calculating the depth using focus cues. This type of 3-D conversion would be done on the fly, rather than hand converting each image on a video frame. Out of focus areas of a photo were assumed to be in the background where focused spots of a photograph were assumed to be in the more forward in space. The computer algorithm does not yet take into account the fact that in photography very often the foreground is out of focus too when taking a pic-
The enjoyment of the experience was diminished.

Improving the visual comfort of stereoscopic images, L. B. Stelmach, W. J. Tam, F. Speranza, R. Renaud, Communications Research Ctr. Canada

Convergence (toe-in) of stereoscopic cameras is a constant discussion topic with stereo photographers—sometimes a topic of passionate debate. The questions are what convergence distance (zero parallax distance) should be used and whether that convergence distance should be achieved by converged (toed-in) cameras or by parallel cameras with image shift.

Angling cameras towards the object of interest is easy to achieve but it causes keystoning and vertical disparities. It was with great interest that I listened to this paper which quantified audience tolerance of keystoning and vertical disparities caused by toe-in for 3-D video displays. They found that the usage of a convergence distance other than infinity was preferred by viewers to the uncomfortably large disparities caused by not using convergence (i.e. convergence distance = infinity).

They also found that the keystone distortion (of up to 5-10 pixels) caused by the converged camera configuration was still considered acceptable by the audiences when compared to the “parallel with image-shift” camera configuration. Of course distortions greater than this were not tolerable.

Roundtable Sessions

The roundtable this year had an interesting dynamic. Led by frequent attendee and StereoGraphics founder Lenny Lipton, the session included Panel Members: Daniel J. Sandin, Univ. of Illinois/Chicago; Dave Cook, NVIDIA Corp.; Mark Blas, Fakespace Inc., Jeff Ferguson, Illxco Inc. (parent company of I-O displays).

One interesting quote by Jeff Ferguson when mentioning their 3-D shutter glasses and 3-D software/DVDs is that they are very popular with the general public. He felt that the only complaints he ever gets about their titles are from what he called “stereo club” types. Many other comments about current stereo content were discussed as were presentation issues. Lamentation over the dearth of current publicly available content was apparent. Some felt it was due to lack of expertise by current cinematographers or other professionals.

Video Theater

The selection of videos this year involved more of a variety of formats than ever before. Hats off to the projection staff for what must have been a tireless preparation for the many formats of 3-D projection and video encoding that was needed. As usual the material was shown on a rear projection screen and no flicker was apparent. There was a wide variance in the quality of the movies this year. Some of the issues had to do with the format the video presentations were intended for. For example if the image was made for viewing on a TV at home the parallax may be too great for viewing on the theater system at the conference. Also the resolution may be lower since most TVs do not have as great a resolution and are not viewed on a large screen (of course this is changing). My theatrical review, basically in the order of presentation:
A 3-D manipulation device (called the Yo Yo) for controlling 3-D VR models was demonstrated by Andreas Simon of Fraunhofer IMK (Sankt Augustin, Germany). A UNIX workstation drove an OpenGL display of various 3-D models which could be manipulated with the Yo Yo device. © 2003 Andrew Woods.

- **Lightspeed Design Group 3D Show Reel** by Lightspeed Design Group (Bellevue, Washington) featuring a range of computer animated 3-D video productions for clients including Nintendo Gamecube, Proctor & Gamble, and various science museums.
- **3-D ridefilms** *The Adventures of Ali Baba and Phantom Loop* by Multi-Dimensional Studios (Midvale, Utah). A variety of live and animated coaster rides were done by Multidimensional Studios LLC in Utah. Frankly, after years of going to these conferences and seeing many 3-D videos, I am a little tired of 3-D coaster rides. These were OK though.
- **Talking Fish in 3D and Jako's & the Pet's Thief** by Enrique Criado, Enxebre Sistemas (Spain) This was an interesting Spanish 3-D offering adding an international element to the screening.
- **A 3-D educational video titled Mondo 3D** by Fernando Iñigo, 3D World Argentina. This was meant for classroom use. I think it would be interesting to see how these are actually used in the classroom setting.
- **HD3D Sports Demo** by Max Penner, Paradise FX Corp. (Van Nuys, California) was a compilation of a range of sports footage including a high school football game, pro wrestling and other sports action all set to a lively music score in 3-D HD TV format. They were interesting albeit somewhat hyperstereo. It was apparent that convergence issues would be important in live 3-D video coverage. While the choice of settings for camera separation and zero parallax distance (convergence) was good for the football game, excessive parallax was immediately apparent when someone walked close to the cameras.
- **Ultimate G's and Radar Men From the Moon** Slingshot Entertainment (Burbank, California) A segment of Slingshot Entertainment's 3-D DVD Ultimate Gs was shown. This is a nicely produced movie about flying that would be good for kids. It reminded me of some very early IMAX films. Slingshot Entertainment's Radar Men from the Moon was the next offering. This is a conversion of a 2-D theatrical release which came out in the 1950s. Although high in the "campiness" factor the effects that they added are basically image shifting (moving the one side of an identical image to make it appear that the entire image is "behind the stereo window") or field delay (similar to a pulfrich effect which relies on the dolly motion of image sequences). Since there was little shot in dolly motion the unimpressive 3-D of this movie was not well received by the experienced 3-D audience.
- **Nekrofilm 3D Sampler** and *A Slice of the World* by Lazlo Magyar, Nekrofilm (Hungary). The former is a collection of material from Nekrofilm's works including computer animations and real world footage. The latter is a short documentary illustrating the wonders of Hungary. Nekrofilm produced some 3-D films that were disturbing and had that sort of dark Eastern European flavor to them. The 3-D animation of a cartoon man relieving himself was not what I would choose for a demonstration film if I wished to promote a 3-D imaging company. They also had a video of live action synchronized swimming to which organizer Andrew Woods quipped, "synchronized swimming looks just as boring in 3-D as it is in 2-D".
- **A range of 2-D footage converted to 3-D by Dynamic Digital Depth** (Santa Monica, California) including a Britney Spears PEPSI advert, a Tokyo Motor Show screen test, a *Men in Black* short, a *Shrek* Trailer, and a Boeing business jet promotion. DDD showed its *Shrek* conversion again along with its standard promotional trailer. They are nice enough but the lack of new material makes one wonder whether they have done anything since the original material was made several years ago.
- **Aconcague—The Top of the Western World and Africa 3D (teaser)** by Tom Riederer, TreeD Films (Santa Barbara, California) Tree-D films showed a home movie of a safari shot with a modified Nu-View adapter in field-sequential format. Although some shakiness and lens flare were apparent it looked pretty good considering it was shot on a Nu-View. It made me wonder what the modifications were.

**Demonstration Session**

This was slightly smaller than in previous years but had some impressive displays that took advantage of current flatscreen technologies. This included autostereoscopic displays from 4D Vision and StereoGraphics. The resolution was impressive as was the compactness of the units. I was at my trade table and missed many of the exhibits but Andrew Woods was nice enough to give me this list:

- **4D Vision** (www.4d-vision.com) Germany) demonstrated their autostereoscopic 50" plasma display.
- **A 3-D manipulation device (called the Yo Yo)** for controlling 3-D VR models was demonstrated by Andreas Simon of Fraunhofer IMK (Sankt Augustin, Germany). A UNIX workstation drove an OpenGL display of various 3-D models which could be manipulated with the Yo Yo device.
- **Steve Berezin of Berezin Stereo Photography** (Mission Viejo, California) demonstrated a wide variety of consumer stereoscopic products, including various 3-D glasses and viewers, books and cameras.

(Continued on page 43)
The Panda’s 3-D Dream

A new 448-seat “4-D” theater has opened in Germany’s Europa-Park. Equipped with surround-sound and a gigantic screen measuring 19x9 meters, the “Magic Cinema 4D” will provide visitors with a different view of the Earth and its wildlife. In the film *Panda Vision*, visitors meet a panda daydreaming of a better world. (Playing at Aquarium of the Pacific in Long Beach, CA, the film is also known as *Animal Vision*.) They dive into the dream, encounter other animals and go on an expedition through ocean, jungle and Antarctic environments.

In cooperation with the World Wide Fund for Nature (WWF Germany), Europa-Park presents this 4-D voyage through the natural wonders of our planet with the help of advanced computer animation animals and landscapes which “surround” visitors and take them into another reality. Awareness of our environment is improved by presenting it as something fascinating and great, but also vulnerable and easily destroyed.


3D Consortium Grows

Dimension Technologies Inc., producer of large screen flat panel 2D/3D switchable displays, has joined the 3D Consortium, a worldwide organization dedicated to encouraging the growth and development of a full-fledged market for 3-D applications and products. The Consortium’s objective is to enhance the potential market for three dimensional images through the development and expansion of I/O devices for 3-D stereographic displays, development and distribution of 3-D content, and promotion of the commercial use of this new technology in a wide variety of application areas.

The five steering members of the Consortium are Itochu Corporation, NTT Data Corporation, Sanyo Electric Company Ltd., Sharp Corporation and Sony Corporation. In addition to the five steering members, the Consortium includes more than 70 standard members, including hardware manufacturers like DIII, software vendors, content vendors, content providers, systems integrators, video production houses, broadcasters, academic organizations and other interested parties.

According to press releases, the Consortium plans to aggressively promote educational activities to encourage widespread application and expansion of 3-D, with the ultimate goal of generating an unprecedented new industry and market for 3-D technology.

Exactly how much effort will go toward basic consumer level photographic equipment like a true 3-D digital camera is unknown, as is the question of whether such an organization will help or hinder small, home based providers of specialized 3-D hardware and software.

The Consortium’s Executive Director is Minoru Taniguchi of Tokyo. Inquiries from companies and organizations in the United States or Europe can be directed to Ian Thompson, Sharp Laboratories of Europe Ltd.: ian.thompson@sharp.co.uk.
Digital Retinal 3-D

High-resolution digital stereoscopic images of the interior of the eye have become easier with the introduction of the 3-Dx Simultaneous Stereo Fundus Camera from Nidek Ltd. of Gamagori, Japan. The six megapixel camera comes with the company's proprietary Navis-3D imaging and database software for on-screen stereo viewing. By allowing simultaneous stereo color images of the optic disc, fundus and external eye, the new camera will be valuable in the assessment and continuing treatment of glaucoma and macular diseases.

The camera's fixed 3mm separation will provide consistent stereo imaging over time and with different operators while documenting ocular changes associated with glaucoma, diabetes and macular degeneration. In addition, Nidek's Navis 3D Solution System will allow a user to switch from a 35 mm platform to digital imaging by simply changing the camera backs.

SpongeBob Soaks Stereo Sensation

The latest 3-D ride film features Nickelodeon cartoon character SpongeBob SquarePants in a 4.4 minute undersea adventure in search of the ultimate Krabby Patty. Blur Studio produced the computer-animated film portion of the attraction and the event's pre-ride film, with creative director Tim Miller and co-directors Paul Taylor and Yas Takata leading a team of nearly two dozen animators.

SpongeBob SquarePants 3D debuted at Paramount Parks theme parks across North America this spring. It is claimed to have a more well developed storyline than the average motion simulator ride without skimping on 3-D sight gags or kinetic choreography. Riders burst through the roof of the Krusty Krab, careen through traffic in Bikini Bottom and are menaced by a paddle-ball-wielding robotic double of SpongeBob’s pal, Patrick.

Animators employed Toon Shader software to replicate the look of cel animation. Contour lines and solid color shading were used as equivalents to cel animation ink and paint techniques to render images that are almost indistinguishable from hand-drawn art.

Locations of the six Paramount theme parks can be found at: www.paramountparks.com.

DEEP Underground

Gary Granat's Walden Media, the backer of James Cameron's Ghosts Of The Abyss, is planning to produce a big budget 3-D movie of Jules Verne's Journey To The Center Of The Earth.

The classic has been refashioned by British screenwriters Paul Chart (American Perfekt) and Gavin Scott (Small Soldiers, The Mists Of Avalon, The Young Indiana Jones Chronicles).

The film will tell the story of a group of youngsters who find Jules Verne's original manuscript of the novel and discover that Verne himself had taken the journey to the center of the earth. Using the manuscript as a map, they follow Verne's journey to the core.

Walden had helped finance the 3-D retrofitting of U.S. Theaters for Ghosts Of The Abyss and is analyzing the international situation at present for both GOTA and future 3-D pictures.

(NewViews continues on page 21)
I had been fascinated with the concept of creating a stereo image from a single 2-D image for years. There were so many "famous" pictures that would look great in 3-D, but that were not originally taken that way. On top of that, there were personal family pictures that would be fun to see in 3-D. I tried many different ideas while figuring out how to do conversions and found that most simply did not work. However, with a lot of time and patience I was able to come up with a simple to use formula that did work. The best part is that it can be done with just about any graphics software.

To be able to convert an image from 2-D to 3-D you simply need a program that allows you to mask areas within an image, and then cut those areas out of the picture and paste them back in. Programs like Paint Shop Pro, Micrografx Picture Publisher, Corel Photopaint, and Adobe Photoshop all have mask tools that will work. That being said, there is a lot to understand about the process, so I recommend you read this entire article, then maybe re-read it before you give this a try. Also, when you do finally give it a try, work with a simple image to start. That may be just a few geometric shapes. I highly recommend this before attempting to edit a true photograph.

The steps to do a successful conversion are really quite simple—just very time consuming. Start by obtaining a scan of your original 2-D image at the highest resolution possible. The more information you have in your image, and the larger it is, the better for the final result. Now, save a copy of this image called 1L.TIF—this will be your left image from the stereo pair. Now save a second copy of the image called 1R.TIF that will become the file you will edit to make the right image for the pair.

The most important part of the process occurs here. This is where you really need to use the most important tool in 2-D to 3-D conversions—your mind. You must take time to study the image to determine the section(s) of the image that should be closest to you. Take your time and really think about what you are seeing. Is there an out of focus item that is really close to you, but hard to notice in 2-D? Be sure you understand the different depths of items in your image, as those depth layers will be crucial as you begin to process it.

Now, zoom in on the area that contains the first item you want to select—the closest item in the view. Draw (or paint depending on your program) a precise mask around it (or them as you may have several items in this first layer). Cut the masked section(s) of your image out, keeping it/them in memory. In Windows, this can be achieved simply by using CTRL-X, which removes the image in the mask and places it in to your system's memory.

At this point, remove the mask from your image and select a blending tool. Make the size of your tool small enough to only blend a few pixels at a time. Carefully blend all areas to the right of the cut out area(s) into the blank areas left when you cut the masked area out. This will in effect copy a small part of the existing image into the blank space. You only need to cover a few pixels worth of blank space, and should be careful
to blend with lines that already exist to help maintain a smooth appearance in the final image.

The reason we do this blending is to add information to the right image that did not exist in the original. After repeating this process many times, we will have shifted the contents of this right image as if it had been recorded by the second lens of a stereo camera.

Once you have finished blending image information in to the right sides of the cut out areas, restore the mask you recently removed. This should clearly mark the original position of the removed image contents, and delineate the new image information you recently added by blending.

Paste the image information from memory back (On Windows machines, you can use CTRL-V.) in to your view and carefully position it exactly back in to its original position. Now, shift it 1 pixel to the left. This can sometimes be achieved by tapping your left arrow key on your keyboard just once. This last, simple action covers some original content to the left side of your mask, and reveals some of the new content you blended in to the right. (Can you understand how this is starting to create the alternate view that a second stereo camera lens would have caught?)

Once your newly pasted image is in place, you will notice that the mask has grown to not only cover the original space, but also the new section added by the 1 pixel move to the left. This is important because you want to continue to move the area just edited as you work so that you do not end up blending an area twice. This type of duplicate blending will introduce retinal rivalries that will ruin your conversion.

In order to continue the conversion process, you must now expand your mask to envelop the next layer in your image. Once you have carefully done that, it is time to cut, blend, paste and move 1 pixel again. This process needs to be repeated, as many times as there are layers, so you can imagine that it might take a long time to achieve a successful conversion. In my experience I have found that most images require between 10 and 30 layers to be believable. This is entirely dependent on your subject matter. For the sample image used for this article, I started with a smaller file, and so only created 7 layers.

A special thing to note is that the 1 pixel moves specified above are important when minimal shifting is required between one layer and the next. If a greater shift in space is required between levels (between a person and the Grand Canyon behind them for example) then additional pixel shifts to the left may be required.

After you have completed the steps to create all the new depth information in the right image, you will have a stereo pair. However, you will most likely have to trim both the left and right images in order to set a proper stereo window as your conversion process steadily “built” the right image in such a way as to continually push the closest layers out in front of the stereo window. Trimming will be especially necessary if you had to move sections in the right image that included the right hand side of the image. In those places, you will be left with white space because you did not have any information to the right to blend from. These need to be trimmed away. Be sure to trim the same amount of data from each image pair half in order to maintain a correct stereo window.
New Members

The Stereoscopic Society of America would like to welcome the following new members:

1096 Harry Howell, College Station, TX
1097 Wojtek Rychlik, Cascade, CO
1098 Neil Schuldenfrei, Alexandria, VA

Mr. Rychlik has some of his very fine 3-D nature photography online at: http://www.pikespeakphoto.com/stereoviews.html. The folks in Speedy Bravo folio are going to be seeing some excellent work from this gentleman.

Treasurer and Membership Secretary Duties Combined

SSA Treasurer Dan Shelley has now taken over the duties of Membership Secretary from Paul Talbot. It makes a lot of sense to combine the Treasurer and Membership Secretary duties into one office. Paul Talbot will unofficially continue to assist Dan but henceforth anyone desiring to join an SSA folio should contact Dan Shelley directly.

Dan's email address is: dshelley@ddesign.com. Contact Dan via regular mail or phone at: Dan Shelley, 4366 Morning Glory Rd., Colorado Springs, CO 80920, (719) 548-9081.

B&W Service

Jonne Goeller, a member of Speedy and Ovine Print folio circuits, writes that “I have a close friend who owns a large custom black and white photo lab in the Northwest and is looking to expand the business into printing top quality black and white stereo prints for the national mail order/Internet market. This lab has regularly printed work for picky fine art photographers, and for major advertising agencies for over 20 years.” Any SSA members who might want to use this service should inquire to: scabrock@aol.com using the subject line B&W Prints.

New Display for SSA Stereocards

“I love wood,” says Speedy Circuit Secretary and OP folio member David Thompson. “To me it has much more warmth and personality, plus the cost is lower and it is easier to work with in my garage.”

For viewing SSA Exhibition stereo cards at the SSA Convention, David, with input from Shab Levy and assistance from Ernie Rainden, built custom lorgnette stereo viewers and displays that will be in use for years to come. Working in his garage, David constructed the viewers and displays by hand. They are easily dismantled for shipping and convenient to assemble.

“The viewers are in three pieces with milled pockets for the lens,” says David. “By removing 4 screws the whole thing comes apart and the lens can be replaced. This makes a strong but fairly lightweight viewer, with the lenses securely held in place. When the viewers were finished they got a couple of coats of polyurethane varnish and chains were attached to the handles.”

Treasurer/Membership 2003 Secretary's Report

“There are several things about this report that are different from previous years,” notes Dan Shelley. “First, I took over the duty of Treasurer from John Baker in November of 2002, so my perspective on that portion of this report will not be for a full year. Second, this is the first time both the Treasurer's report and the Membership Secretary’s report have been combined.”

There are currently 161 total members of the SSA. 152 of them are paid-up members and there are 8 additional Life members. As editor of Stereo World, John Dennis is an “Ex Officio” member. 21 members did not renew this year, which is 7 less than reported lost in July 2002. The current bank balance for the Society is quite healthy and the general treasury is up by $700 over last year’s total. A recent expense of over $400 was incurred to print up new SSA sleeves on lighter paper, thereby reducing the postage costs to send the folio boxes around on the circuit. The primary income derived for the SSA treasury, of course, consists of membership fees.

“Membership dues are collected for two primary reasons,” notes Dan. “The first is to provide funds to reimburse any expenses in maintaining the folios. The second is to allow for annual contact with the membership to ensure that all mailing information is up to date. No cash is kept on hand. All funds are kept in a non-interest bearing checking account at Wells Fargo Bank West N.A. My wife Gina and another SSA member, Les Gehman of Fort Collins, CO, are co-signers on the account to provide multiple access points to the funds should I become incapacitated for any reason in the future.

“This is the first year a member has paid their dues via online payment through PayPal.com. There was a fee for using this service for that one transaction because there was no dedicated SSA account, and my personal “business” account was used instead. I have since created a free SSA account on PayPal.com. This account will currently allow us to have free transactions as it is classified as a non-business account. Hopefully the low transaction volume that will be processed through this account will allow us to keep that designation. However, should we be required to upgrade the account to an official business account in the
future, the fee per transaction will only be 2.99% plus $.30 each, or $.59. I spent $.50 per member in postage and envelopes alone for the 2003 renewal mailings, so even if we do end up getting charged, use of PayPal will not pose a significant expense increase for the SSA. “It is my hope that we will be able to persuade a majority of the membership to begin paying their dues online starting next year, possibly via a simple data collecting form on the SSA web site. Contact information could still be checked, and postage and other mailing expenses could be eliminated for both parties. This will also speed the process of Annual Membership renewals, which was a five-month process in 2003. As our SSA database is reworked in the coming months (post officer transitions) a dedicated effort will be made to verify e-mail address of the membership for future use in this type of communication.”

The Stereoscopic Society of America is a group of currently active stereo photographers who circulate their work by means of postal folios. Both print and transparency formats are used, and several groups are operating folio circuits to meet the needs in each format. When a folio arrives, a member views and makes comments on each of the entries of the other participants. His or her own view, which has traveled the circuit and has been examined and commented upon by the other members, is removed and replaced with a new entry. The folio then continues its endless travels around the circuit. Many long distance friendships have formed among the participants in this manner over the years. Stereo photographers who may be interested in Society membership should contact the Membership Secretary, Dan Shelley, at dshelle@dddesign.com or 4366 Morning Glory Rd., Colorado Springs, CO 80920, (719) 548-3081.

A Tex Memorial

(Continued from page 9)

directors and was appointed Board Member Emeritus in 1998.

While Tex was preparing the first volume of his autobiography in 1993, the Ada Evening News ran a story about the project and included a list of people from his youth he wanted to hear from. After only two responses arrived initially, he received a letter in 1994 from the former Joleeta Little, one of those on the list.

In 1997 Tex and Joleeta were married. They shared the work of preparing material for the Institute for Photographic Research, through which several stereo related monographs were published. These were available via the NSA Book Service, which Tex operated out of his home for several years along with the Stereo World Back issue service. At NSA conventions, Tex and Joleeta were truly a welcome sight in any hotel lobby, with her effusive warmth adding a dose of tonic to every gathering.

The list of things Tex did for the NSA just gets longer the more you think about it. In 1981, when the organization had spent more than it should have in publishing Peter Palmquist’s Lawrence & Houseworth book, he provided financial support to keep the group functioning. In 1997 he produced (with help from Joleeta) a Stereo World index covering volumes 1 through 23. He spearheaded the effort to republish Darrah’s classic The World of Stereographs, (Land Yacht Press, 1997) by working with Darrah’s family and the publisher. He was an early supporter of including present day stereography in Stereo World and at conventions through the Stereo Theater. He did surveys of the membership to determine as closely as possible the percentages of collectors, shooters, and those interested in both. Through the years, he did his best to keep us honest, on our toes, and aware of looming problems. His suggestions were as well informed as his opinions were blunt, but the man who could sound like a curmudgeon one minute could be offering research help to a total stranger the next.

His support for Stereo World, myself, and Art Director Mark Willke over the years combined encouragement with a real appreciation of our efforts and a steadfast defense of editorial and artistic independence. His presence, in person at conventions or via letter or email, was always reassuring. Without him, an awareness that we are all on our own now grows more concrete every day.

—John Dennis

Cover of English Masters of Genre Stereoviews by T.K. Treadwell (With the assistance of Joleeta Treadwell), from The Institute for Photographic Research Monograph series, 2001.
Sir David Brewster was not the best of friends. During a period of rapid technological change when optical discoveries about 3-D were being made and photography invented, these two men were scientific rivals. As Richard L. Gregory writes in his Foreword to *Brewster and Wheatstone On Vision* (Academic Press: 1983) the two men “did not, as it were by their stereo rivalry, see eye to eye.” [See SW Vol. 15 No. 2.]

Sir David Brewster was a Scottish scientist born in 1781 who is most famous for his invention of the kaleidoscope in 1816, which he explained in his *Treatise on the Kaleidoscope* published that same year. Brewster authored over 300 scientific papers and several books including his *Treatise on Optics* in 1831 and a definitive life of Isaac Newton in 1855. For his efforts he was elected a Fellow of the Royal Society in Great Britain and knighted in 1831. With his 1856 book *The Stereoscope*, Brewster set forth the principles of stereoscopic vision and questioned Wheatstone's claim of priority for the discovery of binocular perception.

When Sir Charles Wheatstone presented his 1838 paper “On some remarkable, and hitherto unobserved, Phenomena of Binocular Vision” to the Royal Society of Great Britain, he proved that stereoscopic vision is the result of binocular perception. And by 1852, when Wheatstone published the second part of his paper, photography itself had been invented by Talbot, Niepce and Daguerre and the first stereoscopic photographs produced.

In his 1856 book *The Stereoscope*, Brewster took pains to establish that historical precedents for discoveries similar to Wheatstone's existed and were far from “hitherto unobserved.” In particular, he cited the work of Mr. Elliot, a "Teacher of Mathematics" in Edinburgh, who wrote an essay in 1823 that expressed "the idea, that the relief of solid bodies seen by the eye was produced by the union of the dissimilar pictures of them in each eye, but," according to Brewster, "he never imagined that this idea was his own, believing that it was known to every student of vision."

Brewster claims that Elliot in 1834 conceived of "a simple stereoscope, without lenses or mirrors" consisting of a wooden box 18 inches long, 7 inches wide and 4 inches high that was "an instrument for uniting two dissimilar pictures." Elliot delayed construction of his stereoscope until 1839 and, since photography had not been invented yet, he "drew the transparency of a landscape" as a stereo pair for viewing in his device.

Brewster notes that Elliot, in 1852 after perusing Wheatstone's reflecting stereoscope, "was convinced not only that Wheatstone's theory of the instrument was incorrect, but that his claim to the discovery of the dissimilarity of the images in each eye had no foundation." Both Wheatstone and Brewster surveyed the writings of Euclid, Galen and Leonardo da Vinci in their treatises on binocular vision.

"Now, although Leonardo da Vinci does not state in so many words that he was aware of the dissimilarity of the two pictures," writes Brewster, "the fact is obvious" even though da Vinci "was not led by his subject to state the fact at all." Brewster is emphatic in challenging Wheatstone's claim of discovery. "That the dissimilarity of the two pictures is not a new fact we have already placed beyond a doubt," he states "and
we cannot understand how he failed to observe it in works which he has so often quoted, and in which he professes to have searched for it."

Despite his professional rivalry with Wheatstone, Sir David Brewster made significant contributions to stereography. In *The Stereoscope*, Brewster established that the camera lenses in a stereo photograph should have the same aperture as the human eye, about \( \frac{2}{10} \) of an inch, that the focal lengths of camera and viewer lenses had to be equal and that the interocular should be about 2\( \frac{1}{2} \) inches, the average separation between the two human eyes.

In 1844 Brewster began making compact stereoscopes with magnifying lenses to fuse stereo daguerreotype pictures taken with a lateral shift of the camera between exposures. By 1849 he had developed his lenticular stereotype, a box-like instrument with two centered lenses and a hinged shutter on top to admit light. This stereoscope was first manufactured and sold by Duboscq and Soleil in Paris and first exhibited in London at the 1851 Exhibition at the Crystal Palace. By 1856, when Brewster's book on the Stereoscope was published, the market for stereoscopic photographs was beginning to boom and his book included a large listing of stereoscopic pictures offered for sale by the London Stereoscopic Company.

**References:**


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**NewViews** (Continued from page 15)

### A Stereoscope Parts Source

Classic Holmes stereotype parts, kits or entire viewers are available from the Zaya-Ruzo Co. of Cheshire, CT. Stereoscopes range from a basic wood model at $68.00 to an open card carousel viewer at $187.00. Between these are two folding scopes, a complete scope kit and two lighted models. Available parts include handles, hoods, lenses, cardholder wires, faceplates, thumb hardware for the slide bar (stage), and a complete slide bar replacement kit. The company also repairs and restores vintage stereoscopes of either hand held or table top design. Visit www.threedview.com or write to Zaya-Ruzo Co., 249 Guinevere Ridge, Cheshire CT 06410.

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**Can 3-D Foil Movie Piracy?**

In a joint venture with the state-owned Shanghai Media & Entertainment Group, Warner Bros. is helping operate the nine-screen, 1,500-seat Shanghai Paradise cinema in China. In a country where digital videodiscs of the latest Hollywood blockbusters are sold on the street for a fraction of the cost of movie tickets, the company's solution is to run 3-D films from the 1950s on eight of the screens, all cut to 60 minute running times for showing several times a day.

The report mentions the use of anaglyphic projection so that "they can't be pirated by someone sitting in the theater with a camcorder." This may be inaccurate, since polarized projection would of course seem a better choice both for quality and as a way to make simple camcorder copies impossible. Anaglyphic projection, in fact, is the one 3-D method that could be copied via camcorder, although with terrible quality.

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**Gregory Peck and Realist**

NSA Board member Dieter Lorenz found this photo in the Deutsches Historisches Museum of Berlin and thought it would be an appropriate way to observe the recent death of actor Gregory Peck in June, 2003. The actor is shown here with a Realist in front of Berlin's Brandenburg Gate, probably in 1953 or 1954 while Peck was in Europe filming *Roman Holiday* and *Night People.*
The year 1992 marked the centennial anniversary of the creation of the Adirondack Park located in the State of New York. In celebration of this event, an exhibition entitled "Forever Wild: The Adirondack Experience" was created to examine the life and arts of this region beginning in the 19th century. During 1992, the exhibit was first shown at the Katonah Museum of Art in Westchester, NY. From there it traveled to the Hyde Collection in Glens Falls, NY, and then finally, to the New York Historical Society in New York City. Items shown included paintings, drawings, photographs, books and various Adirondack crafted items and artifacts. The works of such distinguished artists and writers as Winslow Homer, Fred Remington, William Stillman, Edward Bierstadt, and Rockwell Kent were displayed. The Photographic section of the exhibit was dominated by the works of the renowned Seneca Ray Stoddard from Glens Falls, NY. The versatile Stoddard was also a well known publisher, writer, mapmaker, and lecturer whose words and works played an important role in the formation of the Adirondack State Park in 1892. What information has been compiled is from census records, newspaper articles, business directories, old guidebooks and maps, and photographs. There are no direct descendants living today who might qualify as family historians. Baldwin and his wife Margaret had only one child, Jane North Baldwin, who never married to carry on the family line. She was one of the early women to graduate from Cornell University Medical School, receiving her M.D. degree in 1900. When she was engaged as College Physician at Vassar College, Poughkeepsie, NY, the Vassar Alumnae Magazine of July 1, 1936 contained the following: "Dr. Baldwin was brought up in Northern New York State, playing in Ausable Chasm as in her own backyard. And so it almost was. All of Ausable Chasm was given as a grant by George Washington to her forebear, Judge Mathew Adgate, and it was on that tract of land still owned by the family that Dr. Baldwin was born." Available genealogical information confirms that Dr. Baldwin was the great great granddaughter of pioneer landowner, Mathew Adgate. For his services during the Revolutionary War, he was granted over 3500 acres of property located along both sides of the Ausable River, which included all of Ausable Chasm. In the early 1790s Mathew Adgate and his family became the first permanent settlers in this region. Utilizing the potential water power from the falls at the head of the chasm, the new settlement, called Adgates Falls, grew and prospered. Within several decades the upstream settlements of Keeseville, and Ausable Forks also established themselves along the Ausable River, owing their origin and growth to the available water power, timber and iron ore.

By 1870 the various industries near Ausable Chasm had declined due to changing economic conditions. But the community of Adgate Falls, which was renamed Birmingham Falls in 1840, was to have a new lease on life by reinventing Ausable Chasm as a major tourist attraction. The timing for this transition was perfect. The country was experiencing an optimistic post-civil war period, which precipitated a rush of visitors to the Adirondack wilderness, demonstrating a commitment to get back to nature. As a result the Village of Port Kent, located along
"Port Kent." The docks at Port Kent, NY, mainly an industrial port from 1825 on, which in the 1870s became an important tourist gateway to Ausable Chasm and the Adirondacks. Brown mount.

"Stages leaving Port Kent for the Chasm and Adirondacks." Carriages filled with tourists head from the steamboat docks toward their destinations in this view at some point rather brutally hand trimmed to a standard mount size. Ivory mount.
the western shores of Lake Champlain, became a major Tourist Gateway to the Adirondacks. Situated directly three miles East of Ausable Chasm, Port Kent could be reached by steamships originating south from Whitehall, NY, or north from Plattsburgh NY. Tourists arriving at Port Kent paid 10 cents to board a waiting stagecoach headed for Ausable Chasm and Keeseville. At these locations further arrangements could be made to travel to other points within the Adirondacks. Also, By 1873 the Delaware Hudson Railroad had started construction on its last link from Albany, running along the west shore of Lake Champlain northward to Montreal. One of its major tourist stops during the summer months would be Port Kent.

It was during this window of opportunity that a young George W. Baldwin moved to Keeseville NY to open his first photographic gallery. The village of Keeseville was no stranger to photography. As early as 1851 visiting daguerreotype photographers had set up their cameras and equipment in the Adirondack Hotel to do portrait work. In the early 1860s Horace S. Tousley, a portrait painter, established a year-round photographic gallery there. However the most notable thing about Keeseville’s photographic heritage may be that in 1843 it was the birthplace of William H. Jackson, the famed pioneer landscape photographer of the American West. Jackson’s father was a blacksmith in Keeseville at the time, but soon moved on to Plattsburgh, NY, and other locations, before finally settling down in Troy, NY in the 1850s.

In 1874 Seneca Ray Stoddard published his first Adirondack Guidebook The Adirondacks Illustrated, (hereafter referred to as The Illustrated). It included his comments and observations as he visited Ausable Chasm and Keeseville, before continuing on his journey into the Adirondack Wilderness. His narrative would prove to be an important source of information, capturing the environment and setting in which the 24 year old Baldwin launched his photographic career.

The Early Years

George W. Baldwin was born on the 26th of May, 1849 in the Town of Jay, Essex County, New York. He was one of ten children of Jonathan and Alvira Baldwin. Originally from Vermont, his parents were farmers who moved to Essex County in the early 1840s. By 1860 the Baldwins had relocated several miles northward to the town of Black Brook. Their new farm was situated approximately two miles east of Ausable Forks, along a winding road that followed the Ausable River eastward and down stream from Ausable Forks to Keeseville, to Ausable chasm.

By the 1860s The settlement of Ausable Forks had become a classic company town dominated by an iron industry under the reign of J & J Rogers Company. The Rogers Co. owned just about everything in sight. Along with their ironwork facilities they owned and managed the mills, the lumberyards, the inns and several company stores. They made their own wagons and maintained miles of plank roads. Because timber and farms were
"Ausable Chasm entryway and Lodge." Opened in 1874, stereoviews of Ausable Chasm and the Adirondacks were on display and for sale here. Ivory mount.

"Birmingham and Horse Shoe Falls." Located at the entrance to Ausable Chasm, the potential water of these falls attracted settlers as early as 1793. Pink mount.
required to support the Iron industry, they also owned most of the land in the area. Since the Rogers Co. would prevail for many decades to come, their presence provided a measure of security for the Baldwins, enabling them to provide goods and services for a ready made market. By the year 1870, George (age 21), still lived with his parents at the Black Brook farm location. An 1870 Census specifies his occupation as "artist" at this time. During this period most photographers took seriously the notion that photography was an art form and considered themselves to be artists. Without any further evidence, we can only speculate what Baldwin's actual profession was in 1870. As early as the late 1860s nearby cities and villages such as Plattsburgh, Keeseville, and Port Henry in New York, and Burlington in Vermont, all had one or more photographic galleries where the young Baldwin could have served his apprenticeship. On November 8, 1872 the Plattsburgh Sentinel announced the October 15th marriage of George W. Baldwin as he and his bride prepared to move to Keeseville, located some dozen miles east of Ausable Forks. Here he would open his first photographic portrait gallery, on Front Street, in the heart of a thriving business district.

**Keeseville 1873**

In the Autumn of 1873 Seneca Ray Stoddard left his studio in Glens Falls, NY to take his first photographic trip into the interior of the Adirondacks. He intended to photograph Ausable Chasm and the Adirondacks. He also planned to gather information and solicit advertisements for his 1874 Guidebook, *The Illustrated*. After a short trip by rail from Glens Falls to Whitehall, NY, Stoddard and Fred Oblenis, his assistant and brother-in-law, boarded the steamship Vermont which was headed northward on Lake Champlain. Upon reaching Port Kent they boarded a waiting stagecoach to travel to the Chasm House, an inn at Birmingham Falls, located near the entrance to Ausable Chasm. After a night's rest at the inn Stoddard planned to spend several days photographing the Chasm. In *The Illustrated* Stoddard described this natural curiosity as follows: "Ausable Chasm is one of the great wonders of nature and justly ranks with Niagara Falls, Watkins Glen and other most distinguished phenomena of the continent, fully two miles long in length, with a perpendicular height of from seventy five to one hundred and fifty feet. Its width varies from thirty to hundreds of feet representing scenes of great beauty and picturesqueness, and in places it is extremely wild and of almost terrific grandeur."
"Ausable Chasm - In the Boat Ride." The last mile of the Chasm is seen by boat, starting its trip through a narrow passageway having 100 foot high walls on each side. Pink mount.

"Office of Ausable Horse Nail Co. Keeseville N.Y. 1877" (handwritten on back). Daniel Dodge perfected his horse nail making machine here in 1862, which led to a major nail manufacturing industry in Keeseville. Brown mount.
The earliest known photographs of the chasm are stereoviews by J.C. Moulton from Springfield, Mass., taken in the early 1860s. By the mid 1860s, A. F. Styles of Burlington, Vermont and H. K. Averill, Jr. of Plattsburgh, NY had also photographed and produced their own small sets of Ausable Chasm stereoviews. It is of interest to note that it was Styles who taught William H. Jackson land-scape photography in 1865-1866. One wonders whether Jackson might have accompanied Styles as he photographed the Chasm, located only a mile from Keeseville, his birthplace. In April, 1866 Jackson left Styles to start his own career, as an important photographer, who helped to explore and open the American West.

Ausable chasm was first opened to the public in 1870. By the early 1870s the Kilburn Brothers from Littleton, New Hampshire, Horace Tousley, from Keeseville, and R. M. McIntosh of Northfield, Vermont, all had photographed and published their own series of Ausable Chasm stereoviews. Up until 1873, access to the interior of the two mile gorge could only be gained in several places, greatly limiting the areas to be viewed or photographed. This changed in late 1873 when a group of Philadelphians purchased chasm properties and built stairways, galleries and bridges so that tourists could now travel over the entire length of the Chasm by foot and boat. Now it was also possible to photograph areas never photographed before.

If Stoddard had any illusions about being the first one to take photographs along the full length of the gorge, he must have been disappointed as he entered the lodge. Here, within this newly constructed entrance building to Ausable Chasm, he saw on display and for sale many photographs of the different points of interests throughout the chasm. Stoddard would acknowledge, in The Illustrated, that many were works of art, in particular the stereoviews by Purviance of Philadelphia, PA. He would also learn that George W. Baldwin, a portrait photographer located in nearby Keeseville, was the sales agent for all the stereoviews and other photographs sold at the entrance lodge. Anxious to establish outlets for his own photographs, Stoddard decided to visit Baldwin at Keeseville, his next planned stagecoach stop.

Stoddard described Keeseville as a thoroughly wide awake little village, also noting that: "The water power is immense and utilized by the twine, wire, and horse nail manufacturers, the latter being the principal industry of the village. There are also several elegant private residences, churches and stores built of Potsdam sandstone which here abounds. One Firm, that of Mould and Son, deserves special notice for their Yankee push and enterprise. The elder member has long been a moving power and his presence is felt in many places."

Stoddard discovered that Baldwin’s photographic studio was located in the Mould Block Building situated on Front Street. This two story brick structure, built in 1868, was owned by Willis Mould and his son Henry. It contained the firm’s bookstore and drugstore, along with a group of other stores that were rented out. These included Sterns and Rogers Clothing Store, a barbershop and Baldwin’s Picture Gallery, so designated by a bold five by six foot sign mounted at the north end of the building. It was Henry Mould, Civil War veteran and druggist, who would guide Stoddard through the building, which included a stop at Baldwin’s Gallery. As Stoddard later noted in The Illustrated: “His rooms at that place are well worth a visit.” The 1874 Guidebook also contained a full page ad which read as follows: “W. Mould and Son, Druggists, Booksellers, and Stationers, Dealers in Fancy Goods, Fishing Tackle, Ausable Chasm and Adirondack Views, Cigars & Confectionary.” The views mentioned in this ad were two separate sets of stereoviews titled “Adirondack Series” (38 views) and “Ausable Series” (32 Views), published but not photographed by W. Mould & Son. The actual photographer for one or both series was probably Frank Robbins of Keene, New Hampshire, a known photographer who also offered an Adirondack Series of 38 views. The listing of 38 views on the backside of Robbins’ series has the same exact titles and corresponding numbers as the Mould & Son Adirondack series which is also backlisted.

Stoddard was not only successful in soliciting an advertisement from Mould & Son, but was also able to secure a mutual barter arrangement with Baldwin. Stoddard’s photographs would be sold from the Ausable Chasm Entrance Lodge and from Baldwin’s studio in Keeseville as well. In exchange, Stoddard included the following message in The Illustrated:
The Mould Block Building storefront walkway. This building complex contained Baldwin's 2nd floor photo gallery and the Willis Mould & Son bookstore which sold stereoviews. Pink mount.

The Adirondac Hotel, Keeseville, NY. This view was taken from Baldwin's 2nd floor studio window and shows the hotel which contained H. Tousley's Photo Gallery. Pink mount.
A Warning - Do not enter the woods until you have secured a photograph of yourself as a means of identification on your return. Baldwin at Keeseville will take your dimension in any style and size, and it will be a pleasure in after years to point to it and say: “Thus I looked when I entered the Adirondack Wilderness, and” pointing to another which can also be obtained at Baldwin’s as he takes both kinds. “thus when I came out.”

George W. Baldwin’s first year in Keeseville was undoubtedly his most formative year in photography. His unique position as sales agent allowed him to become familiar with the works of some of the finest photographers in the Northeastern USA. Within several years he would expand his horizons to become Stoddard’s main competition, not only at Ausable Chasm, but in the great Adirondack arena as well.

The Remaining Years

Baldwin’s first outdoor photographs were stereoviews taken in late 1874 or early 1875. These were scenic winter views of Ausable Chasm and views of Keeseville’s bridges, streets, buildings and storefronts. During this period he experimented with using different types of cabinet stereo mounts. He finally adopted a 4 1/4 inch x 7 inch mount with a rustic border containing the notation “Gems of the Adirondacks” on the left hand side, while the opposite side simply states “Baldwin Photo, Keeseville, NY.” The background colors for the border are different shades of either pink, green, ivory, or brown.

In July, 1875 Baldwin took several important stereoviews of the shipwreck of the passenger steamship Champlain which ran aground in Lake Champlain near Westport, NY. In 1876 he produced a group of stereoviews depicting the various J & J Rogers ironwork facilities in Ausable Forks, including the company headquarters and company store. At this time he also took several views showing Ausable Fork’s covered bridges, streets and buildings. These were the earliest outdoor photographs ever taken in Ausable Forks, which at that time was the heart of the Rogers enterprise, one of the largest iron companies in the country, employing over 2000 people in the area.

By 1877 Baldwin started to travel within the Adirondack region to photograph the falls and rustic bridges of Keene, the inns at Lake Placid and Saranac Lake, Paul Smith’s at St. Regis Lake, and John Brown’s Home and grave in North Elba. He also produced scenic stereoviews of Wilmington, Loon Lake, Round Lake, Elizabethtown, Keene Valley and upper and lower Saranac Lake. By the end of 1877 Baldwin started to make Boudoir size (5” x 8”) prints of Adirondack scenery. He continued to do portraiture work in his Keeseville Gallery, employing both the carte-de-viste and cabinet card style formats. He also manufactured and sold his own picture frames and employed several women to help in the processing and mounting of his photographs.

After 1880 Baldwin produced no new stereoviews, relying on his existing stock of some 400 to 500 negatives to produce stereoviews for visiting tourists. In August, 1882 the Adirondack Hotel, located across the street from Baldwin’s studio, and containing Horace S. Tousley’s Photographic Gallery...
The mine hoist building at one of several mine sites near Ausable Forks where mined ore was lifted to the surface to be transported to the J & J Rogers Company. Pink mount.

“Camp Comfort.” Tourists are shown posing at this staged photo-op site which would provide them with a picture souvenir of their Adirondack trip. Ivory mount.
burned down during a major fire on Front Street. In February 1883 Willis Mould died and his son Henry took over the management of the Mould Block Building. It was during this period that Baldwin moved his business to Plattsburgh, NY some 15 miles north of Keeseville. The move appears to have been sudden and whether either of the previously mentioned events influenced the move is not known.

With a population of about 8,000, over three times that of Keeseville, Plattsburgh was recognized as a place of commercial importance having direct links to Montreal by rail and to Burlington and St. Albans in Vermont by ferries crossing Lake Champlain. It was these lines of connections that also made the city a main northern gateway to the Adirondacks. In Plattsburgh Baldwin advertised that his portrait photographs were: "artistic and could be enlarged to the size of life or reduced for the smallest locket and finished in oil, ink, crayon or watercolor." He also sold books of Adirondack scenery and manufactured and sold gold and plush picture frames. While at Plattsburgh Baldwin still traveled throughout the Adirondacks to do landscape photographs. Some of his finest landscape photographs, up to 8" x 10" in size, were taken during this period.

In 1893 Baldwin moved again to Saranac Lake, NY. Here he opened "Baldwin's Art Studio" located on Main Street. He continued to do both portrait work and landscape photography. His portrait work increased in Lake Saranac due to a large transient population associated with the establishment of the Trudeau Sanatorium. Doctor Trudeau's work and research on tuberculosis, which attracted world wide attention, had put Saranac Lake on the map. For the seasonal tourists visiting the Saranac Lake area and the nearby emerging village of Lake Placid, Baldwin still offered his artistic photographs of Adirondack scenery.

In 1904 Baldwin and his wife moved to Rutland Vermont, probably prompted by the deteriorating health of his wife, Margaret. In 1907 Margaret Baldwin died of heart disease. Baldwin, who had already established a new photographic business in Rutland, continued his business at the same address for at least another twenty years. On December 11, 1930, the following appeared in the Rutland Herald: "George W. Baldwin, 36 South Main Street died yesterday as a result of injuries received when struck by a car Saturday." The following day the Rutland Herald disclosed that the body of George W. Baldwin, widely known Rutland photographer, would be taken to Ausable Forks, New York, and committal services would be conducted by the Masonic bodies. Baldwin, at the age of 81, had returned to the land of his origin to be laid to rest in the family plot at Fairview Cemetery in Ausable Forks.

Today Baldwin's stereoviews and other outdoor photographs are highly collectible in the greater Adirondack region. In New York the Adirondack Museum at Blue Mountain Lake, the Saranac Free Library in Saranac lake, and the Anderson Falls Heritage Society in Keeseville all have fine collections (Continued on page 37)
Ghosts of the Abyss

review by Lawrence Kaufman

The tale of the Titanic ranks with the great stories of western literature. It has so many elements that make an intriguing film: pride, folly, hope, luck, love and tragedy. The true-life story of human drama and cruel fate has turned into public lore and taken on the force of a mighty myth. For almost a century we have yearned to discover the whole story. Perhaps that is why the story continues to be told and retold on film and in books so often. A simple search of the Internet Movie Database: http://us.imdb.com for "Titanic" brings 54 finds. The first film was a quickie one-reeler Saved from the Titanic (1912) released 29 days after the sinking. It was actress Dorothy Gibson's final film. Gibson was an actual Titanic survivor; she and her mother were on the first lifeboat that departed from the ship. She starred in the film in the actual dress that she had worn that night.

On April 10, 1912 The RMS Titanic left on its maiden voyage across the Atlantic Ocean. By April 15, 1912 the devastating tragedy of this virtually "unsinkable" ship was world news. The Titanic's sinking left only 706 survivors out of the 2,203 passengers and crew members who had boarded.

Ninety-one years later on April 11, 2003, the 3-D motion picture Ghosts of the Abyss (GOTA) left on its maiden voyage to visit the Titanic remains that are resting on the ocean floor. By April 15, 2003, when the weekend grosses were published, GOTA ranked 13th according to the Variety Box-Office report. Variety reported that it played in 97 theaters grossing $1,408,474—an average of $14,520 per theater (compared to the number one film that week Anger Management, which played at 3,551 locations grossing an average $11,890 per location).

Genesis of the Film

James Cameron has been a fan of large format (LF) films since seeing North of Superior (1971) and even a bigger fan since IMAX 3-D was introduced. Cameron and 3-D LF filmmaker Stephen Low (Mark Twain's America in 3D, 1998; Across the Sea of Time, 1995; The Last Buffalo, 1990; and the 2-D Titanic, 1992) discussed the possibility of shooting 3-D high definition (HD) video and blowing up to 3-D LF with good results.

Cameron and Pace decided to slave the fusion. This would also mean that there would be less eyestrain.
and no adjustment time from cut to cut. Many people do not agree with this theory, and there certainly appears to be excessive eyestrain in GOTA that should have been eliminated.

Unlike most LF cameras, the Reality Camera System weighed 24 pounds, including the two zoom lenses and matte box. Plus it ran for two hours and took one minute to reload. Extremely excited with the new system, Cameron had to pick a first project.

His brother Mike had been working for three years on a couple of little robot vehicles (bots) to explore the inside of the Titanic. He was nearing completion and they realized that they could do a 3-D LF film about exploring the Titanic wreck. 3-D HD in the deep ocean to their knowledge had never been done. Cameron thought if he couldn't raise money for a documentary about Titanic, he should forget about doing documentaries. Six months later the production had started.

Cameron was aware of the 3-D footage that had been shot by Emery Kristof, but it wasn’t HD and Cameron had a plan to bring more lighting to the ocean’s floor. Kristof was a National Geographic photographer who was part of the 1985 team that found the wreck-age. A pioneer of innovative underwater photography using robot cameras and remotely operated vehicles (ROVs), Kristof created the preliminary designs for the electronic camera system for the Argo ROV, which first photographed the wreck of the Titanic.

In August, 1998, Kristof's pictures of the Titanic were presented in the National Geographic magazine article, “Tragedy in Three Dimensions.” The pictures were taken in 1991 using high-intensity lighting systems. Kristof recorded dual channel NTSC 3-D video of Titanic during the same dives as Titanc. In the 14-minute National Geographic 3-D short, Titanic: The Real Deal in 3-D (1998), Kristof narrates as viewers glide over the length of the legendary wreck. Images from the film helped inspire Cameron to use similar photographic technology when filming Titanic (1997). Kristof helped Cameron adapt subs-mersibles and lighting for the scenes in Titanic.

While discussing possible inspirations for GOTA and Cameron, I must include Stephen Low, who made Titanica, the first LF dive to Titanic (even more incredible since he used LF cameras!). After their 3-D HD tests, Low announced his next project with the working title Voyage Into the Abyss. The film about deep sea volcanoes will be released as Volcanoes of the Deep Sea (2003).

On August 16th, 2001, James Cameron set out on a ground breaking cinematic voyage, producing the television documentary Expedition: Bismarck (2002), along with billowing geothermal underwater vents teeming with life (for his next documentary) and GOTA; filming them all during the summer and early fall of 2001.

Cameron called this “What I Did On My Summer Vacation.”

The Production

There are only four vehicles in existence capable of withstanding the bone-crushing water pressure at the Titanic’s depth—5,000 pounds per square inch. Two of those are Mir-1 and Mir-2, which were on the Keldysh, the largest research vessel in the world (also the only ship that carries two subs-mersibles). A shell made from nickel-steel alloy and windows seven inches thick protect the passengers from water so dense it could crush a solid-steel safe.

Every aspect of making GOTA was a test of endurance. But Cameron developed new and amazing tools to help on one of the most ambitious and truly dangerous dives imaginable: the Reality Camera system, the ROVs and the Medusa Remote Lighting Platform. These combined tools bring to the surface amazing images unseen for over ninety years. The sheer magnitude of the mission was staggering. Two ships were required, in addition to the Keldysh, the EAS was used as the support ship for the Chandelier.

Called Medusa, the Chandelier is an enormous lighting platform specially designed for the production. Medusa, really a giant vehicle weighing about four tons, had 12,000 watts of light and a 3,000 volt cable that went two and a half miles down into the water. A grid was used with corresponding locations on the Titanic to position Medusa for every shot.

The Reality Camera System begins with two custom-designed Sony HDW-950 cameras in which the core imaging electronics have been de-coupled from the rest of the circuitry (which now trails behind the camera via a 20 foot umbilical cable). This reduces the size of the actual camera to the point that two of them can be mounted side by side. Cameron says they are 69mm apart as not to confuse anyone that he is talking about a film format, if he said they were 70mm apart.

Perhaps the most remarkable filmmaking innovations used on the expedition were the two ROVs, nicknamed Jake and Elwood. Built from scratch, these robot (2-D) cameras were designed to go inside shipwrecks. The entire communication source for the bots was a

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Mike Cameron had built the deep ocean camera housing for his brother in 1995. His company, Dark Matter LLC, specializes in deep-sea engineering and design. They were called upon to create an entirely new titanium housing for the twin cameras. This required a special optical dome port and a corrective “contact lens” which would allow twin lenses to shoot off-center through a single dome port without introducing distortion. The whole system was then mounted on a Dark Matter LLC designed pan and tilt system and integrated with existing controlling mechanisms from the 1995 expedition. Even making the system as small as possible, the 3-D camera system still required packaging one of the largest implantable volumes ever mounted outside of a manned deep submersion vehicle.

When the shooting was done the good news was they had 900 hours of footage, the bad news was also that they had 900 hours of footage and they could only make an hour film. The film is only 59 minutes long since 60 minutes is the longest length for a 3-D LF film without an intermission and they wanted to include one trailer. Only 300 hours was shot in 3-D, so they used the 2-D footage as smaller frames in front of the 3-D footage to help tell the story of their journey to visit the Titanic.

While on the trip EarthShip.tv participated in the expedition and brought the stories back, via satellite, to the Internet and the world. The website http://www.earthship.tv is still online, but has been joined by Disney’s websites for the film: www.ghostsoftheabyss.com.

The Ghosts of the Abyss release

James Cameron teamed with Denver billionaire Philip Anschutz to produce the 3-D GOTA; Cameron’s first film since his box office triumph and Oscar Winning Titanic. The film was distributed by Disney (Buena Vista Pictures Distribution) not only to LF theaters but also to a number of regular 35mm locations that had been retrofitted for 3-D projection. The 35mm locations were in cities that do not have a 3-D LF theater.

The film was produced by Cameron’s company Earthship and Walden Media. Walden Media is a subsidiary of the Anschutz Company. The Denver-based company is one of the largest privately owned and operated ventures in the U.S. (run by billionaire Anschutz). Anschutz also owns Regal, the largest theater chain. They helped to make certain that this film received the largest release possible. Of the 97 screens playing GOTA, 13 were Regal LF screens and 11 were Regal 35mm screens.

It was originally reported there were to be as many as 150 screens converted to digital 3-D and 35mm 3-D projection. Digital projection plans were scrapped early on. Cameron had hoped to have 100 35mm screens open GOTA in 3-D, but they were only able to arrange about half that number (45). Most of the LF theaters booked GOTA until August. After six weeks many 35mm locations stopped showing the film, but it remained in the top twenty box-office grossing films until the beginning of June when the summer films began to open and most 35mm screens had stopped showing the film. For Memorial Day weekend it ranked 13 and was still playing on 75 screens.

Unfortunately there have been many reports of bad 35mm projection experiences. Over/Under anamorphic squeezing might have been the best option for a 35mm 3-D release, but GOTA was not released that way. Disney used currently available lenses for the 35mm theaters, so none of the 35mm 3-D systems are any more advanced than they were in the 1980s. It is believed that Disney for the most part used Isco split lenses, some old mirror boxes for older, non-stadium auditoriums and a few Paramount boxes that are bulky, heavy and hard to set up. Split lenses have a problem in that the polarizer can burn out too fast (due to light and heat over a relatively short period of time). There are not really any backup lenses and only the factory can replace the polarizer. Many reports of poor 35mm presentations could have been polarizer problems.

I visited the Edward’s Mira Mesa Stadium 18 and was very disap-
pointed with the 35mm presentation. The film had major ghosting throughout and brightness was very diminished. The clarity was lacking (due mainly to the film size). For instance, the plaque placed on the *Titanic* at the end of the film could not be read in 35mm, but I had no problem reading it in the LF version.

Disney has been testing the waters of LF since their release of *Fantasia 2000* (1999) with mixed results. It is not certain how many more LF films they will release. They got behind the film with national and regional advertising and rolled out their 800-Phone number, 1-888-DISNEY-6 to pre-purchase tickets. GOTA received a lot of press. On opening day GOTA was one of AOL's rotating “front pages”.

Some Disney requirements could not be met by some institutional LF theaters, such as number of screenings per day. Show requirements for the AM would not allow school groups who wanted to see something other than *GOTA*. Some could not participate in the national group sales program, which would require them to give up school/group contacts. Some already had groups booked throughout the morning and could not cancel them. Disney would not sell a double feature to a group or pre-sell concessions to groups.

Disney did not even offer the film to the California ScienCenter (CSC). CSC had refused to book *Fantasia 2000*. This required Disney to build a temporary LF theater so *Fantasia 2000* could play in Los Angeles. Instead CSC booked *Titanica* and the not-to-be-missed “Titanic: The Artifact Exhibit” as a special museum exhibit.

*GOTA* is Disney's first 3-D LF release, so they perhaps made a few mistakes such as hard locking a 2-D trailer to *GOTA*, so you could not put on your glasses during the preview because only one eye was projecting. Cameron was out pushing the film, doing press junkets, attending premieres in Los Angeles, New York and the UK. He took *GOTA* to the Cannes film festival for a May 17th screening.

**Ghosts of the Abyss Review**

Even though *GOTA* marked some "firsts", including first 3-D film to receive a day and date release in both LF and 35mm theaters, and first LF film from Cameron, it was not the first 3-D LF film release to have been shot entirely with digital equipment. *Ocean Wonderland 3D* (2003) opened February 11, 2003, at the New England Aquarium in Boston and was shot entirely with digital technology.

While the film and subject are incredible, I do not agree with the advertising that called *GOTA* “The most spectacular 3-D experience ever filmed”. Joined by world-renowned scientists, historians and Bill Paxton, Cameron gives much of the screen time to Paxton. I have heard much debate and discussion on how tiring Paxton’s anxieties became. But he plays his part of “Mr. Everyman” very well. The film is billed as unscripted, but since only one dive (footage inside the sub) was shot with the 3-D camera; this required 3-D reshoots of some of the unscripted material seen in the film.

With the quick introductions, I can see how some people were confused about whether this was really a documentary. In the preview, Bill Paxton says, “What if you were suddenly plucked out of your actor life to go on the real adventure? Are you ready for that?” If you didn't know that was the premise, you could be asking “Paxton isn't a scientist, explorer or historian so why is he in the film? Is he playing a part here?” Also, Lewis Abernathy (Cameron’s best friend), played Lewis Bodine, the cynical sidekick to explorer Brock Lovett (Paxton’s character) in *Titanic*. Is he also playing a role here? Actually, as Abernathy explains in *GOTA*, he has long been intrigued with the *Titanic* legend and has been trying to hitch a ride for at least ten years. He was once the youngest member of the 5,000 plus member group, the Titanic Historical Society.

Peering over remains of the bridge of the *Titanic*, Paxton states as he narrates the film, “Try to imagine what it must have been like being on the bridge that night. That split second decision Murdoch had to make”. Cameron does just that with his incredible "ghosts". His idea to film ghost-like actors in period costumes was another stroke of genius. This allows the viewer to better picture what area of the ship is being viewed. Instead of seeing a large clump of rust on the ocean floor, we actually travel to the wreck of the *Titanic* and visit with its 1,500 souls.

I agree with James Cameron when he says, “People have seen the wreck of the *Titanic* before, but now you feel like you are really there”. People have paid $35,000 to dive to the wreck in the MIR subs. Now for around 10 dollars you can experience the Titanic as never before. And if you are claustrophobic and don’t want to take a four hour round trip 12,500 feet down in the middle of the Atlantic, that is a great gift. In 1997, Cameron brought us *Titanic* as she looked in 1912. Now he brings us the ship as she looks in 2003.

Cameron and his expert production crew have added a lot of high-
tech touches that bring the Titanic up close and personal. The film opens on an antique penny arcade, where we peer into stereo images from the Titanic. This trick reminded me a lot of the fabulous imagery from Siegfried & Roy: The Magic Box (1999). These were mostly original 2-D photos that were placed over wireframes to create crystal-clear stereo images. Cameron said all of this stretched out the post-production another six months (actual photos of the Titanic are few, most of what we have seen for years are actually photos of the Titanic’s nearly identical sister ship the Olympic). This all helps emotionally connect the shiny new Titanic of April 1912 to the rotting hulk that’s been sitting on the ocean floor ever since.

Watching “rusticles” form on the remains of the rusting ship just isn’t that exciting. And there are way too many eye-popping close-ups of the portholes on the subs with Paxton peering out. I did not get a headache, but I could feel my eye muscles working overtime.

Some of the incredible moments that really make the film for me include: All the fabulous computer-generated imagery (CGI) work, including the crystal clear “stereo card” reproductions; the previously mentioned night shot of the submarines surfacing and a diver braving some very choppy ocean waves in order to secure them; The ghost re-enactors in period dress; Exploring the cabins and other areas not seen by human eyes in over 90 years; Finding a bowler hat and actually knowing who the owner had been; Exploring Unsinkable Molly Brown’s cabin to verify that she slept on a brass bed; finding a water bottle and glass still upright on a sink after what the ship went through on the journey to its final resting spot; the wonderful leaded glass window of the dining room still intact; and the climatic re-enactment of the ship sinking while a scrapbook worth of superimposed passenger photos flash by us as they go down with the ship.

Incorporating the impact of the emotional reaction when the crew is informed of the 9/11 attacks worked very well in bringing home what the world’s reaction to the sinking of this unsinkable ship must have been like in 1912. The parallels between the Titanic and the World Trade Center are surprising there.

The 3-D Future of the Reality Camera and Cameron

In early June, Earthship completed a 45-minute version of GOTA for the Asian market. Cameron has stated that the DVD release of GOTA would be 90 minutes long, but he says they haven’t made a decision about a 3-D version yet. He does not want to release an anaglyph version.

With the Reality Camera, Cameron’s goal was to come up with the ultimate camera system, one that can be used for either conventional, LF and/or 3-D theatrical features. The Reality Camera creates two 2-D HD 24P masters, which allows you to release any production in either 2-D or 3-D.

The Reality Camera System was used for Spy Kids 3-D (2003), being released July 25, 2003, so we’ll get to see how 3-D anaglyph segments are accepted by today’s audiences.

Cameron has stated that he will begin filming his next feature in 3-D in 2004 for a 2005 release. He is being very secretive about the story line other than to say it will be a science fiction action film and that it is not his long planned Mars film. Being a drama and not a documentary, hopefully there won’t be too many painful close-ups. And hopefully convergence of the cameras can be kept to a minimum. His current plans are to release his next 3-D feature to 2-D and 3-D 35mm theaters and 3-D digital theaters. Twentieth Century Fox will release this film; hopefully someone there is taking notes about the 35mm theatrical problems. I have my fingers crossed.

Gems of the Adirondacks

(Continued from page 32)

of his works including stereoviews. Baldwin’s career choice was unique in that he was a true son of the Adirondacks rather than a relocated or visiting photographer from some distant city. His bread and butter, throughout his career, was his portrait work at which he excelled. His scenic landscape photographs are indeed works of art. But his most important legacy may have been the stereoscopic “Gems” and other photographs that captured the spirit and vitality of the Adirondack region and its people as they struggled to survive off the land. He recorded a vanishing way of life and helped give birth to tourism, an Adirondack industry that still flourishes today.

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Note

Parts of this article were previously published in the 1999, annually published Clinton County Historical Association magazine The Antiquarian, which contained the article “George W. Baldwin, Adirondack Photographer” also authored by Gunther Bauer.

After directing *True Lies* (1994) and *Strange Days* (1995), Cameron made his first 3-D film with *T2 3-D: Battle Across Time* in 1996 as a twin strip, triple-screen 70 mm film as a theme park attraction for Universal Studios. *T2 3-D*, an innovative combination of in-your-face stereoscopic cinema and live performance on stage, is still running today.

Cameron's *Titanic* (1997) broke all box office records worldwide, but it left him with the desire to return to the story of the doomed superliner. To film *Ghosts of the Abyss* in underwater 3-D, Cameron's first documentary, an exploration of the sunken wreck of the *Titanic*, the director called upon his director of photography Vince Pace to design a new 3-D camera built from two high definition (HD) video cameras. I spoke with Cameron and Pace about the Reality Camera System (RCS) just days before the release of *Ghosts of the Abyss*.

James Cameron Interview

RZ: Why do you like 3-D?

Cameron: I think there are people like you and me that are fans of 3-D, that just kind of loved it from the time that we first saw a 3-D film when we were kids. I think the question should be "Why should a general audience like 3-D?"

And the answer is: "We see in 3-D." You look at nature, at the way nature set things up, by the Darwinian process. Everybody's got two eyes, even down into the insect world. They've got a minimum of two. They might have eight. Everybody from lizards to fish, has got two eyes because survival comes from being able to gauge how far away is the prey or the predator. If I'm a frog having to shoot a bug out of the air with my tongue, I have to know how far away it is. That's how we see. Our two eyes are range finders. That's how our brains process the world.

So why shouldn't movies reflect the way we visually process information? We've been looking at a hundred-plus years of films that have been shot from one lens, from one eye, essentially. I've always loved 3-D. I've been attracted to it as a filmmaker in recent years with *T2 3-D* which I made for Universal. With that film I got my feet wet in 3-D and I didn't really know the ins and the outs of the technical side. That was my opportunity to download from the 3-D gurus what you are supposed to do and what you are not supposed to do. I went and looked at all the other 3-D shows that were around like *Muppetvision* and some of the 3-D IMAX films. I looked at what worked and what didn't work. Let them spend their money to teach us what worked and what didn't work.

And we saw a lot of stuff that we didn't think worked very well. We compared our notes. We put our heads together. And we said, "All right, it looks like it doesn't work very well to cut from a distant subject to a close subject." Because the eyes can't fuse quickly enough and the shot might be half over before you get it fused. And we created a little rule book like that. We got through *T2 3-D* like that and I think we did pretty good.

But then we started questioning the rule book. We started saying "Wait a minute. We're never going to be able to do normal films with normal editing if we can't solve these problems." At about the same time I was looking at doing another 3-D IMAX film. This one was going to be about a Mars mission, a fictional film but accurate, educational. So we started looking at the IMAX 3-D technology because for *T2 3-D* we didn't use that. We used twin 70mm cameras with beam splitters. They were a pretty big rig, pretty heavy. We used the Hines rig and a couple of...
other rigs as well and one that we built ourselves at Digital Domain that had active convergence and interocular.

We shot a lot of T2 3-D at a one inch interocular to take the curse off. But it was a real discovery when we started messing around with the HD equipment and had the ability to use real time active convergence and play with it in real time with an open feed. We were looking at a 3-D screen and the camera was sitting right there. We moved the convergence knob and we kind of threw out the rules that we had built for ourselves on the previous project. We spent a year doing research.

I said “I think we can do something else here.” If we just constantly converge at the place where the eyes are looking whenever a shot comes on the screen, the way the brain interprets the new information coming in, the first couple of frames of the incoming shot are used for the brain to cognitively organize the way it would look at that shot. Somehow your brain can adjust to the fact that it’s leapt into a close-up from across the room to being right in somebody’s face. That can happen so much quicker than the eyes can fuse that subject if you leave the convergence in the distance. But if you put the convergence right at that person’s eye, the fusion is instantaneous. It’s the same rate at which the brain processes the incoming information.

We wanted to test that. So we started shooting a whole bunch of different stuff in 3-D and cutting it together in HD online. We ran the online tapes in our digital projection suite that we set up at our facility. Working digitally allowed us to turn this stuff around so much faster, turning around cut material really rapidly.

RZ: And you were projecting with two projectors with polarizers on to a silver screen?

Cameron: Exactly. We used Christie’s DLP roadshow projectors which are basically not quite cinema grade but they’re only a very tiny notch down from that so they were perfect for us in a smaller room.

RZ: How big was your screen?

Cameron: We had a 22 foot screen. It’s a decent sized screen. We shoved it right up in our laps to make it feel like an IMAX film. I actually took the screen and moved it forward 12 feet so it would stand only a few feet in front of the first row. That was pretty good to simulate IMAX.

We did all our work, our own visual effects and everything. Eventually we installed a server and we just loaded everything to the server which would run it in perfect sync. There was no worrying about the decks getting out of sync. The first thing you look for when your stereo space is not working is sync.

RZ: Did you deal with field accuracy?

Cameron: No, but we need to. It’s 24p so technically there is no field and frame accuracy is what you get. But we’ve identified that there’s a phase lock issue between the left and right eye cameras that needs to be worked on. There are a couple of shots in the film that bother me when I see them, that have a slight phase shift.

It’s an issue that’s deep in the electronics of the cameras and it’s something that we’ll resolve before we do the next film. It hasn’t been problematic with the underwater photography. It’s only a problem when you’ve got somebody standing in front of the camera waving their hands around. It’s difficult to discriminate the strobing artifacts of 24p which are inherent and work against you in 3-D. Ideally, in 3-D you want to have 30 frame or 36 frame projection. But we don’t have that so we work within our limitations.

We are looking at the possibility of shooting at 30 frame and then digitally extracting 24 frames, a 2:3 image, from that for the 2-D release of the film. But we don’t know if the algorithms exist to extract that smoothly so we don’t get any additional motion artifacts. If that’s the case then when we retrofit a theater for 3-D, as we’re doing for this film by putting a silver screen in and lenses on the projectors for 50 screens with this little documentary film, we’ll get the screens up to double that.

RZ: It’s wonderful the theaters are being retrofitted with silver screens. Now this is for single-strip projection?

Cameron: Yes. It’s over and under single-strip 3-D projection. We looked at single-strip side-by-side because obviously there’s no way the 3-D can get out of sync when it’s side-by-side. The last thing you want is for the frames to get out of sync. And that’s still possible with the over-under format.

RZ: That would give you a pseudoscopic image.

Cameron: Disney has been really good about having follow-up in the field and having the projection lenses calibrated in each of the 50 theaters. Originally they were going to do 200 theaters. Then
they scaled back. They said, "First of all, we want to be in the best theaters in the market." And this is a pilot program. It costs ten thousand dollars per theater to retrofit for 3-D. It involves the issue of monitoring 3-D projection quality. And we have to educate the exhibitors how to do this.

For a 3-D feature film, I am going to want to go to an order of magnitude for more screens than 50. And that's our next project. We're going to try to jump up to 50 or more 3-D screens. I've asked for 1000 screens but it will probably be somewhat less than that.

RZ: So is the 35mm version of Ghosts of the Abyss the same running time and aspect ratio as the large format version?

Cameron: Exactly the same. We're basically saying, "If you don't have an IMAX 3-D theater in your city, you can still see the film." You're going to see it in 3-D. It's going to be the same film. But you won't have to go to an IMAX theater.

RZ: That's great. You must be thinking about a narrative 3-D film at a running time of 90 minutes or 2 hours. Of course, that's a problem for LF 3-D, given the hour limitation for a platter.

Cameron: Yes, but at this point we'll bypass large format. To me large format is large format. You're going to do documentary or natural history films that may be slightly dramatized. Ghosts of the Abyss is a perfect type of film for large format. The limitation of 60 minutes is fine. We're right up against it now with a 59 minute running time. We're practically overwinding on the platter as it is right now. But the thing is that a lot of the institutional IMAX screens use the shutter 3-D glasses and those would get heavy at a 2 hour running time, uncomfortable at that length of time.

I think it's better for us to show that what you really need in a 3-D theater are the lightweight glasses. They give a little bit more ghosting than what you see with the shutter glasses, but their cheap and they're easy to put out there into the field. And they work pretty well. It's all we ever used when we were making the film. I never even saw the LCS glasses until just recently.

RZ: Did you have a CrystalEyes system to preview your 3-D footage?

Cameron: We used CrystalEyes on the set to analyze the stereo space. But we looked at an HD monitor to check focus and lighting and all that sort of thing. And we would look at the stereo space on CrystalEyes system that was in real time combining the left-eye right-eye output to a single display.

RZ: Did you use the Ultimate green screen compositing process with CrystalEyes?

Cameron: Yes. We could actually feed the Ultimatte image into CrystalEyes. We had to run it through a down conversion. Right now there isn't an HD CrystalEyes system. You've got standard definition CrystalEyes for stereo space. And you look to the side at the HD monitor to see the actual image quality of a single eye. And you jump back and forth with what the right eye and left eye feeds to that monitor.

Right now, it's still a little cumbersome. Or, what we did on Ghosts of the Abyss was to put in stereo projection right on the ship. I would say, "Stay here, I'll be right back." I would run up four decks and run into a conference room, put on the 3-D glasses and look at it in stereo. Then I would call them on a walky-talky and say, "OK, do this," or, "Do that." When it was all adjusted then I would run back down to do the shot. We did it right off the ship.

The ship was kind of interesting because it was a completely unified production system. We had the ship all wired with HD SDI cable trunks so we could plug into it at different places. We were shooting from all over the ship but were recording to mission control where we had our two F-500 decks. And that worked pretty well. And then if we had to go totally mobile, we took two F-250 decks which were put into a Pelican case and we would drag that around and throw it into a Zodiac or a helicopter and it worked fine.

RZ: How many RCS's did you have with you?

Cameron: We had four systems. One was dedicated to the submersible. Two were in constant use topside for two-camera set-ups. And then we kept an additional one in reserve. Because the cameras were calibrated to match to each other, we decided to go with a full system. Although, I think we only had two operable rigs. Sony supplied us with what they called the "Jcam" which is the imagem head specially packaged to our requirements so they could fit within the interocular distance.

The limitation of the Reality Camera System is you can't go subnormal interocular. We are actually at about 2.75 inches with the interocular which is actually 70mm. But if you tell people 70 millimeters in the film business then they think you're talking about a film format.

So I just called it 69mm to make them realize we're talking about an actual metric of the distance between the left and right eye pupils. The Fujinon lenses came very close to fitting but not quite. So we asked Fujinon to make new elements for us which they did. They did some special cutting for us and resizing. We lost, I think, a quarter of an f-stop but it was trivial. So we wound up with 10 to 1 zoom lenses, matched and fitting within the interocular distance we needed.

With the RCS the front element of the lens actually becomes the pivot point for the convergence. It's kind of crude but it happens to be very effective. Most of the reasons that people go to a sub-interocular distance is because their convergence methodology is wrong. And so they're trying to correct one thing with another...
thing. If you're not able to do that, it forces you to figure out how to fix your convergence. So, by constantly dynamically changing convergence throughout the shot we're making the convergence perform in a way that makes it all work.

We're not a hundred percent accurate. I would say we solved the problem most of the time, but there are a few shots where we didn't do it right. But now we know what to do. We didn't find out until we went out to IMAX and by then we had spent a lot of money.

RZ: So you had a convergence puller during photography?

Cameron: We had a convergence puller because in HD you have more depth of field than you need, so you're much less likely to be out of focus than you are to be out of convergence. So what we did was to take the left and right eye images, run them through an effects switcher at 50 percent to each other. We took the output with the assistance cameraman doing a handheld shot and made the thing we wanted to be converged overlay perfectly on that monitor. That gets you within striking distance but it's not perfect. Then in post production we horizontally stretched the image by 3 or 4 percent. That gave us a little bit of a margin on each side and then we actively just programmed in keyframe dynamics. We constantly lined it up the way we wanted it. If we wanted to track with somebody and the convergence on the subject started to split then we just put it right back in with key frames.

So, we really got this whole thing dialed in. Now, IMAX and 3-D, interestingly enough, are a little bit at odds with each other. IMAX shoots everything with the lens axes parallel but there's another problem. Shooting in HD we didn't have to shoot parallel. We were constantly and actively converged which is why we can cut in the movie from a wide shot to a close-up of a guy looking out from a port hole and it works OK. Where you're looking when that shot comes in, is right where the image is converged. Your eyes don't have to adjust to try to fuse the images.

Where IMAX and 3-D are a little bit opposed to each other is with the ratio of the distance to the screen. The width of the screen is not optimized for 3-D. You've got plenty of resolution but that big screen works against you a little bit. I'll tell you why.

When you're in an IMAX theater you tend to not be able to see the entire image at once. So, what you really do is look at one thing, then another, then another one after that. You're moving around and the area of the screen that your brain is analyzing is a subset of the total screen. So that means that if you don't happen to land in the place where we've fused the image, prefused it for you, you're going to be having your eyes hurting a little bit.

Part of the fun of an IMAX movie is that you're looking around the screen. You have the choice of looking around at different parts of the image. That's the way the brain works. You do the obvious thing and then you kind of start screwing around. In 35mm the ratio of distance to screen size is perfect for 3-D. Because you're just enough outside of it that it's not that interesting to look over in a little corner. You pretty much stay where you have been forced to anticipate where you will be.

Once that image is locked in, once it's captured, that's where the fusion point is going to be. Or we can adjust it slightly later but we have to make a decision. Otherwise you'll be looking at something and, if you're at the wrong place, you'll be looking at something that's unfused. Now, your eyes will be able to fuse it and start working it. And when you're working it you're feeling it with feedback from your eye muscles that cause the pain and the discomfort.

So, the whole idea is how do you make a 3-D film where you've removed the discomfort factor? Where you have sort of predigested the fusion processing for the audience. Because they normally don't have to do it at all. They're watching a 2-D film and there is no fusion. It's all fused. You know what I mean?

RZ: So there were some places with forgiveness?

Cameron: There was some forgiveness but not much. That degree of forgiveness goes down rapidly when you go into IMAX because now, again, you're looking at a
subset of the total frame. So, the error in an individual place becomes bigger, relative to your field of view.

RZ: How much did you keep in mind the large format “sweet spot,” one-third of the way up from the bottom in the middle of the frame?

Cameron: That was less of a concern for us because we were shooting in the 16 by 9 aspect ratio. IMAX, I think, is 4:3 so what we did was to actually have black masking printed right into the print at the top and bottom of the frame for IMAX and you just don’t see it. We had to figure out what our extractions would be. And we actually went one further. You think that what you would do is to slam that 16 by 9 all the way out to the sides of the IMAX frame. But we actually cropped in a little on the sides as well.

We didn’t want to overwhelm the audience. We were not interested that much in the size of the image. We were interested in the stereo presentation. So we actually masked in slightly on the sides of the image. Then we masked for our vertical extraction.

We went for two-thirds of our masking at the top and one-third at the bottom so it was applying the same basic principle of the “sweet spot” but we just shifted the whole image down. And we don’t have as much sacrificial open space at the top. In fact, we didn’t compose for that at all. We just made a nice 16 by 9 composition. It seems to work OK.

RZ: It works fine. One of the beauties of the film is how many different visual elements are integrated into 3-D space so seamlessly, from CG of the ship to the 3-D footage of the sunken ship and the actors brought into the ship in stereo.

Cameron: We were trying to interpolate the geometry after the fact. So we would show up on the set on the green screen stage. We knew what our focal length was when we shot the underwater stuff. We knew approximately how far the deck extended. But we had to move things around a lot so they matched the stereo space. We said, “OK pick that up and drag it a couple feet back.” And then we would look at it on the CrystalEyes monitor. It took us a long time to put all the elements on tape.

And then when we started compositing we found something would be pseudoscopic. We called it “embedding” and the beauty of the digital was that we could freeze the image. The guy would just loop it on the server by scrolling back. Then we would freeze the image. I took a laser pointer and would use it and say “OK, that right there needs to go on the Z-axis back two feet. This right here needs to come forward.” Sometimes we warped the elements so that they fit better. There was a lot of post massage of the image but it was really easy to do in HD because once it was coded into the server you could just stop it.

We were watching a movie on a 22 foot screen, almost the same quality as the finished product. Except, we could stop it. It wasn’t going to burn through. It was cool.

RZ: Well, you’ve made a very interesting work. It’s ground breaking to release it simultaneously in 35mm and large format and it’s also an excellent fusion of documentary and narrative in 3-D.

Cameron: Thanks. I appreciate that.

Vince Pace Interview

RZ: It’s quite an innovation to build the Reality Camera System (RCS). Can you recall the very first conversations you had with James Cameron about it and what was driving you and him to build the camera?

Pace: My relationship with Jim Cameron started back on The Abyss. He had an interest in high definition (HD) back in September of 2000. Because underwater has always been kind of the gateway for electronic cinematography, because of tape loads and instant imaging over film, he suggested we head out to Truck Lagoon to experiment with some underwater footage of HD.

And so I headed out with him with one of my HD camera packages and we shot Truck Lagoon. It was there that he started to discuss with me his interest in building a small remote head camera and the possibility of using it for 3-D acquisition. He started to describe his holy grail camera system.

That’s when it all began for me.

RZ: You eventually put together a complex array of elements. I understand the Panavision Prime lenses were initially too wide for the 69mm interocular? So you went to using a pair of Fujinon lenses.

Pace: Yes. In the beginning, for me, my interest was in working on an advisor basis with Jim. So he had me join in meetings with Panavision, with Sony and certainly entertain other lens manufacturers whether they be Canon or Fujinon. I was there in the lucky position of no commitment, just listening. It was through those discussions that I generated an interest in participating in creating the 3-D system. And also start to review what various vendors would bring to the table on a component level for that system.

So, when we met with Sony, they were in agreement to build narrow camera bodies to be laying down 24p HD format. Fujinon stepped up to the plate next and said that they could create matched zoom lenses for us that would be within that 69mm interocular. Since we had to do field recording, and Sony did not have a field recording solution in 24p, Evertz stepped up with a solution to go through a segmented frame process to be able to lay it down with current field decks and at the end of the day be able to extract your 24p master once again. We were using HDW 250 VTRs as our recording method.

RZ: What was the zoom ratio on the Fujinon lenses?

Pace: 5 to 50. That was perfect for what we were trying to accomplish.

RZ: And then, eventually, Panavision came up with some prime lenses that worked for you with your interocular.

Pace: Yes. They were developing zoom lenses. But they did have prime lenses that they felt that they could design for us that would fit within the 69mm interocular. So they ended up making 5mm, 7mm, 10mm, 12mm, and 14mm focal length lenses.

As the focal lengths relate to HD, it would be a 2½ times ratio if you were to consider 35mm motion.
picture film. So we were looking at a 12.5mm focal length on up as far as it relates to 35mm.

**RZ:** What focal length did you do most of your shooting with when you were down there?

**Pace:** For the *Titanic*, one of the reasons that we went with the Panavision Prime lenses was because they were a faster lens, so for the most of your shooting with when Panavision Prime lenses was our selection was between the best lens choice for us.

**RZ:** What was the f stop on that?

**Pace:** I believe a 1.6. The Fujinons were great to have this tool set on both Panavision and Fujinon sides because creatively we could look at a situation and use the best tool for the job. Whereas a lot of the topside material is very fast with a gun style and the Fujinons were perfect for that application.

**RZ:** So you have interlocking focus, iris and zoom with the RCS?

**Pace:** Yes, that's correct. We have basically a motion controller brain underneath the camera system that's capable of interacting with all of the seven channels; zoom, focus and iris and then a signal times 2 for a single convergence channel. So it is that software that is driving all those different channels. And we can interlock them. Or we can offset them to get the best calibration and synchronicity between the system.

**RZ:** Can you converge independently as well as slave convergence to the other functions?

**Pace:** That is correct.

**RZ:** What did you shoot the most footage with? The convergence slaved to focus or independent?

**Pace:** It was slaved. However, it was slaved where the driving factor was convergence and not focus. In the beginning we were just heading out with the system and learning it. We also were adding the other layer of convergence to an operator's position. So about two weeks into the process we realized that we needed to get a good focus puller out on the job. We brought a focus puller out to the ship and had him settle in. Obviously, he was staring at totally new equipment and controls. He settled in with the equipment. And we started shooting he started to apply his talent as a focus puller. We quickly realized the depth of field was much more acceptable for a shot than the convergence point.

When we looked at the 3-D shot, it might have been acceptable as far as our focus marks but it wasn’t acceptable how it translated as a convergence field. So we determined that the depth of convergence was more of a narrow band than the depth of field for focus. And we gave the focus puller another hat called “convergence puller.” We addressed shots with that main control channel being the driving factor for many of the shots.

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**Stereoscopic Displays & Applications Conference 2003**

(Continued from page 13)

- Parallax Player software, high resolution 22” SynthaGram autostereoscopic monitor (model 222), 42” SynthaGram (model 422), and 20” SynthaGram (model 202) from StereoGraphics Corporation, www.stereographics.com.
- Dep3D (Los Gatos, California) demonstrated a 40” stereoscopic rear-projection TV using polarized 3-D glasses and a range of stereo-enabled video games
- Hideki Kakeya of University of Tsukuba (Tsukuba, Japan) demonstrated a 3-D workbench based on a desktop autostereoscopic display.
- Takashi Kawai of Waseda University (Tokyo, Japan) demonstrated “Stereodit” software available from Lets Corporation (Japan). “Stereodit” has been developed for the editing of digital stereoscopic video files.
- Dynamic Digital Depth (http://www.ddd.com Santa Monica, California) demonstrated a range of 2-D to 3-D conversion technologies including a new computer display driver for generating multi view stereoscopic displays for appropriately enabled computer games and applications in scientific visualization. A StereoGraphics SynthaGram monitor and DTI autostereoscopic monitor were used on this stand.

**Keynote Address**

An interesting finish to the conference was Ian Howard's keynote address “Understanding stereoscopic vision”. The Emeritus Professor at the Centre for Vision Research at York University, Canada, gave an interesting literary and historical revue of stereoscopic vision. He also brought copies of his new tome *Seeing in Depth*, a two volume hardcover scholarly review which includes much of the scientific literature on stereoscopic vision up to this point. With nearly 1000 pages on the subject, it covers much material that was heretofore scattered amongst many different publications. For ordering information: www.hpl.cs.yorku.ca/iporto111 or I Porteous, 49 Dove Lane, Thornhill Ontario, Canada L3T 1W1.

I found the conference interesting because it was from the technical non-hobbyist view. This would be a good conference for more stereo photography hobbyist to attend because they will have more influence on some of the professionals who will be releasing 3-D products to the public.

The 2004 Stereoscopic Displays and Applications conference will be held January 19-21, 2004 in San Jose, California. Further details are available on the conference website: www.stereoscopic.org. Don’t forget—two free and complete ebooks are also available for download from this site: *Foundations of the Stereoscopic Cinema* by Lenny Lipton and *Three Dimensional Photography* by Herbert McKay.

**About the author**

Steve Berezin is the president of Berezin Stereo Photography Products, which offers 3-D products for the shooter and hobbyist: http://www.berezin.com/3d.
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STEREO VIEWS for sale on our website at: www.daves-stereos.com. E-mail: wood@pikeonline.net or contact us by writing to Dave or Cyndi Wood, PO Box 838, Milford, PA 18337. Phone (570) 296-6126. Also wanted - views by L. Hensel of NY and PA.

STEREOVIEW PRICE GUIDE. Only $8.00 Great for people buying from auctions and for collectors who want the latest realized auction values. Only numbered views only $50 are listed. Doc Boehme, 1236 Oakcrest Ave, Roseville, MN 55113.

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ralalia. Keith F. Davis, 5105 West 120th Terrace, Overland Park, KS 66205, or mds105@aol.com.


REAL EYES 2-D to 3-D video converter. Brad Bishop, 7728 Boeing Ave., Los Angeles, CA 90045

tact: Don Schwarck, 1159 Vassar, South Lyon, MI 48178, (248) 437-9195 or dsundman@Light-
hartmut8wettmann.de or:

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There is a good selection of stereoscopes of various makers and styles including viewers by Cadwell, Beckers, Smith & Beck, Gibbons, a Jules Richard Taxiphote with slides, Brewsters, two Stereo-Graphoscopes, an unusual folding Underwood viewer and a stereo daguerreotype in a Mascher viewing case.

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