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It's a Qajaq!

by Mike Bielski

INTRODUCTION — PART ONE: THE BASICS

IN HIS BOOK *Qaanniornermut ilitsersuut* (*Instruction in Kayak Building*) H. C. Petersen acknowledges the difficulty first-time builders face: "There is, of course, a challenge in tackling the difficult art of kayak building and the first result of one's efforts may well be disappointing" (p. 7).

In the wake of completing my first kayak I was sure my inventory of mis-steps would have been shorter if I had started with a bit more information. Long

Since I will never build a first kayak again, I wanted to put the fruits of my compulsive labor to good use for other first-time builders.

me researching how I could have done things better. Since I will never build a first kayak again, I wanted to put the fruits of my compulsive labor to good use for other first-time builders. So, with the goal of shortening your list of potential mis-steps, we'll look at the process over the course of three articles. The focus of this first installment is the instructional texts and which ones best suit your project. The next installment will look at materials and techniques. The final installment will include case studies from some first-time builders

and a discussion with Harvey Golden about building historic reproduction kayaks and their suitability for a first-timer. Although this series is aimed at first-time builders, veterans will likely find it interesting as well, even though, quoting Petersen, "Many old Greenland kayak-builders will doubtless have their objections" (p. 6).



Photo by Emilie Sargent.

Warts and all, the author christens his first qajaq on the shore of Lake Erie with a bottle of Third Coast Beer.

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Read past Masik issues:
<http://www.qajaqusa.org/QUSA/newsletter.html>

MISSION

Qajaq USA is a non-profit membership organization that is officially recognized by Qaannat Kattuffiat (The Greenland Kayaking Association). Qajaq USA is committed to supporting Qaannat Kattuffiat and their efforts to preserve, study and promote the traditions and techniques of Greenland kayaking while seeking to further the appreciation and development of Greenland-style kayaking in the United States.

GREENLAND KAYAK BUILDING BOOKS

Four main texts cover the skin-on-frame building process:

Christopher Cunningham, *Building the Greenland Kayak: A Manual for Its Construction and Use* (Camden, Maine: Ragged Mountain Press, 2003).

Robert Morris, *Building Skin-on-Frame Boats* (Hartley & Marks, 2001).

H. C. Petersen, *Instruction in Kayak Building* (Nuuk: The Greenland National Museum and Archives and Atuakkiorfik/Greenland Publishers, 2001).

Mark Starr, *Building a Greenland Kayak* (Mystic Seaport, The Museum of America and the Sea, 2002).

Each has different takes on method and materials, and each has special features that set it apart from the others. While it is possible to build a kayak using just one text, looking at multiple texts offers several advantages that will help ensure success.

The first advantage is identifying idiosyncrasies specific to one author's method that may not be suitable for your project. Acquiring lumber is a good example: Robert Morris uses yellow cedar almost exclusively. Like the Inuit who used the resources that washed ashore in their locale, Morris is making use of the raw materials specific to his location in British Columbia. Unless you live in the same region, yellow cedar is probably not a viable option for you.

The second advantage, and no less important, is since everyone learns differently, what is totally unclear when reading one text may make perfect sense when reading another.

A third advantage is matching your goals to the text that most closely conforms to the type of kayak you want to build. When choosing, look through the same lens you use when selecting other tools for a woodworking task. If your goal is to accurately build a historic reproduction, choose Starr's book and use his construction methods and line drawings of museum boats in the appendix. If you are interested in a historic Greenland hunting craft, steer toward Petersen or Cunningham, but remember that Petersen presents his design as a composite rather than authentic historic craft. And if your aspirations reach beyond the Greenland kayak to other Arctic craft, be sure to look into Morris.

Some of the information here may seem complex unless you have read at least one of the texts or are familiar with the process, but don't let that dissuade you! It will be clear once you have done a little bit of research.

What follows is an overview of the texts, in order of publication, looking at these construction details: *Design; Gunwales and deck beam layout; Rib layout and bending; Stringers, stems, and lashing; Skinning, sewing, and coaming.*

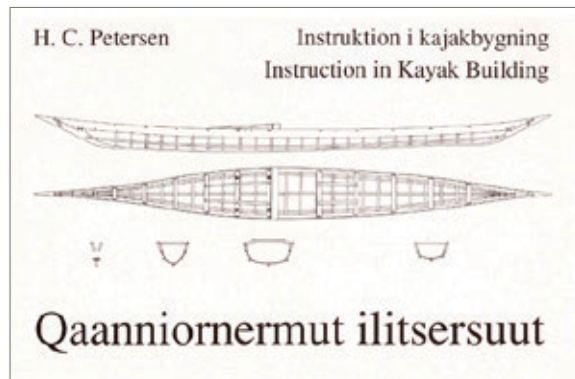
Whichever texts you choose, be sure to read them completely before starting to build. If you get stuck on a detail—which you will—feel free to post

a question on the Qajaq USA Web forum. There are probably other builders who have faced the same issues and would be happy to help you out.

H. C. Petersen: *Qaanniormut ilitsersuut* (Instruction in Kayak Building)

H. C. Petersen, born on the west coast of Greenland in 1925, took a strong interest in preserving knowledge of Greenland kayaks: "While he was principal of Knud Rasmussen's High School in Sisimiut/Holsteinborg between 1962 and 1975, he worked hard to ensure that the traditions linked to the construction of kayaks should not be forgotten. Much of what he knows about the Greenland kayak was learned from older, experienced Greenland kayak-builders" (back cover).

Instruction in Kayak Building was first published in 1982 by the Greenland National Museum & Archives. This coincided with the resurgence of interest in kayaking among native Greenlanders and the founding of Qaannat Kattuffiat. It has no frills and contains no information on buying or using tools or woodworking technique. It is strictly about the design parameters and construction methods for traditional hunting kayaks. It is the source for people interested in building this type of craft, and other instructional texts are heavily influenced by this work. It was formerly available only from bookstores in Greenland, making it quite expensive, but copies are now available through Qajaq USA's Web site http://www.qajaqusa.org/QUSA/merchandise_online.php. Holding this book feels like holding a piece of history.



Construction Details Design

It is very difficult to separate the idea of design from the method of building in this book. According to Petersen, the kayak must be tailor made to fit the paddler, so the kayak is simply built the way it is built. With the exception of a kayak with no sheer shown only to illustrate the opposite of the type of kayak built in the book, there is no discussion of design. Because of this, *Instruction in Kayak Building* may not be the best book to start with, but after reading other texts to gain a better understand the process, it is a great resource and clearer in some respects because of its limited scope. A measured drawing in the center of the book includes details of the lashing and pegs, in addition to rib and deck beam locations.

Gunwales and Deck Beam Layout

The layout proceeds with two boards planed and ripped to final dimensions. Instead of adding wedges to the gunwales to raise the curve of the bow

and stern, the sheer is created by a combination of gunwale flare and shaping the deck side of the gunwales according to a set of dimensions.

After shaping is complete, a mortise is cut at 25 cm (just over 9–¾") behind the center point for the after-cockpit deck beam. This distance is arbitrary and 4 to 5 inches further forward than in the other texts.

Before assembling anything else, a temporary beam is inserted and the frame is lifted up to the small of the paddler's back, and one leg is extended with the foot slightly forward to locate the foot (or fourth) brace. From this point the width is calculated from the paddler's hip measurement, and then the deck beams are laid out: five in the stern, and six in the bow, not counting the *masik*, technically not a deck beam. In Petersen's method, the shape of the gunwales is dictated by the width of the deck beams. No gunwale flare angle is specified, rather a bevel can be lifted from an illustration.

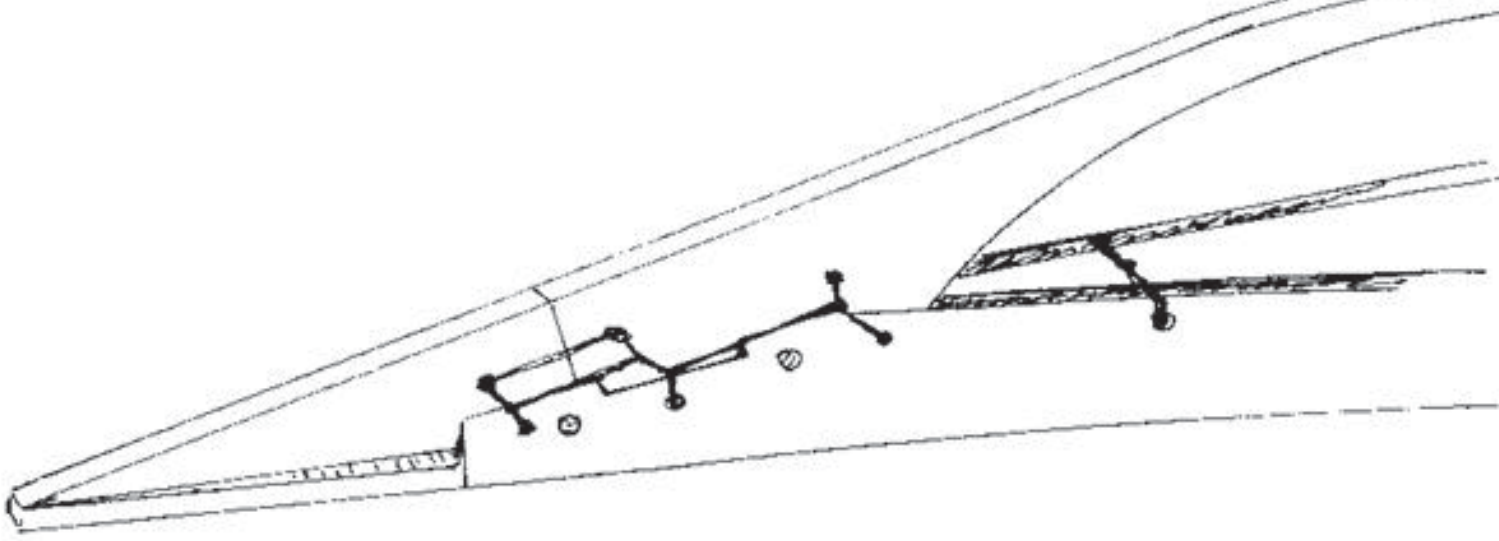
A measured drawing shows the ratio of deck beam widths based on a 50 cm (19-5/8") wide kayak. With this number of deck beams, beams five and six, which are situated between the foot rest and the *masik*, are curved, and are shown as sawn rather than bent. The *masik* is not installed until the frame is complete.

Deck Beam Attachment

The deck beams are attached using through-tenons, which run completely through the gunwale. These must be cut at the correct angle relative to the angle of the deck beams, so be careful to mark the inside and outside of the port and starboard (left and right) gunwales. Then the deck beams are inserted, and the gunwales are brought together using a Spanish windlass—several loops of rope twisted by a stick. Gunwale tips are held in place by a board with a dovetail key 14 cm (5–1/2") wide at the top that is slid toward the center of the boat until it meets resistance. At this point the gunwales are faired, then pegged and lashed.

Rib Layout and Bending

Twenty-five rib stock pieces are laid out without regard to the deck beam mortises. The ribs are 18 mm × 6 mm, (11/16" × ¼"). Rib placement begins 60 cm (23–5/8") from the end of each gunwale, and they are evenly distributed between those points. As in other texts, this necessitates the use of a seat or the rearrangement of the ribs to clear the seating area to allow sitting on the kayak's skin instead. Ribs are mortised 20–25 mm (¾"–1") into the gunwale. After determining the rib locations, the length of the rib stock at each mortise is determined by laying the stock across the gunwales perpendicular to the centerline of the kayak and adding the width of four fingers on either side. The ribs are bent freehand, checking occasionally with a stick to ensure they make fair curves at the stringer locations. Because the rib length is determined through the rib measurements taken from the gunwale, the shape of the keel is predetermined. Keep in mind



Bow detail, Figure 25, *Instruction in Kayak Building*, p. 41.

that the ribs themselves do not define the shape of the finished kayak, the keel and chine stringers do, and certainly the contact points for these pieces are properly faired.

Stringers, Stems, and Lashing

Of the books reviewed, Petersen has the most complex keel/stem arrangement. Rather than a keel fastened to the stem, the end of the keel sweeps up and becomes the stem, which is notched into the end of the gunwales. This may be difficult to execute because of the precision needed to match the notches in the gunwales and keel/stem pieces, and because the stock required for making the pieces will likely need to be scarfed together rather than made from a single piece, given the necessary width of the sweep. He details nicely how to produce a traditional scarf, and also gives an alternative method of attaching the keel where it is lashed to the gunwale rather than notched. In either case, an end piece is then added to produce the final point of the stems.

The shape of the bow and stern are not discussed—the angle is taken from the drawing and comes largely as a result of the keel shape. The placement of the chine stringers is one of the few decisions with any leeway or design discussion. He explains how moving them affects performance, but has no bias toward any location. There is no discussion of the chine stringers being thinned toward the ends or being below the level of the skin at the bow and stern, but in the drawing a slight rise at the bow is evident. Stringer ends extend all the way to the stems and are fitted flush against them, but are not fixed to them with pegs or lashing. Instead, they are lashed to each other and simply rest against the stems.

Skinning, Sewing, and Coaming

Petersen includes a good discussion of the history of the coaming ring in Greenland, but in the end the shape is defined by the dimensions of the kayak. In Petersen's method of sewing, after the cloth is laid out and cut roughly to length, a pocket is sewn on each end where the stems will fit. After the pockets are forced over the stems, a cord run in a zigzag pattern is used to pull the cloth tight. In

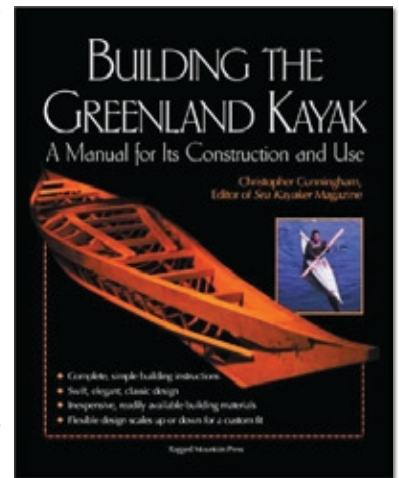
most cases this cord is left in the boat even after the final seam is stitched. Canvas is used for the skin, which is not as stretchy as nylon, so he discusses how to pull darts in the fabric to make the turn at the bow and the stern come out tight.

Christopher Cunningham: *Building the Greenland Kayak, A Manual for its Construction and Use*

Chris Cunningham, the editor of *Sea Kayaker* magazine, has been building kayaks since 1979. He has taught classes on building Greenland kayaks at The Wooden Boat School in Maine and has produced several videos on kayaking and another book on kayaking. This book is an outgrowth of his 1993–94 articles on building Greenland kayaks in *Sea Kayaker* magazine. The book is well organized with the table of contents serving as the construction order as well as the chapter guide. The appendix has a bill of materials covering lumber, skin, and coating. Cunningham's book also has an incredible number of photographs—frequently as many as four per page—that illustrate nearly every procedure in the project.

This is the book of jigs. A quick scan reveals jigs for circular saw, hand saw, spoke-shave, block plane, router, rasp, drill, router table, and steam bending. If you are new to woodworking or are very inexperienced, jigs can be invaluable. However, if your aim is to build a kayak, building jigs instead may become a frustration. Keep in mind that if your woodworking skills are decent you may not need as many jigs.

This is also a very complete book. In addition to the construction of a kayak, it covers basic paddling skills and rolls; paddle-making; construction of a spray skirt, float bags, avataq, and norsaq; children's kayaks with rockers for dry-land training; a balance stool for indoor training; and even a folding kayak.



Construction Details

Design

In his chapter on design, Cunningham states that his book is an extension of Petersen's *Instruction in Kayak Building*, and even quotes from Petersen's book when explaining the genesis of the design. However, he uses a different system for placing the aft-cockpit deck beam, one more suited to a modern Western paddler. Cunningham's text is the only book that does not contain a measured drawing example kayak. The critical dimensions of deck beam layout are clearly illustrated in a photograph with superimposed graphics, which ensures a good fit.

Gunwales and Deck Beam Layout

Cunningham's gunwale layout begins with a pair of boards ripped and planed to final dimension. He covers both modern and traditional methods of scarfing to piece shorter

lengths to make sufficiently long stock for the gunwales and explains why the traditional makkusiineq-type scarf may be superior to a glued through-the-thickness scarf.

Instead of placing the aft-cockpit deck beam at an arbitrary distance from the gunwale center, he uses a plank on top of scrap of wood like a teeter-totter to find the center of balance with the paddler sitting on the plank. From this point, he uses the plank as a story pole to mark the critical deck beams: the after-cockpit beam, foot rest, and curved deck beams. The masik is not placed until the frame is complete. He uses a photo of someone sitting on a plank with each of these locations superimposed and labeled to help locate the critical deck beams on the story pole. He also marks the location of the “sit bones” and heel on the story pole to aid in rib placement. The centerline of the gunwales is then aligned with the balance point of the teeter-totter, and the markings are transferred from the story pole to the gunwales.

As with Petersen the rib mortises are cut first, then the gunwale tops are shaped using the same guide. Following this, the through-mortises are cut. Cunningham uses a gunwale flare of 73° because he feels that a greater angle creates too much shear. The width measurement is calculated using the hip measurement, but he gives differing dimensions based on the intended use of the finished kayak and level of experience of the paddler. Instead of using the deck beams to shape the kayak as in Petersen, he uses five building forms, in a manner similar to that of the other authors, to hold the gunwales in place for fitting the deck beams, and then uses a Spanish windlass to pull the gunwales together. For the curved deck beams, he uses sawn rather than bent stock and gives very detailed instructions for shaping the beams.

Deck Beam Attachment

Like Petersen, Cunningham advocates through-tenons for deck beam attachment. His constant gunwale flare of 73° makes this somewhat more straightforward, and he offers multiple means for creating the mortises. He also presents the method for using dowel joints, and although it is not his preferred method, there is enough information to adequately complete the job.

Rib Layout and Bending

The ribs are laid out without regard to the deck beam mortises, but care is taken to transfer the markings of the sit bones and heel from the story pole made when mocking up the critical deck beams. These areas are designated as “no rib zones.” Once the no-rib zones are established, 25 ribs are evenly distributed throughout the length of the gunwales. This will allow the kayaker the option of sitting directly on the skin rather than on a seat, which was the norm in some parts of Greenland. He

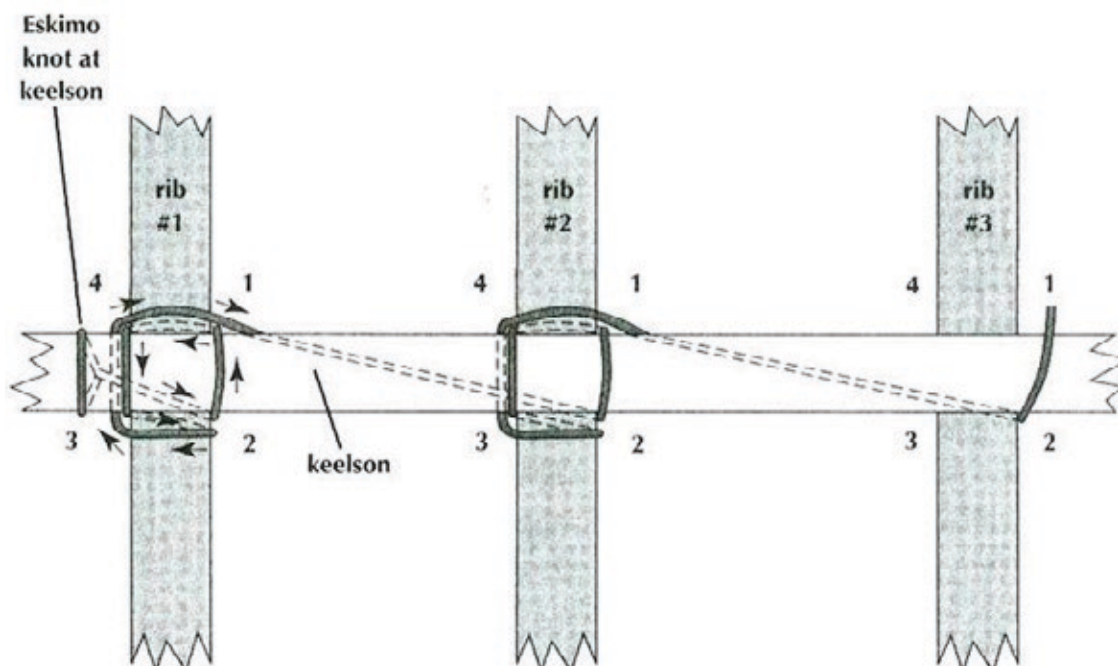
begins determining the length of rib stock in the same manner as Petersen, but then adds a “rib gauge” to ensure the proper increase in rib length toward the bow. The rib stock is rough cut to $\frac{3}{8}'' \times \frac{7}{8}''$, and then the ends are thinned to $\frac{5}{16}''$ all the way to the point of the bend. The thicker $\frac{3}{8}''$ dimension is intended to prevent the occasional breakage of $\frac{1}{4}''$ ribs in completed kayaks that have seen some use.

To make bending this thicker material more trouble free, he gives a variety of methods for thinning the ribs so that only the portion of the rib on the bottom of the “U” shape is $\frac{3}{8}''$, and unlike in Morris, there is no arc to this section—it remains completely flat.

Stringers, Stems, and Lashing

The design of the stems is one of the few points in Cunningham’s process where the instruction is to do what looks right. He suggests a given angle, but also says to adjust it to personal taste. This is tempered by a discussion of the pros and cons of certain designs, but is an area where looking at as many photos of kayaks from other sources as possible can help you find a good solution.

There is also a good amount of discussion about adding a skeg or hollow to the keel line at the stern, but Cunningham does not recommend it, instead favoring a detachable skeg covered later in the text. (This is the only text to discuss adding a detachable skeg in any detail.) His method of attaching the keel to the stems is much less complex than Petersen or Starr. He uses the same method as Morris, where the keel stringer acts as the foot of the stem, and is doweled in place. Instead of bending new ribs to fair the stringers, Cunningham advocates using small blocks of wood



Lashing keel detail, *Building the Greenland Kayak*, p. 85

to bridge any gaps between ribs and stringers. The placement of the chine stringers is the least complex of any of the texts, with the direction focused on whether the skin will touch the ribs rather than the performance characteristics of a given location. Consequently, this is a situation where consulting another text would be beneficial. As with Petersen, the chine stringers are carried onto the stems, but not pegged or lashed to them. The instruction in lashing follows the other texts, with its own variations, but the completion of the lashing by using a “serving stick” (i.e., a small piece of wood around which one end of the lashing is wrapped) is good tip that will make the task easier, even if it does not cut the amount of time spent on the task.

Skinning, Sewing, and Coaming

Cunningham gives scant instructions for designing the shape of the coaming ring, giving instead guidelines based on the dimensions of the kayak itself. What he lacks in depth in this conversation he makes up for with careful direction in using a backer to bend the steamed coaming stock around a form to help avoid breakage. He also covers in greater depth than the other authors the addition of the lip to the coaming ring.

Cunningham’s method of skinning begins by first stretching the fabric longitudinally along the keel, using a stapler to hold the fabric in place. The fabric is then stretched and stapled to one gunwale top, and trimmed just inside the gunwale. Then the fabric is stretched and stapled to the opposite gunwale, and pulled across, placing the seam along one of the gunwales instead of down the center of the deck as with all the other authors. This allows the use of straight, rather than curved, needles to stitch the seam, and like Morris’s method, is a way of reducing the chance of abrasion damaging the seam—in this case by moving it out of harm’s way. The staples are removed as the seam is stitched so the seam can bear the tension in the skin rather than the staples. He also briefly covers sewing a dart in the fabric to make the curve of the stems, if necessary, pointing out that skinning a kayak is similar to wrapping a football in paper: there’s going to be excess material somewhere.

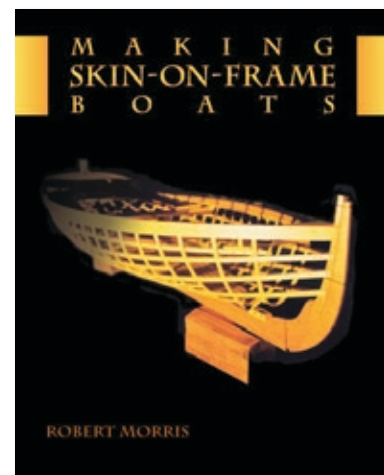
Other

As mentioned in the introduction, this book is complete in its inclusion of extras as well. It gives a good background instruction in paddling, including the sometimes-confusing-for-beginners entry into a skin boat, and several rolls and basic forward strokes. There are also plans and construction details for all the necessary paddling accessories, among them a paddle, spray skirt, tuilik, avataq, and norsaq. In addition, there are instructions for getting small children paddling in their own skin-on-frame kayaks.

Robert Morris: *Building Skin-on-Frame Boats*

Robert Morris spent part of his childhood in Arctic Canada, where he was first exposed to kayaks. He later ran Brewery Creek Small Boat Shop in Vancouver, British Columbia, where in addition to building boats, he taught skin-on-frame boat-building classes. This book has a great overview of the development of the skin-on-frame boat in general—not just kayaks. It also has a great section on buying and using tools and materials (particularly selecting lumber) that will be especially valuable if you are insecure about your woodworking skills, but have some experience.

This text is also pragmatic about tool usage, being the only book to advocate cutting rib mortises with a router as the primary method for the task. This book does not focus solely on the Greenland-style kayak—it details many other skin-on-frame boats as well—but uses the Greenland kayak as an example to teach the process.



Construction Details

Design

There is sufficient information to design a nice boat, and there is a scale drawing of a Morris-designed Greenland kayak on a pullout centerfold, along with the drawings for the other boats in the text. The instruction depends a lot on “what looks right.” If you haven’t been exposed to many skin-on-frame kayaks and don’t have a good eye for what looks right, designing your own boat, even given the anthropomorphic guidelines, can be nerve-wracking. This is a situation where a companion book such as Harvey Golden’s *Kayaks of Greenland* would be helpful.

Gunwales and Deck Beam Layout

Morris prefers to mark out the gunwales from a single piece of 2" × 4" stock, which is later ripped in half to ensure that (1) the marks are identical and (2) that the gunwales have closer to identical flex and shape. This method is difficult to accomplish without a table saw. He is neutral on adding a bow wedge to the gunwales to add more sheer, but there is a good amount of information on the topic and it’s easy to accomplish if it’s in your design concept. Morris also cautions not to have deck beams and ribs meet at the same location so as not to overly weaken the gunwales, so rib layout is done at the same time as deck beam layout. Because of this he suggests a goal number of deck beams to strive for rather than a set number. He suggests an arbitrary constant 15° (or 75° depending on orientation) angle for the gunwale flare to make installing deck beams easier.

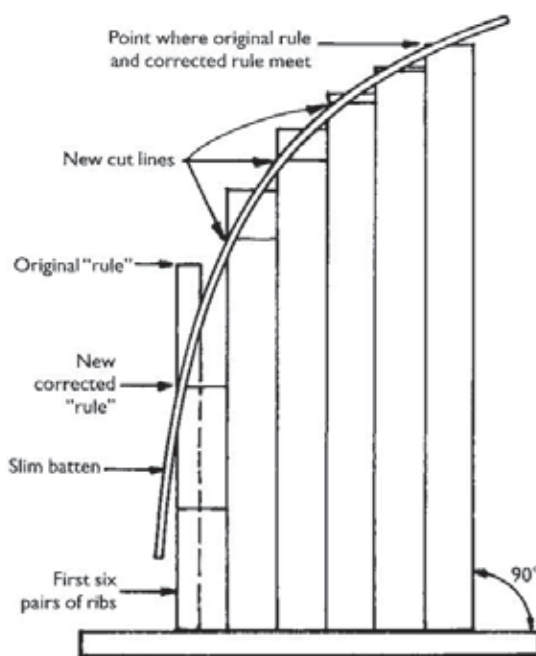
As for deck-beam layout, Morris offers two methods of locating the position of the after-cockpit deck beam, both of which produce very close to the same measure-

ment. For locating the footrest, however, a number of methods involving computations are offered. The width guideline leads to a bit of a wide kayak, which, depending on your paddling experience, you may wish to change. It also suggests omitting the two curved deck beams between the footrest and masik. While they are not necessary for the structural integrity of your kayak unless you plan to carry a lot of gear on the deck, you should consider the possibility of sliding a heavy composite kayak up onto your deck during a T-rescue when you assess whether or not to add these deck beams.

He is neutral on whether the masik should be sawn, bent, or laminated, and doesn't specify a dimension, but unlike in the other books, the masik is located and installed with the rest of the deck beams.

Deck Beam Attachment

Morris recommends using dowel joints to attach the deck beams. This is the quickest and least complex method, and in testing (*Wood Magazine* # 173) the dowel joint is nearly as strong as a mortise-and-tenon joint. However, this is only true provided the dowels come from quality stock. Whitewood dowels are very weak and rot prone, so look for hardwood dowels. Red oak, which is much stronger than whitewood, but still susceptible to rot, is a better choice, or you can make your own from highly rot-resistant white oak using a block plane, router table, dowel plate, or a dowel cutter (see video by Christian Becksvoort on dowel-making on the *Fine Woodworking* Web site). This advice goes for all the other dowels you will use in your construction as well. (For a complete overview of dowel joints, see Bruce Hoadley's article in *Fine Woodworking* #21 or the *Fine Woodworking* Web site.) Also keep in mind that strength in this joint is not as critical as you would expect. The deck beams are under incredible tension from both the sprung gunwales and the taut skin, so in most instances keeping them in position is more important than making them strong enough to resist shearing forces they are unlikely to encounter.



Rib layout detail, *Building Skin-on-Frame Boats*, p. 113

Rib Layout and Bending

Compared with the other authors, Morris uses fewer ribs, but they are wider. He

suggests a dimension of $\frac{1}{4}'' \times 1\text{--}\frac{1}{2}''$, which is twice the width specified in the other books. This dimension works well for either the softwood that he uses or the more common hardwood in most boats. Instead of a set number of ribs, he suggests an acceptable range for the number of ribs. The measured drawing in the pullout has 22. Even though his method of locating ribs is much less arbitrary than those of the other authors, if followed, ribs will be placed in the seating area. Many kayakers prefer to sit directly on the skin of the kayak, and plan their ribs around this inclination.

Morris advocates bending the ribs freehand as in Petersen, but after installing the keel stringer rather than before. This is a great system, and quite speedy. However, it still requires a calculation for rib length. Morris's method of measuring with a batten and then arranging rib stock in a parabola can get you close. The best solution may be to simply make trial ribs out of an easily accessible material like bending birch plywood or electrical wire (romex) to establish rib length. If the ribs are too narrow they can be corrected with blocks of wood to fair the chines, rather than replacing them. He also mentions that you should try and keep some curvature in bottom of the ribs because it is stronger than a flat rib and will better resist breakage due to fatigue once the kayak is in use.

Stringers, Stems, and Lashing

Morris presents several methods for attaching the keel stringer and stems, but in the recommended method, the keel is attached to the foot of the stem with dowels. There is a drawing of stem shapes on a grid and discussion of traditional stem shapes, but if you aren't familiar with many kayaks be sure to look at a lot of photos and lines drawings of stem profiles before you design yours.

The positioning of the chine stringers is covered as thoroughly as the other texts, but there is a lot more design freedom, which can again be a bit unsettling.

Morris covers several types of lashing, and although his techniques differ from those of the other authors, he does an excellent job of presenting a system that produces a tight boat.

Skinning, Sewing, and Coaming

Morris gives a good method for designing a coaming ring of your own dimensions, and leaves it fairly open what those dimensions should be. However, he recommends that the coaming be sized to fit standard commercial spray skirts and tuiliks. He doesn't commit to one method for bending, but covers laminating and bending equally. Morris makes the comment that when stretching canvas if your knuckles aren't bleeding you aren't doing it right. Because his method of sewing does not use the traditional zigzag stitching to pull the material tight before stitching the final seam, tightly stretching the cloth to the gunwales is extremely important. From here, the stitch

he uses is also nontraditional. In his book he uses 1/8" rope with the fabric rolled over it on either side of the seam. He then uses a running whipstitch, done with two needles, through all four layers of fabric to complete the seam. As long as you have stretched your skin material tightly, you will end up with an extremely tight boat because the skin is stretched around the rope as the seam progresses down the deck.

Another bonus is that because the rope is tacked in place at the bow and masik it is easy to stitch a straight seam. The end result looks neat, and provides excellent protection from abrasion for the actual seam, because it is protected by the rope bead.

Other Information

In addition to instruction on building the West Greenland kayak, Morris's book includes plans and instructions for a number of other types of traditional Arctic kayaks, a baidarka, and several other small craft including canoes and dinghies using the skin-on-frame method.

Mark Starr: *Building a Greenland Kayak*

Mark Starr was the supervisor for the documentation office at the Henry B. duPont Preservation Shipyard at Mystic Seaport. He also taught classes on building Greenland-style kayaks at Mystic Seaport. There are comparatively few illustrations and photos, but because the text is so clear you won't miss them. Unfortunately, the text's font size is small.

Starr's instructions are heavily influenced by the traditional methods of kayak building, and he acknowledges H. C. Petersen's *Instructions in Kayak Building* as one of his primary sources. He even calls the parts of the kayak by their proper Greenlandic names in most instances. However, some non-Greenlandic traditional boatbuilding techniques and materials find their way from the environs of Mystic Seaport. Most notably is the coaming rim, which is attached by copper nails and rivets, much like the planking found on traditional small boats. While he covers tools used, he assumes a reasonable level of woodworking skill and doesn't dwell on woodworking technique. This book has a very logical method of laying out the critical deck beams to ensure a well-fitting kayak.



Construction Details

Design

The design parameters are quite clear, and very good for beginners. In the introduction Starr states: "Throughout the course of this book you will be given design decisions to make, and I will explain the reasons and implications behind each path you choose to follow. You will weigh the options and balance your decision against your goals before proceeding to the next step" (p. xv). The concept that

what looks right probably is right does not come into play until after these decisions have been made and, after explaining what to look for, is used as a guide for determining the accuracy of the construction rather than the design parameters.

Gunwales and Deck Beam Layout

Starr's gunwale layout begins with a pair of boards ripped and planed to final dimension and trimmed to the arbitrary length of 16", which may be too long for smaller paddlers. He strongly advocates adding wedges to both the bow and stern, and suggests 3-½" and 2-½" over 4", respectively.

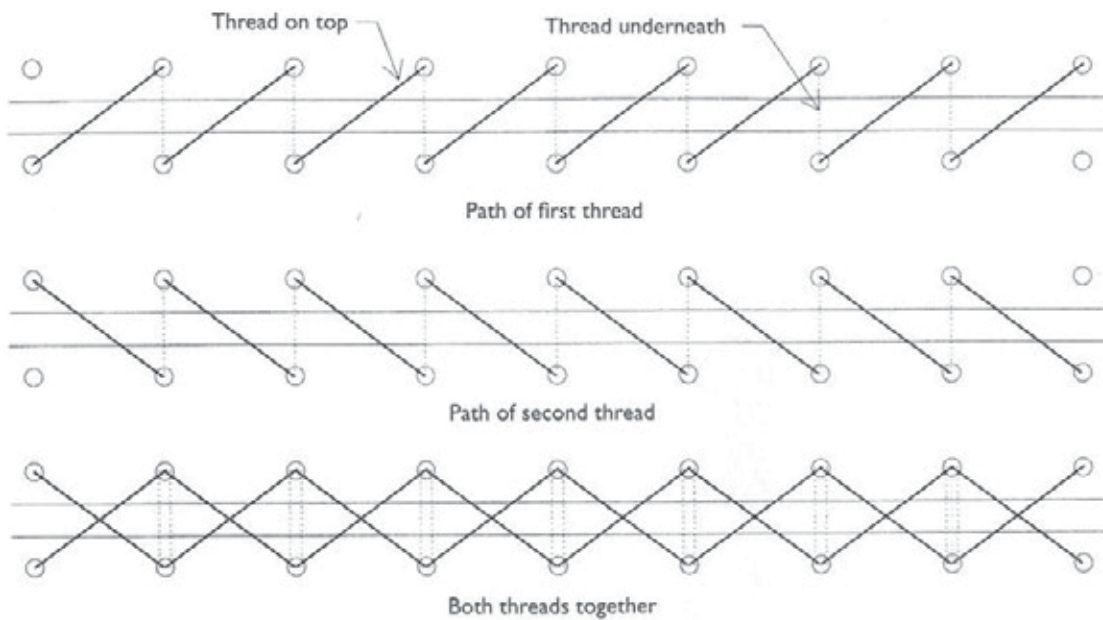
In his construction order, the mortises are cut for the ribs with drill and chisel before any other work proceeds on the gunwales. He locates the first rib at the center point and then places the remaining ribs at 6" on center for a total of 25 ribs. He plans for ¼" × ¾" hardwood ribs, and only suggests deviation from the 6" spacing where the heels will rest, which is difficult to plan for because the deck beams have not yet been laid out. This system will put ribs in the seating areas as well.

After a reasonable discussion on beam width, the gunwales are then flared to their final shape and checked for symmetry before laying out deck beam locations. The angle at which they're situated varies, depending on the beam width and desired sheer, which he discusses in the text.

Starr cites historic kayaks in museum collections when stating that having a deck beam and rib meet in the same location does not overly weaken the gunwales, so deck beam layout is done without regard to rib placement. The aft cockpit beam location is arbitrary, at 15-½", which is slightly further back than other methods of calculating the location, but this will accommodate the seat back he shows in the section on fitting out. The critical location of the footrest beam is done in a manner similar to Petersen's. The back rest beam is temporarily held in place, and the user sits in the kayak's shell and finds the location that feels most comfortable. The remaining flat beams are evenly spaced. The masak and curved deck beams are installed after the rest of the frame is complete by test fitting them for location when sitting inside the frame.

Deck Beam Attachment

Starr uses blind mortises that only reach halfway through the gunwales for attaching the deck beams because he feels these weaken the integrity of the gunwales less than through-mortises. Although the deck-beam tenons will only be 3/8" deep, the tension from the sprung gunwales combined with the skin tension will ensure that this is plenty strong for its intended purpose. He uses a bevel gauge to lift the angle of the gunwales at each beam location, shapes the end of the beam stock, and then uses this as a visual aid for the angle for drilling the mortises.



Sewing detail, Figure 5.9, *Building a Greenland Kayak* p. 81.

Rib Layout and Bending

In his introduction to the chapter on bending the ribs, or framing, Starr makes a strong case for his preferred method of building molds to bend the ribs around, but says that bending freehand is also an option. Molds make the most sense in a classroom setting if you are constructing many kayaks and are a traditional method of bending ribs in the construction of larger boats. If you have the time and materials available and the thought of bending wood makes you uncomfortable, it is well worth the reduction in anxiety to build a set of molds. In his method the ribs are first bent around the mold, trimmed to length with a saw, and transferred to the boat where they are inserted and adjusted. If you choose to bend the ribs freehand you will still need to calculate rib length.

Stringers, Stems, and Lashing

A lot of care is taken to describe the placement and lashing of the keelson, and the information on stem shapes is well thought out. Starr presents a really nice method for using cardboard to mock up the shape that simplifies the transfer to your stock, thus reducing the chance for error. The method of attaching the stem and keel is midway between the method used by Morris and Cunningham and Petersen's method. In Starr's method the keel fits into a notch in the bottom of stem, but does not curve upward to form the main part of the stem.

The only part of the design process that is somewhat vague is the chine stringer placement, but it is only vague in comparison to the rest of the book, not in comparison to the other texts. It is well directed, but the discussion is more about skin clearance and symmetry than the effects on performance. It

is also the only time in the entire book that a caption from a photo gives information not contained in the text, when it advises that the chines should rise up at the ends. Regardless, following his careful instruction will work well.

In Starr's method, the stringers terminate before the stems. The lashing instructions are good and present several options, but are a bit less straightforward than Morris.

Skinning, Sewing, and Coaming

Starr uses nylon exclusively, and doesn't address any other materials. He takes pains to caution against stretching the fabric too tightly, which is at odds with other authors. In the photographs of the unshrunk skin it looks quite slack, but Starr says after wetting and drying in the hot sun it will shrink tight to the frame, with any remaining wrinkles removed with a hot steam iron. He uses an innovative jig with a V-groove tied to the frame and a soldering iron to cut the fabric and sear it in one operation, but does not use the zig-zag method of tightening the skin or Morris's rope method. He instead uses a crossing stitch with two needles.

Starr uses a steam-bent coaming rim, and gives plans for a very nice bending form (in the case of the coaming, unlike the ribs, a form is needed), which uses wedges to secure the stock instead of clamps, making it a much faster process and more easily done by a single person than the methods of the other authors. Keep in mind when looking at the coaming shapes he presents that a spray skirt or tui-lik will have a harder time sealing on long, flat or nearly flat coaming sections.

Other Information

This book also includes a number of scale drawings of historic kayaks in museum collections. This is a resource you can refer to when planning your design, or you can build a replica directly from the drawings. Also included are instructions for making a Greenland paddle.



Mike Bielski is a professional artist and cabinet maker who also writes on occasion. He has most recently been published in Wooden Boat and Fine Woodworking. He built his first qajaq in Waterville, Ohio, and paddles on the Great Lakes.

Editor's Letter

Anyone with an interest in building Greenland-style kayaks who has frequented the Qajaq USA forum has seen references to Cunningham, Morris, Petersen, and Starr, authors of four books on kayak building. The Web site offers thumbnail summaries of the books, but in this issue, woodworker and artist Mike Bielski has dug deeper, summarizing the books in terms of five criteria: design; gunwales and deck beam layout; rib layout and bending; stringers, stems, and lashing; and skinning, sewing, and coaming.

Likewise, anyone who has tried to survey a kayak, or marveled at a line drawing, probably owes a bit of debt to John Brand, whose *Little Kayak Books* are fine examples of detailed kayak surveys, precise writing, and well thought out design. In this issue, John's wife, Stella, and their two children, Russell and Carna, talk about John's work and life.

Utilizing skin-on-frame techniques, Bill Samson built a replica of a Bristol Bay kayak. In his article, he documents some of the challenges unique to boats with reverse sheer and details his particular solution.

Before Kamp Absalonsen, a senior judge of the Greenland National Championship, attended Delmarva, he spent time in Northern Virginia. During his stay, several Qajaq USA members assembled at the Smithsonian's Museum of Natural History to view the kayak Maligiaq Padilla had built during the Festival of Greenland, held in 2005. Dubsie documents this visit.

Kamp lives in Ilulissat, site of the 2007 competition. Sandy Noyes observed the competition and spent some time with Kamp while he was there. He records his experiences as a photojournalist — sharing his impressions of Greenland and its people and his photographs of a landscape of primeval beauty.

This issue would not have been possible without the able proofreading of Bill Price, Bonita Martin, and Wes Ostertag. Their efforts greatly improved the quality of the issue. A special thanks for the photographic skills of Elisabeth Doornink and Mark Whitaker, both of whom contributed images to this issue.

Art Director Thomas Duncan again dealt with a large number of photographs, seamlessly weaving them with the text, never overshadowing the authors' words, but allowing them to shine in their own light.

Tom Milani
June 2008

Share those happenings—publish your experiences in *The Masik*.

Any traditional kayaking related material is encouraged (e.g. baidarkas, etc.). On average articles would be one or two pages in length, but not limited to that. Just a few possible topics: Craftsmanship, Travel, Skills, Adventures, or Achievements. Material submitted doesn't have to be flawless. Grammar and spelling will be reviewed. Articles may be edited for length and clarity. Accompany your text with photos—JPEG format, color, best quality, minimum 2 megapixels or better. We can scan prints or slides if needed.

Send your material as e-mail attachments to Tom Milani, thomasm@qajaqusa.org.

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Variety—The Spice of Life

At the Anglesey symposium this year in Wales I was happy to see a growing acceptance of Greenland-style paddles in the UK, including press given to Rowland Woollven's use of a GP to circumnavigate Great Britain by sea kayak. Rowland is a member of Qajaq USA, by the way.

I love to see fusion and sharing between the different kayaking styles and disciplines, and although this is happening slowly over time, it still seems that each "camp" remains extremely insular and closed to new ideas. The "Greenland" camp is no exception—perhaps because many of us "converted" from a "Euro" background.

Several months ago I started entering organized races with my Greenland paddle and won a small local race—although the wing paddlers were literally breathing down my neck.

Although I was fast with my Greenland paddle and could stay with the pack, I found that I was faster with a wing and could move ahead of the pack. While I own a variety of Euros and different paddles, I found it was quite refreshing to try a different style.

In the weeks that followed I began race training with some of the local racers. Taking both my Greenland paddled and a borrowed wing, it was quite simple to test the merits of each paddle in a racing environment. Although I was fast with my Greenland paddle and could stay with the pack, I found that I was faster with a wing and could move ahead of the pack. While I own a variety of Euros and different paddles, I found it was quite refreshing to try a different style. As expected, there

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is tremendous overlap between a GP and a wing, although the subtleties still need to be learned.

What I discovered is that while I would use a wing for maximum speed in a race, I still prefer my GP for regular paddling as I find it much more versatile. Using the wing was

So, rather than worrying if you will be “disowned” by any one group if you experiment, pick up something new and give it a try! It can only make you a better paddler.

also interesting because it allowed me to rediscover the joys of using a GP. As compared to the wing, the ease of stowing the paddle on deck, the ability to blend strokes and perform a much larger repertoire of strokes, the automatic orientation of the blade in your hand, and a number of small items are things about the GP that I appreciate. Moreover, as

compared to “race culture,” I have even more appreciation for the rich culture behind the Greenland paddle.

So, rather than worrying if you will be “disowned” by any one group if you experiment, pick up something new and give it a try! It can only make you a better paddler.

The more paddle types and disciplines that you try, from open canoes, wave skis, surf skis to Aleut blades to wings, to whitewater to expeditioning, the more fun you will have, the more open-minded you’ll become, the more walls will tumble down between “camps,” and perhaps the more you will appreciate your GP!

— Greg Stamer

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Brand Family Interview

Photo courtesy of Mark Whitaker

Tom Milani speaks with John Brand's family about *The Little Kayak Books*

Editor's note: This interview with John Brand's family was conducted by e-mail in June 2008. John's wife, Stella, and their two children, Russell and Carna, participated. Carna arranged for the questions to be put to Russell and Stella, and the family provided the photographs in digital form. I am grateful to them all for sharing John's—and their—story.

Masik: Could you provide a brief biography of John?

Stella says: John was born in 1931 in Bocking, Essex, and was educated in nearby Braintree. He lived with his family until we married and moved to Colchester, also in Essex. He went to Braintree High School and after that attended the Mid Essex Technical College Architectural School in Chelmsford. He continued his studies at the Architectural Association, Bedford Square, London. He obtained the AA Diploma there and obtained his degree as an architect.

Russell added: John came from a family of established builders, so I suppose it was natural that his talents should be channeled into architecture. After graduating, he worked in the public sector with Essex County Council and then with Colchester Borough Council, because he said he thought he could change people's lives by improving the condition in which they lived. For several years he was involved with the campaign for nuclear disarmament.

Carna added: His work involved designing and drawing plans for schools, libraries, and houses and overseeing the building process. He also designed houses for a few private individuals and the family.

John bought copies of Percy Blandford's plans, which were available and built his first canoe, a family-sized canoe with wooden frame and canvas covering



John Brand, circa early 1980s

Masik: How did John become interested in skin-on-frame kayaks?

Stella says: When John was not working, he was interested in camping and liked rowing boats on the local river. He had read books by Percy Blandford, a canoe enthusiast, who designed boats for use by the Scouting organizations. John bought copies of Percy Blandford's plans, which were available, and built his first canoe—a family-sized canoe with wooden frame and canvas covering. He used this on the river and also for longer estuary trips. As well as working full time, John had designed and built his own house, but in his spare time he began to read the various canoeing magazines and became interested in Eskimo kayaks.

Russell says: John was a keen Boy Scout, which might explain his preference for outdoor active hobbies. Probably Dad became inspired by John D. Heath's work after reading an article of his called "The Kayak of the Eskimo" in the August 1961 edition of *American White Water* magazine. I think what attracted Dad to Eskimo kayaks was their efficiency and utilitarian use of materials, yet they were so seaworthy. The canoes of the time were comparatively heavy and hard going, all the design lessons of the kayak having apparently been forgotten.

Stella adds: About this time he started to correspond with John Heath, which led to a lasting friendship for many years. Similarly, he was in touch with other well-known experts around the world like David Zimmerly, Eugene Arima, Wolfgang Brinck, H. C. Petersen, and Hugh Collins, all of whom he held in high regard.

[N.B.: Russell thinks that he started corresponding with John Heath at the latest in March 1963, and in more recent years he had a regular correspondence with Harvey Golden.]

Stella continues: As John became more interested in Eskimo boats he decided to study the ones which are in the collections of UK museums. He started to visit them and obtained permission to take the lines and measurements etc. of some of the kayaks. At this time he had help with the measuring etc. from Charles Ranshaw, an enthusiast from London whom he had met through a magazine called *Canoeing*.

Russell adds: John admired Charlie for many things, one being that he had paddled across the English Channel in 1947. Also, many of the instruments they used in the surveys were made by Charlie himself.

Carna says: Obviously, it was a hobby that became a passion and gripped him for many years. I'm sure he was a great admirer of the Inuit and their culture, with their skills and ingenuity practiced in such a harsh and adverse environment.

Masik: What led him to write his books?

Stella says: After some twenty-odd years, John had collected so much information and details of Eskimo kayaks that it seemed better to group them together, and it was then that John formed the idea of a book. He was extremely concerned about the conservation of the existing kayaks, especially in the museums, because a lot of them were in quite a



frail condition, and he wanted to convey this to fellow enthusiasts everywhere—to raise people's awareness.

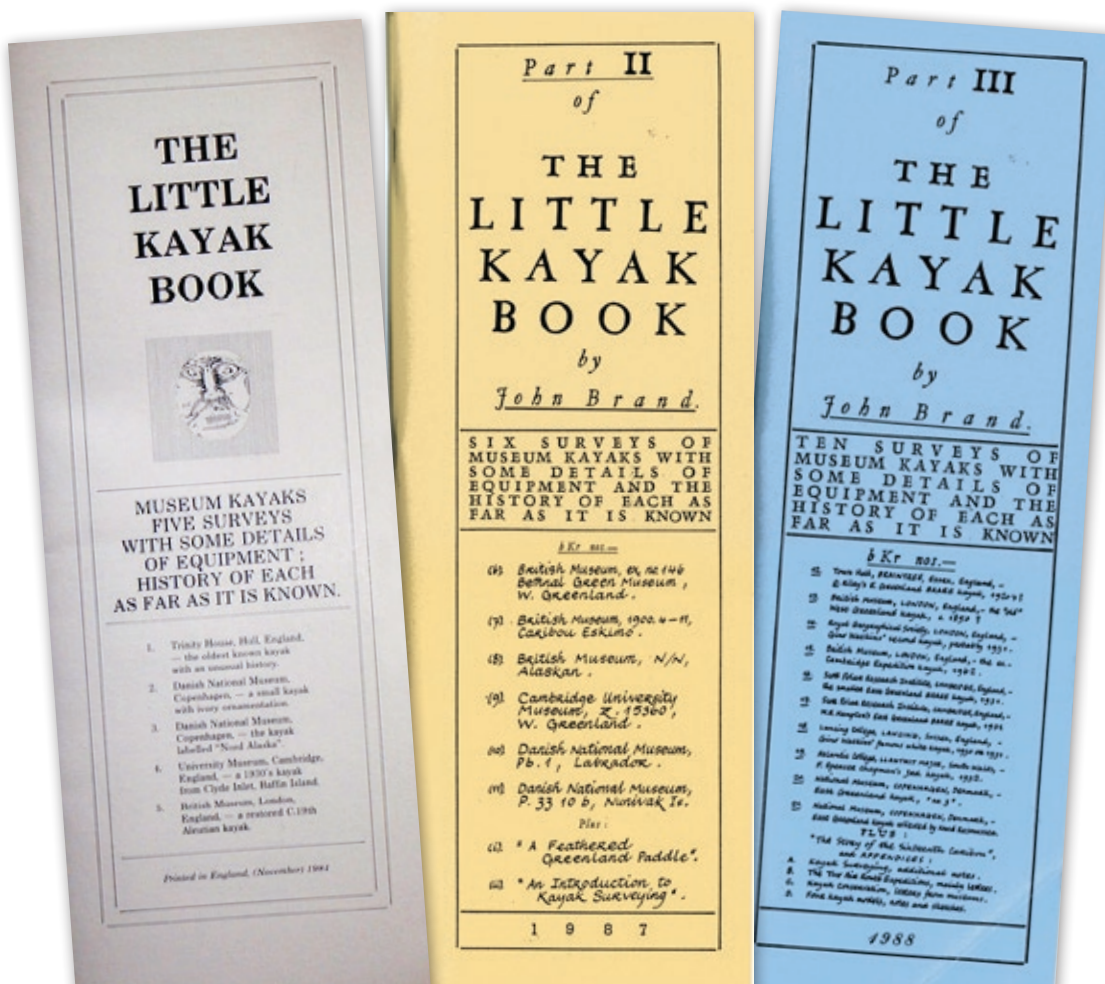
Russell says: Dad formed the Kayak Research Group in Colchester in about 1981 to try to promote awareness. Although flyers were distributed at canoeing fairs, the venture faltered. He wanted mainstream canoeists to take another look at the forgotten museum kayaks to learn from them and to help to preserve them. In days before computers, it was more difficult for similar-minded people to come together.

Carna says: Maybe he was a little before his time and did this work before it was considered to be highly important to preserve and record historical artifacts so carefully.

Masik: The long, thin design of the books shows the drawings to great advantage. How much input did he have into it?

Stella says: The long, narrow form of the books was entirely John's idea. He felt it was right, because of the extreme length of the kayaks. It was not easy to do, because of problems with printers etc., but John persevered. Design was always very important in everything that John did.

Carna says: I can't remember too much discussion about the shape and size of the book, but I can't imagine that any other shape and size would better suit kayak plans.



Masik: The Little Kayak Books are highly regarded now. How did John feel about their reception and impact?

Stella says: It was a long and painstaking venture to publish the *Little Kayak Books*. John was very pleased when he received letters of appreciation from all over the world.

Carna echoes this.

Masik: Did he have plans for any other books? In the preface to the first Little Kayak Book, he mentions the many letters he received from John Heath—had he ever planned to publish them?

Stella says: I don't think he would have thought of publishing John Heath's letters. Also, no mention of any further books, possibly because of his illness, which made it difficult for him to write.

Russell says: I think that the decision not to publish more may even have been made before Dad's illness made it difficult to write.

Carna says: No, I don't think there were plans for more books.

Masik: Since the annual Greenland kayaking competition became open to outsiders, the number of people interested in traditional paddling techniques and building methods has grown rapidly. What did John think of this growing interest in Greenland-style kayaking?

Stella, Russell and Carna say: We don't know for sure, but everything seems to point to the conclusion that he would have been very happy, after years of trying to interest more people in kayak research and replica building, that things were taking off. As early as the 1960s, he was sending the Smithsonian Institute his surveys for use by like-minded individuals in something called "Project Eskimo."

Masik: I see Stella's name in several of the surveys. How did you work together?

Stella says: I was not a kayaker, but I helped John with all the surveys in the Danish National Museum, Copenhagen, and some of the other museums in the UK as well. He did all the actual measuring. I held the tape measure when required, and I wrote everything down. I also helped by making drawings of the small items, which he used later for reference.

Masik: Did John build many kayaks?

Stella says: He built several kayaks, some of them on the living room floor!

Russell says: He made several replicas in fiberglass, scaled up to his dimensions. Generally, they were heavier than skin boats and were not as easy to handle as he would have liked. I think he would have refined them if he had carried on, but it was costly in materials and time. He made at least one from a wooden frame covered with plastic-coated canvas. Exactly which replicas they were I guess that those he corresponded with will remember better than me.

Carna says: I certainly remember many being built inside the house with the explanation that it was a more suitable temperature there than outside in the wintertime. I'm afraid that we don't know details about these boats.

Masik: Did John paddle much? Where did he paddle?

Stella says: John paddled from his early thirties, usually alone, sometimes with friends. He paddled regularly on our local rivers—the Colne, the Chelmer, and Blackwater, and the Stour. He did some estuary and occasionally sea canoeing. He was a keen member of several local canoe clubs, regularly entering races at various venues and earning quite a few club medals.



John Brand, paddling in the early 1980s.

Russell says: I would say he started slightly younger; Mum and Dad went to Maldon for a late honeymoon in a canoe quite early on. Also, we went to Scotland and canoed on the open sea there. Before he had a car, he would tow the canoes for miles behind his bicycle; he was even spoken to by a policeman! He canoed until 17 November 2003, the last few times on the Chelmer, and he remained a strong paddler even then.

Masik: Many of us are glad that *The Little Kayak Book* is in print again. What led you to make it available? Will the second and third *Little Kayak Books* become available again?

Stella says: We made the decision because so many people still write to say that they are disappointed not to be able to obtain any *Little Kayak Books*. Also, it seems a way of carrying on John's lifetime work, which was cut short by his illness. The last years have been very bad for John, and it seems something positive for the family to do for him!

Russell says: It was after Harvey Golden contacted us at the beginning of the year that got us talking about doing something. We would like to republish his other books and maybe some of his papers if there is enough interest.

Carna says: I agree with my mother's sentiments, and I am very happy to help people interested in traditional kayaks and Inuit culture to buy copies of *The Little Kayak Books*. I hope that sales of LKB 1 will be sufficient to enable us to reprint copies of Volumes II and III. Since the launch of the Web site, many people have expressed interest in these volumes, and I hope in the near future to be able to cost out this venture. We would like any proceeds from the sales of these books to go either towards promoting my father's kayaking work or to an Alzheimer's charity.

The Little Kayak Book 1 is available from the Brands at their website:

<http://www.littlekayakbook.co.uk> and from the Q-USA store at:

http://www.qajaqusa.org/QUSA/merchandise_online.php

An Alaskan Kayak

by Bill Samsom

Alaskan sea kayaks tend to be rather beamier and shorter than the ones we are used to paddling today. Their other noticeable feature is the large, almost circular cockpit with coaming going right out to the sides of the kayak, at the height of the deck ridge.

Initially, I dismissed these kayaks as seeming like barges in comparison with sleek Greenland or Aleut kayaks and wondered why the Alaskans would ever want to build kayaks like that.

Then I followed Wolfgang Brinck's construction of a King Island type on his blog

[http://www.wolfgangbrinck.com/boats/tales/kings-](http://www.wolfgangbrinck.com/boats/tales/kings-land.html)

[land.html](http://www.wolfgangbrinck.com/boats/tales/kings-land.html), as well as his favorable comments on

how this kayak was pretty fast under paddle as

well as being extremely comfortable and

roomy. I also watched Andrew Elizaga's

video of SSTIKS 2007 [http://](http://video.google.com/videoplay?docid=-7945625348635274424)

[video.google.com/videop](http://video.google.com/videoplay?docid=-7945625348635274424)

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[48635274424](http://video.google.com/videoplay?docid=-7945625348635274424), where

there is extensive

footage of John Pe-

tersen paddling a Kodiak replica by Harvey Golden. This showed that Alaskan kayaks are indeed nimble and maneuverable, as well as looking really cool on the water.

I contacted Harvey and Wolfgang to discuss my itch to build an Alaskan boat, and both gave me huge encouragement.

There are, of course, many different styles of kayak in Western Alaska, from the Kodiak type in the south to the kayaks of King Island in the north, with the Norton Sound, Yukon-Kuskokwim, and Bristol Bay types in between. All but the Bristol Bay type have already been replicated, so I thought it would be nice to plug that gap.

My only knowledge of Bristol Bay kayaks came from the survey of USNM 76265 that appears in Adney and Chapelle's *The Bark Canoes and Skin Boats of North America*.

It turned out, though, that Harvey had recently surveyed this boat, as well as a beautiful example at Fort Ross. Wolfgang had also had a look at the Fort Ross kayak, and both had taken numerous photographs of it—inside and out. Harvey



**The 19th century
Bristol Bay kayak
at Fort Ross.**

*Photo courtesy of
Harvey Golden*

**I contacted
Harvey and
Wolfgang to
discuss my
itch to build
an Alaskan
boat, and both
gave me huge
encouragement.**

had prepared a survey for the book he is writing on kayaks from Alaska among other places. Both generously shared all their material with me, and then it was up to me to get on with the task of building a replica of the Fort Ross kayak.

As the construction of Greenland and Aleut kayaks has been well covered elsewhere, I don't intend to talk about the standard processes of fitting ribs, mortising deck-beams, and so on. I would like to deal with some of the unique issues that need to be faced when tackling the construction of an Alaskan type of kayak.

A great puzzle for me was how to achieve the reverse sheer that so many of these craft have. When a pair of gunwales are joined front and rear and the deck-beams fitted, fixing the flare of these gunwales, there is a natural tendency for the gunwales to cock upwards at the ends, giving the kind of sheer-line you'd expect from a Greenland kayak.



Deck structure strapped down onto a weighted trestle to achieve reverse sheer. Keelson in place. *Photo Bill Samson*

So how can this be overcome?

The answer is to invert the deck structure (gunwales and deck-beams) over a pair of trestles positioned near the ends, and then hang weights from the middle until the desired reverse sheer-line is achieved. In fact, you really need to go a bit beyond this because there's bound to be some spring-back when the hull is completed and the weights removed. My rule of thumb was to double the extent of reverse sheer required when I added the weights

and that worked out nicely once the weights were removed.

Wolfgang pointed out to me that the keelson would act "like the string of a bow" in maintaining the reverse sheer. In other words, it is tension in the keelson that keeps it there.

David Zimmerly, in his book *Qayaq*, says that the Hooper Bay builders that he worked with in the 1970s made the keelson in two parts, front and rear, and joined these with a stepped scarf cut so as to achieve the required tension.

In the original boat, it is likely that the stern piece was part of the keelson, but the availability of dimensional timber dictated that the stern piece was made separately and pegged onto the keelson.

It seemed sensible to fit the stem piece, the stern piece, and the keelson to the deck



Side view of frame showing reverse sheer locked in. *Photo Bill Samson*

structure before putting in the ribs. In this way I could temporarily fix the keelson in a position that gave depths to sheer corresponding to the survey, all the way along the hull.

With the keelson in place before the ribs, it is necessary to trim the ribs to fit, rather than working from a formula for rib length. Wolfgang Brinck explains how trimming of ribs to fit can be done, in his book *The Aleutian Kayak*.

The ribs of the original kayak tended to be U-shaped, with a flat bottom, toward the stern of the craft, and more V-shaped towards the bow. Rather than leaving this to chance,



Rib bending jig with shapes at various stations marked on the surface. *Photo Bill Samson*

I built a rib-bending jig, with full-size rib shapes for various stations drawn on it. In this way I was able to get close to the rib shapes of the original kayak.

The frame of the original kayak showed grooves carved into almost every component—gunwales, ribs, coaming, deck stringers...

The reason for carving these grooves is now forgotten. Some modern builders have re-

ferred to them as "spirit lines," but there would appear to be no evidence that they were called this by the original builders. Be that as it may, I have attempted to duplicate these as far as I can, and they add to the authentic feel of this replica.

The original was covered in seal or walrus skin (or possibly a mixture of the two). I chose to cover mine in untreated cotton duck canvas. There were a number of reasons for doing this. Cotton canvas is readily available in the UK. Cotton is a natural fiber, which seems to me to be in keeping with the spirit of a replica kayak. Cotton tightens in wet conditions, and this helps improve the performance of the kayak.

On the minus side, cotton will probably not last forever, though having said that, I do have a cotton-covered kayak that I made about 10 years ago, and the original skin is still fine.

Rather than paint the cotton, I decided to varnish it to retain some of the translucency that looks so attractive in a skin-on-frame boat. I used a traditional varnish—Le Tonkinois—



Frame skinned in loomstate cotton duck and waterproofed with linseed-oil varnish. *Photo Bill Samson*

a very old linseed-oil-based formulation that gives a nice buttery color to the canvas. Before applying the varnish, though, I tinted the cotton with cold tea to warm up the final color.

The finished boat shows a markedly hollow waterline at front and rear, resulting in a low prismatic coefficient and wetted surface. That helps account for the good speed that can be achieved in these boats, which also carry their way very nicely.

Having paddled her in a variety of conditions, she is (perhaps surprisingly) little affected by the wind, with no great tendency to weathercock or leecock. The fine entry helps deal with lumpy water, and there is no noticeable “slamming” in a head sea. She tracks nicely in a following sea, and has never wanted to broach.

One of the nicest features of this type of kayak is that no sprayskirt is needed in all but the wildest conditions. The coaming is so high, she takes on little or no water. Normally, there’s no need to get “dressed up” to go for a paddle. Rolling up the trouser legs is all that’s needed, and the kayak keeps me dry.

The internal volume is huge, too, and anyone planning to make a kayak for extended trips should consider an Alaskan type. There’s no shortage of space under

the deck for tents, sleeping bags, clothing, food, water, and whatever else is needed for an expedition. It's also possible to crawl up inside the hull to retrieve stuff.

For the moment, at least, this is my most-used kayak. This is the first time I've built a kayak and found that there's nothing I'd want to do differently if I built another of the same type.

Dr Bill Samson is a retired astronomer and has been involved in making kayaks for the past 10 years, his first being a Brinck baidarka. Since then, he has built a Greenland-style kayak, a Morris Recovery kayak, and most recently the Bristol Bay kayak. He has also built a variety of stitch-and-glue kayaks and Percy Blandford's PBK kayaks. He lives with his wife, Sheila, in Broughty Ferry, on the east coast of Scotland.

She floats! Photo courtesy of Tom Love



Ilulissat Explorations

by Sandy Noyes



7/7/07—On arrival

As soon as you leave the uninhabited north tip of Newfoundland it's only an hour or so by air to the first sight of Greenland. Newfoundland, by the way, had snow along every ridge line and disjointed pack ice in the bays. Looked pretty forbidding.

Landfall in Greenland: is it the Rockies I'm seeing, Alberta? Swiss Alps? It's much, much bigger. Was that a low-lying cloud on the horizon or something solid, like frosting? No, it's the infinite, flat and distant ice cap spilling itself into the valleys—our contemporary ice age.

Ilulissat ice fiord from the plane is a cascade of enormous white diamonds crushed into chaotic heaps hundreds of feet high, stretching as far as the eye can see, a fiord of broken ice. The scale is beyond comprehension.

Are those sonic booms from U.S. aircraft? No, the icebergs aground at the fiord entrance are releasing their internal stresses.

The Greenland Air stewardess gave me a hitch to the youth hostel because my ride was a no-show, and then she and her husband took me on the grand tour of the town, insisting on it. It is a beautiful cubist study in primary colors.

We drive by the championship site. By chance, a pre-competition kayak race is just end-

Old sealskin-covered kayak on side of building, Ilulissat, July 6, 2007. Disko Island and its ice cap are visible in background.

Editor's note:

Sandy Noyes traveled to Ilulissat from 7–17 July 2007, observing the Greenland competition and exploring the surrounding area. This article and accompanying photos are an excerpt from his e-mail correspondence and journals during that time. Copyright resides with the author.

ing. There is Kamp Absalonsen! She knows which one he is. The winner holds his paddle high. All is turquoise icebergs, Disko Island peaks in the distance, and sheets of white. This all happens in the first 45 minutes on the ground.

The sun sets as best it can for an Arctic sun, casting nearly horizontal shadows after 11 p.m. until 6 a.m., by which time it has moved around to the east and climbed to our 10 a.m. sun level. It cooled off and got slightly darker during the “night.” After 6 a.m. it starts to heat up again for the “day.” The magical witching hour for photography, with its revealing light, is just before sunset at home, but here it lasts from 9 p.m. to 5 a.m. Getting up for a sniff of air at 3 a.m. and seeing bright sun is invigorating and uplifting.

7/9 ferry arrives

It appears that Javier Knorr and I are the only foreigners here. I am spending a good deal of time with him. There has been a 20-knot wind here all day, Monday, playing havoc with first day of racing, with many capsizes. It blows across the course creating

2-foot waves at the long fetch at harbor entrance. Javier is very game in a strange boat and with strange paddle just selected, and he heads right out beside some very rugged-looking fellows. I have to hand it to him. Yes, he came back in the outboard boat after capsize, like some others, but bounced right back on land and seemed unfazed. He has learned some Greenlandic and hangs right in with the group, and really has his heart in it. They announce him as “Javier from España.”

I introduced myself to Kamp at the ferry dock when the boats unloaded Sunday. He said he was in France in May and spoke French (I end up speaking 50% English and 50% French with him). He is kindly asking how photography is going from time to time.

I figured out pretty fast who Javier was. He is very welcoming and introduces me to other English-speaking Greenlanders, who are gentle and warm. “Ida”—pronounced “Ita”—is



The Lutheran church at Illulissat

competing even though she gave birth a year ago. (She wins three gold medals in the end.) This is SOF heaven, with about 60 boats lying around, every one unique. A note on landscape: the hills and valleys are scraped round, suggesting to me that all of this exposed land was under ice not too



Formal procession of teams to the Zion Church, July 8.

long before the Saqqaq culture arrived here 4,500 years ago. I have yet to walk over to the Sermermiut ruins, but will soon.

The ferry arrival with teams singing anthems, boat unloading, solemn procession, the church service, the introducing of teams, the laying of the wreath—all this has gone by.

Even though the championship is really the private affair of the West Greenland teams—this gets more and more obvious every day—it doesn't seem quite right that no one American turns up except for me, with all the huge interest in traditional kayaking in the U.S. However, the event is inherently Greenlandic, their show, as I see it. Too many internationals would change it, for sure, and might cause some confusion here.

It is actually hot here today, but blowing excessively hard from the east, as noted....

The 9 km face of the ice fiord consists of an armada of icebergs about 300 feet high that are stranded at the entrance to the ocean. Behind these is 48 km of ice buildup, all jumbled with no water showing—like a floating logjam in Paul Bunyon's most wild improbable fantasy. And behind that is the 12 km face of Sermeq Kujalleq, the glacier proper. This is all sitting there behind a hill so we can't see it during kayak events. But it is sort of a million-ton gorilla, and I want to spend more time with it. UNESCO has this to say: "Sermeq Kujalleq is the pre-eminent glacier in the northern hemisphere...only surpassed by Antarctica in terms of size and calving."



7/10 rolling

Javier not competing. He has hurt his knee getting into a boat yesterday, the knee that was recently in surgery. This has made him subdued today, and I'm sorry I won't be able to egg him on in rolling.

They are playing Elvis's "Love me Tender," on the P.A. system as the rolling event goes on.

Kalinnguaq Olsvig from Ilulissat is one of the very best. Warming up, he touches his nose to the deck. "He's very flexible," says Javier. Kalinnguaq is given a ping pong ball to make the hand roll harder. Then he takes a block of concrete on board for the "brick" roll. It seems to weigh about 15 pounds when I lift it. He has no problem rolling with it, but misses the straightjacket at end.

Panninguaq Olsvig, Team Ilulissat, is one of the most talented women. She is Kalinnguaq's niece.

The men are not so avid with their underwater paddling; they stop after about 6 strokes—to get their points, I presume (also, to spend less time in the 33 °F water?)—but many do it.

Missed rolls elicit an "Ai-eee!" from the crowd.

They are playing Elvis's "Love me Tender," on the P.A. system as the rolling event goes on.



Strenuous moves in the rope event, July 12.

7/11 Ilimanaq

During the long-distance races, I've booked a ride on the *Smilla* to investigate Ilimanaq, a small, strikingly beautiful town on the opposite bank of the fiord—20-odd buildings and a small church (no cars), sitting in a pristine setting, in a 19th-century atmosphere. Some serious photo opportunities here. We are thudding into numerous small icebergs all the way. The face of the ice fiord is no place for SOFs.

**7/14 and 7/15. in Kamp's boat;
Sermermiut**

The portage race (Friday) had a very difficult dry-land section, up a rock, then over a rock wall, then over a paved road for 400 yards past the church. Javier entered this one and I finally had a chance to cheer him on in mid-race.

Javier has celebrated his finish with a 20-foot swim in the ice water, to the familiar Greenlandic cheer: "Hey, hey, hey, hey, hi, hi, hi !!!"

At the finish, I shout "Go, Javier!" from Kamp's boat. We are just returning from a trip to Ilimanaq. Kamp has proposed to Richard Best, James Song, and I that we cruise among the icebergs in his private boat. Richard and James have just arrived. We are fortunate indeed and delighted; how lucky can we get?

So once again I am photographing in lovely Ilimanaq and, en route, floating in the colossal glassy sculpture park of the iceberg bank. Kamp takes us quite close to these fragile cliffs and their little waterfalls and races through one gauntlet. The issue is to watch out for pieces falling off. There's a slight risk of bergs rolling over, too.

At Kamp's mooring back in the harbor a father and son are putting rifles into their boat to go out for the evening. Hunting seal and walrus is legal.

This year Javier has been counted as native Greenlandic in the competition for the first time, not as a foreigner. He is rightly pleased with this decision. It's pretty impressive to me.

The relay was today (Saturday) and they passed off norsaqs as batons. There were so many bergs in the bay that they relocated to a cove (Itisuarsuk Harbor) next to the airport. Later, I took a beautiful walk back to town past a cemetery. Much photography work there. Both Ilulissat cemeteries command views of the white ice fiord on the horizon, giving a sense of generations intimately connected to this landscape.



Relay teams prepare to assemble at the starting line, Itisuarsuk Harbor, July 15.



Cemetery above Itisuarsuk Harbor, looking south at ice fiord.



Ilimanaq sled dog pens, house, and iceberg, looking south.



The events are now officially over, with the final celebration about to occur. Tables are set with white cloths, with team place names for each table...

The cove at Sermermiut, icebergs, view west, July 15.

Sermermiut

Sermermiut itself is a protected green valley of wildflowers, tundra, and lichen-covered rocks ending in a beach facing the isfjeldsbanken. Flora and fauna in the brief, intense arctic summer are actually similar to flora in an alpine meadow above timberline in the Rockies. A snow bunting darts by me on the trail; the bird breeds here in the arctic in summer. Three or four ruins are visible, but they are only rectangular mounds with some rocks indicating foundation walls. The beach would have been ideal as a put-in for the Thule people and their kayaks, but not for any larger craft.

It is the most beautiful pastoral beach campsite anywhere that I've seen, and it's perfectly obvious why it was chosen in antiquity, with a freshwater stream running through it, all facing the afternoon sun and the horizon of blue ice. I photographed it about 10 p.m.

Sermermiut was recently named a World Heritage Site by UNESCO—along with the entire ice fiord.

A quick hike over the hill and into a ravine produces a life-altering experience. This is the “nakkaavik,” or “kællingekløften.” You are suddenly eyeball to eyeball with the immensity of the ice fiord with nothing intervening. It's at your feet about 200 feet away, clicking and moaning and seething and sighing. Occasional bangs.

You look across a half mile to a 300-foot high iceberg, and the whiteness of the fjord extends as far as the nearest mountain range, as far as you can see. And it is only about one quarter of the fjord you are seeing. The ice jam goes on for another 30 miles.

The story is that at the kællingecloften, the elderly of Sermermiut would jump into the ice water if they felt they were getting to be a burden or a danger to the community. Hence the name, the “old ladies’ ravine.” Still, it is extra beautiful.

If you happen to be part Greenlandic gnome—“dværg” in Danish—from a previous century, Sermermiut would be your locus, the center of your world, where your heart always longs to be. This place was first settled by your great-grandparents many times removed.

The site does have a timeless aura to it, gentle wind, 70 °F air in the 10 p.m. sunshine, and it is not hard to picture the community here in the summers, during Periclean Greece.

I also get up to Holmens Bakke, or “Sequinniarfik” about a mile to the east. This is the spot the whole town comes to January 13 when the sun first appears after 6 weeks below

Ilulissat ice fiord and Sermermiut headland, looking south. This is the point at which the 48 km long ice buildup begins the mix with open water.



the horizon. Bluebells (“tikiussaq” in Greenlandic) are in full blossom on the ridge. As the sun gets lower I hear the repeated hoarse cry of an arctic blue fox, a beautiful animal a bit larger than a house cat. Richard and James spotted one last night running back and forth on an iceberg. But the call I hear in the “night” is arresting. I don’t catch sight of him among the green hills and long shadows, however. The call echoes.

Once again, it’s the scale of the landscape here that inspires wonder, but one gradually gets used to it, as well as the crystalline days and nights, and finally it all settles into a feeling of general well-being, that life is pretty fine.

7/15 – at the banquet

Javier has been given a Greenlandic name: “Qaavigarsuaq.” He is the first to get a prize (I am sitting at the Qaarsut table with him and Kamp and the team from that town), plus many compliments from the master of ceremonies. He is given an official Ilulissat flag, a nice design with inverted and right-side-up icebergs.

There is the song singing, the “naggataarnersiorneq.” All is phonetic and very easy to pronounce and sing along with. “Qaa ikinngutit qajartulaarta,” etc. We are singing and swaying side-to-side while holding hands.

There are frequent group cheers, including “Skøl,” shouted very loud, and “et, to, tre, hoorah, hoorah, hoorah!!” (“one, two, three” in Danish) and “Pi-sor-taq!! Pi-sor-taq!!” repeatedly. Which is: “Champ-i-on!! Champ-i-on!!”

Javier jumps up to accept a second prize, which is a large shell-shaped pendant with stripes.

At this meal he is in more or less fluent conversation in Greenlandic, so I get to witness his facility. He told me he is professionally interested in linguistics and speaks five languages now.

Eliarsi Inuusutoq, from Sisimiut, gets the overall winner prize.

I have been studying his moves and learning from him. He is short, muscular, and full of smiles and good cheer; of course he did all rolls, excepting the straightjacket. Did OK on the ropes too (Thursday), but not as well as Jakob Peter, in my opinion.

Jakob Peter from Nuuk is the second prize winner. More “Pi-sor-taq!”

Notes

• It seems that icebergs come in five sizes:

- 1) The lying down Empire State Building size.
- 2) The New York City brownstone size.
- 3) The 18-wheeler size.
- 4) The upended Jeep Cherokee size.
- 5) Then there is the refrigerator size, and these are chipped away at with an ice pick and sections taken home in plastic bags. It seems that it’s fresh water and perfectly good for household ice.

• **Important word to the wise**—statesiders should observe that when eyes are averted and head is shaken side to side slightly and silently, it means: stop what you’re doing, it’s not working, and you’re making me uncomfortable. Also: I don’t understand at all. Also: just “No!”

• **A sign in a tourist hotel says:** “If you ask permission to take someone’s picture and there is silence, it means NO.”

• **Kamp: in sculling down**, face down into water to the side (move #2 in rolling sequence), backs of both hands should be facing up, not the way some Americans are doing it with one palm facing up. Properly done, you come up into a low brace, logically.

• **I notice that for some contestants** one palm is cupped entirely over tip of blade in extended paddle position for turning the boat around quickly.

• **There’s a variation on side-sculling here:** shaft and blade are held straight down into the water almost touching hull, with shaft slanted slightly toward the bow. Then with quick powerful wrist flicks you move the boat sideways in a sculling motion. The sculling blade is only moving back and forth a foot or so.

• **Wooden skegs are a handwidth wide** plus two inches at each end, stick down from hull the length of index finger, and are tied on with fish line. About a quarter of the kayaks have skegs.

• **Most kayaks are 17-1/2 boot-lengths long** (my boot is exactly 12 inches), but one is 19-1/2. This one has a triple ripple—keel strip area of bottom is raised gently in three places about 1/2 inch creating a wave design to hull bottom.

Ilulissat wins the overall team prize, to much jubilation. They have trained very hard for it.

By now it is 10 p.m. at the party, and I decide to turn in.

Today they are all gone, which seems a shame. But I consoled myself with an in-depth 5-hour walk around the loop by the icefjord, taking many pictures. It was overcast with detailed cloud formations and textures, white bergs against dark sky, something totally new here after the last eight days of sun—and excellent for photography. There were several explosive ice cascades from the face of a berg, which set off large waves in a semicircle reflecting the sky. A new batch of wildflower species is blooming this weekend, including a large-petalled magenta beauty. Later, I discover that this is Greenland's national flower, "niviarsiak," which translates as "young maidens."

Richard, Clive, Raquel, and James are packing up for their Monday departure for Aasiaat from Ilimanaq. It was such a pleasure to get to know this crew a bit. They are to head off into pure wilderness and unknown conditions in three 17-foot Feathercraft and one slightly shorter folding kayak.



I can only have endless admiration for this boat design and what it has meant historically here. And when that special elation and sense of freedom in my kayak comes over me at sea, it is now against this historical backdrop and this landscape, an added richness.

7/16 the long view

Being here even for this short time, I started to sense in my bones in what way kayaking is important to Greenlanders, especially after the party last night—for distinguishing, differentiating, who they uniquely are and what their heritage is.

So, speaking as the *only* non-Greenlander in the room last night (since Javier has been formally adopted), and feeling a bit uncomfortable and out of place in there, I'm going to attempt wading into these deep waters: I don't have a rational explanation for this feeling, but it is nonetheless present. Just a phase you have to pass through when you come? Non-Greenlanders who take up

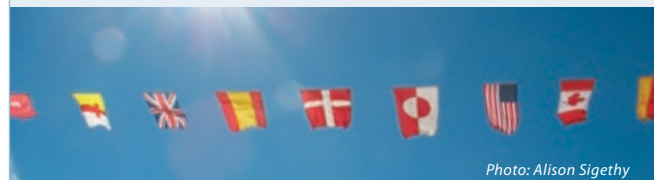


Photo: Alison Sigethy

The Flag of Greenland

• **At the races, many flags flap in the wind** on a line above the finish markers. The flag of Greenland (Aappalaartoq, the "red") is a special beauty. The red half-sphere on top evokes for me the arctic summer midnight sun shining against a white sky while the rest of the planet sleeps by moonlight below. The image can be read in reverse, suggesting the planet's dark Arctic winter in full shadow at noon (called "The Burden"), with light from below bathing the rest of us to the south during our midday.

• **However, the flag's designer, Thue Christiansen,** has this to say: "The large white part in the flag symbolizes the ice cap and our fjords are represented by the red part in the circle. The white part of the circle symbolizes the ice bergs and the pack ice, and the large red part in the flag represents the ocean" (see, e.g., <http://www.crwflags.com/fotw/flags/gl.html#meaning>).

Note the difference in the interpretations! Mine is literal and astronomical; his is abstract and symbolic.



kayaking as a sport or occupation, it seems to me now, are in it for equally valid but different reasons than Greenlanders are.

Not to struggle over what is authentic or not—but I think it's a good idea for "us" to not let it drift into unconsciousness too much that kayaking is and has been such a striking cultural centerpiece for Greenlanders, almost in their genes. As much as sled dogging is (and the sled dogs are ubiquitous). You see that better being here.

Kayaking for Greenlanders is going to be, *ipso facto*, from a skin layer closer to the core of the onion, culturally. No harm! It's not kayak or starve any more for any of us, like it was for the folks at Sermermiut. "We" can now enjoy the fruits of Greenlanders' labors as well as they can, and have done so already, I guess, from 1970 on. Also, we can "make it our own."

I can only have endless admiration for this boat design and what it has meant historically here. And when that special elation and sense of freedom in my kayak comes over me at sea, it is now against this historical backdrop and this landscape, an added richness. I feel like I'm a participant in a culture which has kayaking at its core. In fact, seal hunters in qaannat are iconic, and delicate engravings of them, with their avataqs behind the cockpit, have appeared on Greenland's postage stamps in much the same way as Mt. Rushmore has appeared on ours. Essence, icon, and archetype: it may be a stretch, but for me there's an element of truth to it, that kayaking can and does at times enter into a kind of mythopoeic zone, when you contemplate its origins.



The long view may be that while “we” were cultivating and storing surpluses of our grain in the Fertile Crescent in the BC years, they were hunting from highly specialized boats in the Arctic desert—and they continued to do so for a very long time.

It confirms what Jared Diamond is saying in *Guns, Germs, and Steel*, that geography is destiny. That said, it doesn't diminish the fact that we're one family, the genomes are identical. You can see that perfectly clearly being here, too. It's one factor among many favoring cultural exchange.

Javier will stay in Greenland, leading his tour groups for Tierras Polares in the south, until September when he returns to his Barcelona day job teaching 14- to 18-year-olds. Lucky man... “I don't complain,” he says.

I don't like leaving, but it has started to rain a bit, and I have a comprehensive collection of images under my belt, so it is time... As I write this, Richard et al. are getting off their ferry in Ilimanaq and putting together their folding boats, Aasiaat bound.

2005 Kayak Dusted Off for Inspection

Kamp Absalonsen, a Greenland competition senior judge and lifelong kayak expert, made his first visit to the U.S. this past fall. One of Kamp's requests was to see the kayak



Bill Fitzhugh, of the Museum of Natural History, retrieves Maligiaq's kayak.

Maligiaq Padilla built during the Smithsonian National Museum of Natural History's Festival of Greenland. Maligiaq made a special trip from Greenland in May 2005 for the live kayak-building demonstration (see the Winter 2005 issue of the *Masik*).

Monday, October 1, 2007, Kamp and an entourage of four met Abbey Brazee at the Museum and made their way through the back hallways flanked with floor-to-ceiling storage cabinets. Bill Fitzhugh, director of the Arctic Studies Center and curator of the Department of Anthropology at the Museum, welcomed the group to

his office, then led them to the kayak, which rested on top of a

set of cabinets and required a pair of rolling stepladders to bring to the floor. With the keen eye of a veteran builder, Kamp examined the kayak from bow to stern while Bill removed the "Do Not Touch" signs affixed to the deck.

Kamp seemed satisfied that such a prestigious institution had an accurate representation of his cultural heritage, even though he did not pronounce the kayak flawless. The lack of a seeqqortarfik, a deck beam just forward of the masik, may have been because Maligiaq had only a limited



Do not touch.

With the keen eye of a veteran builder, Kamp examined the kayak from bow to stern while Bill removed the "Do Not Touch" signs affixed to the deck.



Kamp, Dubside, Tom Sharp with Maligiaq's kayak.

time to construct the kayak. Although relatively young, Maligiaq's kayaking knowledge and skills are widely recognized in U.S.

traditional sea-kayaking circles.

In 1998, when he was 16, he won the Greenland National Kayaking Championship and subsequently made his first trip to the U.S. to attend the Delmarva Paddler's Retreat, a gathering of sea kayakers held in Delaware each October.

After hoisting the kayak back to its perch, everyone posed in Bill's office for a group photo before saying goodbye.



Kamp checking out a paddle.



Kamp discussing the finer points of Maligiaq's kayak. Bill Fitzhugh (left, in sandals) and Peter Fuchs (in blue shirt, across from Bill) and Dubside (front) look on.

Biography:

Dubside competed at the Greenland Kayaking Championships both in 2004 and 2006. His knowledge, expertise, and enthusiasm are captured in two instructional DVDs, "Greenland Rolling with Dubside" and "Qajaasaarneq—Greenland Rope Gymnastics." He favors folding kayaks, always wears black, and has been encouraging others to learn the Greenlandic names of the competition rolling and rope moves, as he has done.



Counterclockwise from front: Dubside, Kamp Absalonsen, Alison Sigethy, Bill Fitzhugh, Peter Fuchs, Tom Sharp

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