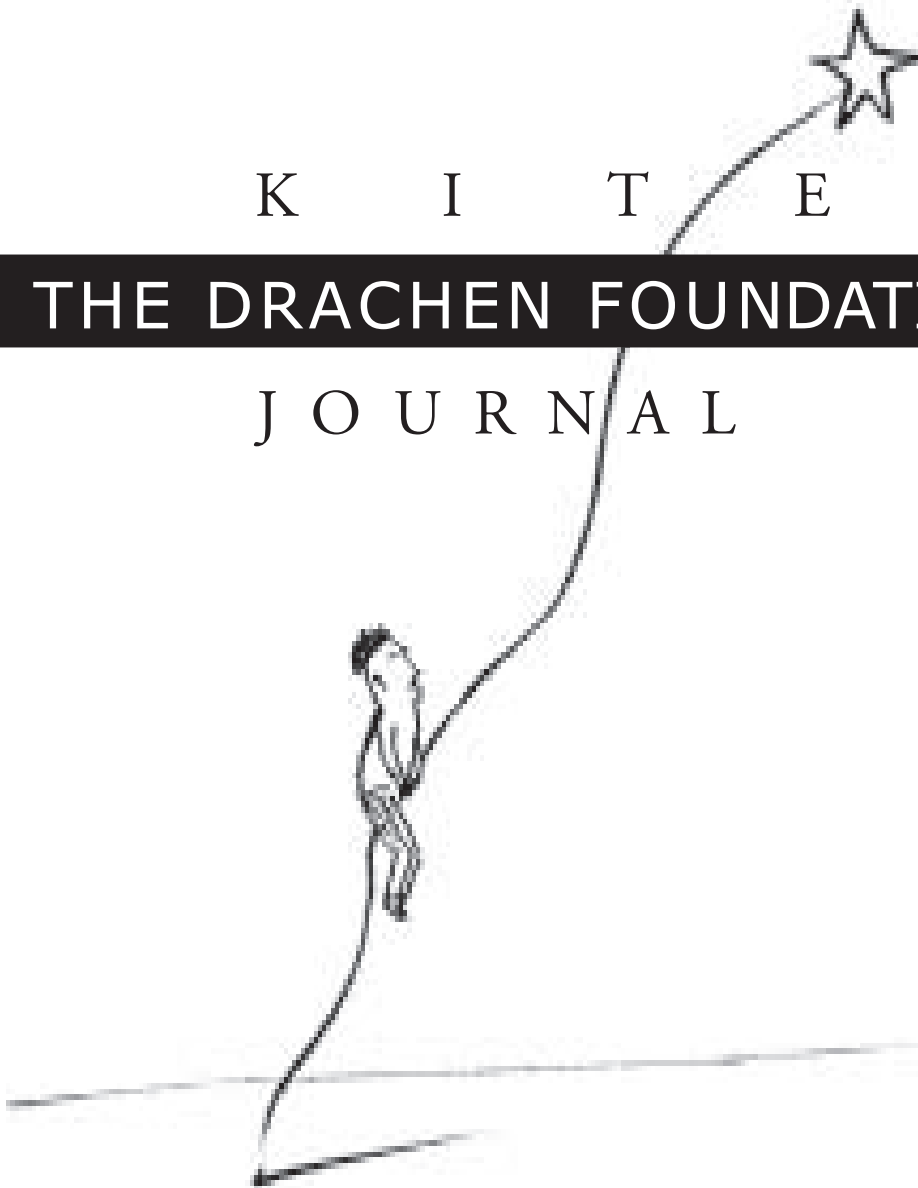


K I T E

THE DRACHEN FOUNDATION

JOURNAL



About Our Contributors

Roger Glencross



Roger Glencross is a certified public accountant by profession. His chief hobby is arcane design work, such as man-powered helicopters. Currently he is working on a wind-powered seaplane. He explains it as "a kite that lifts a man by obtaining lifting power

from a drogue anchor." He is a former official of the Amateur Yacht Research Society, an international educational charity based in London. His Pocock appreciation (page 22) was written for the journal of that society. Married and the father of five, Glencross lives in New Malden, Surrey, England.

A former school system superintendent now working as a

management consultant in the Internet industry, Bob White, of Port Colborne, Ontario, Canada, rediscovered his childhood interest in kites in the 1980s. Ever since,



he has been building and flying kites and teaching about them at school workshops. He is researching and writing a book on kite pioneers, such as William Eddy (page 10). White's wife is an accomplished kite designer and his three sons excellent fliers.

Ed Grauel

A former Eastman Kodak executive, Ed Graul, of Rochester, New York, is a wonder. At age 94,



he remains busy designing, making and flying kites. The world's leading authority on kite patents (page 28), he has for many years conducted scientific studies on kites. The research papers that resulted are now being systematically published for the first time in this journal (page 34).

Tal Streeter



Tal Streeter, of Verbank, New York, has written two of the best books in English ever published on kites, *The Art of the Japanese Kite* and *A Kite Journey Through India*.

He is working on volumes about Indonesian kites and kite pioneer Domina Jalbert, inventor of the parafoil. Streeter

is an artist of note, designing large-scale steel sculptures and large kites. His 350-meter Great Tower of Light for the city of Kwanju, Korea, is under way. He is currently a professor of art at the State University of New York at Purchase. A collector of kites and associated materials for many years, he hopes to open his own kite museum in the next decade, either in the U.S. or Europe.

The Drachen Foundation: Kite Archives, Science and Culture

The Drachen Foundation is a 501(c)(3) private non-profit foundation, which promotes learning about kites, art, culture, science and history through an integrated collection management, exhibition, education, research, and publication

program.

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Year 2000 Feted With 'Tangles' in the Sky

A Kite Heaven in the Desert of India

By Tal Streeter

There is something old and new in the wind!

Have you glimpsed them out of the corner of your eye, on the kite festival fields, flying in the skies over parks and beaches? Darting, spinning, bee-like butterflies might be a better description of the diamond shapes sparkling in the sunlight, changing their course, flitting here and there like playful butterflies. That all sounds nice and a pretty picture, too, but it's also an exciting, pulse-pounding experience.

These little kites dashing across the sky, they're calling them Indian-style, single-line sports kites in the United States. In Hindi, they're known as patang, which has come to be translated in the rest of the world as Indian-style fighter kites.

Kite fighting? The Indians insist it's not really fighting but simply Indian kite flying, and the game, the sport, the competition the Indians refer to as tangles, peych (tangle) uland (fighting). This aligns Indian-style kite tangles with the character of games of basketball and football in the U.S., soccer in Europe (and tennis, marbles, jacks, chess, all the competitions which derive from contests of skill and strategy). We don't refer to these Western sports as fighting events, but simply as games. Kites and these other games share elements of strategy as opponents try to outwit and out-fly each other: men and women, boys and girls, honing skills, challenging one another in the sport of kite flying. Opinions vary throughout the world just how the West



might interpret this Indian sport. Indian-style adherents favor the use of traditional Indian manjha ground glass cutting line. A newly emerging group, however, worries about the accidents attendant upon glass lines. This group plays "touch" rather than cutting games; flying without ground glass, the flier achieves points for simply making contact with an opponent's flying line from above and below. Competitors maneuver their kites to touch and avoid being touched, or "cut" tissue paper tails with passes of un-coated flying line. (This is also practiced, though rarely, in India.) One excellent result of adaptations from outside India are newly engineered, faster Indian-style kites, and high performance reels.

Competitions are also evolving where kites are flown on very short lines (in comparison to the Indian tradition where kites are customarily flown at quite a distance). Members of the worldwide International Manjha Club, headquartered in France, are still committed to glass flying lines (as are some teams throughout the United States), but where will this ancient Indian sport end up? Only "up" is certain.

Many from among the worldwide competition fliers cut their teeth on meeting each other in Jodhpur. The annual Jodhpur-Jaipur Desert Kite Festival participants from abroad and the local clubs participating in the competition heats have been intrigued by the notion of encouraging improved flight and equipment in Indian kite flying tangles.

A few Desert Kite Festivals back I spoke with Frank Coenraets who came with his team from Belgium. I asked Frank what he had learned in the Jodhpur tangle competition, flying against India's master kite fighters.

"In my first direct observation of an Indian flier," he said, "I was astounded at how fast he could pull in line, hand over hand. It could only be described as a whirlwind. This turned out to be my greatest weakness, pulling in too slowly. My teammates and I were all very hyper and quite shaken by our defeat in the heats with the Indian teams. In that first encounter, I had been determined to win and was angry with myself when winning proved to be impossible. The second year we learned how to enjoy ourselves, ensuring that losing could not overshadow the fun of the match. Now, I think we are better into the sportsmanship of kite tangles, which brings such great pleasure regardless of winning or losing."

The Belgium team gained high marks for sportsmanship, but on a return visit lost its match to a Jodhpur team by the score of 6-0. "The Belgium team will be back," Frank declared.

I must add that I recently joined this 6-0 club, beaten by the Delhi team at the Millennium festival this year. Thus far the traditional Indian fliers have held onto the crown, with the exception of 1998, when a Hong Kong

club took the championship using amazing equipment: slightly smaller, and thereby faster, kites, flown off machine shop manufactured kite reels—and using flying techniques adapted to the requirements of the new materials.

What is in store for the tangle kite fliers at future Desert Festival challenges? No one is prepared to hazard a guess. The Hong Kong captain says with a smile, "The Indians will adapt their style to match ours. If we are not better in our next match, they will win. Improved equipment provides a momentary advantage, but in the end matches are ultimately still won by years and years of practice, as well as aptitude which defines the best teams."



At this point, still unique throughout India, the Desert Kite Festival hosts not only traditional Indian-style tangle competitions, but fliers and kite makers from around the world, flying the full range of kites, big, small, glorious, multi-colored, in innovative shapes and forms, the kites we have come to expect in world-class international festivals.

And what better place for tangles and these kite creations than being hosted by one of the most glamorous, exotic, extravagantly

grand states in India, the center of a centuries-old tradition of kite flying, Rajasthan.

The Ankush Club of Delhi led by Deepak Gupta took home the coveted Desert Kite Millennium trophy cup, by the way! It defeated the Pink City Club of Jaipur in the finals, 3 cuts to 1. Congratulations Delhi! Well done!

The large-scale and innovative Western-style kite scene was beautifully represented by the effort of fliers Silvie Perruch and Christophe Shred from the French Collectif Zoone; by Frenchman Nicolas Chorier's aerial remote control camera rig and by the big rokkaku and

delta which carried them aloft; by Sarah Michal and Frederique Barbier of France working as a team to loft a variety of stunning creations by Michel Gressier; by the charming Japanese pair Masami and Akiko Takakuwa; and by Barry Pitman from England flying David Leigh originals.

Kiteflier participants and foreigners attending the festival are provided beautiful accommodations at one of Maharaja Gaj Singh's estates located on the outskirts of Jodhpur, the Balsamand Palace (now a Welcomgroup resort hotel). The Jodhpur palaces and grounds are right



out of a fairy tale picture book or splendid costume movie, with large monkeys and peacocks roaming freely, jackals howling through the night, complaining perhaps, about our evening campfires. The Indian teams and foreign guests are greeted by the Maharaja at a welcoming party on the terrace of yet another magnificent palace—the summer or so-called monsoon palace—built into the waters of a large artificial lake. Mind-boggling, wide-eyed wonder would be quite inadequate to sum up the feelings of the kite visitor's first night in Jodhpur. And, the hospitality of the Maharaja and the festival organizers—grand palaces

nonwithstanding—well, you're made to feel right at home.

Let the best fliers with the best equipment take home the gold and—in subsequent festivals it will be an amount of gold formed into a pendant, along with a trophy and parchment signed and presented by His Royal Highness Maharaja Gaj Singh at a victory awards celebration—or a special prize from the trophy-laden table.

Kite flying in the daytime: late into the evening around the campfire, kite talk; sumptuous accommodations, banquet tables set for kings and queens, splendid palaces, Rajasthani dancers, and musical entertainment, gorgeous gardens and lawns. At one banquet, one of Jodhpur's kite fliers raised candle-lit paper lanterns spaced at intervals on the kite flying line. The kite itself was invisible, swallowed up by the darkness of the night sky.

The last day of the Desert Kite Festival on January 14, on the celebration day of Makar Sankranti, everyone visits streets teeming with kiteshops and flies in the fabled pink city of Jaipur, the jewel of Rajasthan: kites fly into the sky from Jaipur's rooftops; kites every which way you turn! Uncountable thousands. More colorful kites dancing in the sky than the most ardent kite enthusiast could ever imagine in his fondest dreams. More than
© Tal Streeter 2000



Manjha Mania in India's Jaipur City

By Ben Ruhe

Japan has its kite extravaganzas such as Hammamatsu. France presents an unrivalled panoply of the sport at beautiful seaside Dieppe in Normandy. But for sheer brio the Makar Sankranti festival throughout India, and in Jaipur in particular, on January 14 each year is hard to top.

On this day, as the sun ascends for the first time into the northern hemisphere, millions of Indians mark a time of rebirth by taking to the rooftop terraces in their cities and towns to fly fighter kites equipped with ground glass cutting lines. The object is to slice another kite—any kite—out of the sky. It's a dawn to dusk free-for-all which must be seen to be believed. Kite fighting is the ultimate



Ground glass and glue are applied to kite line. The resulting "manjha" permits fighter kite fliers to slice opponents out of the sky.

equalitarian, democratic sport. In Jaipur alone, it is estimated that upwards of one million people spend the day flying their darting little raptors. Manjha is the Indian word for the cutting line. Manjha mania is what

occurs in Jaipur.

Participating in the spectacle this year were foreigners attracted by the annual Jodhpur-Jaipur Desert Kite Festival, beautifully organized by Ajay Prakash of Bombay, a travel agent and kite fancier. The week-long event begins in Jodhpur, under the patronage of Maharaja Gaj Singh, and concludes in Jaipur with the mass fly there. Joining Europeans and Japanese this year was a contingent of five Americans, three of them from the Drachen Foundation in Seattle, led by administrator Ali Fujino. Among those on hand was sculptor and writer Tal Streeter of Verbank, New York.

Fighters and manjha blossomed in the small shops of Jaipur bazaar before the festival, with customers three and four deep. Excitement was in the air. Most buyers

purchased a dozen or more kites to fly. Mortality in the air is plentiful. But the kites of paper, bamboo and glue are cheap—between 10 and 25 American cents each.

Makar Sankranti began with a dawn cannonading from around the city. Loudspeakers announced the festival was commencing. In their own good time the Desert Kite Festival guests from abroad ascended to a large terrace on top of a government building in downtown Jaipur and prepared to do battle. Except at sacrosanct temple sites, everywhere one looked rooftops were full of partying Indians, most flying kites or readying their kites to fly or

observing the scene or just hanging out. On a small terrace nearby could be counted 17 people. Smiles and noise and verve were general.

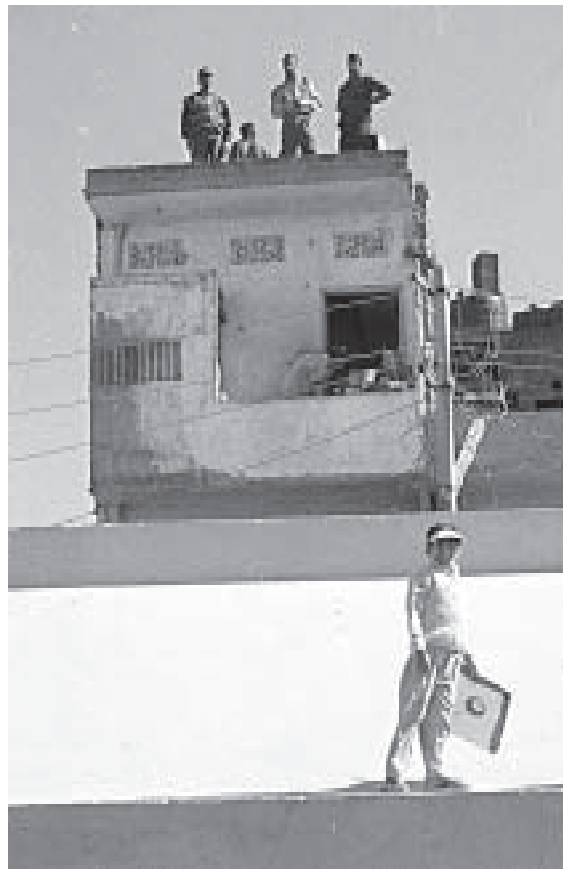
Because the fighter kites are so small, just the ones close

by were visible to the naked eye. But a glance through binoculars showed the sky at any given point sprinkled with kites like so many flowers in an aerial garden. That's the point. The brightly colored kites symbolically represent the flowers to come.

On the terrace was jeweller Pankaj Sethi, age 40, with daughter Urvashi, 8, as line tender. He had brought a phenomenal 200 kites with him. Here was a serious flier! By mid-morning he had cut 17 kites. How many had he lost? "Seven or eight," he said. "But that's the game." Flying his kite so far out it was no more than a dot, with the line quite invisible after the first hundred

meters or so, Sethi suddenly tensed, pulled in line with amazing rapidity and abruptly shouted "Kaata! (I've cut it!)" The sharp pull is what produces the slicing action. Within less than five minutes, he had been cut out of the sky himself by a roving fighter. Temporarily deflated, Sethi reeled in what line was left, tied on more manjha and a kite, and launched again. This would go on all day, or until he tired, or until his hands—slashed by the razor line—became so painful he had to quit. Because of the need to have a good feel of the lines, gloves are not used. Anyway, cuts and blood are seen as a badge of honor.

Nearer at hand, the foreigners and friends had their kites expertly bridled by Babu Khan of Jodhpur, a professional kite maker, and gave the fighting a try. Dr. Gyan Prakash of Mount Abu, distinguished father of organizer Ajay Prakash, got a kite about 50 feet into the air. As he maneuvered it, his young nephew Dr. Amit Prakash, standing behind him, calmly brought his



Party day in Jaipur as kite fliers take to rooftops.

fighter swooping down and deftly slashed his uncle's kite from the sky. Laughter all around. "Even if he is the senior medical man in the clan, it doesn't matter," said Amit, laughing. "It's all in the family." As Amit explains: "The principles of aerodynamics teach you how to fly kites, isn't it?" he loses concentration. An attack from an unseen quarter cuts his fighter. He reels in remnant line, a bit disgruntled.

Ali Fujino of Drachen, a natural athlete trained in childhood by her father Jack, 85, who was a big time baseball catcher, shows "Jumbo" Jack, who is along on the trip, she hasn't lost her coordination. Learning the tricky art of maneuvering a fighter, she manages six cuts of her own. She gives no figure on how many kites she loses. Flying nearby, Keith Yoshida, a Drachen Foundation board member,

acquits himself well too.

Because they are too poor to buy their own kites, little boys cruise the roofs and streets pursuing downed fighters, which flutter to the ground like brightly colored leaves. Their hair's-breath rooftop leaps from building to building—shouting as they go—is a spectacle all its own. (The local newspaper duly reports the next day that more than 100 people were injured in Jaipur during the festival, many seriously, from rooftop falls. It also reports hundreds of birds, while flying freely in the open sky, collided with cutting line and were downed. It's all easy to believe.)

By mid-afternoon, roofs and wires sport tangles of broken kites and tangled lines. Trees look like Christmas trees. By this time, the hot, dry desert climate of Jaipur has worn out the visitors and they decamp for their hotel, a former palace. It's been a day of great memories. May there be many more celebrations of Makar Sankranti—a kite flier's dream come true.

Maharaja Talks About Kites

Editor's note: The annual Desert Kite Festival of Rajasthan, a state in India, runs for three days at Jodhpur and then three more in nearby Jaipur, culminating in the celebration of Makar Sankranti. Makar Sankranti on January 14 marks the first day the sun rises above the equator and thus celebrates a time of renewal and growth. Kites symbolize the flowers to come. Sitting out on the lawn of his looming 347-room red sandstone palace, Maharajah Gaj Singh, of Jodhpur, lead patron of the Desert Kite Festival, is pleased to chat about the event:

"When the city of Jodhpur joined hands to celebrate the 50th anniversary of the opening of the Umaid Bhawan Palace in 1993, there were festivities throughout the year," he notes. "One was a kite festival, conceived by myself. The festival was very successful and it got known in the kite world.

"Some years later, Ajay Prakash broached the idea of a yearly kite festival to me." A Bombay travel agent, Prakash had known the Maharaja since childhood because his parents, both medical doctors, were closely associated with the monarchy. "I liked the idea," says Gaj Singh. "I was head of the Rajasthan Tourism Development Corporation at that time and the concept fitted right in with my thinking. The first festival held in 1997 gave us more useful recognition around the world.

"We have the festival dates established now and get regular funding from the government. Our Jodhpur festival leads to the Makar Sankranti celebration on the 14th of January in Jaipur, and elsewhere in India, when



kites are flown from roof terraces.

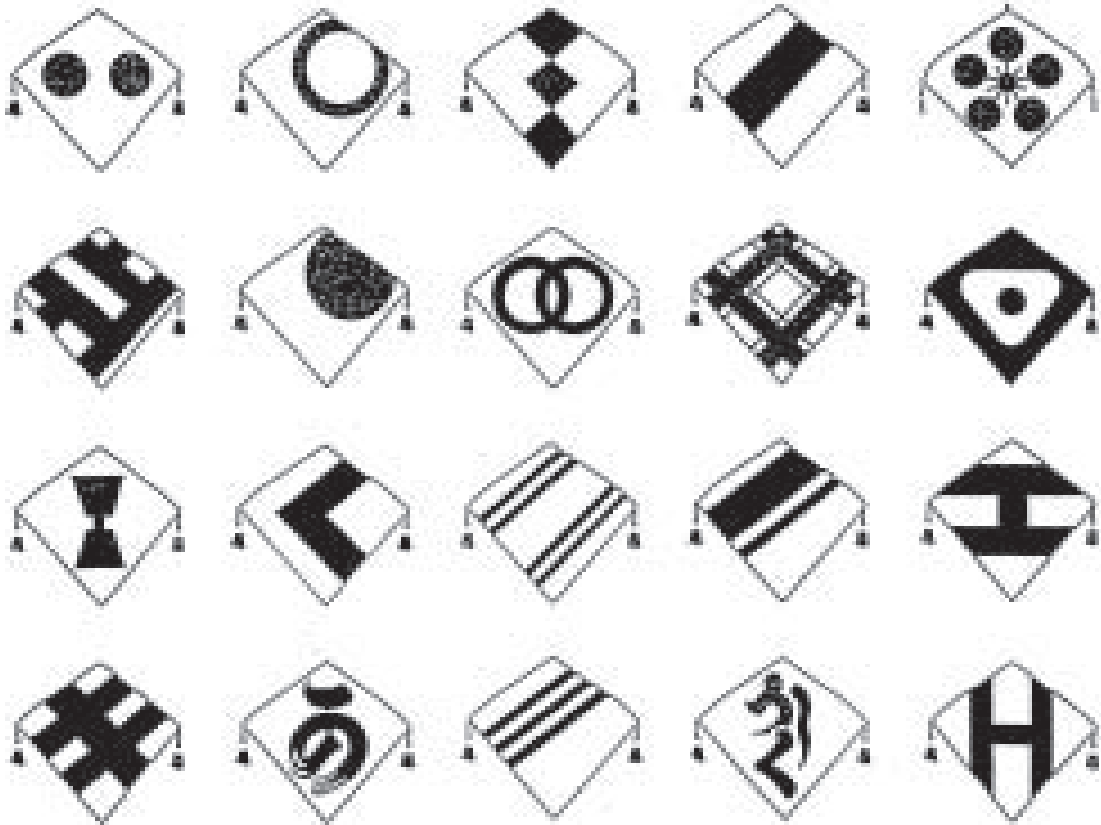
"Makar Sankranti happens to be the day after my birthday on the 13th," he adds. There is a note of self-benediction.

"Having Western kite fliers come and perform with their large, showy kites amid the tiny Indian fighters is a nice mix. This mixing is not competitive, but friendly. Sometimes I join in the flying, but mostly I watch and preside, handing out awards and congratulations at the end of the day."

Showing the understated British humor he learned at Eton and Oxford, the dignified, somewhat reserved Maharaja muses on kites: "We did have a problem with too many pigeons at the palace. Because of Hindu reverence for life, we tried putting up hawk kites to scare the pigeons away." With a faint smile, he ends: "It worked for a while, then the pigeons got smart." 🍀

—Ben Ruhe

Japanese Nagasaki Kites as Art



The Nagasaki hata is an exceptionally manoeuvrable fighting kite, traditionally decorated with simple, bold designs in red, white and blue. These images are from a kitemaker's pattern book.

An Echo of Social Life

In a world where industrial technology has become less and less comprehensible to most of us, though its products are ubiquitous, there is a special satisfaction to be had in kitemaking and flying. Almost anyone can master the required technology and produce a wonderful and, in a sense, magical artifact. When the kite takes to the air, the invisible energy of the wind can be felt in the taut flying line. The sense of interdependence between restraint and freedom the flier has at this time can seem like an echo of the nature of social life generally.

—Andrew Hunter, "The Quilter," 1992

He Put Diamonds in the Sky

The Story of William Eddy's Ubiquitous Kite

Editor's note: Following is a short version of an essay on one of America's early kite innovators. The abstract by the

author was published in a slightly different version in the Jodhpur-Jaipur Desert Kite Festival catalogue marking the recent Millennium fly in Rajasthan, India. The original version, complete with extensive bibliography, can be read on the KiteLife.com Internet site.

By Bob White

William Abner Eddy of Bayonne, New Jersey is credited with creating the popular diamond-shaped, tail-less kite that is recognized around the world.

Born into a moderately wealthy family in New York City on Jan. 28, 1850, Eddy was encouraged by his father to have an interest in science. Eddy built and flew kites at an early age. He became skilled in building and flying flat, hexagonal kites which were the predominate type of kite flown in the 1860s. These kites required tails of varying length for stability in a variety of wind conditions. In 1865, at the age of 15, Eddy tied a lantern to the tail of a hexagonal and sent it aloft, creating real excitement in his neighborhood as the blue light of the lens sparkled in the sky.

Eddy attended the University of Chicago where he trained as an accountant. Following graduation, he came back to New York City to work on the Herald, a highly respected newspaper.

As an adult, Eddy resumed his fascination for kites. He brought to this pastime the precision, determination and problem-solving abilities of an educated professional.

During the late 1880s, kites were being employed in new ways to explore wind, weather and the principles of flight. This interested Eddy a great deal and he used his spare time to design kites which would generate lift sufficient to raise scientific instruments into the atmosphere.

At first, he used familiar hexagons with tails. By training them in series, Eddy increased the altitude his kites could attain. He experimented with kite shapes and methods of linking kites into trains.

Newspaper stories of Douglas Archibald in England and Alexander McAdie of the United States Weather Bureau using kites to measure the atmosphere inspired Eddy to work harder to design a stable kite to lift instruments. He began to experiment with the diamond shape used by another scientific explorer, Arthur Batut, of France. Batut's kites were flat and required a tail to keep them stable in flight.

Eddy heard of a kite built and flown by inhabitants of the island of Java, now part of Indonesia, but formerly part of the Malay archipelago. The kite was known to the West as the "Malay kite." This tail-less kite was described as "buoyant," which seemed to Eddy to mean it flew well despite not needing a tail to furnish



William A. Eddy

drag and therefore keep it directed properly into the wind. Having no measurements to go on, Eddy began modifying diamond kites so they would fly without tails. Tails, Eddy had discovered by experience, created many wrap-around problems when kites were flown in train.

Eddy also tried out a new way of linking kites together. By 1891 he found that the best system was to give each kite its individual string and allow it to branch upward from a main line. The common practice had been to link kites one behind the other on a single line.

Eddy noted that a bow in the cross spar of the kite tended to make wind spill more uniformly off the sail. He tinkered with how much to bow the cross spar to achieve greatest stability. By the next year, all of Eddy's diamonds incorporated a dihedral bow. Thus evolved the Eddy diamond kite.

Eddy built his kites in varying sizes to determine their

sky. This was the first meteorological instrument able to record graphically and simultaneously conditions both in the free air and the ground.

On May 30, 1895, he made another pioneering flight, taking the first mid-air photograph in the Western Hemisphere.

About this time, Eddy had one of his most dramatic breakaway flights. Their line having been accidentally cut, his train of eight kites drifted across the water from Bayonne, where he was flying, to Staten Island, to New York Bay, and eventually to land. Eddy rescued them after a chase by ferry, train and then afoot.

However, the use of Eddy's practical, high lift and stable diamonds was shortly eclipsed by the box kites of Lawrence Hargrave of Sydney, Australia. The Hargrave box kite was adopted as the primary lift kite of the U.S. Weather Bureau in 1896. An adaptation of it was used at Blue Hill as well.



On Aug. 1, 1898, Eddy applied for a patent for his diamond and on March 27, 1900, he was granted Patent No. 6446375 by the U.S. Patent Office. Intellectual, manufacturing and distribution rights to the kite were given.

Eddy continued working with kites and demonstrated their use in carrying telephone lines to relay messages and to measure static electricity in the lower atmosphere.

ability to lift. His work came to the attention of other explorers of the lower atmosphere and he became established as an important pioneer.

During 1894–85 Eddy worked at the famous Blue Hill Observatory outside Boston, Massachusetts, where he helped to innovate measurement of the lower atmosphere with instruments suspended from kites. On Aug. 4, 1894, he used kites to lift a thermograph into the

The Eddy diamond enjoyed widespread distribution as a children's toy from shortly after the patent was granted to the late 1940s. The High-Flier Kite Company marketed it widely. The kit consisted of a sleeve of instructions, a printed paper sail and two spruce spars. It retailed for from 10 to 25 cents, or the equivalent, in North America and Europe.

The Eddy diamond remains ubiquitous. It is the most



The Blue Hill Observatory in 1895. The numbered Eddy kites were used to raise instruments to measure the atmosphere.

recognizable kite shape in our culture. Magazine advertisements and TV commercials invariably show an Eddy diamond. If asked to draw a picture of a kite, children and adults not experienced in kiting will almost always portray his diamond.

Clive Hart, the highly respected Australian kite historian who wrote the definitive *Kites—An Historical Survey*, comments that Eddy's refinement and application of the dihedral principle "constituted the first genuine advance in Western kite design since the development of the diamond shape in Renaissance times."

William Abner Eddy died at age 59 in Bayonne, New Jersey. 🌳

© Bob White 2000

A Kite for Michael and

Christopher

All through that Sunday afternoon

A kite flew above Sunday,
a tightened drumhead, an armful of blown chaff.

I'd seen it grey and slippy in the making,

I'd tapped it when it dried out white and stiff,
I'd tied the bows of newspaper
Along a six-foot tail.

and now it dragged as if the bellied string
were a wet rope hauled upon
to lift a shoal.

But now it was far up like a small black lark

My friend says that the human soul

is about the weight of a snipe
yet the soul at anchor there,
the string that sags and ascends,
weighs like a furrow assumed into the heavens.

Before the kite plunges down into the wood
and this line goes useless

—Seamus Heaney

East Meets West in Montana Show

Logan Airport in Billings, Montana, is the scene of a wonderful exhibition of kites, on view through March of next year. As proof that the East, in this case Japan's Kumamoto state, and the West, represented by host Montana, do after all meet despite the Kipling injunction, an exhibition titled *Sky, Wind and World* has been mounted in the air facility. Two million passengers are expected to view it.

Kumamoto and Montana are sister states and this exhibit is the latest manifestation of their friendly partnership.

On behalf of the East, Kumamoto shows many kites made by Tadakazu Funasaki, 62, a master of the craft. The West responds with an array from top U.S. and Canadian builders.

Funasaki, a well respected cultural ambassador for Japan following kite goodwill trips to Italy and Brazil, has his creations displayed together. They hang over



On view at Billings: A traditional Japanese rokkaku kite used to dispel demons.

the check-in counters as an exotic greeting for newcomers. The Western contribution lines the length of the south side of the airport.

The exhibit was conceived as a kind of twice-over celebration of the Millennium.

It was mounted in time for the start of the year 2000 and the kites in it will be auctioned on the internet starting Jan. 1, 2001. Proceeds go to the Yellowstone Art Museum.

Terry Zee Lee, organizer of the show, recalls how the exhibit came into being: "I was in the airport and commented to my mother how wonderful the airport would look with kites hanging from the ceiling." The idea took fruit as Lee got powers in the kite world to help out. They included Adam Grow, president of the American Kiteflyers Association, and Scott Skinner, kitemaker, collector and president of the Drachen Foundation, who both attended the opening reception for the display.

Lee commented: "A kite is a metaphor for life. Although Montana is an isolated state, I feel this exhibit can broaden our perspectives with a small, known thing—kites." She adds hopefully, "Maybe this exhibit will help establish kite flying as a sport in Montana." ✦



Also on display is Linda Johnston's sode kite entitled "I wear my heart on my sleeve."

For more information, please visit the www.skywindworld.org website. The kite images on this page come from this site.

Book Review

The Saga of S.F. Cody, the Flying Cowboy

'Colonel' Cody and the Flying Cathedral: The Adventures of the Cowboy Who Conquered Britain's Skies, by Garry Jenkins, 288 pp, New York: Picador (St. Martin's Press), U.S.A. \$24

By Ben Ruhe

After the plane he was flying came apart in midair and he fell 500 feet to his death on Aug. 7, 1913, Samuel Franklin Cody was accorded a hero's funeral at Aldershot, England. A procession viewed by fifty thousand people delivered his body to the military cemetery there and Cody was interred with Great Britain's heroes, the first civilian and the only American cowboy ever to be accorded such an honor.

This spontaneous outpouring of national grief by the public as well as the British establishment, led by King George V, for a upstart Yankee who had previously been the subject of derision and even contempt was the fitting end to a strange, flamboyant career that British author Garry Jenkins now convincingly sorts out in 'Colonel' Cody and The Flying Cathedral : The Adventures of the Cowboy Who Conquered Britain's Skies. Two earlier volumes on Cody took him pretty much at his own word, a serious mistake, particularly as far as his early life goes, as Jenkins discovered.

Using shrewd guesses and new evidence, some of it made available by the Cody family's sale at auction of historic Cody archives as well as the release of previously classified official documentation in the United Kingdom, Jenkins recreates Cody's life from birth and teenage years in America, to Wild West showman fame in Europe, through pioneering man-lifting kite experiments, which led Cody directly to the first sustained, controllable manned flight in Britain

in 1908. Following this great triumph, Cody—a mix of P.T. Barnum and Orville Wright—did five years of aviation barnstorming which led to a complete turnabout in his reputation. "The British public's chief and best showman of flight" was how a periodical summed him up. Then came his tragic, predictably dramatic death and ascension to a kind of sainthood. Cody would have approved the whole script. Judging from the current interest in early aviation, can a movie be far behind?

As Cody told it, and the versions varied widely in the telling, he was born in Texas in 1861, narrowly escaped an attack on his family by Indians, did bronco-busting, led long distance Texas to Montana cattle drives as a teenager, and dug gold in Alaska.



Cody used a kite to pull this boat across the English channel.

In fact, as Jenkins learned from another avid English researcher, Jean Roberts, Cody was born Franklin Samuel Cowdery in Davenport, Iowa, in 1867, or six years later than he claimed. His family line traced back to

the Pilgrims and the men in the family had a reputation for being adventuresome. Because Davenport, on the Mississippi, was a gateway to the vast prairies of the West, Cody became an expert horseman at an early age and may well have reached Montana as a teenager to do bronco-busting. He may have visited the Yukon too, although there is no documentation of this claim. What is not in doubt is that Cody became an expert at rope tricks, trick shooting and hard riding.

An exhibitionist by nature, the colorful Cody was early drawn to professional showmanship and served a documented apprenticeship with a kind of circus which toured the eastern part of the U.S. Featured were horses, shooting, Indian attacks and stagecoach robberies. The myth of the American West was enshrined as a moneymaker.

Greener pastures were to be found abroad, however, and Cody by 1888 was in England. After shedding a young American wife, Cody

by 1891 linked up with petite Britisher Lela Davis, whose father was an important horse trader with royal palace connections. Fifteen years his senior, Lela brought not only fearlessness and skill as a horsewoman to Cody's troupe but four children as well, including three young sons, all of whom Cody trained in American frontier skills.

Ostentatiously affecting cowboy garb—buckskins, high heeled boots, ten gallon hat, long mustaches, flowing hair—Cody went so far as to bill himself as the son of Buffalo Bill Cody. The great man's lawyers quickly enjoined the young Cody from this preposterous claim.

Lela's loyalty and trust in Cody, which never wavered over 22 years, was so great she acted as a target for him. Encircled by 20 glass balls, she stood stoically as Cody plinked them one by one with rapid gunfire. In case he missed, Lela wore a red body suit so the blood wouldn't show. Although Buffalo Bill Cody in a moment of revelation revealed he fired birdshot, not slugs, at targets, Samuel Cody never went beyond admitting he used "sub-charged" cartridges—cartridges light on powder so the bullets wouldn't ricochet or, if misaimed, be too wounding.



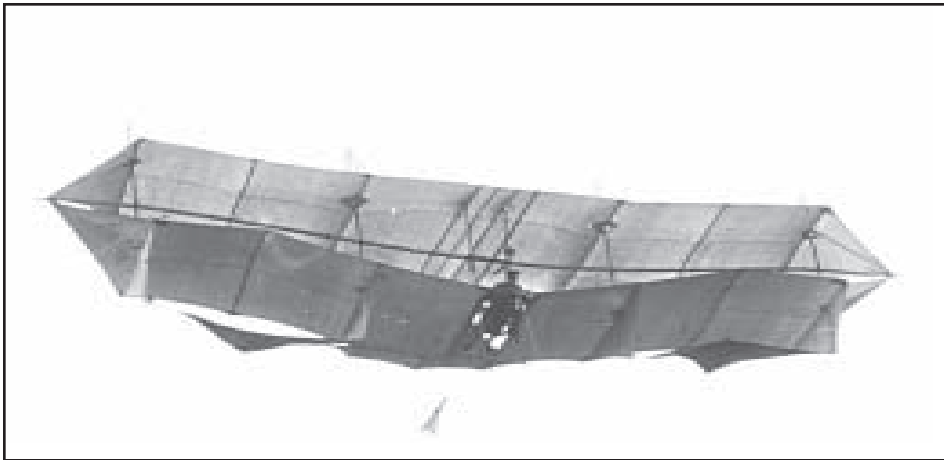
Loyal, daring Lela Cody goes aloft during manlifting experiments. The kite is the famous, beautiful Cody Kite.

Cody and family performed in music hall reviews, then toured on their own. Cody wrote and produced successful melodramas with titles such as *The Klondyke Nugget*. Running year after year, these extravaganzas kept Cody in funds. Having a steady source of income permitted Cody to experiment with a new craze—kites. Early documentation on this important aspect of his career—when, how and why he got started—is exceedingly thin.

Spreading out onto the Continent, Cody supplemented his purse with widely publicized challenges to famous bicycle riders, mainly French, that he, on horseback, could outride them in marathons. Horses against two-wheelers. It was pure outrageous

Cody. More often than not, Cody scooped up the purse, plus bets he made on himself. The races became a good source of income for him.

Almost an illiterate, to judge from the entries in his diaries, purchased by the Drachen Foundation and made available to Jenkins, Cody although clearly unschooled was nevertheless an obvious genius, with an obsessive energy. Picking up on the new Hargrave box kite which had reached Europe from Australia, Cody modified the design by adding wings and the resulting Cody Kite became a classic—efficient and beautiful. Cody patented it in 1901 and the lovely design is still widely



A Cody glider is flown by an unknown pilot.

flown today. Cody's original kites, of which there are a number remaining, are now recognized as marvels of craftsmanship.

Because of the Boer War, Britain realized that signaling and artillery observation needed improvement and brash Cody was quick to try to sell his kites to the military for these purposes. While the various services were in penny-pinching modes, visionary officers saw the need for what Cody offered and he was taken on, at different times, by both the British navy and army to develop man-lifting kites. Although reasonably successful, his work provoked much discord and Cody fought long and hard to be compensated as he felt was fitting. Seeking appropriate pay for his labors and inventions would continue for Cody almost up to his death.

A century ago, the idea of manned flight was in the collective consciousness around the world and Cody at some unknown point caught the fever. He realized his huge kites were the vehicle that might lead to manned flight. With the reported success of the Wright brothers in America in building a workable airplane, European countries fought to catch up in this revolutionary field and Cody was engaged to take his aerodynamic knowledge and ability to the royal military establishment at Farnborough, just west of London. He was attached to the balloon wing at the military base there, commanded during its most important years by Colonel J.E. Capper.

On a visit to the U.S., Capper had seen the Wrights fly at Akron, Ohio, and he gave Cody inside information on their aircraft design, as Jenkins discovered during his research. Capper also apparently envisioned himself as the man who would fly first in England and secretly undermined Cody by giving a second young genius the chance to build an airplane at a

remote estate. This project failed, however.

In response to the Germans and in a detour from their winged aircraft studies, Cody and Capper designed, built and flew England's first dirigible. Their flight around St. Paul's Cathedral in London in 1907 drew enthusiastic public and media attention. Cody in ten gallon hat is clearly visible in photos as pilot of the Nulli Secundus (Second to None) during this epic trip. It was a first step toward Cody's deification by the British, after two decades of his being considered an American cowboy buffoon.

Cody now set about building an oversize airplane, which was to evolve into the Flying Cathedral of the biography's title. It was officially known as British Army Aeroplane No. 1. Powered with a powerful French engine, Cody got the aircraft to achieve a series of very short flights or "jumps," as he called them. He then made Britain's first extended powered flight on Oct. 16, 1908 at Farnborough. It was a jaunt of more than a quarter of a mile and lasted 17 seconds. Cody crashed the plane on landing but this did not matter. The feat made front page headlines across the nation. "The secret of flight is solved," said Cody in an interview. Britain had joined the air age.

As the aviation industry spurted, promotional races from one city to another lured new pilots and new aircraft. Because the 'round-England competitions were open to British citizens only, Cody got himself naturalized so he could compete too. With his intelligence, skill and demonic drive, he won his share of fat purses.

Meanwhile, he kept experimenting with aircraft design and developed first a monoplane, then seaplane.

He was flying the seaplane with a passenger aboard when the aircraft broke up in midair and both men fell to their deaths. The funeral, ordered by the King who had earlier given Cody the honorary title of "colonel," followed and Cody, at age 46, was enshrined as one of the U.K.'s most celebrated and loved characters of the early 20th century.

Garry Jenkins' fine book, 10 years in the research and writing after the author fell in love with the Cody story while researching Welsh aviation pioneers, perhaps falls short in its failure to thoroughly pin down the facts of Cody's early life, although this may be impossible to do now after the lapse of almost a century and a half. Also lacking, and a more serious absence, is a convincing explanation of Cody's driven personality. How could he have persevered for so long in a country that specializes in the acid, unforgiving putdown of colonials? It remains an enigma.

Jenkins does reveal the interesting events that occurred after Cody's demise. That abandoned, never divorced American wife named Maude, from Norristown, Pennsylvania, turned out to be still alive and a suit on her behalf against the estate won her Cody's money. In a typically American twist, the major beneficiary in the end was Maude's lawyer. Faithful Lela and family in England won nothing except the everyday remains of Cody's career—the guns, the kites, the photographs, the press clippings, the trophies. It was a large collection of arcana which the Americans spurned as worthless. Almost a century later Cody's British family was to have a last laugh. When this historic material was sold both at auction and privately, it proved a financial bonanza.

Perhaps publication of this well illustrated, bittersweet Jenkins volume will provoke further interest in Cody and bring to light more of his remarkable story. For now, one can accept that 'Colonel' Cody and the Flying Cathedral proves that the most colorful and extraordinary tales are often those which are true. 🌿

Drachen's Cody Collection

When his family placed Samuel Cody memorabilia on auction at Sotheby's in London a few years ago, the major buyer of kite material was the Drachen Foundation. Handwritten journals in which Cody described his pioneering kite experiments, many original and later kites, charming drawings and detailed sketches by him, hundreds of glass plate negatives showing work in progress, correspondence, business records, posters, press clippings and letters of condolence upon his death, including a telegram from King George V, were acquired.

Subsequently, the Foundation purchased and was given more material by the family.

Altogether, it is by far the largest collection of Cody kite material anywhere. The accession catalogue runs to 39 single-spaced pages in length. Since it was acquired by a non-profit institution, Cody material—now professionally conserved, as needed—is being made readily available free upon request to the global public. Only fees for copying and postage are imposed. This availability is in line with Drachen's mandate to increase and diffuse knowledge about kites worldwide. The Cody holding has had a particular importance for Drachen itself. Initially focused on American kite doings, a large field in itself, Drachen with its accession of the Cody material set a new, international course that has since had substantial impact on the world kiting community—and can be expected to do so for many years. particularly with the recent opening of a new three-story Drachen headquarters in Seattle.

For information on the Cody holding, contact the Drachen staff or consult the Foundation's on-line site at www.drachen.org.

—Ali Fujino

Documenting the Earth From Kites

If you love kites and are skilled at photography, how do you put the two together to make a vocation? Nicolas Chorier, 37, of Montpellier, France, faced this question a few years ago. His answer was: aerial kite photography.

Chorier discovered there was a small but steady market for documentary photographs. Planners, architects, builders, beauracrats, tourist officials, even homeowners wanted shots of their sites or structures from the air. Besides being useful, aerial photographs from low altitude are often surprising and pleasing in the unexpected view they yield. They give a jog to conventional ways of looking.



Nicolas Chorier

Kites, Chorier discovered, had it all over noisy, expensive helicopters, which are in fact barred from low level flying by some French cities. Kites on the other hand are inexpensive, portable, easy to fly and take down. Above all, they are nonintrusive. They can also get really close up. And they can sit in the sky for hours. They have the advantage too over fussy, expensive balloons—another potential rival—because they can readily be flown in winds that will drive the balloon down from the sky.

Early on, Chorier realized aerial kite photography involved just four basic parameters: weight limits, movment in the air, stability and the necessary remote control system. Everyone in the aerial photo field faced these problems. After solving the practical matters of getting pictures from the skies, Chorier sought to give himself an advantage. He wanted to branch out, go world-wide.

So he started experimenting and refining. First he decided to scale up his images. Many kite

photographers use a 35 mm camera; Chorier went to the 120 mm (4.5 by 6 centimeter) size. He gets definition 3.7 times better. Chorier's camera of choice is a \$2,000 lightweight polycarbonate Fuji GA645W with wide angle lens. "Excellent, perfect," is how he describes its

performance. As his lifting platform, he settled on the six-sided Japanese rokkaku and the everyday delta as kites of choice. Both are stable, both do without bothersome tails.

In his search for new and money saving approaches, video monitoring soon came to the fore. Having a tiny video attached to his flash support, he could see exactly the picture he wanted on his small TV on the ground and shoot when

things were correctly lined up, and not before or after. Real savings and control here.

By using a double line, loosely braided together, Chorier found he could eliminate hateful vibration. He also obtained protection against camera loss. A flight near a rooftop edge might, as an example, cause a single line to snag and cut it. But it would only slice one of the two Chorier lines. The chances of both lines being exposed to the same peril simultaneously are nil. Saving the flying rig is vital because substantial funds are involved.

The two lines are also useful when great stability is required, such as when shooting mosaics—a series of overlapping photos. Chorier separates the kevlar no-stretch lines and anchors them perhaps 30 yards apart, perpendicular to the wind. "The triangle doesn't move," he says. This stability aspect is often important. If a kite is used to monitor pollution, for example, it can be placed exactly over a smokestack and left to its photographic and related work for hours at a time.



The Taj Mahal in Agra, as dramatically photographed by Chorier.

Chorier made sure his rig was compatible with any type of camera, including all digital types. This gave him flexibility.

He has also taken on making videos. "Since sound rises, you can easily hear, and record, people talking 300 yards below. This capability could be used for surveillance, but I do not choose to use it this way," says Chorier. Videos are the way to go for money-making. Chorier plans to specialize in making them in the future.

Chorier has discovered that kites, in a good wind, can be so well controlled they can be made to slowly travel, or traverse, only a few feet above a target. This is a unique capability he has only begun to exploit.

Other possibilities for kite photography are the use of infrared film to document water use at night at irrigation projects and the use of the medium to

count wild animals over a period of time without in any way disturbing them. Always inventive, Chorier is investigating the use of solar batteries to extend his aerial operations.

So far, Chorier has made a vocation of aerial kite photography by making mainly documentary shots in his home area, in the south of France. But he is thinking bigger. Projects ahead include documenting an important 15-year French experimental agricultural project in the Matto Grosso of Brazil, shooting archeological sites, photographing monuments such as the Taj Mahal in India in a way they have never been seen before by the public. (The first time he flew a kite over the Taj he was arrested, then he had an invitation to return and shoot away, courtesy of the Agra tourist bureau and of Ajay Prakash of Bombay, a travel agent and kite fan.)

Having come to the attention of the Drachen Foundation, the volatile Chorier has been commissioned to organize a touring school exhibition on aerial kite photography, to premiere at the Dieppe kite festival next fall in Normandy. He has also been entrusted to make a collection for Drachen of the world's best kite photography since Arthur Batut of France made the first shot from the air in the late 19th century. Ali Fujino, administrator of the Drachen Foundation, says simply: "Katsutaka Murooka, of Tokyo, and Nicolas Chorier are two of the best kite photographers I've seen so far." Thus the commissions.

Born in Nigeria where his father was a businessman, Chorier is self-educated and has had a go at woodworking, making furniture, and doing upholstery. He survived a shortish brush with hated military duty and a stint of nefarious activity in Morocco ("I was stupid but lucky," he says) before taking up first a career as a musician then as a theater technician. The latter role ended when Chorier fell 36 feet from a lift and ended up with 14 broken bones.

Though all of this Chorier pursued his interest in photography and kites. At one point in the late 80's he had a stack



of Flexifoils and skied on bare feet for miles in the sand and did jumps up to 40 feet long at a Mediterranean beach close to his home in Montpellier. Basically, if some kite stunt was dangerous, Chorier gave it a shot.

Chorier found his vocation when a local kite fancier hired him to document a collecting trip to several Asian countries. Chorier discovered a glorious world there and when the kite assignment was completed went back to an island in northeast Malaysia where he worked as a snorkeling instructor

Another Chorier aerial photo: A Balinese festival, with giant bebean kites.

and scuba divemaster. He added to his collection of injuries in the latter capacity when he went too deep while suffering from a slight cold. The result was loss of hearing in one ear.

Always one to do the unusual and challenging, Chorier lived out everyone's Robinson Crusoe dream by having himself marooned on a lovely, tiny uninhabited island in Malaysia. He had only some rice, his clothes, scanty equipment such as a knife and fishing rig. As it happened, he managed to live some weeks of total bliss. "In fact," says Chorier, "passing fishermen gave me so many fish to eat I never had a problem with food. Only my poor financial condition eventually forced me to come home to France and find a job. But I'll never forget those blissful weeks alone on that tiny island." Chorier of course had his kites and cameras with him all the while and his aerial shots of white sand, cobalt sea and palm trees cause viewers to groan in envy.

"I don't want to photograph new tram lines in Montpellier," says Chorier. "I want to photograph lions in Africa." The next chapters in his questing life will predictably be less than humdrum. 🌿

—Ben Ruhe

Peter Lynn Muses Aloud

Inventive New Zealander Developing New Kite

Editor's note: The following was taken from a recent newsletter written and circulated globally by Peter Lynn of Ashburton, New Zealand, one of the foremost figures in the world of commercial kiting.

"I'm immersed in the development of a new kite, and being an obsessive sort of person who can only think about one thing at a time, I just hate interruptions when the lady has fluttered her eyes and the chase is on.

"There are two types of research and development. The first is aimed at getting totally new breakthrough type things such as our kite traction industry has seen with the original Flexifoil, The WipiKa and only a few other kites in the 20 years plus since the power kiting revolution started. Getting one of these is every designer's dream but, as history shows, it is incredibly difficult; requires talent, perseverance beyond the bounds of all rational behavior, at least some luck, and is at best an uncertain path to fame and financial security. The windsurfer, one of the most significant recreational inventions of this century, was, I think, invented by someone called James Drake in the late '60s. Is he famous now? Rich?

"Going for real breakthroughs is like thinking about sex every second of your life but having it only once or perhaps never. Frustrating stuff. Not that I can deny that making a true breakthrough is not worth all the suffering and more. The warm glow afterward is also short-lived though, quickly replaced by a gnawing

Fun and Games in Colombia

A British guest at a festival of the air in Medellin, Colombia, a while back noted that the airport where it was held had more than international kite flying going on. There was pigeon racing, radio-controlled model aircraft flying, parachuting, parascending, microlight flying and gliding. This in addition to busy commercial air traffic. Plus a drug shootout in one corner of the airfield. "Our British Civil Aviation Authority," he comments, "would have had a collective heart attack."



Peter Lynn takes Max Sutton for a kite buggy jaunt. The scene is Long Beach, Washington.

'can I do it again' fear. Additionally, as fields become more developed, there are less and less undug spots remaining to be investigated for potential buried treasure—as an individual, the best odds are at the beginning, it only seems like there are more chances for discoveries later because many more people are looking.

"The second sort of research and development is optimization—around here sometimes disparagingly referred to as 'technician's work.' But optimization can be very satisfying to do because there is measurable progress, often daily. It can also be financially rewarding, though not often for the designer. Optimization is the main development path once an industry is established and basic designs have become established. Incremental improvements can carry ideas through to undreamt of levels of function and sophistication. Who could have predicted that in just 70 years the Wright's No. 2 Flyer would evolve into the Boeing 747, safely and comfortably carrying 350 people at more than 600 miles an hour, six miles up, for 6,000 miles—and cheaply enough to put passenger boats out of business?"

Pocock's 'The Aeropleustic Art'

Yachtsman Appraises 1827 British Kite Classic

By Roger Glencross

Jane Austen and the Bronte sisters are back in vogue and the Amateur Yacht Research Society enters into the spirit of the 19th century by this appreciation of a book published in 1827, *The Aeropleustic Art*, by a Bristol schoolmaster who built, patented and drove a kite buggy at 20 miles per hour almost two centuries ago. The volume is virtually unobtainable, as is a second edition published in 1851 retitled *A Treatise of the Aeropleustic Art or Navigation in the Air by the Use of Kites or Buoyant Sails, With a Description of the Char-volant or Kite Carriage*. A facsimile edition of the first edition was published in 1969 in a print run of only 95 copies, by Edward L. Sterne of San Francisco, who cannot now be traced.

One of George Pocock's purposes in publishing his work was to convince doubters that kite traction really worked. Even people who observed the kite buggy in action were not always convinced. A lady explaining the mechanism to her neighbors who were also watching, said:

"I'll tell you all about it. They have got a man up there behind the kite, and he is pulling them along." A scientist proved that it was impossible for Pocock's wheels of only two-feet six-inches diameter to revolve fast enough to achieve the speed that was claimed. Pocock stated that "publication is a duty which the author owes to his

friends, ladies as well as gentlemen, for their protection against future insult."

How Pocock would have loved the Amateur Yacht Research Society, and joined it like a shot! He states in his first book that "the most extensive sphere of action for experiment presents itself on the unencumbered surface of the majestic ocean. There, how frequently, when laying to, or at anchor, or when under sail, or at any other season, when hands might be spared, what



Three Pocock char-volants pulled by kites traveling in various directions, e.g. tacking with the wind.

endless trials and improvements might be made by the application of the aeropleustic discovery." The first trial of his new kite control system was on a lake, where he kite-towed the earl of Suffolk's pleasure boat. Pocock envisioned that kites could "serve as ancillary sails to the navy, merchantmen, trading vessels, etc. After spreading all the canvas possible in the usual way, very considerable power may be added by the application of these buoyant sails as ancillaries, and this power may be so

attached, as to counteract the injurious pressure which a crowd of canvas is known to occasion and which not infrequently causes too great a dip of the vessel on its lee; for let it be recollected, that the draught power of these sails, while aiding progress, is also exerted in buoying up the vessel!"

He foresaw kiteboats when he said: "One thing is evident, namely, that from use of this novel principle will arise an entirely new branch in the art of sailing." He hypothesizes many ideas for employing kites at sea, including a six-man amphibious kite buggy. He readily admits that many improvements could be made to kites and suggests kite buggy races to achieve this, "to compete with each other's equipage in running with and against the wind, and in all the various angles of traverse."

George Pocock is an example of an ideal inventor, supplying figures for every aspect of kite bugging, from VMG (velocity made good) to true windspeed versus force on the kiteline for various areas of the kite. He explains the all-important kite and buggy controls and his journeys were "timed by chronometer in hand." He states what he has not tried and he went to the trouble of patenting his innovations in Britain and France, ensuring that design drawings are extant. He states what he believes to be the basic principles of kite bugging, so that when he gets it wrong we know how much he knew. Above all, he makes a clear distinction between the experiments which he carried out himself, and ideas which he hopes his successors will attempt.

The work is only 51 pages long and if one excludes the 30 songs, poems and quotations from famous poets, it is considerably shorter. Included in these poems are several self-written (self-inflicted?) stanzas designed to accompany long kite buggy journeys. Several are in Latin, one in Greek, mercifully in translation. In preparing this appreciation of the first edition of Pocock's book, I have omitted to include an appreciation of his poetical works!

Pocock's Inventions

Like most great innovators, Pocock pioneered not one but several inventions. These included the folding kite, kite trains used as traction, four lines for kite control in traction, and a purpose-built kite buggy. He eschews paper kites for linen ones for greater durability. While he may not have been the first to try all these, he was

apparently the first to write it up in detail, and to me that is an equally great achievement.



The invention of the folding kite may not seem very exciting, but in fact it was what made all the other inventions practicable. "The whole scheme was abandoned for a considerable time, owing to the very great inconvenience of carrying and bringing back the kites, the length and breadth of which made them so unportable, so liable to be broken. They occupied much room also when laid by." When Pocock made joints in the wings and standard (i.e. the king-post), "they are now as portable and as easily stowed away as a large umbrella." This, and the replacement of paper with linen, "gave quite a new zest

to the undertaking; and I felt renewed in hope again. The kites could now be taken in the car with little or no inconvenience."

According to David Pelham's Penguin Book of Kites, the first recorded account of a train of kites being used was by Alexander Wilson at Camlachie in Scotland in 1749. Wilson used them to raise thermometers to measure the temperature at various heights. Pocock tied several kites together, but always with the purpose of exceeding the height of his rival schoolfriends. As a result there was always the maximum possible gap between each kite. But he also noticed that the power of their draught increased to almost any extent and this is what made him interested in kite traction. He was able to pull a sledge very fast, and also pull his one-horse carriage with a full party, even on turf. He had proved that there was sufficient pulling power, even in a modest wind, provided that a train of kites was employed.

Kite control was now found to be the stumbling block. "It was not known how to control or direct that power whilst aloft in the air. It was easy enough to raise kites, but it was excessively laborious to stand against them, or to take them down again; especially when traveling, it became necessary, in order to prevent the

entanglement of the strings in lofty trees, to detach the kites from the car; this required great bodily strength, and occasionally much more than was present; and so sickening was the toil, that the idea of succeeding so as to make the system either useful or pleasurable was again relinquished."

After many experiments, methods were discovered for the complete management of the kites—for reducing their power and for steering their course. This was achieved with four lines. A line goes to the top of the kite and is fixed and not controlled. A second, longer line goes to the bottom of the kite and is drawn in to increase the angle of attack and let out to reduce power. This also controls height. Two further lines are attached at the sides, for steering. "These act upon the kite much the same as reins do upon a gig horse. By this movement the traverse is performed; trees and other obstacles avoided, and many advantages obtained." He explains the chief advantage: "Where there is space for traverse, as on plains or downs, it is possible to beat up against the wind."

George Pocock's fourth invention was the purpose-built kite buggy, or as rendered in French char-volant. "This vehicle, constructed expressly to be drawn by kites, has the following peculiarities: Firstly, before the charioteer, is an upright spindle, with a T handle at the top; the lower end of this spindle, which runs through the bed of the car, is square, fitting into a socket of a small horizontal wheel; round which, a strap passing leads round another horizontal wheel fastened to the pivot of the front axletree: by this apparatus, termed the guide, the chariot is directed with the nicest precision. Secondly, there is a regulator or drag, suspended by a spring, beneath the hinder part of the car; the shoe of this drag is pressed by a lever power on the ground, by which too great a velocity is prevented, or the vehicle suddenly stopped; this is effected without alighting."

He keeps a reel and chronometer on board. Pocock departs from the traditional coach building practice by having a greater length between the front and hinder circles. "The reason for the unusual length of the char-volant are, that it is far less liable to be upset, in turning, backing, or traveling swiftly."

Only a single sentence covers Pocock's claim to have achieved manlifting. "It was now proved that by these

kites might be raised in the air to a vast height, and shall not a father's pride shield the vanity of family associations, when he observed that his daughter, who earnestly claimed from him the daring honour, was the first aeropleust!" Pelham says that she was lifted 300 feet into the air seated in an armchair suspended from the kite line. Amateur Yacht Research Society members still carry on the tradition of testing particularly dodgy experiments on their children first!

Results in Figures

Pocock's earliest carriage traveled at 20 miles per hour for a mile and this amazing speed encouraged him to persevere in spite of all difficulties. He managed 15 mph for several miles "when the wind was not furious, neither were the kites sufficiently powerful, for the bad state of the roads. This speed was also effected with the wheels not exceeding 30 inches in diameter."

He wanted to be able to predict how much kite area would be required for all conditions. "The power of a kite 12 feet high, with the wind blowing at the rate of 20 miles in an hour, is as much as a man of moderate strength can stand against. With a rather boisterous wind, such a kite has been known to break a line capable of suspending 200 pounds. This kite spreads a surface of 49 square feet. It should be particularly noticed, that these may serve as standing ratios, from which, by the rule of proportion, the power of larger kites can be calculated." He knew that kite power was proportional to kite area, not kite length, as some believed. "Two kites, one 15 feet in length and the other 12, have sufficient power to draw a carriage with four or five persons, when the wind is brisk." Pocock summarizes these results "selected from different authors and generally confirmed by experience" as follows:

Pace	Draught	
Power		
A gentle breeze	3 to 5 mph	3.25 cwt
An active breeze	7 to 12 mph	5.25 cwt
Pleasant gale	14 to 18 mph	7.5 cwt
Brisk gale	20 to 26 mph	9.25 cwt
Strong gale	30 to 100 mph	
No experiments at hurricane speed have been made		

The draught power is calculated from experiments made with a four-wheeled car, weighing 2 cwt and

drawn by two kites; spreading a surface of 100 square feet.

The best velocity made good achieved was 115 degrees



Pocock envisioned kites providing traction during a boat race.

from downwind, with the kite reaching a maximum of 45 degrees from downwind.

Suggested Uses of Kites

For shipwreck rescues, Pocock urges that a collapsible kite be stowed in readiness on board, rather than the work of manufacturing the kite be started once the ship has run aground. He describes how mariners can be lifted to the clifftop by kites, but does not claim ever to have tried it. Pelham claims that Pocock lofted his son from a beach to the top of a 200 foot cliff and down again. Pocock hoped that the system would be so perfected that even female passengers and children might be rescued in a hammock or cot swung securely from the kite. He suggests kite bum-sking, lofting a man from a ship for better observation, and for signaling at great distances by day or night. He suggests a military use: "They will serve for observatories, scalade, for passing over and alighting on the opposite side of rivers, for telegraphic information and for signals." He describes the techniques for crossing rivers in winds of

various directions without claiming to have achieved it. "The day may not be far distant, when this system, having been proved perfectly safe and very delightful, ladies themselves shall be seen making their transit of our rivers."

Pocock sees the ultimate kite buggy as a six-man amphibious vehicle designed to cross the Sahara desert. It needs a crew of three, with the other three resting, so it need never stop. It would have a boat-shaped body to aid lake crossings and it would have wheels and sledge runners as appropriate to the ground. It would cross 2,500 miles of desert in 10 days and 10 hours, at a cost of 80 pounds sterling. Any offers?

In another context, the author admits to the possibility of the kite buggy becoming becalmed. His proposed solution: "A method has been contrived for the accommodation of a pony, or pair. This accommodation consists of a low platform with two wheels, attached to the char-volant. The cattle are perfectly fresh to perform their duty and to return the favor of giving back-carriage to their winged associates, or of helping them forward, should the wind fail. Thus the equipage is rendered complete."

Winds

The inventor knew of the fickleness of the wind and sought various means of overcoming it. These included auxiliary horse power, as just stated, and concentrating on the sea where tacking was a more practical proposition than on tree-lined roads. But his chief aid was the wind velocity gradient with which he was well acquainted. He urges study of "the higher regions of the atmosphere, where, when the winds sleep below, there are powerful and steady currents of air rapidly floating." They are especially noticed at sea and had never yet been used, hence his use of trains of kites. It was important to get the kites up before the wind died at ground level, then the high-up wind kept the kites going even when it was dead calm at ground level. The unreliability of the wind in Britain means that kite buggies would be used for amusement only, unless auxiliary power is available. But not so in foreign parts. Pocock believed that kite buggies would really come into their own in those countries with predictable winds. He describes them as constant winds (e.g. the trade winds), periodical winds (e.g. the monsoons) and alternating winds (e.g. the sea and land breezes near

coasts).

Blind Spots

If only George Pocock had met his contemporary Sir George Cayley, the great aeronautical engineer! Cayley could have put him right on a number of things. Pocock writes: "The primary power by which a kite is projected upward into the air will be found in the mechanical principle of the wedge, the wind acting as such on the inclined plane of the kite's surface." He did not question what prevented the kite from veering more than 45 degrees left or right of downwind: "By means of sidelines, an obliquity may be given to the kite's surface, right or left; and thus the angle of incidence is formed on which the wind acting produces a traverse. By this method, therefore, the power is placed to draw an angle, favorable to the desired course." Pocock seems happy with a kite angle of attack also of 45 degrees and did not attempt to improve on it. "By the action of the wind on the before mentioned obliquity, which with a perpendicular, forms an angle of about 45 degrees, a power is produced which draws forward, and lifts upward in nearly an equal proportion."

With Pocock's less than perfect grasp of fundamentals, it is not surprising that he did not attempt new kite shapes. His sole comment on kite shape is: "The shape may vary, but for what is termed the pilot, or uppermost kite, the common circular-headed shape is certainly best." Since Cayley also used this English arch top kite no doubt he was right for his times. Pocock always put the maximum gap in his kite train (of two kites usually) that the upper kite could carry in length of line. It did not seem to occur to him to use a dozen kites close together as per Jacob's Ladder, but he only wanted to use the wind velocity gradient. He suggested races "to determine exactly how far to the right or left of the wind's course the kites might be veered with a given length of cordage and bearing different weights."

Pocock realized the keel-like resistance of the kite buggy wheels but considered that the buggy always traveled in the direction that the wheels are rolling, thereby showing that he had no concept of tire slip angle. He humbly admits that he is a landlubber unacquainted with practical navigation. He failed to repeat Benjamin Franklin's electricity experiment: "When raining, and when the pilot kite has been enveloped in a black electric cloud, and the cordage has been so

fastened below as to afford the fairest opportunity for the discovery (of the electric fluid), no effect whatever resulted." (Don't try this at home, folks!)

Together with most of his contemporaries, Pocock had no doubt that breathing would be impossible when traveling at speed. When he found that his 20 mph journeys did not harm respiration, he had a ready answer: "That the swiftness of movement would almost prevent breathing is certain if going against the wind: but when traveling at such a rate, it is with the wind—and thus a perfect calm is enjoyed."

Further Advantages of Kites

Pocock especially enjoyed passing tollgates without paying the dues, since the regulations omitted to list a rate for kitecraft. The unlimited power of a large kite train could exceed three pair of horses and since only the Monarch was allowed to exceed that number, kite riders traveled like kings. The cost in hay for the horses saved eight pounds sterling a ton and they could race 60 miles without a rest or a drink. Try that on your favorite nag!

No 19th century work would be complete without a claim to the moral high ground. Thus Pocock on kite bugging: "Wherever it might be introduced and practiced, manliness would succeed to effeminacy; sloth be banished by activity; and health, strength and courage, triumph over sickness and fear." (Sorry, girls.)

Volume Being Reissued

As part of its mandate to increase and diffuse knowledge about kites worldwide, the Drachen Foundation supplied the Amateur Yacht Research Society, based in England, with a copy of George Pocock's famous book *The Aeropleustic Art*. Fittingly, the society—which gathers and disseminates research on sailcraft—now plans to reproduce the volume and make it available globally.

Dave Culp of the San Francisco area, a member of the society's governing board and keen yachtsman, with a particular interest in kite-powered boats, has taken on the project. The Drachen Foundation is helping by scanning into digital form, with high resolution, the book plates. Culp can be contacted via e-mail at dave@dcss.org. He also maintains a web site at <http://www.dcss.org/speeds>.

An Ingenious Civil War Kite-Flying Scheme

Editor's note: Terry Foenander of Toowoomba, Australia, spends a lot of his free time in libraries perusing and copying interesting—"and mainly obscure," in his words—articles from American newspapers from the Civil War period. He plans to incorporate his choicest finds into a forthcoming book. One of these nuggets concerned kites and is reproduced here with his kind permission. The article is from the March 13, 1864 issue of the New York Herald.

Kite Flying by Rebel Prisoners Is New Method of Communication

The Chicago Tribune of Sunday last, in an article on the Confederate prisoners at Camp Douglas, near that city, mentions the following incident:

"Early last week several of the rebels were seized with a mania for kite flying. Pine sticks, paper, paste and twine were in requisition, and soon a half-score of six-cornered kites were ready to take a sail. Flying kites is a harmless amusement, and the colonel commanding, remembering how in his boyhood he used to stand on the village common and gaze at his own kite as it wandered heavenwards, was not disposed to deprive the poor fellows, shut in from the world, seeing nothing beautiful unless it is above them, of any enjoyment they might derive from such a recreation.

"So towards evening of the first day the rebel kites were permitted to rise. Away off southward and upward they floated till they were mere specks in the sky. Federal and rebel enjoyed the sight for half an hour, and then the kites were 'wound down.' The next evening the kites flew again, but unfortunately the strings of two or three broke, and they went tumbling on toward the south. No suspicion yet. The next evening the kites again floated, and the strings again broke.

"'Something strange in that,' thought the colonel aloud to his officers. 'When the next string breaks order a soldier to follow the kite and we'll see what ails the cord.' Soon a string snapped; away went the kite and away went the soldier after it. It dropped in a field a mile and a half away, and the soldier found it, and in its paper tail he also found a letter addressed to a certain Chicago

copperhead.

"What the contents of the letter were, or to whom it was directed, we are not informed. But it is known that it furnished the government with the clue to a plot. The envelope contained two letters, neither of which criminated the person to whom it was directed. One note simply requested him to mail the inclosed letter to Hon. Mr. So and so, Louisville, Kentucky, and promised him the everlasting remembrance and gratitude of the 'oppressed Southern people.' But neither he nor the Kentucky man will ever receive the notes—the latter will receive something else before long.

"It is supposed that some person was stationed at a convenient point, from which, after nightfall, he could readily reach the runaway kite and secure the letter.

"It was a pretty plot, indeed. But the rebels will have to devise a more ingenious postal scheme than this. The only effect of the discovery has been naturally to increase the vigilance of the garrison." 🌿

The kite is flying in the sky
But it is in the the hands of the people of the earth.
So we too should go up,
But we should keep our passions on the earth
And let our spirits soar.

—Dasopant (1551-1615), from the
Marathi "The Grantharaja"

German Kite Patents a Treasure Trove

By Ed Grauel

Between the years 1882 and 1994, a total of 100 patents were issued by the German Patent Office for kites and kite accessories. This averages about one patent per year, approximately the same number of patents issued by the British Patent Office for English patents over a period of years. In contrast, the U.S. Patent Office issued an average of six to seven patents per year from 1886 to 1998, indicating a much greater interest in kiting in America than in those two European countries. Our usually reliable source of information about German patents is unable to provide information about kite patents issued after 1994.

Of the 100 German patents, 12, or 12 percent, were also patented in the U.S., so the subject matter of the patents was not new in this country. These German patents are:

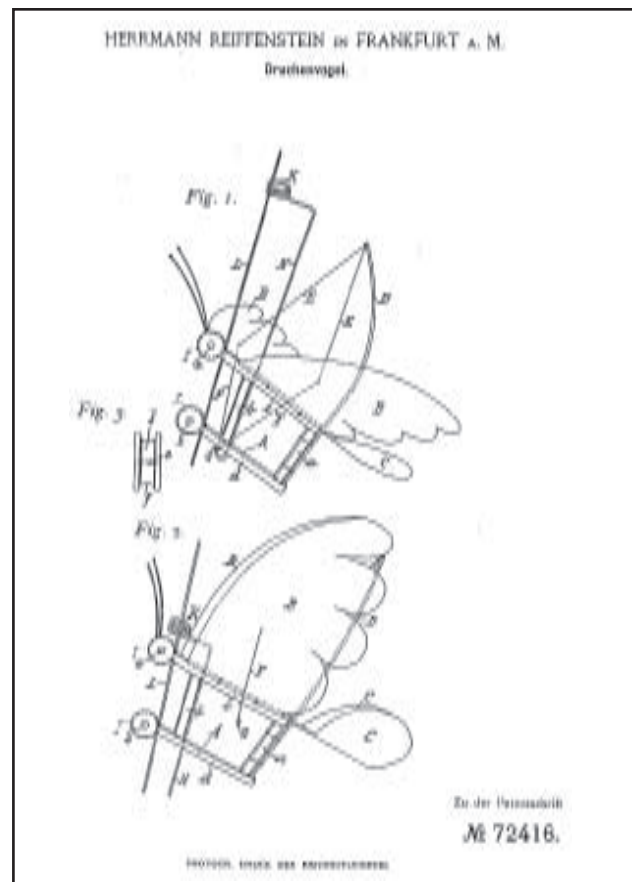
No. 51,499, for ship rescue; 200,677, hummer kite; 200,872, foldable kite; 235,722, triangular box kite; 335,342, line traveler; 494,556, airplane-type kite; 2,360,254, airplane-type kite; 2,440,507, two-line bowed kite; 2,505,050, parawing-type kite; 2,604,216, two-line delta-wing; 2,737,597, two-line channeled; and 3,830,459, two-line delta-wing.

Of the remaining 88 patents, 16 are for multiple-line control kites, 10 auto-folding kites, 9 line travelers, 7 inflatable kites, 6 fighter-type kites, 5 airplane-type kites, 5 rotor or rotary kites, 4 kites which change center of gravity, and 2 reel-winders.

As with other kite groupings, several of the patents covering multi-line control kites show ingenuity in concept, even if being somewhat difficult, and perhaps expensive to produce. Patent No. 186,718, for example, provides for two keels, the bottom one used as a rudder for steering purposes; No. 2,631,699 with an inflatable streamer near the bottom of the kite to act as a rudder; No. 2,920,538 with a steering device which permits shifting the position of the two-line connection; No. 4,133,021 for two kites on a rotatable coupling; and No. 4,303,042 with adjustable spreaders running through a

hollow fixture on the mast.

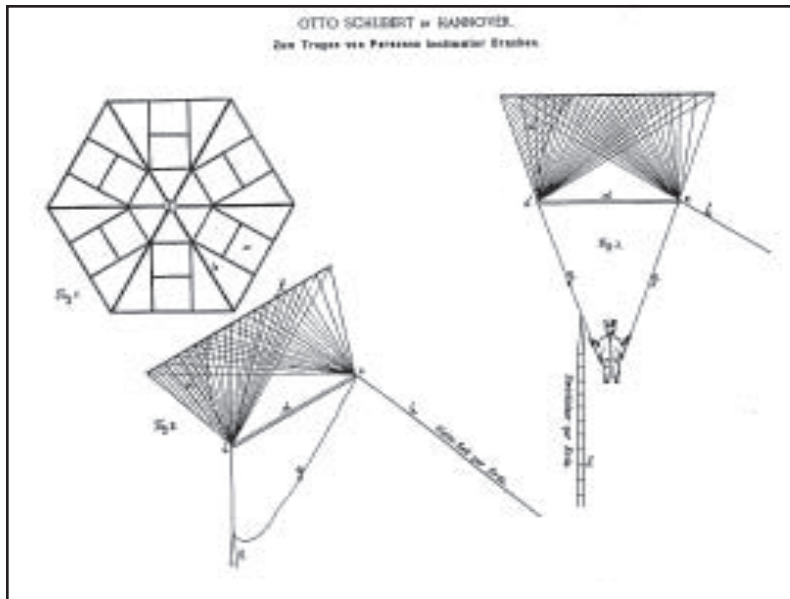
The auto-foldable kites also have ideas not generally known in this country—No. 74,232 with a hinged center mast; No. 81,316 with a slide on the center mast to permit folding like an umbrella; No. 316,435 with slidable tubes to permit folding the kite; No. 352,222



Patent 72,416: Line traveler with bird-like foldable wings.

with vertical and horizontal hinges to permit folding; and No. 442,109 with a central radial socket.

Principles used for line travelers are pretty well known in this country but No. 389,863 which drops an object which remains in a horizontal position and No. 2,647,269



Patent No. 71,599: Three views of a six-sided kite.

with rotating wing-like arms and No. 3,122,364 using a radio control are novel and unusual.

Inflatable kites such as No. 1,531,448 which can change altitude by a pull on the line; No. 2,631,699 with an inflatable streamer at the bottom of the kite to act as a rudder; and No. 3,523,918, a sled-type kite with an M-shaped inflatable tube, involve features not commonly known.

Fighter-type kites as No. 1,478,649 with a sleeve which slides up and down the center mast; No. 2,022,378 with a spreader stiffener at mid-section; No. 2,116,424 with multiple bridle-connection points; No. 3,016,403 with a maneuverable spreader

to alter the center of gravity, are also different than American versions.

Patent No. 1,944,375 with a tension between two wings which permits the wings to move backward and lock in position is the only airplane-type kite embodying ideas not generally known in this country.

Except for No. 576,487, which proposes hollow and lined flight lines to permit changing bridle points from the ground, and No. 4,302,863, a four-sided box kite held open by flexible internal spars which can be wound for tightening, the remaining patents cover fairly well known ideas.

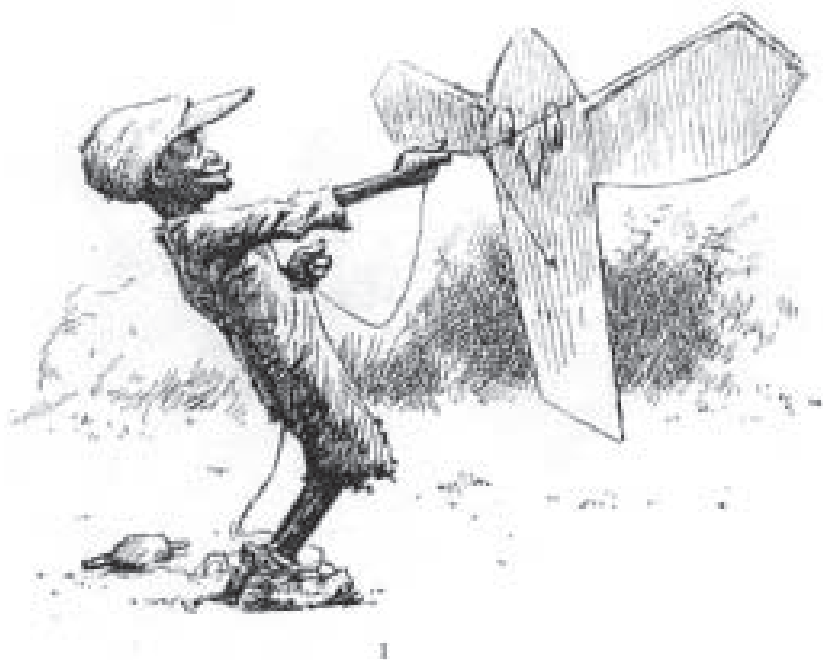
In summary, German kite patents are ingenious, somewhat complicated, and perhaps impracticable when cost and the difficulty involved in producing many of the ideas are taken into account. Nonetheless, the patents are a treasure-trove for kitefliers wanting to try new concepts and particularly for kite manufacturers looking for new product ideas. 🗝️

Morning Portrait	
<p>If you follow the string from the green kite flutter-flying there above the city you will see the kite man wearing a bowler hat and beard both black strolling down Couch Street the sky throbbing in his hand.</p>	<p>If you follow him farther to the front of his shop where kites hang like colored leaves about to drop you will see him tie the string sky and all to a parking meter then puzzle how much to pay for catching the wind on such a day.</p>
—Gwendolyn Endicott	

A Segment of American Cultural History

In addition to his large, choice collection of kites from around the world, Scott Skinner, president of the Drachen Foundation, has amassed a comprehensive trove of kite art. Included are prints by Japanese masters Hiroshige and Hokusai, paintings, postage stamps, drawings, cartoons, porcelains, enameled pins, emblazoned clothing, photographs, videos and a vast collection of printed material. He also collects kite flying paraphernalia from around the globe, particularly Asia, such as line, winders, tools, and the raw materials used in kite construction. Some of these objects are works of art in themselves.

Internet auctions have provided Skinner with a new, wonderful source of supply for his kite hoard and one of his recent acquisitions was the set of four drawings from Century magazine reproduced here. They are by illustrator E.W. Kemble and are part of his so-called “comical” images of Southern life. Kemble is perhaps best known for illustrating Mark Twain’s *The Adventures of Huckleberry Finn*. If the racial stereotyping implied in much of Kemble’s work is now considered inappropriate or even offensive, the drawings are indubitably part of turn-of-the-century American social history. And certainly Kemble’s pen and ink draftsmanship is imaginative, fluid and expert—illustration carried to the edge of fine art.





Although it is his first example, African-American memorabilia it turns out is considered a hot new collectible. PBS's popular "Antiques Road Show" has featured several African-American items and a recent edition even had an expert on the subject who showed slave tags and leg irons and late 19th and early 20th century art work by Kemble and contemporaries.

This was the so-called golden age of American illustration which lasted from about 1880 to 1930. Charles Dana Gibson of Gibson girl fame and Frederick Remington, whose paintings and sculptures romantically mythologized the American West, were Kemble contemporaries and friends. A highly prolific draftsman, Kemble wrote many books, illustrated many more and is avidly collected today.



As Skinner has discovered, collecting for him has become a way of life, a philosophy rather than a mere matter of acquisition. "It is," he says, "a way to fine tune the mind's eye." 🌿

Flying in the Beginning

A Low-Key Account of High Adventure in 1897

Editor's note: In the late 1890s, kite experimentation was in full force in many countries. Observation for military purposes, aerial photography, lifting of wires across gorges and rivers—these were the aims. For some of the experimenters, such as the Wrights, actual manned flight was the goal from the start. An unsung figure in this early work in the United States was Army Lt. Hugh D. Wise, who as early as 1896 was conducting important kite experiments on New York City's Governor's Island, in sight of the Statue of Liberty. Wise pretty much financed his own studies, although he did have the aid of military personnel. After extensive experimentation, Wise hit upon a modified Hargrave box kite as best for his purposes, and in the following low key account, published by Century magazine, he details how, after first narrowly escaping death or serious injury, he pulled off a "first" in the U.S.—a manned kite ascension. Wise went on to experiment with gliders, but his inventive work was nipped in the bud by his service in the Spanish-American war and then a posting to the Philippines. He was never able to fulfill his great early promise as a flight pioneer.

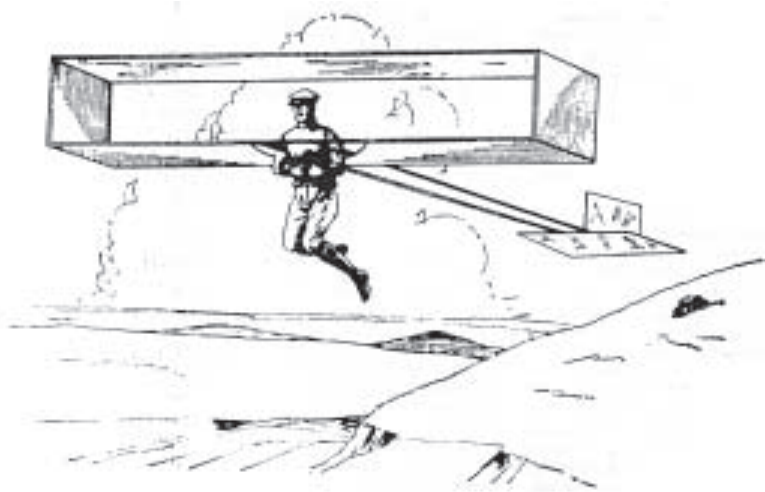
Text and illustrations by Hugh D. Wise

"...Experimenting with large kites is not without its humorous phases, and a day or two after the experiment with the dummy 'Jimmy' an incident occurred which, though ridiculous, well nigh resulted seriously. The same kites that bore the dummy had been sent up about two hundred feet, when the two men who were assisting me went for another kite, leaving me alone at the windlass. Noticing that the rope was in danger of being cut by the cogs, I put on the brake, and passing around to the front, bore down on the rope, which did not appear to be under great strain. In order to readjust the rope on the drum it was necessary to relieve the tension. Near the windlass a piece of rope had been spliced to the main line as a leader for the cord of another kite. This I wrapped around my waist and tied with a bow; then, drawing my knife, I cut the main line from the windlass.

"I was not long in discovering my mistake, for as the rope parted the knife flew from my hand, I was jerked over on my back, and started for a sleigh-ride across the grass at a rapid pace. In my efforts to untie the bow, I pulled the wrong end and made a hard knot. Finally I managed to get to my feet; but this was little better, and in spite of my efforts I was rapidly approaching the sea-wall. Where it would all have ended I am unable

to say; but I am inclined to believe that I should have needed no ferry ticket to Staten Island had not a friendly lamp-post happened to be directly in the line of travel. I approached it with outstretched arms, clasped it in a fond embrace, and there I hung until assistance arrived. With great difficulty three men led back this runaway team and harnessed it again to the windlass. Since then I have not been 'so attached' to large kites.

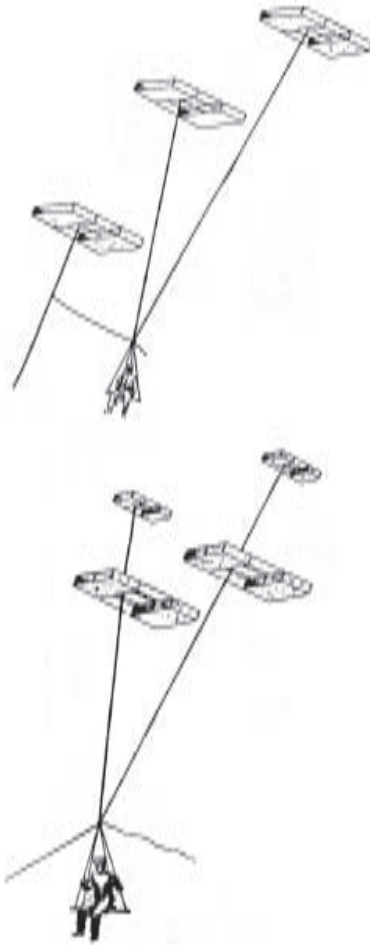
"Having successfully lifted the dummy, my next attempt was to lift a man." (Wise goes on to detail an attempt by him to make an ascension which came to grief when



the unexpectedly tremendous power of the kites in the air caused the rope to tighten on the windlass with such a powerful jerk the central truss of the lower kite was torn.) He continues: "The two upper kites, steadied by the weight of the helpless lower one, floated away. As they passed over the fort they were caught by some soldiers, and the tandem was saved, though the kites were broken against the neighboring walls in lowering them. So ended this experiment, and the work of weeks had been torn to pieces in a few moments.

"An experiment is a failure when nothing is accomplished by it; therefore, this one was not a failure, for by it were detected errors to be avoided in the future, and the damaged kites were the price paid for their detection.

"It was not until the E kite, probably the largest kite of this type ever built, was completed that I again attempted an ascent. In the meantime the broken kites had been repaired, and strong ash spines had been substituted in the large kites. On January 22, 1897 at 4 p.m. the anemometer registered a wind velocity of 15 miles an hour, which was more than sufficient to lift a man with the kites now at my disposal. All my



Top: "Jimmy," an old uniform stuffed and weighted, was the passenger in early experiments with large man-carrying tandem kites. Bottom: A different tandem arrangement was developed after "Jimmy" was severely mauled, and "the writer was the first person to be borne aloft by his kites."

experiments had shown that the best tandem for lifting weight was one in which the kites were tied one to another; but as I had more power than I needed, I decided to send up two tandems, and to unite them, since this greatly facilitated their management. The windlass, wound with 500 feet of 1/2-inch rope, was placed in position and lashed to a tree. C was launched and tied to the back of B, and the two kites were allowed to rise to the end of 150 feet of 5/6-inch rope, which was then made fast to a tree. One hundred feet of the large rope was now run from the windlass and made fast to E, to the back of which F, having been launched, was tied. Six men took hold of the rope 50 feet from E, the man stationed by the kite raised its front edge, and it rose gracefully from the ground. The strain was given gradually to the windlass, and then the first tandem was brought up and tied to the main line. At the point of junction the same apparatus used in the last experiment was made fast, and the kites were allowed to rise until the pulley was about 30 feet from the ground, when taking my seat in the chair, I was hoisted to the pulley. The line sagged badly, so that I was at height of only about 20 feet.

In a few minutes the breeze died out considerably, and I was lowered to the ground, where I waited for the wind to freshen.

"After a short wait the wind rose to 17 miles an hour, and when I was hoisted to the pulley there was not a great sag in the line. Grasping the halyard, I made it fast to the chair and gave the signal to the men at the windlass. As the rope ran out the kites bore me up until I was as high as the neighboring houses, when I signaled to stop the windlass. A measurement of the trailing rope showed a height of 42 feet from the ground to the chair. The sensation was not at all unpleasant—a gentle swaying and lifting not unlike the motion of a swing. I was tempted to go higher, for there would have been no difficulty; but I was not provided with a parachute, and I did not wish to run any unnecessary risk. After remaining aloft a short while and observing the action of the kites, I signaled to wind in and when near the ground I was lowered by the pulley, with the satisfaction of knowing that this experiment at least had been a success, and that it was the first kite ascension in the United States."

Two Kite Research Papers

By Ed Grauel

Measurement of Line Tension

This is a report on an attempt to measure line tension on various types of kites when in the air, and at various windspeeds, to determine if there were any correlations with size, weight, or type of kite. The results were not as expected.

The first problem, of course, is a suitable means of measuring tension exerted on a kite line. Most available scales are either in pounds with approximations for fractions of pounds; or in half ounces, with the top limit one pound. Since neither type seemed suitable for the purpose, I tested various springs (attached at one end in V-type molding with a line tied at the other end through a screw-eye to a clip) until I found one which would measure fairly accurately from a half-ounce to four pounds. Designations in half-ounces were marked on the inside of the V-molding so they could be read easily in the field. A second scale was made by selecting a stronger spring which would measure tensions from four to eight pounds. Designations in quarter-pounds were marked on the scale.



A rigid keeled on-the-wind kite obtains lift from wind striking the lower surface.

Thirty-five kites were selected for testing, which included several sizes and weights of flat, bowed, box, parafoil, keeled and rotary kites.

An arbitrary

decision was made to measure line tension at three different wind speeds—as close to 8, 15 and 20 miles per hour as possible.

As data accumulated, I made an attempt to find some



A parachute kite requiring air movement to form and to provide lift is an against-the-wind kite which adds to the tension on the flying line.

correlation between the tension readings and the surface area or size of the kites being tested. There appeared to be no apparent connection—kites with small surface areas would frequently outpull ones with large surface areas, and vice versa. No correlation here.

Next, I weighted each kite and attempted a correlation between this factor and line tension. The ratios varied from tensions two times the weight of the kite being tested to 40 times the weight. More often than not, the lightest weight kite would outpull much heavier kites. No correlation here either.

In studying the data accumulated, I noticed that various types of kites consistently outpulled the others. These were sleds, parafoils, rotaries and combinations of these kites—kites which required wind movement, both to form and lift them. In other words, kites which fly against the wind, as contrasted with kites which fly on the wind, such as flat, bowed, keeled, box and parawing kites, or combinations of these types.

Here the results were entirely consistent: kites which fly on the wind had an average line tension of $7 \frac{1}{2}$ times the weight of the kites, at windspeeds of 8 mph. This compares with 20.1 times the weight of the kite for against-the-wind types at 8 mph. At 15 mph, line tension doubled to 15 times weight for on-the-wind kites, and to 40 times weight for against-the-wind types. At 20 mph, line tension did not appear to increase significantly over the 15 mph readings, but my data is

not as reliable at this greater wind speed.

If these results are valid, it could be expected that an on-the-wind kite, such as a bowed, keeled delta-wing, or parawing, which weighed approximately one ounce, would have a line pull between 7 and 8 ounces at a wind speed of 8 mph, and around 15 ounces at 15 mph or more. An against-the-wind kite, such as a sled, parafoil or rotary, which weighed approximately one ounce, would have a line pull of approximately 20 ounces at 8 mph, and around 40 ounces at 15 or more mph. Significant differences.

In summary, while this study discloses no correlation between the size and weight of a kite with the amount of line tension, it definitely establishes that any kite **How High a Kite?** observing the elevation wind will create significantly less lift than a kite which requires the wind to form an interesting story about the amount of lift the kite is generating in relation to the amount of drag present. For example, if a properly bridled kite flies at 45 degrees under ideal wind conditions, it means that the lift-drag ratio is approximately 1.0 and therefore both forces are equal.

If, however, the kite achieves a maximum of 63 degrees under suitable flying conditions, the lift-drag ratio is about 2.0, meaning that the amount of lift is twice that of the drag. At approximately 71 degrees, the ratio is 3.0; at 76 degrees 4.0; at 78 degrees 5.0; and at 88 degrees an astronomical 30.0.

Conversely, at 40 degrees, under suitable flying conditions, the ratio is 0.8; 31 degrees 0.6; 22 degrees

0.4; and at 11 degrees the ratio drops below 0.2, or 20 percent lift vs. 80 percent drag. The mathematically minded may recognize these figures as the natural trigonometric tangent functions for angles.

This type of information leads to an intriguing question about the optimum angle of elevation (AE) an average kite achieves, so it might be possible to tell whether the kite we are flying is better than, or not as good as, an over-all average. But before answering this question, however, we first have to think about suitable methods of measuring kite elevation.

Such measurements should be taken when horizontal surface winds are blowing with reasonable consistency, without excessive gusting and without any influence from thermals, updrafts or downdrafts. The kite to be measured should be flown on a taut line, preferably monofilament or equivalent to minimize line drag, and at least 100 feet high to avoid ground turbulence. An inclinometer is needed to read the angles of elevation and several readings should be taken when the kite is in a stabilized flying condition; the readings should then be averaged.

Using these criteria, 31 kites of various types, sizes and coverings were selected for analysis. A previous study I published in the summer 1975 issue of Kite Tales magazine established a minimum and maximum wind tolerance for each type of kite studied, as well as optimum towing points. Based on this information, angles of elevation were taken for each kite when it was flying at the minimum and also the maximum windspeeds. In addition, a third reading was taken at the midpoint between the minimum and maximum windspeeds.

So, back to the basic question about the angle of elevation kites normally achieve. At the minimum windspeed a kite requires to become airborne and to continue to climb, which in the case of the 31 kites studied varied from 2 to 10 miles per hour, an average AE for the 31 kites was 40.6 degrees, or more properly, 40 degrees 36 minutes.

At the maximum windspeed the kites would take before power diving, looping or going out of control, which varied from 12 to 50 miles per hour for the kites studied,

Father and Son
No sound—a spell—on, on out
where the wind went, our kite sent back
its thrill along the string that
sagged but sang and said, "I'm here!
I'm here!"—till broke somewhere,
gone years ago, but sailed forever clear
of earth. I hold—whatever tugs
the other end—I hold that string.
—William Stafford

the average AE was 45.5 degrees, or 45 degrees 30 minutes.

At the midpoint windspeed, which varied from 8 to 30 miles per hour for the kites studied, the average AE was 52.7 degrees, or 52 degrees 42 minutes. This would be considered the average AE for all the kites studied—individually or collectively.

To many kitefliers these figures may seem surprisingly and unexpectedly low. At the minimum windspeeds, the average 40.6 represents a lift ratio of only 0.86. The average 45.5 at the maximum windspeeds is just slightly a positive 1.02 in lift-drag ratio, and even the average midpoint windspeed of 52.7 is 1.31, or only 31 percent more than a lift-drag ratio of equality.

I have no good explanation for these low figures, and can only suggest that the 80- to 90-degree elevations some kites achieve apparently do so under the influence of thermals for short periods of time, or when winds are changing direction or intensity. The maximum I could obtain for individual kites on a sustained basis were 68 degrees for a 30-inch sled kite, 65 degrees for a fighter-type kite, and 64 degrees for a stub-wing box and also a keeled delta-wing with apron.

As for types of kites, sleds of various sizes had the highest AEs, followed in order by winged boxes, bowed kites, parawings, delta wings, box kites, parafoil types, rotaries, parachutes and, at the lowest range, flat kites with tails. Gary Hinze, the kite theoretician in San Jose, California, tells me that a kite with a high aspect ratio will generally achieve a higher AE than a kite with a low aspect ratio. I didn't compute the areas of lifting surfaces for each of the kites studied in order to determine aspect ratio.



Sled-type kites will normally fly at a higher angle than the average 52° for all types of kites

It is interesting to note that the AE at maximum windspeed is lower than at the midpoint windspeeds—45.5 as compared with 52.7 degrees. This was universally true; every kite tested flew higher at midpoint than at the maximum windspeed, indicating that additional wind pressure drives a kite higher, up to a certain point, then starts contributing to drag.

A few interesting asides resulted from this study of elevation. For example, changing the towing point upward or downward from the optimum point changed the minimum and maximum windspeeds, but didn't

appear to affect the achieved elevations materially. Measurements of the amount of wind required to obtain zero angles of elevation—in other words, the kite flying straight out on a horizontal line—resulted in windspeeds from one-half to one mile per hour less than the minimum windspeeds required to make the kite take off and up.

Some experiments were made by placing weights, varying from one-half ounce to three ounces,

at the point of the attachment of the flying line to the bridle, and also at the trailing edge of various kites, changing the towing point when necessary. While the weights increased the minimum-maximum windspeeds slightly, the lightest weights increased AE by 5 to 10 percent, while the heavier weights simply caused an unacceptable bridle swing and instability. It is possible, however, that measurement errors could account for these results.

So, if the kite you are flying gets above 53 degrees from the horizontal, it is doing better than the average kite included in this study. If it gets above 68 degrees and stays there for a period under normal wind conditions, it is a winner in the elevation sweepstakes. And that's the kite you can truthfully brag about.

Charles Schulz Remembered

PEANUTS CHARLES SCHULZ



By Scott Skinner

Our country is built on competition: winning and losing define success in sports, business, and daily life. We can become blinded by winning, sacrificing our family life for business success, or “taking the money” while sacrificing honor and ethics. Charles Schulz, creator of the Peanuts comic strip, reminded us of the honor in simply playing the game. His central character, Charlie Brown, the penultimate loser, always came back to play the game again. In almost fifty years, Charlie won one baseball game, never kicked that field goal, and snagged his kite in countless trees. Serious kitefliers might be dismayed that Charlie never got it right, but we can’t imagine how many millions of people smiled at Charlie’s hopeless attempts.

When Charles Schulz died on February 13th, his comics had been translated into over 60 languages. Newspapers all over the world carried the syndicated strip. Charlie Brown may well be the most famous kiteflier of the 20th Century. For those of us under fifty, we have never been without Charlie Brown, Lucy, Snoopy, and the rest. They are a part of our consciousness and we know immediately what will happen when Lucy holds the football, when Snoopy dons the flight glasses, or when Charlie picks up his trusty red kite. Good grief!

I’ve made a few red kites—I hope I always return to the game with Charlie’s optimism. Thank you, Charles Schulz.

Letters to the Editor

Spiritual Chiropractors

Editor's note: The following note arrived from a member of the firm which trained Drachen staff Ali Fujino and Elizabeth Snodgrass in desktop publishing.

Dear Drachen,

I happened to carry a co-worker's mail to his desk this morning and ended up reading issue No. 3 of the Drachen Journal in its entirety. I was having a horrible day and then the power of kite-oriented text and images adjusted my brain to its original, correct and happy disposition. I had no idea you were spiritual chiropractors as well as desktop publishers.

Your friend at Ivey,
Meredith Yeary
Training Coordinator
Ivey Seright Computer Graphics

Meeting With Jalbert

Dear sirs,

I read on the computer about Domina Jalbert and the parafoil. I thought you might be interested how I met Jalbert back in the '70s. I was on the beach in Boca Raton and I met this gentleman flying a kite. It being a parafoil, he described it to me and explained to me that he designed it after the wing of his Bonanza airplane. He sold me one of his kites and described his larger one that would pull a seven-man life raft. A couple of days later, I bought the larger kite from him plus a drum of parachute cord to fly it. I still have these kites. I also took a picture of him on the beach which turned out well. I still have that picture. Thought you might like to hear from someone who admired this fine gentleman.

Arthur Hill, M.D.
North Chatham, Massachusetts



Drawing by Richard Stine

Taking Issue

Dear Ben Ruhe,

I do have a problem with your sentence, 'All that was required was a powerful engine...and Bell would have had a flyable manned aircraft.' (Alexander Graham Bell's Historic Tetras, issue No. 3 of Drachen Journal.) Just because you can pull up a lot of tetrahedral pieces on a cord doesn't mean it is flyable. It would take a great deal to control and balance it, as well as manage the engine and the pilot. The problem of resistance to lift I think would have doomed that design as it proceeded into larger and more powerful versions.

I think after the other aeroplanes were successful, (Glenn Curtiss and his friends put together a powered tetrahedral machine, which I think managed to get off the ground. They wanted to do a nice thing for the old man.

Leonard E. Opdycke
Publisher, Aero Journal
Poughkeepsie,
New York

India Is Heard From

Dear Drachen,

Terrific issue. The best by far, so far. Hats off!

Ajay Prakash
Mumbai, India

Old and New Material

To Drachen,

The whole idea of the Drachen Foundation's Kite Journal, not flashy but serious, solid looking from the first page: I'm impressed. Digging out old and new material. This is my idea of something truly admirable in a kite magazine.

Tal Streeter
talkite@ix.ntcom.
com

The Drachen Journal

This journal is produced by The Drachen Foundation and is issued twice a year.

Single copies and subscriptions (including back issues) are free. Contact the Foundation's administrative office.

If you have questions or comments about the Kite Journal or kites in general, please submit them to the Foundation.



Drawing by Mary Jo McKinnon
Permission to use given by Joe Vaughn

About the Journal Staff

Editor and major contributor to the Drachen Journal, well traveled Ben Ruhe regularly contributes articles to special interest publications on subjects as diverse as boomerangs, tribal art and flint-knapping.

Scott Skinner, president of the Drachen Foundation, is a former pilot instructor at the U.S. Air Force Academy. He has been a kite enthusiast for two decades—designing, making, flying, collecting and teaching about kites.

Ali Fujino is the administrator of Drachen. A museum specialist since age 19 when she began work at the Smithsonian Institution, she has long been fascinated with anything that can become airborne.

Elizabeth Snodgrass is the desktop publisher of the Drachen Journal. She is an anthropologist by training and through her association with the Drachen Foundation has come to love kites.

Illustration credits

Ben Ruhe: Pages 2 (Streeter), 3, 4, 7, 8, 18; Ali Fujino: Pages 2 (Grauel), 5, 21; Blue Hill Observatory: Pages 10, 11, 12; www.skywindworld.org website: Page 13; Nicolas Chorier: Pages 19, 20; Ed Grauel: Pages 34, 36; United Features Syndicate: Page 37.