# A BRIEF HISTORY OF CONCRETE CANOEING

By John A. Gilbert

## ABSTRACT

Typing the string "concrete canoe" into a major search engine like Google can produce more than 1 000 000 hits and this paper tracks the evolution of concrete canoeing over the past thirty-five years.

## Introduction

"One bright and balmy day back in May ~~1981~~ 1971, a car with a trailer drove slowly through Kickapoo State Park. Few of the picnickers even noticed it pass by; those who did saw nothing unusual in the ungainly looking object tied securely on back, and quickly turned back to their barbeques and Frisbees. Little did they realize they had seen the world's first concrete canoe pass by enroute to the world's first concrete canoe race" (Young and Gilbert 2005).

But concrete boats were not a new idea. As far back as 1848, Joseph Louis Labot of France had built a ferro-cement boat (see Figure 1) that can be seen today in the Brignoles Museum. A Dutch concrete boat built in 1887 was still in use at the Amsterdam Zoo as late as 1967.

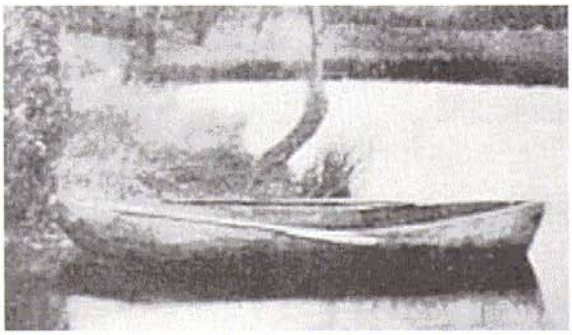

**Figure 1. A photograph taken at the turn of the century showing one of the ferro-cement dinghies built by Lambot in 1848, on the pond at Miraval, France.**

Concrete boats were also built during the Second World War. By the 1960s, sea-going concrete yachts were being commercially produced in several countries. Since then, many a backyard has seen a concrete hull slowly grow to completion and move out to sea.

But concrete canoes, this was something else, having to be propelled by manpower rather than horsepower. Could they become practical, or would they be too heavy and clumsy?

## The Challenge

In late 1969, Professor Clyde Kesler suggested to students in his Properties and Behavior of Concrete class that they might try to build a canoe out of concrete. Word of these doings soon reached Professor John McLaughlin, head of civil engineering at nearby Purdue University. In the true spirit of campus rivalry, students working under the direction of Professors Charles Scholer and Robert Lee carefully guarded the doors of Purdue's Concrete Laboratory while the team hatched plans to build a similar craft. In due course, the University of Illinois received a letter from Purdue: Would Illinois accept a challenge for a concrete canoe race?

## Crowning the First World Champions

The two schools met on May 16, 1971 to hold what is believed to be the world's first concrete canoe competition on the Inland Sea, a tiny lake in east-central Illinois. The Illinois canoe weighed in at 360 lbs (163 kg) compared to a mere 125 lbs (57 kg) for the Purdue canoe.

Although highly favored with a much lighter craft, the Purdue paddlers were less skilled in mastering the idiosyncrasies of a concrete canoe. Capsizing just before the finish line cost them a crucial race, and Illinois took the fifth, and final heat to win 3-2, thereby winning the coveted trophy, a slender shaft of exposed aggregate concrete, mounted on a sawed concrete base and topped by a plaster-of-paris canoe model (see Figure 2).

Purdue won the consolation prize, a concrete "life preserver" made of normal weight concrete so heavy that two men were required to lift it (see Figure 3).

Fastest time for an individual heat on the 1040 ft (317 m) long course was 2 minutes 46 seconds. Both canoes were made of ferro-cement and the designs were based on the assumption of equal tensile and compressive strength.

Illinois used #3 reinforcing bars bent and welded at each end of the canoe to make the gunwales and keel (Hurd 1972). A single rib of #3 bar was welded to the gunwales and keel at mid-length. Four layers of chicken wire were placed over this frame and a stiff mortar was troweled onto the wire mesh. The final thickness of the hull averaged 0.5 in. (13 mm) and no forms were used. Urbana's concrete canoe was certainly no thing of beauty. Certainly she was curvaceous, but most of the curves were in the wrong places and at 360 lbs (163 kg), no one was going to carry her over any threshold. But she floated!

Unlike the Illinois team, Purdue created a mold of insulating foam plastic to the exact contours of the canoe's interior and covered it with thin plastic sheeting (Hurd 1972). Over this they assembled their reinforcement to the desired shape. They also used four layers of chicken wire netting with supplementary reinforcement of #2 bars laid along the keel and gunwales. Their lightweight mortar was plastered onto the mesh to create an average shell thickness of 0.375 in. (10 mm).

The faces of the Illinois team fell when they saw the Purdue craft, since it actually looked like a canoe rather than a caricature of one. The use of a mold taken from an aluminum canoe together with the use of lightweight perlite aggregate produced a business-like craft. But it soon became apparent that concrete canoes are not like their tamer counterparts made from aluminum or fiberglass. These canoes had minds of their own and needed to be coaxed, wheedled, and urged around the course. And just when one felt one had control of the situation one was liable to be tossed unceremoniously into the water by a none too subtle roll (see Figure 4). The Illinois team had lived with their boat longer than had the Purdue group with their canoe and, by dint of losing fewer crew members, finally prevailed to become the 1971 World Champions.

## Concrete Canoeing Quickly Spreads

When Professor Kesler showed up at the next meeting of the American Concrete Institute (ACI) sporting his World

**Figure 2. University of Illinois team - 1971 World Champions - proudly display their winning trophy, handcrafted in the U of I Concrete Laboratory (Photograph: C. E. Kesler).**

**Figure 3. The Purdue University team took home their own 2nd place trophy (Photograph: C. E. Kesler).**

**Figure 4. Action during one of the heats in the 1st Annual Concrete Canoe Race at Kickapoo, 1971. Purdue is nearest the camera (Photograph: C. E. Kesler).**


**Figure 5. Professor Clyde E. Kesler, "The Father of Concrete Canoeing."**

Champion T-shirt (see Figure 5), the gauntlet was down once more! Purdue strategists went into secret session once again and this time called on reinforcements. A year later at Eagle Creek Park, Indianapolis sixteen Midwest schools assembled for the Second Annual Concrete Canoe Race. Purdue went home this time victorious while Illinois had to settle for a tie for third place.

But the damage was done! Concrete canoe fever had infected the country almost unnoticed. There were rumors of similar goings on out in California and Oklahoma, but the true extent of the infection was not evident until the following year. Twenty-six schools turned up again at Eagle Creek Park in 1973 and three other canoe races were held across the country.

In 1974, twenty-six schools assembled again, this time at Notre Dame, and five other races were held. By 1976, the year a race was again hosted by Illinois, there were at least ten races nationwide and the following year at least fourteen races were held.

In April 1981, Professor Francis Young at the University of Illinois commemorated the 10th anniversary of the first concrete canoe race and compiled a summary of the races that had taken place (Young and Gilbert 2005). By that time, concrete canoe racing had spread around the world with races being held in Holland, England, and New Zealand. Concrete canoeing has now spread to Germany, Canada, Japan, South Africa, and the United Arab Emirates (ConcreteCanoe.org 2006).

## ASCE National Concrete Canoe Competition

In the mid 1980s, Dr. R. John Craig, a professor at the New Jersey Institute of Technology and member of the American Society of Civil Engineers (ASCE) Committee on Student Services (CSS), and other members of CSS began to formulate plans for more uniform Regional Competitions and formalized a plan to study the feasibility of a National Competition.

In the spring of 1985, Dr. Craig first brought his grand vision of a National Concrete Canoe Competition to ASCE. He was instrumental in bringing delegates from all over the country to meet one auspicious day in New York City at the executive conference of the ASCE National Headquarters. During this meeting, the feasibility of conducting a National Concrete Canoe Competition was discussed, preliminary rules prepared, and a formal recommendation to proceed was drafted.

In the fall of 1985 the preliminary rules were presented to the CSS. During the next year discussions regarding sponsorship were conducted with Degussa Admixtures, Inc. (formerly known as Master Builders, Inc.) and ASCE Headquarters. After almost two years of committee debate, while meeting at the fall 1987 ASCE National Convention the Educational Activities Committee (EDAC) adopted the preliminary rules and established a standing task committee to implement the rules and requirements.

In the winter of 1987, just as the first National Competition was in sight, Dr. Craig was diagnosed with a rare inoperable brain tumor. He passed away just two months before his dream of a National Concrete Canoe Competition came to fruition. In June of 1988 the first National Competition was held in East Lansing, Michigan hosted by Michigan State University (Team UAH 1988).

Master Builders (Degussa Admixtures, Inc.) sponsored the event exclusively for many years. But other sponsors have since supported the effort including Baker Concrete Construction, Cemex, Pennoni, U.S. Silica Company, SI Concrete Systems, 3M Specialty Materials Division, Marsh, Geo Services, Clark-Nexsen, RBF Consulting, and Bentley.

In the spring of 1989, CSS approved the formation of a permanent subcommittee to ensure the execution of the National Concrete Canoe Competition (NCCC) and, through the efforts and dedication of individuals like Dr. R. John Craig, the NCCC remains a mainstay of Civil Engineering education.

In that spirit ASCE and Degussa Admixtures, Inc. dedicated the Coed Sprint Race at the NCCC as a memorial to the teamwork and dedication of Dr. R. John Craig. It is their distinct honor to present this award to the school that best exemplifies the spirit and cooperative ideals of the competition by placing first in the Coed Sprint Race each year (see Figure 6).

Many other people worked diligently behind the scenes for many years especially those who served on the Committee for National Concrete Canoe Competitions (CNCCC). Individuals like Tony Massing, who formulated some of the first rules and judged the competition for many years, are still actively involved. In fact, Tony currently manages the list server.

Other key individuals continue to be recognized at the national level. An award is currently given for innovation in honor of Anthony Crest a national leader in the design and

**Figure 6. The Wisconsin Badgers powered to a first place finish in the co-ed sprint at the 2005 NCCC. (Photograph: Bart Boatwright, courtesy of the American Society of Civil Engineers)**

construction industry. Tony was a member of the American Concrete Institute and an advocate of the competition. He passed away suddenly on April 23, 2002 at the young age of 61.

## Facts and Figures

As of 2005, there are 272 ASCE student chapters, clubs, and international student groups. And, during the eighteen years that the NCCCs have been held, 394 teams and nearly 6 800 students have participated at the national level. The Université de Sherbrooke has the distinction of being the first international competitor invited to participate at the NCCC in 1994. The Universidad Nacional Autonoma de Mexico joined the field in 2002. But seven-time Canadian National champion Université Laval has been the most successful of the international contingent, appearing six times at the U.S. Nationals while placing second in three of their stints.

According to a survey completed prior to the 2005 NCCC, an estimated 3 400 teams and more than 26 500 students have entered the regional competitions in the hopes of qualifying. Four new schools qualified in 2005 bringing the total number of schools that participated at the national level to 102 (Team UAH 2006).

There have been only seven schools to win the ASCE/MBT National Concrete Canoe Competition: University of Alabama in Huntsville (Team UAH), University of California - Berkeley (Bears), Clemson University (3CT), Florida Institute of Technology (FIT), Michigan State University (MSU), South Dakota School of Mines and Technology (SD Tech), and the University of Wisconsin - Madison (Badgers).

The Berkeley Bears, the UW-Madison Badgers, Team UAH, and Clemson's 3CT are the only teams to have won the competition more than once. All four schools have won back-to-back titles; the Berkeley Bears are the only school to have accomplished this feat twice. UW-Madison stands alone in winning three consecutive national championships.

As you look over this list of multiple-title holders, you may be surprised to learn how deep the blood of concrete canoeing really runs. For example, the four-time national champion, Berkeley Bears, participated in the first West Coast Concrete Canoe Race held in 1972. The Badgers from the University of Wisconsin-Madison have won the competition three times and currently reign as the national champions. They hosted their first concrete canoe competition in 1976.

Five-time national champion Team UAH hails from Southeast and has been in the game for only twenty years. But the first Southeast Regional Competition was held at North Carolina State in 1974. Clemson University, the host of the 2005 NCCC, earned three national titles and hosted their first regional competition in 1976.

As teams vie for a spot in the nineteenth NCCC, it seems fitting to also recognize and commend Oklahoma State University, the host of the 2006 NCCC, for their successes and dedication to the sport. Oklahoma was one of the first states to promote concrete canoe racing and the 1st Great Plains Concrete Canoe Race took place there in 1972… more than thirty years ago.

## Conclusion

Concrete canoeing has come a long way in the past thirty-five years. And, typing the string "concrete canoe" into a major search engine like Google can produce more than 1 000 000 hits, an order of magnitude more than just three years ago.

## Biography

*Dr. John A. Gilbert served as a co-faculty advisor for the ASCE Student Chapter at the University of Alabama in Huntsville for the past twenty years. John has written many articles on concrete canoeing and currently serves as the web master for concretecanoe.org.*

## References


ConcreteCanoe.org, http://concretecanoe.org/, 2006

Hurd M. K. , *C.E. Students Stage World's First Concrete Canoe Race*, Civil Engineering Magazine, January, http://www.uah.edu/student_life/organizations/ASCE/FortheRecord/1972article.htm, 1972

Team UAH, *1988 – The Fortunate Fifteen*, http://www.uah.edu/student_life/organizations/ASCE/FortheRecord/1988record.htm, 1988

Team UAH, *For the Record – 1988 to Present*, http://www.uah.edu/student_life/organizations/ASCE/FortheRecord/Record.htm, 2006

Young F., Gilbert J.A., *Concrete Canoe Fever*, http://www.uah.edu/student_life/organizations/ASCE/Articles/YoungHistory/Youngarticletext.htm, 2005