ALL PHOTOS COURTESY THE AUTHOR

Here are few remarks by some of those who worked closely with Walter Bird:

"I met Walter Bird for the first time in 1963, when the architect Victor Lundy and I came to Buffalo to work on Victor's glorious bubble trees for the Brass Rail Restaurant pavilions of the New York Worlds Fair. In 1980, Walter and I shared a trailer at the construction site of the Haj Terminal, the world's largest roof structure and the toughest design project of my career. He had just sold his firm and his first wife had just died. In between the Fair and the Haj, we shared numerous projects. Walter was one of the great pioneers of construction technology of the 20th Century. He understood deeply how his structures behaved. He was inquisitive and fearless. And a wonderful friend. (He taught me to order my steak rare.) I will miss him.

—Horst Berger, Distinguished Professor of Architecture, City College of New York

"Walter was made of sterner stuff than most and expected no less of others. Our adventures in those early days did not seem exceptional at the time, but in retrospect, they were testaments to the indomitable will of individuals with exceptional talent and a passion to succeed. Probably one of the finest hours for Wally and me was to appear together at a symposium in Vermont to describe the potentials of this emerging technology to provide shelter for man and his activities on a billing that included R. Buckminster Fuller himself. Much of that potential has yet to be realized, but that which has is owed in no small measure to the ingenuity and passion of Walter W. Bird…an engineer's engineer and a dear friend upon whose shoulders I was allowed to stand to see the possibilities of a new 'built landscape.' He is greatly missed."

—John Effenberger, Visionary, FLUORx, LLC (longtime Chief Technical Officer at Chemfab Inc.)

"I had the pleasure of meeting Walter a couple of times. One was at the 20th anniversary of the building of LaVerne in 1993. I found him to be a fascinating man with an incredible lack of ego. He was clearly a brilliant engineer who was always more than happy to talk about structures. I do not know that I have ever met a nicer person."

—Marcel Dery, Market Manager-Architectural, Saint-Gobain Performance Plastics

Inspiration

The Last Flight

Homage to Walter Bird, with comments from those who knew him well

BY R.E. Shaeffer

On April 6th of this year I lost a good friend and hero. Walter W. Bird was 93 when he passed away. He was best known as the founder and leader of the Birdair Company, the nation's largest and most recognized fabricator and builder of membrane structures.

Walter graduated from Massachusetts Institute of Technology (M.I.T.) in 1934 with a degree in aeronautical engineering. At the peak of the Depression, the only job he could find was designing new streamlined railway cars for the Pullman Company. Shortly thereafter he became an invited fellow at the Sloan School of Management at M.I.T. and ranked first in his class. During World War II, Walter Bird finally got to use his aeronautical education designing fighter planes for the Curtiss-Wright Airplane Division. One of the planes he worked on was the P-40 of *Flying Tiger* fame. When the war ended, he joined the Cornell Aeronautical Laboratory in Buffalo, New York, which had a contract with the Air Force to find new ways to enclose and protect large radar antennas being designed for the harsh climate of the Arctic. These shelters had to be non-metallic to avoid interference with the radar signals. Under Walter's direction the first air-supported prototype was constructed of Neoprene-coated fiberglass fabric in 1946. (See Fig. 3, pg. 60.) Within a few years, hundreds of these domes of various materials were constructed for the military.

In 1955, Walter Bird and a few of his associates left to found Birdair Structures Inc. The company was conceived by a few people seated around Walter's kitchen table in his Buffalo home. This fledgling organization landed contracts for military applications and also became involved with tennis and swimming pool "bubbles," one of which (over his own backyard pool) made the cover of *Life* magazine in November of 1957. (See Fig. 4.)

In the 1960s, the company was awarded its first really large contract, building huge radomes to protect the satellite tracking antennas used around the world. (Early satellites were not in fixed orbits and had to be constantly tracked.) These domes were built of coated Dacron**,** and were more than 60m (200 ft.) in diameter.

For the Expo '70 in Osaka, Japan, Walter helped David Geiger, the late engineer, design the U.S. Pavilion. The low-profile air-supported roof was restrained by steel cables and was ideally suited for a site that was subject to both high winds and high seismic forces. This temporary structure used a skin of PVC-coated woven glass fiber. Walter had hoped to get the construction contract but it was awarded to the Japanese firm of Taiyo Kogyo. (Much later, in 1989, this firm bought the Birdair Co. and still runs it today.) The U.S. Pavilion served as the pioneer for the many air-supported stadiums constructed during the 1970s and 80s of PTFE-coated fiberglass and designed by the Geiger-Berger firm and built by Birdair.

In 1973, Walter Bird constructed the first permanent membrane structure not supported by air. The La-Verne College Student Activities Center can be seen in Figures 1 and 5. It is still in use today, long since dispelling any notions that the PTFE-glass fabric would not last.

After that, Birdair constructed most of the permanent membrane structures in the United States and many around the world. These include the Bullock's Department Store in San Mateo, Cal., the Haj Terminal in Jeddah, Saudi Arabia (See Fig. 2), Riyadh Stadium in the same country, and the tensegrity derived cable domes for the Suncoast Dome in St. Petersburg, Fla., and the Georgia Dome in Atlanta. (An anecdotal story told to me by his third wife [he outlived the first two] involved this last structure. After Walter had retired, he visited the construction site while on vacation. His wife watched him pull into the site, pop on a hard hat and clambered up to the roof to watch the fabric panels being fastened to cables. When he came back to the car he told his wife the perimeter of the roof was too flat and rainwater was going to "pond" or accumulate in those areas. This observation was later borne out and special members had to be installed to correct the problem.)

Over nearly 35 years the organization that Walter started in his kitchen has built over 750 projects in 35 countries on five continents. Birdair's more recent structures include the Denver Airport, the membrane for the Millennium Dome in the United Kingdom, and the retractable roof of the Reliant Stadium in Houston, Texas. In addition to David Geiger, Walter Bird collaborated with such notable designers as Horst Berger, Ted Happold, Fazlur Khan, Matthys Levy, Frei Otto, Peter Rice, Jörg Schlaich, and Paul Weidlinger.

Walter Bird was a talented engineer, a master at construction, and a remarkable businessman. He was highly instrumental in developing a whole new industry, that of fabric structures. He will not be soon forgotten.

R.E. Shaeffer, PE, is a contributing editor for Fabric Architecture. *His last contribution, "South of the Borders," appeared in the Mar./Apr. 2006 issue.*

Fig. 1: Walter Bird (with hat) and the architect, John Shaver, inside the Center in 1993 when the structure's 20th birthday was celebrated. Photograph taken by the author. **Bellow: (Fig. 2)** The Haj Terminal of 1980 is still the largest fabric structure ever built. Photograph courtesy of Taiyo Birdair Inc.

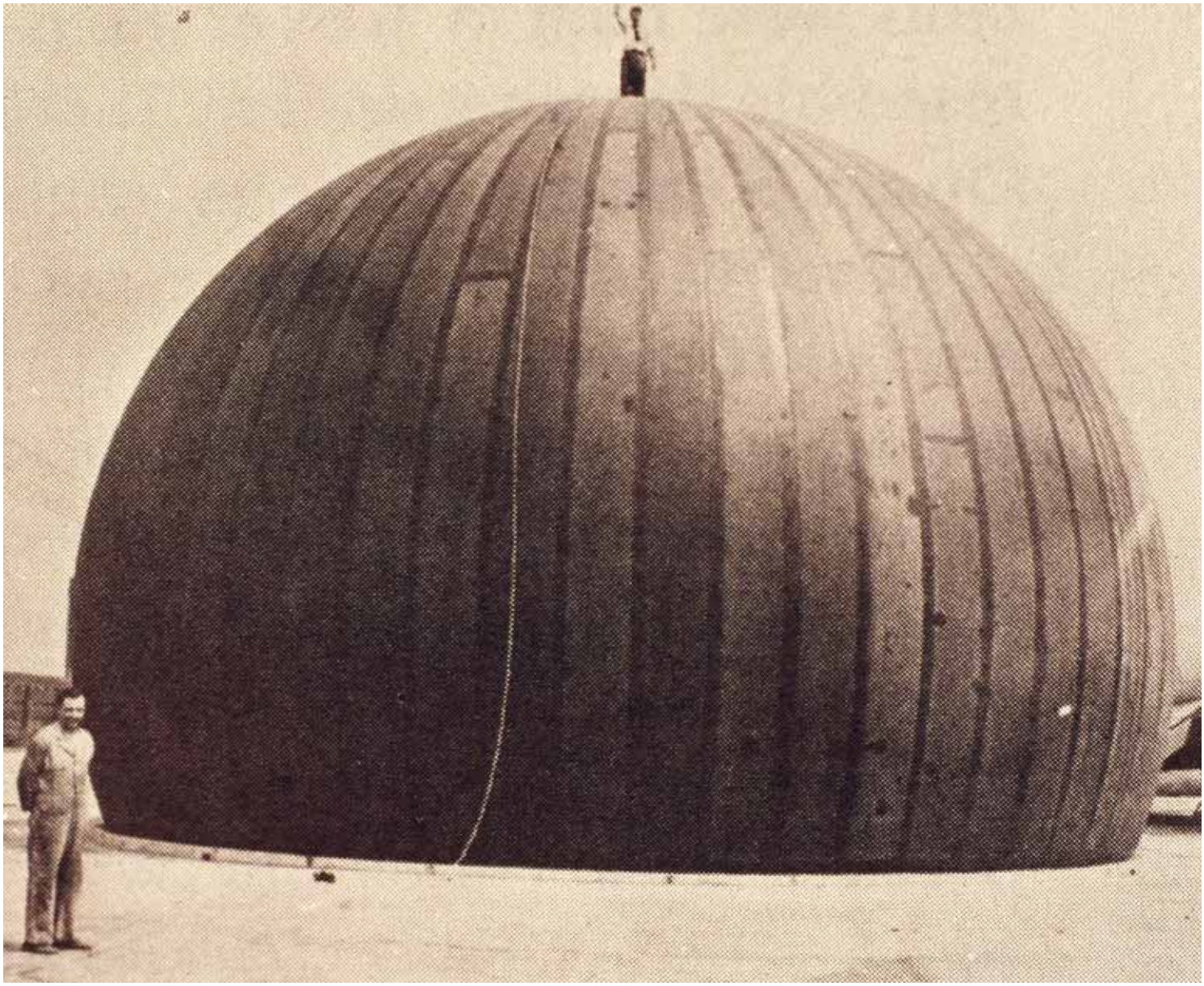

Fig 3. Walter Bird atop his first radome in 1946. Photograph courtesy of Milt Punnett and the Cornell Aeronautical Laboratory. (His shoes can be seen next to the climbing rope he used to mount the dome.) **Opposite, top: Fig.4** A swimming pool air-supported cover with transparent walls shown in Nov. 11, 1957 *LIFE* magazine. **Opposite, bottom: Fig.5** The Laverne College Student Activities Center (1973).

More remarks by some of those who worked closely with Walter Bird:

"Walter Bird had a dream; he lived it; he achieved it. I owe my career in tensile fabric structures to his vision. I believe I speak for a lot of people when I say he will be missed but not forgotten. Thanks, Wally! With deepest respect,"

—Larry Keene, FabriTec Structures Sales Manager, SE USA (long-time Birdair employee)

"I first worked with Walter Bird in 1958 when the MEBAC Theatre was built in Boston. We were both on the fabric roof but Walter was braver than I since he walked toward the center and I stayed near the edge. Over the years I continued collaborating with Walter and remember particularly the construction of the athletic facility for Riyadh University that had to be completed in the record time of six months. Throughout these years, I continually sought his advice for every fabric project I designed and welcomed his insights. He was a terrific person and a very inventive engineer. He always seemed to be available whenever I needed advice on a tricky detail and was generous in sharing his broad knowledge."

—Matthys Lévy, PE, Chairman-Emeritus, Weidlinger Associates LLP

"I first met Walter Bird during my early tenure at Birdair, when he asked to stop by the office on a Saturday to show his wife some of our new projects. I was fortunate to present some of our recent efforts such as the San Diego Convention Center, the Olympic Stadium in Rome, the Georgia Dome (arguing air-supported structures are more user friendly than tension structures—less obstructions) and Chene Park Amphitheater, while Walter showed me the virtues of his passion about better buildings, utilizing membrane technology! From this first encounter, I was hooked. Walter taught me just how exciting tensioned membrane technology is and just what a special individual he was. His passion and genuine love for the technology was inspirational. I have not met anyone since who was as brilliant and exciting to simply listen to about his passion. I miss him deeply and am thankful for the time we shared."

—Doug Radcliffe, Principal, Radcliffe Steel (long-time Vice President-Sales and Marketing at Birdair)

"When Birdair first started. I *was* the Engineering Department. Of course, Wally was always an engineer at heart, so I hardly had to worry about being alone. What a creative and considerate individual! (While at the Cornell Aeronautical Laboratory, he even persuaded me to apply for their graduate fellowship at Cornell, and off I went!) Wally was always a hands-on, back of the envelope, innovator who enjoyed working on new concepts with architects. I feel truly fortunate to have worked with him for so many years."

—Milt Punnett, Consulting Engineer, Saint-Gobain Performance Plastics (long-time Chief Engineer with Birdair)

"I had the pleasure of working with Walter and his team from Birdair on the Haj Terminal in Jeddah, Saudi Arabia. This project, due to its enormous scale and complexity, required extraordinary commitments from the design, fabrication and construction firms involved. Walter provided a calm, professional attitude toward this unprecedented effort which helped guide the entire design effort to a successful conclusion. His wise counsel and willingness to innovate were instrumental in realizing this unique design."

—John Zils, FAIA, PE, Associate Partner, Skidmore, Owings & Merrill LLP (project engineer for SOM on the Haj Terminal)

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