K I T E
THE DRACHEN FOUNDATION
J O U R N A L

The Adrenalin Rush of Kite Manlifting

A celestial angel, Cocky Eek flies through the air with the greatest of ease----not to mention style. The brave Dutchwoman, an artist and costume maker, created her own dramatic 60-foot dress. She is part of a Dutch flight team headed by Patrick de Koning, which uses six Conyne kites (note kites behind Eek) and has so far chalked up five successful lifts. *Page 3.*

Patrick de Koning

No. 16 Fall 2004

Kiteflying is the beauty of extremely controlled freedom.
Anon.

The kites powerfully rising up were our wishes.
Anon.

Kite! Fly. Fly up, flapping your wings.
Your heart and my heart
Together as one heart.
Saeng-Jin Lee

The Journal Staff


Ben Ruhe

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 could become airborne. Fujino is a member of the prestigious Explorers Club of New York City in recognition of her 25 years of cultural work in Third World countries.


Ben Ruhe


Malcolm Goodman

Editor of 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.

Note to readers: Articles in this issue of the Drachen Foundation Journal not bylined were written by editor Ben Ruhe.

How to Find This Journal

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The Drachen Foundation:
Kite Archives, Science and Culture

The Drachen Foundation is devoted to the increase and diffusion of knowledge about kites worldwide. A 501(c)(3) private nonprofit corporation, Drachen views kites from the standpoint of art, culture, science and history. It uses an integrated program of exhibitions, education, research, collections management, and publications to promote learning about kites. The archive it maintains is freely open to the public for research.

Study Center Location
1905 Queen Anne Avenue North / 200
Seattle, Washington 98109-2500 U.S.A.

Office Hours
Monday–Friday 9 a.m.–5 p.m.

Research Library
By appointment only: 206-282-4349

‘People Emotionally Touched’

Dutch Achieve Dream of Human Flying

After thinking about it for a decade, Patrick de Koning of Ymuiden, Holland, decided in 2001 to make a manlifting kite system. He had been a convert to single line flying for years, “searching for difficult winds in strange places in the landscape----gales, or light winds barely touching your cheek. I liked single line kites for their nice behavior and ability to make the wind visible. Soaring skies, chaotic clouds----the eye rests on a high-flying kite glued to the sky, you dream away.”

Desiring a high-lift kite but not wanting to use the overly copied, in his view, Cody design, De Koning opted for the Conyne, which he altered a bit to increase lift. “Its flying characteristics are unbeatable,” he says.

After making the patterns, De Koning, an engineer, and girlfriend Caroline de Roy cut and sewed kites. “It took seven full weeks to get the system built from paper until the moment the kites flew,” he says.

The first flight, without a human aboard, was on May 8, 2001. “Everything went as foreseen,” says De Koning, “except the line pull was insane. When the slack flying line----anchored to a truck----tightened with the pull of the Conyne train, the 35 people launching and holding the line were dragged over the shore. Problems prevented us from attempting a manlift that day, but on the following day, with a human aboard, we succeeding in achieving a height of eight meters.”

“Manlift” is actually a misnomer, because the person being hoisted into the air is a woman, Cocky Eek, of Amsterdam, who dons a chic all-white Tyvek dress of her own design and manufacture (she’s a professional costume maker and artist). The spectacular dress is 60 feet long. Patrick had long wanted to make a manlifting system, Cocky dreamed of flying. They were introduced by friends. The partnership was formed.

A month later, on an island, Caroline got to fly too and she achieved an altitude of 40 meters, highest to date. “There was a deep blue sky with white cumulus clouds pushed by a strong Beaufort 5 wind, yellowish dunes, a wild sea,” recalls De Koning. “The kites were marvelous fliers and lifters. It was the best flying so far.”

On a visit to the famous Weifang kite festival in northeast China last spring, De Koning and his team of two women, plus pickup friends both foreign and Chinese, adjourned to Fuyanshan flying field and began the painstaking work of assembling the rig. It was mid-afternoon and the wind was very strong. Two hours later when the pilot kite and five lifters were ready to launch, the breeze had dropped significantly and the team got Cocky into the air only 20 meters high for a half minute or so, before she had to descend into the waiting arms of De Koning, who keeps careful track of the kites and Cocky at all times. “This was the first time our group had the wind dictate the length of a manlifting flight,” says De Koning.

Still the effort was considered a great success. Troy Gunn, captain of the American TKO stunt kite team, says: “There was a real adrenalin rush from the danger involved. She was putting her life into the hands of the gods. And when Cocky landed she had the biggest grin on her face I’ve ever seen.”

“I loved it too,” says Gunn, “that at the edge of the flying field were two men using a hand plow pulled by two mules to till the soil. They were wearing Mao suits. It was a lovely anachronism.”

Weifang was De Koning's fifth successful manlifting effort. He notes that flying the kites takes a lot of energy, time, and a substantial number of people to help out. The whole process is very demanding, with De Koning double checking every detail, in the interests of safety. "Cocky enjoys the flying very much, and she is not afraid," he says. "She completely trusts what I do and make."

De Koning concludes: "Manlifting gets people together to achieve something wonderful. When the system first flew, I enjoyed an unforeseen aspect: People were not only fascinated, they were emotionally touched. They could achieve their own dream of flying, because it was so close and open. It was a priceless experience for everyone involved."

* * * * * * * * *

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Patrick de Koning

Cocky Eek flying.

Caroline de Roy

Patrick de Koning sewing.

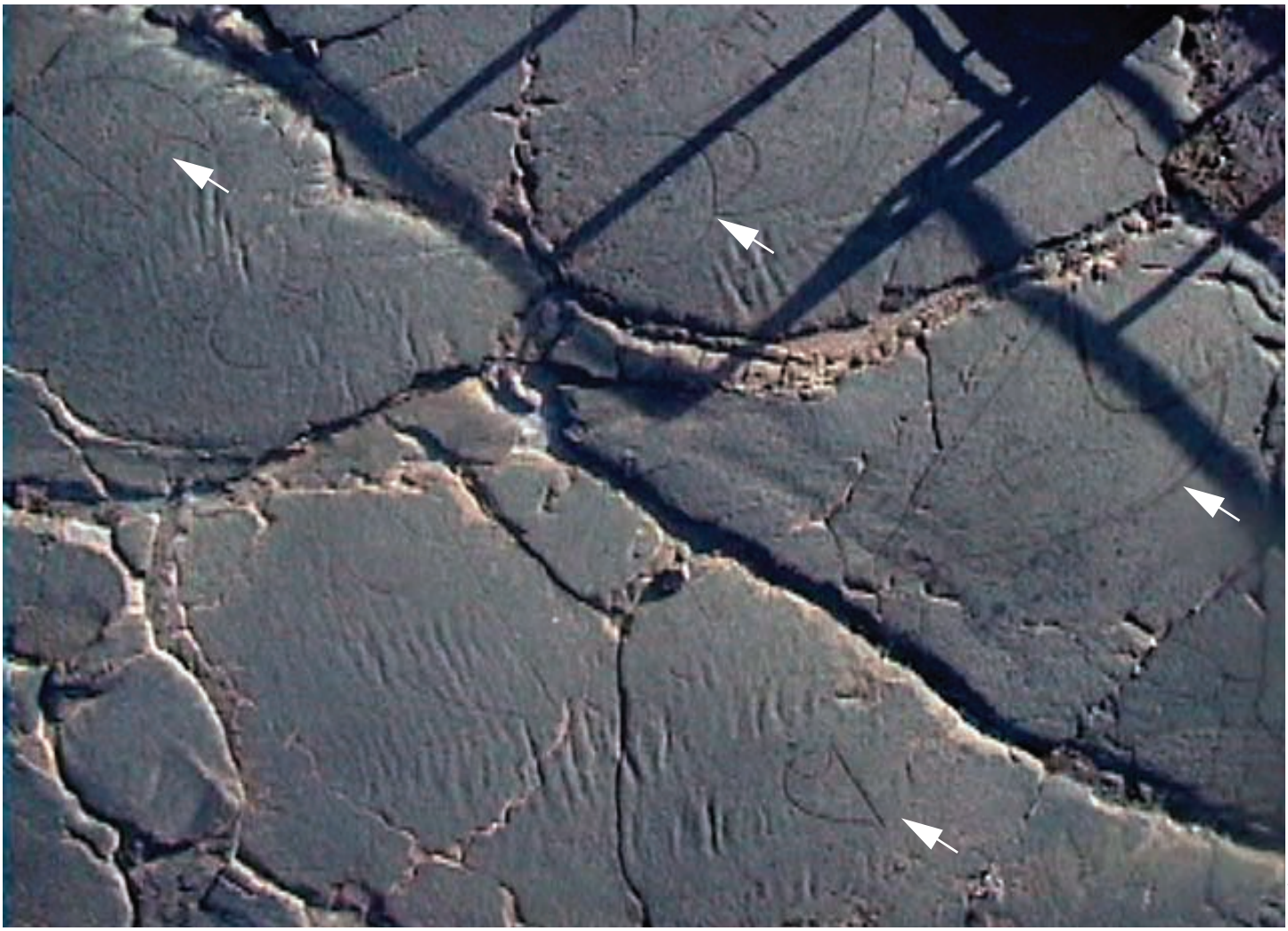
Polynesian Treasure in Hawaii

Photographing Rock Carvings From the Air

As part of the Drachen Foundation's campaign to spread the word about the efficacy of kite aerial photography, Eric Muhs, resident boffin of the Foundation, journeyed to Hawaii to show Professor Don Ryan and his archeology cohorts how a rapid digital recording technique works. Ryan, of Pacific Lutheran University, in Tacoma, Washington, has done projects in the Holy Land, Egypt, and the Canary Islands. The team target was ancient Polynesian rock carvings in a large ground level lava deposit on the Big Island of Hawaii.

The site is known as Kaupulehu and is on the protected grounds of a resort north of Kona airport. It is of particular interest to the Foundation because among its thousands of images of stick figures, boat sails, and abstractions it includes two of kites, similar to the famous Maori bird kites of New Zealand. Kite images have been found at two other lava sites in Hawaii.

Kites were widely used in ancient South Sea cultures, from Easter Island to the Banda Sea. They were used for sport, in ritual, and for utilitarian purposes. The ability of a kite to efficiently and rapidly tow a raft or boat is well documented in studies of Polynesian culture.



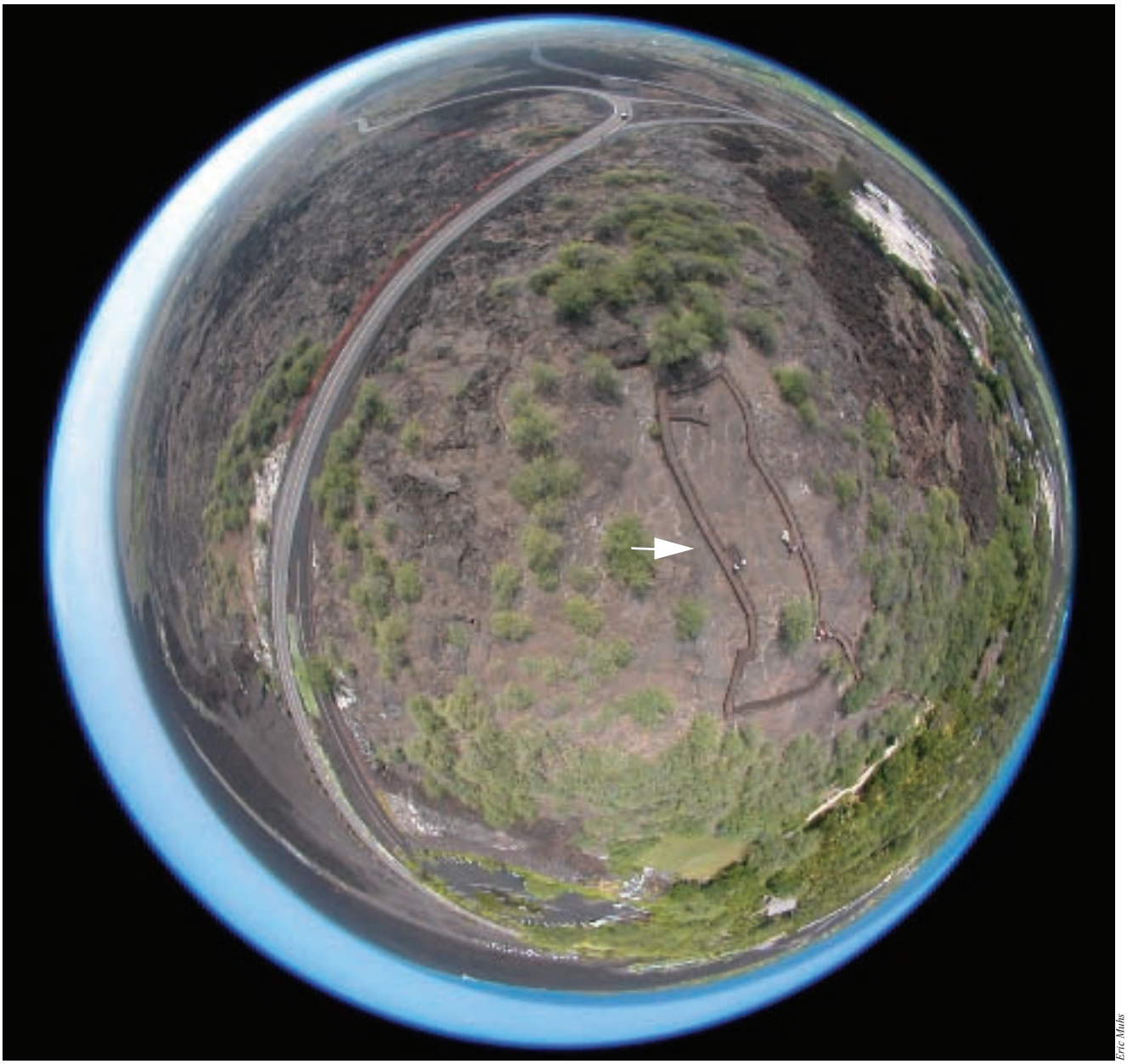
Eric Muhs

A closeup of the petroglyph site where thousands of stick figures, boat sails, and asbractions were incised into the lava. Because the old Polynesian carvings are shallow, they are difficult to photograph. Arrows point to several of the carvings.

Muhs, who photographed himself from a kite at the frigid South Pole two years ago, found the going more difficult at tropical Kaupulehu. The petroglyphs are abraded into lava but not very deeply, thus they afford little contrast for photographic purposes. Beyond which the lava is deeply pitted and the images so numerous some are carved atop older ones. Equally problematic was the wind. Photography was best accomplished at dawn and twilight, to obtain raking light. This was just when the wind was calmest. "It was a no go, not a breath of wind," says Muhs. Frustration.

Muhs and group did get some nice ground level, hand held photographs of the old carvings during the calm periods. When the wind did come up for an hour or two, they found the most efficient use of kite aerial photography was in mapping the site itself. "Since kite aerial photography seems to work best from a height of 30 to 100 feet," says Muhs, "I was interested in stitching together a mosaic of images of the site. The mosaic needs to be seamless. This seems possible in the future with the use of appropriate computer software." Muhs also used a fisheye lens to make some horizon to horizon shots which hold promise as a site-inclusive technique.

What's next? Professor Ryan is talking about the famous quarries at Easter Island.



Eric Muhs

A fisheye photograph taken from a kite shows the petroglyph site at Kaupulehu on the Big Island of Hawaii. For protection the site is surrounded by a wall. Choice viewing spots have been placed on the periphery.

‘The Kite Came to Life in My Head’
Red Baron Flies Again at Festivals

Thijo van Beek, of Mijdrecht, Holland, is one of the success stories of international kiting. A truckdriver by profession, as he frequently points out in his booming voice, before making some exquisitely sensitive comment, or bestowing a well crafted compliment, or cracking a refreshing joke in his fluent, charmingly accented English, Van Beek has made a name for himself with just one kite.


Ben Ruhe

Thijo van Beek

It’s one among many he has built but it’s a lulu, a colorful, half-scale Red Baron tri-wing which flies beautifully in a stiff wind and takes a crew of four to launch and control. The Red Baron refers of course to young, handsome, deadly Baron Manfred von Richthofen, who shot down 80 Allied planes until finally being killed himself during World War 1. His scarlet tri-plane, a Fokker DR1, was only the third kite Van Beek made, after two rather basic ones enabled him to get his hand in.

“People ask me for plans of the Red Baron so they can make one of their own,” says Van Beek. “I tell them there are no plans. I just thought and thought about the kite while cruising the autobahns in Germany. I made a few notes, but that’s all. The kite came to life in my head.” Van Beek did do his homework of course, visiting an aviation museum with a Fokker DR1 in its collection. “The curators couldn’t have been more helpful,” says the Dutchman.

He constructed his original Red Baron in l994, replaced it with a shiny new model last year. (The original has been donated to the Drachen Foundation collection of historic kites.) He figures the original design and assembly took him 300 hours of thought and labor. The kite has taken Van Beek and his red-haired companion Ada Schonhage literally around the world. They were a featured attraction at Taipei international festival, after earlier appearances at festivals in Bedford and Sunderland, England. Over the years, they’ve also been to Columbia, Lebanon, and a range of European countries.

Ada took up kitemaking after meeting Van Beek in l995 and has turned out some beautiful, dramatic kites herself.

With a wingspan of 3.6 meters, which makes it exactly half the size of the airplane Von Richthofen was flying when he was killed (by an Australian machine gunner firing from the ground), the Red Baron kite is big and impressive, but hardly seems large enough to be half the size of an actual military airplane. Three stepped wings obviously generated enormous lift for the plane, as they do for the contemporary kite. Maneuverability of the aircraft must have been superb. In Von Richthofen’s hands, it was a deadly weapon.

Thijo (pronounced Tie-Oh) van Beek says he got the idea for the Red Baron kite after viewing a documentary on Von Richthofen. “I was fascinated,” he says. “It took 73 meters of 6mm carbon fiber to make the kite, and there are 70 spars to assemble, plus a lot more that stay in the kite when it is folded up.”

Working with concentration and practiced deftness, it takes Ada and Thijo three-quarters of an hour to assemble the kite. “We could never put it together except that all the parts are in special bags, with labeled pockets.” Disassembling the kite is slightly quicker. It takes a half hour. Amazingly, the big kite packs down into one sack only two meters high and 20cm. in diameter, an easy parcel for an airline to handle.

Thijo van Beek's shiny new Red Baron kite.

An exceptionally powerfully built man with rugged countenance to match, as well as a well honed skill in the martial arts, Van Beek presents oddly as ultra amiable and is universally liked for his enthusiasm and salty humor.

"He's so cute," says Ali Fujino, administrator of the Drachen Kite Foundation. She viewed him in action in Taiwan. "It's so appropriate he's a truck driver. He's like a truck himself. You put him into gear and he just goes and goes. He's one of the success stories of international kiting. He has found his place in the sun."

Fujino adds, "And don't forget Ada. She is a big part of the story. She's the cheerleader. She keeps the truck from driving over the cliff."

Van Beek maintains an extensive website filled with photographs at http://www.home.zonnet.nl/RedBaronKite/ It's well worth a look.

One story from the site: "When my oldest son Vincent was 4, he wanted a kite. We bought him one, and after a while he wanted to fly it. I told him to get his own kite, this one was mine! How cruel can you be?"

Van Beek tells of his most memorable kite experience: "I was on the coast of France once, with the truck, and I had to wait awhile for my load. I always have kites with me and I took out a seagull kite. I took it up about 100 meters and let it fly for a while. A group of real seagulls flew over and started to circle the kite. It looked like they had a discussion and after a few minutes one attacked the kite. Like a hawk, he fell down from the sky, claws forward to kill the intruder. But the intruder was a bit bigger, at 2.4 meters, and when the gull was really close I just pulled the line a little and made the kite's wings move. It scared the seagull, who hooked away. But the next one was on his way already. He also attacked. I pulled the line and the same thing happened again. The birds took turns, and kept attacking for about 10 minutes. Really a great experience! And I was all alone, nobody around to share it with. I'll never forget this, for as long as I live."

Profound Issues Posed by Asymmetry

The Joy of Making Both Art and Kites

By Ben Ruhe

Istvan Bodoczky

Istvan Bodoczky, of Budapest, Hungary, is a painter of beautiful abstractions. As professor of art and pedagogy at the Hungarian University of Craft and Design, he is also a committed teacher. Born into a family of lawyers, he instead chose to be an artist at the age of 14. "I'm considered a rebel by my family," he says.

Father of three sons, he took up kiteflying in the l970s to amuse them. It was hard going for him at first because he couldn't get his homemade kites to fly. "The children were upset, so I kept at it," he recalls. He not only persevered, he became "obsessive," he says. He experimented, studied books including Pelham, and duly became an expert, even writing a book on the subject in 1983. Making an old warhorse Boxkite was what finally changed things for him. "My then wife's father had been a pilot during World War II and he suggested I make a Gibson Girl-type kite of the sort stocked on life rafts for emergencies. It flew beautifully. That was my breakthrough."

"My pictures and kites came together when a Hungarian television crew challenged me to fly one of my oddly shaped paintings on exhibition in an art gallery. It was a work on paper framed by bamboo with a free-form, highly irregular outline. I was rather annoyed at the challenge.

"But I did take up the challenge and luckily that first painting cum kite flew. It flew so easily and so well that it made me believe I could fly anything. Then I found out it was not so easy after all. But I remained convinced that if I had luck and patience I could make any of my paintings fly and this has proved to be the case.

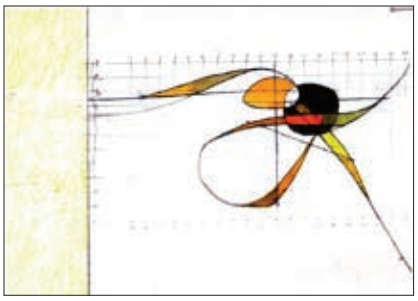
"Combining painting with kites kept me from developing a split personality, which I did not want to have. By making paintings that fly, I get the joy of doing both art and making kites."

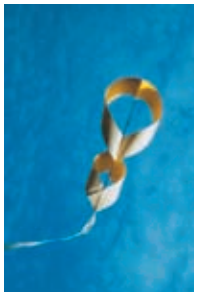
Soft-spoken, reflective, serene, Bodoczky confides that most of his asymmetric creations do not fly well immediately. "I go to a faraway, hidden spot to test fly them. I'm not an expert at aerodynamics. I use trial and error. I add beeswax to change the weighting, change the bridling which I have only guessed at to begin with. And of course I use tails. Almost all my kites fly at the end. I never give up. But I am not fond of some of them if too much struggle has been involved."

Selling works of art to live is hard scrabble, as almost any artist will testify, but Bodoczky's skill is so obvious and his work so appealingly imaginative he early on began to be exhibited-----first in Budapest, then nationally, then internationally.

Bodoczky became renowned in the kite world when he won the major design prize at the prestigious Dieppe, France, kite festival in l989. "That put me on the international kite circuit," he says. "Invitations to travel to festivals around the world followed." Steady sales of his art have followed as both museums and kite collectors have joined in admiration of his work.

"When I do my paintings on paper, stretched on bamboo frames, with asymmetrical outlines," he says, "I never think of what I am doing in terms of kites. That would ruin the painting. I only consider the possibility of flying





All photos by Istvan Bodoczky

Left, a Bodoczky kite with extreme asymmetry. Above, drawing for a kite. Right, the simple Ribbon kite, for beginning fliers. Note that everything Bodoczky does has a light, original touch.

the work if it pleases me as a painting." He says something beautiful next: "I believe if the painting is good as an artwork, it will fly."

Bodoczky's asymmetrical kites pose profound philosophical issues. He defines symmetry as similarity, correspondence, or balance among systems. It is an exact correspondence in position or form about a given point, line, or plane.

"When talking about symmetry, we usually think of something visual," says the artist. "Most often it means mirror symmetry, or perfect balance, which induces positive feelings, feelings of security. Repetition is a form of symmetry, but can be boring, even unbearable. Mirror symmetry is closer to eternity than real life, for life is movement and movement is induced by the lack of balance.

"Compare the traditional European flat surface kite with the Indian Fighter. European Flats can be tied to a pole and left for hours. The Indian Fighter, on the other hand, needs constant attention. It stays in the air only as long as it moves. The maneuverability of the kite is due to its capacity to lose and regain balance.

"When teaching, I tell my students asymmetric makes a composition dramatic. It is like balancing a stone with feathers. While this would not be a symmetrical arrangement in visual terms, the weight could be. As another example, a small yellow spot in a painting can counterbalance a large black spot. It is not the shape and size of elements alone that count; their other qualities and meanings might be more decisive. It is the complex interplay of the different qualities and context that forms the balance of the painting. The balance is not optical symmetry, it is the symmetry of 'effect.'"

Bodoczky's third book on kites, *Hidden Symmetry*, published by the Drachen Foundation in 2000 and among the most beautiful kite books ever issued (Bodoczky designed it), makes the point that shape, weighting, and area of a kite need not be symmetrical, but the lift has to be, otherwise the kite will not fly. This is the hidden symmetry the book title refers to.

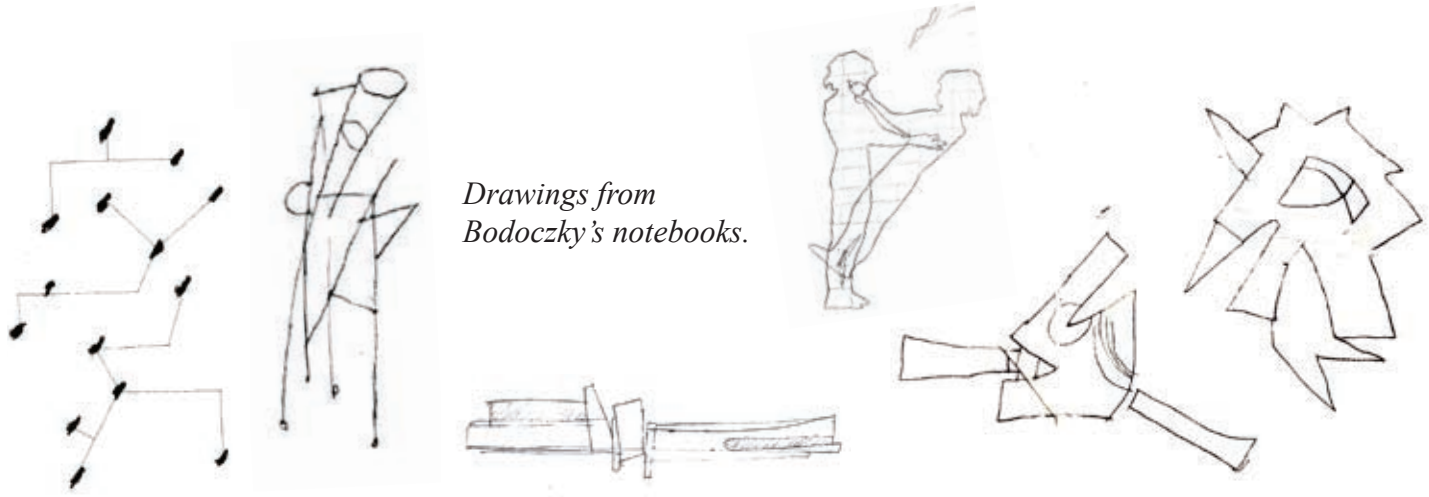
Bodoczky feels that apart from his color and design sense----he paints surfaces with now vivid, now reticent colors alternating with collage-like patches, newspaper cuttings, even photographs---- much of the appeal of his art is in the achievement of balance in a complicated way. This achieves tension. And tension creates the feeling of movement, making the work visually eventful, dramatic, life-like.

An interesting point has been made about the artist's flying sculptures. Because they contain negative spaces, these spaces enhance the viewer's interest by constantly evolving as the sky, clouds, and light changes. In these

creations the kite is never a static sculpture; rather, it changes constantly within its environment. Bodoczky offers the novice or advanced kitemaker a new perspective on these flying objects. He plants the seeds for creative thought.

Bodoczky recommends using paper as a medium for painting. "Although it has limited durability, paper is easily available and inexpensive, quick to work with, the creator needs no special equipment or skills, and it is an excellent surface for painting. It is highly suitable for making small-scale models of larger kites, experimenting with new designs, for improvisations. It allows maximum playfulness.

"But paper's greatest value is of a spiritual nature. It makes people who are in touch with it a lot more sensitive. The fragile and vulnerable character of paper helps those who work with it accept the ephemeral nature of life."



Drawings from Bodoczky's notebooks.

The History of Kites in Hungary

"We don't know for sure when kites first appeared in Hungary," says Istvan Bodoczky.

"The word for kite in Hungarian is sarkany (dragon), which is probably a translation of the German drachen, for there is no evidence that the medieval European kite, the dragon-shaped Dracone, was used in Hungary. The first mention of kites in print in Hungary as a 'light construction flying up in the wind' appeared in the periodical Magyar Kurir in 1799.

"In other European countries, kiting was already a popular pastime for children. Many Hungarians studied in Germany, Holland, and England in the 18th century and when they returned home some of them became tutors or advisors to aristocratic families. It is highly likely that they brought the knowledge of the kite with them."

Bodooczky continues: "A lithograph by Miklos Barabas, published in a book at the beginning of the 19th century, shows children kiting, with a typical 19th century house of the lesser nobility in the background. The figure standing in the middle is probably the children's tutor. The shape of the kite is the English Archtop, but the decoration is Hungarian: a Turk wearing a turban. This is interesting because we know from nursery rhymes that children were still threatened by Turks at that time. (After 150 years of occupation by Turkey, Hungary became free from the Ottoman Empire in the early 18th century.) So instead of the frightening Dracone, Hungarian children painted Turks on their kites to make them scary.

"The sail was made of canvas. Paper was used only later, after 1848. Initially, paper kites, as we know from a poem, were pasted together from smaller pieces of paper-----letters, bills, newspapers."

The Istvan Bodoczky Story

Living in a Dangerous Time

Istvan Bodoczky picked one of the worst years of the 20th century to be born-----1943. World War II was raging and horrible post-war conflicts loomed.

His father was a law courts judge in Szolnok, Hungary, and the family was well off. That changed when the German invaders took over the family home as a headquarters. "We lost everything," says Bodoczky. Relatives, friends, his father's colleagues helped keep them alive.

Next the conquering Russians took over the house as a hospital. The family----father, housewife mother, brother and sister, and tiny tot Istvan----survived this new world, but barely. "My father was forced to become a member of the Communist party to earn a living," says the artist. "Meanwhile my family remained religious. I was secretly taken to church.

"It was a dangerous time. In school we were taught there was no God. When I was a little boy, the secret police asked me whether my father went to church. I had been taught already to keep my mouth shut. Life at home and life out in public were two different things."

The dangers continued. During the Hungarian Revolution, Istvan now 13 and with a boy's curiosity watched the street fighting. A friend standing beside him was shot dead. "My father gave me a big smack," he recalls.

Although the family tradition was the law-----both Istvan's sister and brother are today sitting judges in Hungary----Istvan chose at 14 to attend art school, an education he continued until 27, with time out for work as a printer. "Schooling was free and I lived at home," he explains of this extended education in the arts.

In l968, Istvan married an Oxford-educated English eye specialist who had gotten to know him through correspondence and several visits to Hungary to visit him. They had three sons, Nicholas, now a musician; Peter, a flier in Florida; and Tony, a filmmaker and teacher. Istvan learned fluent English from his wife.

The union ended in divorce and Bodoczky subsequently married a fellow Hungarian, with whom he had a fourth son, Benjamin, now 17. When his wife died, Istvan raised Ben by himself.

"I have one grandchild, aged 10, son of my oldest son," says Istvan to conclude a summary biographical sketch.

An asymmetrical kite happily flying in the blue sky.

Making Your Own Asymmetric Kite


Istvan Bodoczky

Following are some hints by Istvan Bodoczky for making an asymmetric kite.

- *Start work only if you are in the proper mood for experimenting.*
- *Use inexpensive materials-----bamboo for the frame, paper for the sails.*
- *The bamboo should be very thinly split. It is better to use many thin elements as a grid rather than a few stronger ones. This makes the structure more flexible and also give more support to the paper sail.*
- *There is no rule on whether to make the frame or sail first. Try both.*
- *Use cotton thread for tying the pieces together, and secure the knots with glue.*
- *Don't think of the sail as the front of the kite, but rather use the frame for visual effect and put the sail behind the frame.*
- *To begin with, make a flat kite. A single sail kite with wild outline will be more difficult to fly than a complex one consisting of many separate pieces.*
- *Make the kite some two to three feet in diameter. Remember the rule: the bigger the kite, the more crudeness it will tolerate.*
- *Asymmetric kites almost invariably require tails. I use crepe paper. The longer the tail, the more chance it has, with its delayed movements, to make up for any lack of balance. On the other hand, the kite's weight-lifting ability limits the amount of tail that can be used. As with the bridle points, I guess where to fix the tails.*
- *Don't worry about calculating where to fix the bridle points. Simply test this out in a far away corner of a flying field. Go alone! Using a two-legged bridle gives more chance for the tails to find the balance, or help regain it.*
- *In addition to the tails, you may need some extra weight here and there to counteract the asymmetry of shape and size. For extra weight, try sticking some pieces of paper to the sail. Or use a weight on the end of the tail----a pebble may do the job.*
- *An asymmetric kite is not a badly made kite, it is not imperfect, it needs just as much attention to esthetic values as any other kite.*

Using Kites to Generate Electricity: Plodding, Low Tech Approach Wins

Electrical power generation using kites has been given a preliminary study by David D. Lang Associates, Seattle, on behalf of the Drachen Foundation. As its mandate, the Foundation seeks to increase and diffuse knowledge about kites worldwide.

The study spans power levels from municipal to small domestic applications. Five schemes for power generation were identified and examined.

They were evaluated with 12 criteria: maximum power potential, scalability (ability to accommodate a range of power), practicality, potential for autonomous operation, manufacturing cost relative to return on investment, prototyping cost, complexity, safety relative to design intent, environmental impact, accommodating wind variability, probability of success when demonstrated, and probability of operational success.

For convenience, the schemes were dubbed Ladder Mill, Reel, Fly Gen, Buggy, and Sail.

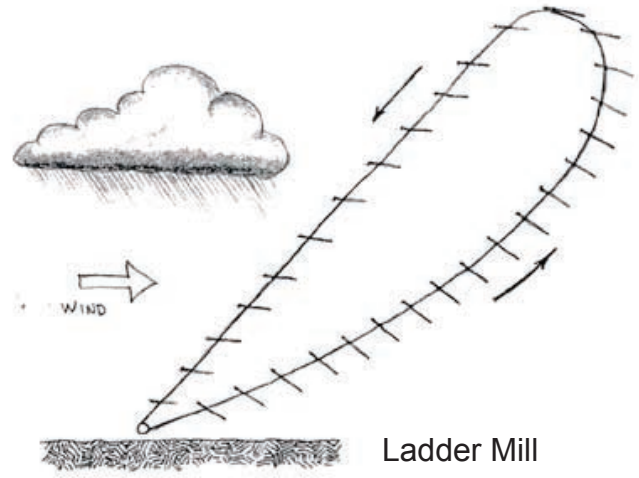
Ladder Mill. This is a continuously circulating loop of kites envisioned as flying up to altitudes of 30,000 feet. Kites on the up-bound or power side operate at full lift angle of attack creating high tension on the up-bound cable, kites on the down-bound or return side of the loop operate at near zero angle of attack, thus creating low tension on the retrieve cable. These tension differentials on the order of 10,000 pounds when applied to a capstan on the ground (like a belt around a pulley) can generate significant shaft torque to turn generating machinery. The cables would be made of carbon nanotube, which is on the order of 230 times stronger than steel on a strength per weight basis.

Reel. A plodding, low tech approach, this alternative envisions a stable kite with hard, steady pull. The kite is simply reeled out, then in, using a capstan connected to a generator. During the reel-out or power stroke, the kite pulls a maximum load. It is then depowered and reeled back. Power is harvested from the net energy gained during reel out, less than required to reel in. Electrical and mechanical components required are simple.

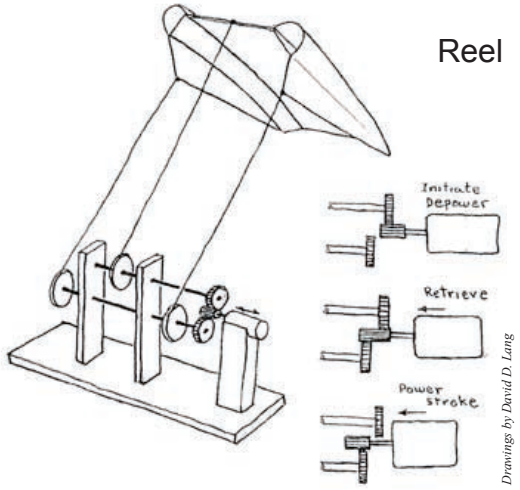
Fly Gen. This scheme harnesses the power experienced in traction kiting. It depends upon a maneuver common to traction kiting, the figure-8, in which the kite dives from high to low altitudes, trading potential energy (altitude) for kinetic energy (speed). The resulting increase in speed induces high relative winds at the kite and thus high dynamic pressures which result in high lift on the kite, experienced as high tension in the kite lines. A kite with high lift-to-drag ratio is critical to the success of this technique. Scaling up power output will be possible only via increased kite size. Adding kites or stacking is not an option since the control system is not practically attainable. Note that this scheme is unique in the fact that it is the only one in which the generator goes aireborne (thus the name Fly Gen).

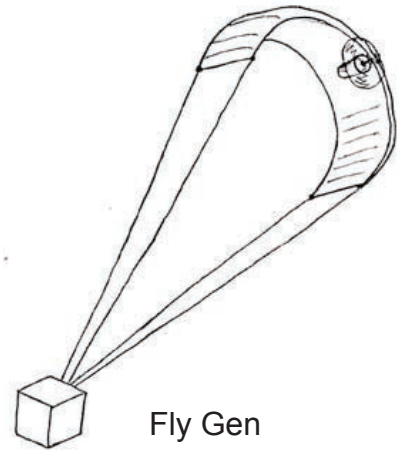
Buggy. As with Fly Gen, figure-8 maneuvers are used. The question becomes, can transient high tension periods be converted into real power? This can be achieved only if the kite is given velocity along the direction of the kite line, this being the direction of the tension. A reciprocating ground mechanical device would be needed to harvest power in this scheme.

Sail. This scheme is a kind of ground-based harnessing of the power inherent in nautical sailing technology. The pulling element is a movable ground-based mast with sail that is trimmed to the optimal point of sail. The mast and sail are mounted on a movable member that reciprocates perpendicular to the wind. With the sail at an

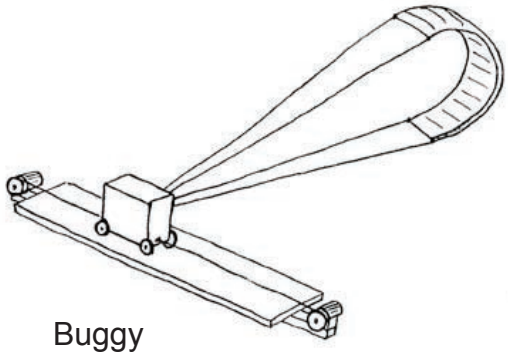


Ladder Mill

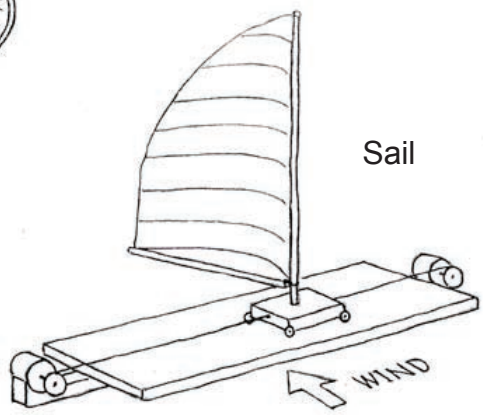




Fly Gen



Buggy



angle to the wind, the side-load moves the slider, activating the reciprocating mechanism to harvest the power, via cable arrangements and capstans putting torque on a generator. Power is generated in both directions of the reciprocating cycle.

Ratings were based on a scale of 1 to 10 with l representing "bad" and 10 "best." Specific kite foil technology was not addressed, viz. is the Sled more efficient than an Inflatable for a particular scheme?

On a scale of 100, Dave Lang rated Reel at 86 points, Sail 70, Ladder Mill 61, Fly Gen 60, and Buggy 45. "I tried to evaluate these schemes impartially," he says. "I would gracefully entertain challenges to the high score I have awarded the Reel, since I introduced it."

Reel scored 8s or 9s out of 10 in 8 of the 12 criteria categories. Sail scored only two 8s, but had a solid ranking down the line. Ladder Mill had the only 10----two of them in fact, for potential and scalability----but drew five poor ratings, including 2s for practicality, complexity, and wind variability.

Lang has written a fascinating report on the experiments he conducted and will be pleased to send it to those requesting a copy: SeattleDL@comcast.net.

About the Inventors

Inventor of the **Ladder Mill**, Wubbo Ockels is a professor at the Delft University of Technology in Holland. Ockels flew a Space Lab mission in l985 on behalf of the European Space Agency. Ockels vigorously encourages student interest in science and headed a team that won a solar car race across the Australian desert.

Dave Lang, inventor of the **Reel** scheme, was long involved in crew training and flight simulation in NASA's space flight program. He has been an independent consultant for two decades, working on everything from Learjet landing gear loads to automated turbine blades for a Columbia River power plant. The Seattleite has been the leader of a Cajun and Zydeco band for 25 years.

Peter Lynn is a pioneer in "extreme" kite sports such as land buggying and ocean kite sailing. His **Power Gen** concept follows from this work. The New Zealander is considered the leading kite showman in the world with his enormous soft kites and is among the top scientific theorists in the sport.

Inventor of the revolutionary four-line stunt kite aptly dubbed the Revolution, Joe Hadzicki, of San Diego, is the father of the **Buggy** electrical generation scheme. He is a prolific inventor and a business entrepreneur. In addition to designing kites, Hadzicki is pursuing the application of carbon fiber technology in a number of fields.

Jose Sainz, of San Diego, who conceived the **Sail** power generating scheme, has repeatedly won major honors at American Kiteflier Association conventions for his beautiful appliqué creations. He was a natural from the beginning. Only three years after taking up kitemaking, he won the association's "triple" in l992----first prize in class, grand championship, and people's choice. Sainz is famed for using images that pay honor to his Hispanic-Aztecan heritage..

Secrets of the Sky ----How Kites Fly

Without diminishing the unique magic of a kite in flight, what actually enables it to fly, to remain suspended in the sky, escaping earth's gravity?

Although the kite has been around for thousands of years, the answer to this question of an object which flies is relatively recent. There are adherents to several scientific opinions, but the most generally accepted is one posited in 1738 by a Swiss mathematician, Daniel Bernoulli, who stated that "fluids in motion exert less pressure on their surroundings the faster they move." For the kite's flight, the key lies in the kite's angle of flight which divides the passage of air above and below the kite plane. Bridle lines attached to a flying line (a kite is a tethered aircraft) are set so that the kite's front edge is higher than the back. The causes the normal stream of air molecules (wind) through which the kite passes to be broken into two halves; air jumps over the top surface, speeding up, causing a low pressure area, while on the bottom surface, the air, comparatively speaking, is slowed down, creating a high pressure area pushing upward. The difference in high and low pressure is very slight, but sufficient to give the kite lift------a kind of vacuum above and push below to fill that vacuum. This aerodynamic principle is precisely the same as that of an airplane wing, a boat sail (generating a force which moves the boat forward), and a bird's wing. (Tal Streeter, Art That Flies)

Russian Becomes Stunt Flying Expert

The North East Kite Fliers, one of England's largest kite clubs, is proud to report that its Russian member Alexander Iksanov has developed considerable skill at Canadian Ray Bethel's trick of flying three stunt kites simultaneously, two from the hand and one from the belt. Harry Pert, a veteran member of the association, went with his wife to visit Iksanov at his home in the Urals, near Ekaterinburg, last year and saw him perform.


Alexander Iksanov

Alexander Iksanov

"The whole trip was an amazing experience and well worth the effort to go there," says Pert. "We flew kites almost every day."

An engineer by profession, Iksanov made contact with the British group via the BBC and was brought over by the club for a month's visit with his family in 1999. During that trip, Iksanov saw Bethel demonstrating at the big Sunderland kite festival.

North East Kite Fliers members presented Iksanov with an array of kites to take home with him, as well as space age materials such as ripstop fabric and carbon fiber rods, unavailable to him in Russia, so he could make his own.

Pert reports Iksanov is now not only an expert flier but also proficient kitemaker. He and family----wife and two sons----are spreading the word about the pleasures of kiteflying in their remote part of the world. Via the Internet, Iksanov has even gone global. Take a look at his interesting Website at www.kiteman.ru.

Major Dryhenceforth Draws a Blank

It is the popular belief that rainfall follows battles and Fourth of July celebrations. It has been easy to infer that the explosion of the guns sets up a commotion in the air, creates convectional circulation, and leads to precipitation. Such reasoning has led to numerous attempts to create rain by means of high explosives. According to W. Prescott Webb in his book The Great Plains (Grosset & Dunlap, 1931), probably the most elaborate efforts of this kind were made on a ranch near Midland, Texas, in l891, and at San Antonio the following year.

The experiment was assigned to the U.S Department of of Agriculture and the secretary of agriculture selected Major R.G. Dryenforth to carry it out. The apparatus for the experiment consisted of the following;

Twenty thousand pounds of iron borings and 16,000 pounds of sulphuric acid for the generation of 50,000 feet of hydrogen gas; 25,000 pounds of potassium chlorate for evolving 12,000 feet of oxygen gas, involving the use of 50 retorts and furnaces; 68 explosive balloons of 10 and 12 feet diameter; and three large balloons for ascensions. Material for 100 cloth-covered kites and ingredients for the manufacture of several thousand pounds of rack-a-rock powder and other high explosives.

The intention was to produce rain by violent and continued concussions, both on the earth's surface and in the air, and there were three lines of operations, each two miles in length and one mile apart. The first line consisted of a large number of ground batteries by which heavy charges of dynamite and rack-a-rock powder were to be discharged at frequent intervals. The second line was to be of kites flown high, with connections of electric wire, by means of which dynamite cartridges were to be carried up and exploded. The third and principal line was to be of explosive balloons, to be exploded at elevations greater than those attained by the kites, at one- or two-hour intervals through the operations.

Professor A. McFarlane, a physicist from the University of Texas, was present and sent an account to the New York World dated December 4, l892. A little rain fell in both cases, though the results did not justify the effort, and in the mind of scientific men the rain had little or no relation to the efforts made to produce it.

The man who conducted the experiments acquired the title of Major Dryhenceforth.

The Key to Opening Doors

Editor's note: The following essay was written by a school teacher who has found kites a useful teaching tool in her classes in the Alpes de Haute Provence of southern France. It appeared in the journal of Au Fil des Vents, an international kite research organization headquartered in nearby Reilanne.

By Christine Ricatte

Kiting is an excellent form of expression. If a playful and original approach is used by the teacher, students learn useful skills. They learn to know materials, use tools, engage with nature, discover distant civilizations. Some find kiting soothing, indeed even theraputic.

Teaching kitemaking and kiteflying is one of my major teaching tools. From early on, I came to see kites as a field to be explored as an alternate way for children to learn. The kite gives a child a new approach to knowledge----a spiritual dimension, if you will.

Children take to kites very quickly. They like to dream and to escape and kites lead naturally in these directions. Kites open doors to thoughts of travel, to other horizons, cultures, ways of life.

While maintaining its manual and playful character, the world of the kite is cultural, artistic, and sensory. It has this specific quality: it breaks the traditional constraints of schooling and gives children a brighter perspective. School subjects take on a higher meaning. History, geography, arithmetic, science, geometry, and physical education are seen in a different light. Kites become a bridge between children and these subjects.

Children never stop wondering about kites----origins, shapes, colors, materials. This is one reason why adults using kites as a teaching tool need a body of reference documentation. Constructing a kite is a form of self expression. Children put a lot into it, as if this object which takes to the air in their hands awakens a notion of things to come, a secret corner of their souls. "It flies!" This moment in time, almost miraculous, is gratifying to the child. Having constructed a kite and expressed himself through it, the child is able to feel a thread leading him to new places of discovery. His creation offered to the wind, the student is far away from school.

The relationship between child and kite is both personal and collective, personal in the learning and the way of making and flying, collective in sharing with others.

The kite is movement. It dances in the sky as the child on the ground invents choreography: forward, back, hold the line steady, pull, feed out, run together. It is not unusual to hear a child inventing an imaginary world as he flies, identifying with the kite by giving it a name, character, a role in the great theater of the sky.

Kites for Travel

When you go on holiday take some string and tape with you. Make a model of a kite you remember. Or have a soft little kite with you.

Fly the kite whenever you feel there is nothing else interesting to do.

Fly the kite when there is some interesting wind.

Fly the kite above famous buildings all over the world and get your friends to take photos of you. These photos are nice to send to other kiting friends. (Marten Bondestam, Boback, Finland)

Skydiving Legend Bill Ottley Recalls How the Parafoil Revolutionized His Sport

As skydiving icon Bill Ottley, of Washington, D.C., notes, people in his sport tend to think of today, of the moment; or maybe tomorrow, what's ahead? But yesterday, or history, doesn't interest them much.

Holder of degrees from Yale, Georgetown, and Embry Riddle, Ottley, a much-honored veteran of parachuting, has a more scholarly take. He knows and honors the history of the sport.

Ottley in the late l960s in fact flew down to Boca Raton, Florida, specifically to meet Domina Jalbert, inventor of the Parafoil. It was Jalbert's ram air inflation concept that led to the steerable square parachute and to safer, more precise jumping. The new 'chute had two layers of fabric and in flight air was ducted between the layers, forming a semi-rigid airfoil cross-section, enabling the freefaller to "fly" the 'chute down like a highly maneuverable glider. "I wanted him to know the parachuting world recognized his genius," says Ottley. "He had invented something basic to aviation. It was something that rearranged the lives and even the safety of an enormous number of people---hundreds of thousands of people around the world have skydived at least once, and here in the United States more than 40,000 people are active in the sport today."

Ottley explains that "with the old round 'chute, the sport skydiver attempted to land on a predetermined ground target using a kind of black magic. It was Mary Poppins floating through the air. The jumper had to calculate the position of the airplane, wind speed, and other elements. Then he took a deep breath and jumped."

With Jalbert's steerable 'chute, the sport changed radically. Skydiving became more controllable and safer. With the square canopy able to move forward at 35 miles an hour or more, the jumper could now go where he wanted, instead of where the wind pushed him. He could challenge the wind. He could land on a dime, literally.

The Jalbert invention had a direct impact on Ottley's own life. Having taken up jumping in l959 after a short-lived U.S. Air Force career, Ottley made 2,500 sorties in the early years and collected 20 broken bones. He cracked a fibula on his 13th jump, but was back at it as soon as his leg healed. This was the equivalent of a bullfighter receiving his first goring and coming back for more.

With the round parachutes, Ottley had 19 malfunctions and lots of crash landings, some really jolting. A malfunction meant his main 'chute refused to open and he had to cut it away so he could activate his reserve parachute. And he had to do it in seconds. "These malfunctions were heart-stopping seconds," he says. "There was a lot of adrenalin flowing. Some of the landings were rather hard." He winces in recollection. With the introduction of the Jalbert airfoil 'chute in l970, Ottley made 1,700 more jumps without a single malfunction and no serious injuries. "In fact, the control is so good I've landed on one foot more than once."

"I did break six other bones," he says, "but those came in other sports-----snow and water skiing, flying planes, gliders and balloons, riding motorcycles."

After visiting Jalbert at his laboratory in Florida, Ottley saw him frequently at air events over the years. "We always talked. We were the old men. I found him a fascinating man, full of ideas." Ottley like many others recalls Jalbert as unusually handsome. "He looked something like Tyrone Power." Ottley adds: "I always held him in awe for his mind. He was an important innovator. Others took his Parafoil idea and perfected and commercialized it----- and cashed in on it-----but Jalbert was the inventor. He deserves to be honored for this."

Why did Ottley spend a lifetime pursuing skydiving as a sport? He recalls himself as the guy with the thick glasses and lack of athletic skills who learned to do something excitingly different. "I've always liked the adrenalin rush that goes with jumping. Then there is the camaraderie of the sport. That's the big thing. You get to know an enormous number of extraordinarily likeable people, a wonderful collection of all-American type A personalities."

Ottley spent his life working in aviation and has a long and impressive *curriculum vitae*. Among his many jobs and honors, he points to being U.S. delegate to the International General Aviation Committee of the *Federation Aeronautique Internationale*, based in Europe, as being one of the most long-term and meaningful.

Now 74, Ottley has long since had to give up sports because of an old skydiving ankle injury suffered in a night landing that now causes him to hobble and use a cane. "It was my error and not an equipment failure," he says, with his customary straightforwardness.

His strongest memory? Surprisingly, it goes back to when he was just 11 years old. "I was a military brat and sat on a roof in Honolulu watching something interesting. It was the Japanese bombing Pearl Harbor."

Tom Jeckel

Combining imagination and technical skill, Tom Jeckel of Germany comes up with some of the more dramatic photographs in the kite world. Here he captures a power kiter planing at high speed in the sand on the way to takeoff----hopefully. A wipeout is possible too.

Drachen Celebrating 10th Anniversary

A Large Mandate

After 10 years as a foundation, the challenge for the Drachen Foundation is not to lose its focus. What can we do that impacts more people rather than dealing solely with the kite community? We've expanded outside this community. We had to lay a foundation, and this is almost completed, although it will always shift.

Our mandate is people, culture, history. It's a large mandate.

In order to be more effective in its programming, the Foundation had to take the time to learn the complex kite cultures of Europe, Asia, and elsewhere. In the U.S., it is easier----a hobbyist culture.

Kiting is great to open up your head. You get into ice kiting, boarding, big time ocean sailing, aerial photography, innovative workshops and exhibitions, book publishing, even electrical power generation.

The future is going to be interesting for Drachen. We're going to keep paying attention to the niches of kiting. And technology is important for us. Right now, computerization and the Internet is what it's all about.

Our key job for the future? To be available with a great deal of online information and to assist people in taking that knowledge and making it physical-----to make and fly a kite.

Ali Fujino
Administrator, Drachen Foundation

Zest for Fun

The Drachen Foundation makes a unique contribution in our global kite community. It combines a strategic view of the subject, human and financial resources, an eye for talent, and a zest for fun.

The practical results are kiter exchanges and workshops, a broad archive of research materials, traveling exhibitions, public outreach, and focused programs to preserve our precious kite heritage. Other individuals and organizations do some of these things; Drachen does them all.

On this 10th anniversary of Drachen's founding, I congratulate the Foundation on its accomplishments, and on behalf of kiters everywhere, thank it for its vision.

David Gomberg
President, American Kitefliers Association

The Beauty Spot

Drachen is the beauty spot on the face of the over-all kite community.

Over the years, I've done what seemed useful to give Scott Skinner encouragement as a "kite artist." This is not an accolade hard-nosed artists easily (professionally, I might say) hand out to every amateur artist on the block----and it's a particularly difficult issue in the kite community, one I'm very fussy with myself, holding to the accepted standards in the art world, not the kite world. Scott, for me, has consistently shown the characteristics so difficult to pin down to anyone's satisfaction, with an artist's instincts and dedication.

This accolade from me is quite independent of other factors: friendship, whether or not this "artist" is a sweetheart or the opposite, or any other consideration than the "art quotient," again, so difficult to pin down without a lot of words----and so mysterious to the general public.

And isn't it a bonus that Scott, in person, apart from the artist and other hats he wears, is such an admirable and nice person?

Tal Streeter
Kite scholar and collector

Influence for Good

Drachen has had a great influence for good on kiting. It does things no one else can do. Examples are its paper kites workshops, small kites workshop, the importation of international fliers to teach kitemaking, touring exhibitions, publications. It's been a very positive influence.

Scott Skinner, president, and Ali Fujino, administrator, are a wonderful combination. With Scott, one person is in a position to make decisions that an organization can't. This makes for efficiency. One of Ali's roles is to say "no": an organization needs someone who can do this, and she can-----diplomatically.

Bill Lockhart
Former co-director of the Junction, Texas, kite retreat

Update on Cave Painting

Wolfgang Bieck and wife Mona Hie, of Bad Bevensen, Germany, made a second expedition to Muna island in Indonesia to more closely examine the cave painting of a man flying a kite that has now been viewed and photographed by several groups. The issue is age. Is the painting ancient----if so it may trump the Chinese claim to having invented the kite----or is it a modern day fake, as some suspect?

Bieck documented the mural with 360-degree virtual reality video and and made closeup photos as well as pinpointing its GPS position within three meters. He made other tests about which he is close-mouthed, although taking a sample of the paint was not one of them, for reasons of conservation. Complex dating tests are presumably in the works right now.

An Indonesian group from Jakarta led by Sari Majid viewed the painting late last year but has not responded to questions about its findings.

Edo Kite Prints as High Art

Color woodblock prints vibrantly convey the popular urban culture of 18th and 19th century Edo, now called Tokyo. In a book that brings together two of Edo's most colorful traditions, prints and kites, John Stevenson celebrates the charm and significance of the mass-produced, elegant broadsheets known as ukiyo-e. The term means "pictures of the floating world," a pun on a Buddhist concept of the fleeting world of desires that is, coincidentally but poetically, appropriate for a study of kites borne on the wind.

Edo artists experimented with woodblock printing techniques during the 18th century as kiteflying became increasingly popular. Each influenced the other: kitemakers copied woodblock print designs to decorate their creations of bamboo, cloth, and paper, and printers used images of kites in their designs.

The prints are products of Tokugawa Edo (1603-1867) and Meiji Tokyo (1868-1912). They record highlights of the Kabuki theater, brothels, and Sumo wrestling, enthusiastically presenting star actors and celebrity courtesans and vignettes of everyday life. These images capture for us the character of life as it was lived and imagined by the printmakers and kitefliers of Old Japan. It seems that everyone thrills to the sight of a kite straining upward into the sky, and woodblock prints are perhaps the most accessible form of traditional Japanese visual culture.

The prints are from the Scott Skinner Collection. Skinner, of Monument, Colorado, is president of the Drachen Foundation, of Seattle. Stevenson, the author of the volume, is a leading scholar in the field of Japanese prints. The 200-page, 10-by-12-inch book has 115 illustrations, 100 of them in color, with 14 foldouts. It was issued by the University of Washington Press. A cloth edition is available for $50 plus handling with the Drachen Foundation serving as retail distributor. To order, contact the Foundation shop at www.drachen.org*. For wholesale orders, contact the University of Washington Press at www.washington.edu/uwpress.*

In its promotion blurb for the volume, the Press concludes: "Kite aficionados and lovers of Japanese art alike will be delighted by this study."

Gary Hawkey

Flying kites on a windy day. The pole and ring may be a device to get more height or to avoid obstacles. These two pages come from an uncolored, anonymous wood-block-printed book dated about 1752.

The 'Why' of Collecting Kite Prints

Editor's note: Following is a reminiscence by the president of the Drachen Foundation.

By Scott Skinner

Ukiyo-e are woodblock prints made in Japan from the end of the 1700s to the early 1900s. They are pictures of the "floating world," images of the pristine world of the imagination. They have become a pictorial record of 19th century Japan in a time before foreign intervention and before the camera. Each is a snapshot of a particular time, place, person, and even emotion. To explain my fascination with *ukiyo-e* is easy; my primary artistic influences have always been Japanese kites. American geometric patchwork is a natural graphic technique when so many of the traditional Japanese kite shapes are geometric. When I discovered that many traditional Japanese icons could also be translated into patchwork, my passion for Japanese imagery grew.

I had seen many pictures of *ukiyo-e* in the Japanese kite books that I looked at for inspiration and could tell that some included realistic renderings of kites. I assumed, correctly, that these *ukiyo-e* are comparatively rare – at least compared to those portraying sumo stars, famous warriors, and kabuki actors – but I made it a point, if ever in Japan, to look for examples. As luck would have it, I found my first kite *ukiyo-e* in the United States, at an event that would send me to Japan for the first time. In Newport, Rhode Island, at the then Blackships International Kite Festival, I finished second in both the judged and peoples' choice competitions and was awarded a trip to Japan when the winner couldn't travel. In wandering the shops in Newport, I came across a modest (not in price) Hokusai diptych that included a kite. I bought it and was immediately hooked.

As it turned out, I traveled to Japan twice in 1989 and with guidebook in hand I learned where the *ukiyo-e* happy hunting grounds were located. That first trip taught me what I have since seen on almost every trip: look at 100 prints, and maybe there will be one with kites, look at 1,000 prints and you might do no better. What looked like an expensive hobby really wasn't, because of the rarity of the prey. I rarely found more than two prints on any one trip. The elusiveness of the prey just made the game more fun, not to mention how pleasurable it is to look at so many beautiful prints and not be even the least bit tempted by any except those with kites.

As my collection of prints grew, I started looking more closely at them and began to really appreciate their beauty. I could see that each told a story and it didn't really matter to me what the specifics of that story was (Upon reading John Stevenson's scholarship in *Japanese Kite Prints* about the details included in my prints I can now see how wrong I was to remain ignorant). The composition, the color, the relationships between people and their environments – all were interesting and beautiful. The bonus for me as a kite artist was to see traditional motifs and decoration that I might include in my own Japanese-inspired kites. I could also study unusual kite shapes and forgotten kite ideas buried in the detail of *ukiyo-e.*

I know how lucky I am to have traveled often to Japan and to have been able to afford many of the prints that I've collected. When John Stevenson agreed to write about these *ukiyo-e* it was a wonderful opportunity to share new knowledge with the international kite community and even to the Japanese kite community. With the popularity worldwide of Japanese kite shapes, the stories and details that John brings to the kite world are extraordinary. They make my collecting obsession an asset that can be shared with kitefliers and spread the richness of Japanese culture to many who might never experience it firsthand. Through it all I know that there will always be prints that I'll never find, and that drives me to continue to look. I was recently told that if you could see the heart of a collector you'd see that it was on fire. That's the heart that drives us all to find the next one.