Russell Venditto
Western State College
Jack Mountain Bushcraft
Earth Skills Semester Program

A normal fall semester lasts fourteen weeks. On week seven, mid-term examinations are given: students rush to the library, check out the books they still have not bought, and try to stuff a hopelessly large amount of information into their brains as quickly as possible. Five exams and one paper later, these same students commence to forget everything they just committed to their short-term memory, since it has lost its immediate purpose. The tests are over, that dreadful paper is finally finished, and now it is time for them to go out and celebrate their academic success – for even if John has just failed every single mid-term exam and turned in a handwritten paper consisting of only three paragraphs, his ordeal is over. Sally, who has mastered the art of cramming, is confident that she aced her mid-terms. Everyone, no matter how they did on their exams, is relieved for the same reason: the finals are not cumulative. Everything their professors just picked their brains for will not be present on the final exams in December. Professors who dare to give cumulative final exams are thought to be cruel, vindictive, and just plain mean. I would like to take some time to discuss just how wildly different the experience at Jack Mountain is from a normal college semester. To start, the semester lasts just ten weeks, and there are no exams. Every night, at home and on trips, the students sleep in shelters they have built with their own hands. Exams are not necessary because everything is practiced daily, at least to the point of competency and often beyond. Students study botany and zoology using the local flora and fauna as the object of their studies, and because of the daily contact with them the students are able to identify a specimen by its Latin name at a glance. Manual skills such as axe- and knife-

work are put to use just about every day of the course, even on the weekends. Traveling by canoe on a river the students are placed in a situation where they must choose either to learn the correct way to pole the canoe or to give up and sit down on the bank of the river. The "middle ground" of simply attending class and trying to absorb the information through osmosis is not an option at Jack Mountain, and this is what makes the school and its students stand out miles above a traditional college.

Personally, I can say that I learned much more in ten weeks than I have in the past three years at college. Genuine interest in the course material, constant practice, truly challenging situations, and the camaraderie of a small group of like-minded individuals contributed to my intense academic experience. Never in college have I taken a course in which one hundred percent of the material covered was of interest to me. That includes the semester I just completed at Jack Mountain. Atl-atls simply do not fascinate me. I appreciate their historical significance, I vaguely understand how they work, but I still do not care enough about atl-atls to spend a week studying about them. On a literary parallel, Fernando Pessoa bores me half to death, yet in a Portuguese literature course I am forced to suffer through two weeks of Pessoa's poetry. At Jack Mountain, my lack of passion for atl-atls prompted Tim to suggest I study something else – atl-atls were the subject of discussion over the course of three consecutive days of rain, and there were plenty of other rainy day projects, after all. One student had no desire to make a longbow, though she did go through the process from felling the white ash tree to roughing out a stave. She directed her energy elsewhere while the majority of the group was working on bows. Because the group size is so small, the curriculum adapts to individual preference in most instances. I believe that this flexibility worked to

everyone's benefit and that we all took much more from this course than we would have had the curriculum been rigid.

From an academic standpoint, my studies must appear terribly incomplete. Certainly I must have only dabbled in botany, because I have not memorized each and every plant family, nor can I identify the male and female parts of flowers. Astronomy seems to have been overlooked – I did not even learn which stars are of which magnitude! Mammal studies? They must have been a joke! I only have notes on four animals. Assumptions about the depth and quality of my education aside, the previous statements are true. I do not know the plant families, though I did learn that plants are categorized based on how they reproduce, and that both the poison water hemlock (*Cicuta virosa*) and wild carrot (*Daucus carota*) are in the family *Umbelliferae*, meaning they both have flowering umbels, and that in this case both have similar appearances. I have a large collection of pressed plants, each index card containing detailed information ranging from the Latin name of the plant to its uses throughout history. As for mammal studies, while we only took detailed notes, cross-referenced from multiple sources, on five animals – the mink, the fisher, the white-tailed deer, the red squirrel, and the porcupine – we know those animals and their habits quite thoroughly. Living in the bush also forces one to become acquainted with many other members of the animal kingdom. I never actually saw a bear, a fox, a bobcat, or a coyote, and I did not study them in books, but I can identify their tracks and sign, point out their preferred foods, make an educated guess as to what would interest them, and identify their preferred territories. While it is true that I did not study the composition of stars or learn to differentiate between the magnitudes of different celestial bodies, I can identify constellations and determine where the North Star is in relation to these constellations. On our trip to the

White Mountains we had the chance to practice this applied astronomy when all but a small section of the sky overhead was obscured by clouds. Judging by the patterns we could find, we decided that the stars we could see were in the constellations Lyra and Cygnus, and from there we estimated where the rest of Cygnus would be and drew lines from the end to the wingtip and made a ninety-degree turn to find where the North Star was located. In the morning, we found we were correct: the sun rose almost exactly ninety degrees from where we decided north was. I took an astronomy course in college to satisfy a general education requirement – all I remember from that class was the professor wearing a helmet and sitting in a little red wagon, which was being propelled across the room by a canister of compressed carbon dioxide. I have, of course, forgotten everything else I "learned" in that course. Which was the better educational experience? You can decide.

I had very high expectations for the course before I started, and within the first two days they were surpassed. I have been fortunate enough to have been taught by many brilliant minds and caring individuals throughout my educational career. I have studied under the world's leading expert and the pioneer of the field of child language acquisition. My high school band director consistently takes a rag-tag group of students, many of whom have never played an instrument before, and invites them into the jazz band. Included in this jazz band – which in my time in high school was made up of almost thirty members – are non-traditional instruments such as the bass clarinet, two flutes, and any other instrument a person wants to play. Through perseverance, determination, and Mr. Narcisi's phenomenal ability to impart his musical knowledge to his students, the jazz band wins the prestigious Berklee College of Music High School

Jazz Festival year after year. I have taken Portuguese courses with the same professor for five consecutive semesters. Dr. Fagundes has the almost superhuman ability to make literature and grammar classes not only tolerable, but enjoyable. I *wanted* to come to class each day and find out what message, humor, or social commentary was hidden within those dry medieval canticles. That being said, I want my full meaning to be understood when I say that Tim Smith is the best teacher I have ever had. He was at the picnic table each morning at 9:00, fully caffeinated, making wisecracks, and ready to lead us through the new day's challenges with a huge smile and a boatload of confidence in our ability to rise to those challenges. Tim possesses a wealth of knowledge encompassing every subject from cultural anthropology to obscure music from the 1980s to the many types and uses of fires in the bush. What is more important is that Tim passes this knowledge on to his students, and he does it extremely well. Whether we were learning about the botanical classification system or how to tiller a bow, Tim was able to quickly and effectively teach us the essentials and let us continue to learn by asking questions and experimentation. When we were learning to build conical shelters, Tim explained that he could either tell us what to do step-by-step, or he could give us the basics and let us use what we learned about the mechanisms of energy transfer, making the shelter design an extension of the creative process. I am certain that if he told us exactly how he builds his shelters, what to do and what not to do, we would have all had excellent shelters the first night. What would we have learned, though? We would know of no other way to build a cone shelter apart from Tim's way, which is not what he wants us to get out of the course. We were encouraged to question what we were learning and to try our own methods if we were doubtful. He has said numerous times that dogma is deadly, especially in the bush, and I believe him. Tim's own words are better than my

paraphrase, so I will direct the reader to a specific post on his weblog, found at http://www.jackmtn.com/simplog/?p=191.

In addition to being an outstanding education, Tim also handles group dynamics masterfully. Any tension in the group is quickly dissolved by the judicious use of humor and excellent interpersonal skills. Tim's sense of humor and his observations about the natural world did wonders to break up the monotony of three hours of paddling through deadwater on a river trip, although corny jokes could not stop the sun from messing with a person's well-being. After we landed and made camp that day Tim realized we were all sun-weary, dehydrated, and exhausted. Immediately, he shrugged off his own exhaustion and became extra gregarious and energetic, carrying the group out of our slump long enough for us to cook dinner. Not only did Tim physically revive the group, he also brought our dour mood back to being cheerful within minutes. Having worked as a counselor for years, I understand what he did and how he did it, but I am almost positive that I could not have made that Herculean effort that afternoon.

While Tim did the lion's share of the teaching in the course, the students also found themselves sharing their knowledge with the group. Two students had taken all of the mycology courses at their college and had gone on to design their own intensive mycology course, which they had just completed in the previous semester. Everyone, students and instructor included, learned more about mushrooms from these two gentlemen than we ever thought possible. All I knew about mushrooms before starting the course was that store-bought mushrooms are tasty, and any and all mushrooms in the outdoors can and will kill you if you so much as look at them the wrong way. I thank my aunt for that knowledge. Our resident mycologists took us on numerous mushroom walks, taught us to use the dichotomous key in the mushroom field guides, taught us

about the cellular structure of mushrooms, showed us which mushrooms were edible (and which of the edibles were delicious), and added the word "mycelium" to my vocabulary. Tim had expressed an interest in mushrooms at the beginning of the course, and these students took the reins and brought mushroom studies into the course curriculum, much to everyone's delight. Aside from sharing our individual areas of expertise, we also taught each other as a group. I learned that sharing techniques and strategies for tackling a problem is an effective way of teaching both myself and others how to think creatively and surmount a new obstacle. None of us had ever even seen a drawknife or a spokeshave when we started making our axe handles. Through shared adversity and shared ideas we figured out which ways of using the tools did not work and which were superior. Not only were we learning how to use our tools, we were also learning how to relate and interact with one another, improving our group dynamics and building a strong foundation of acceptance and helpfulness that would remain unshaken throughout the ten weeks we were taking the course.

Strong leadership skills are absolutely vital in the outdoor guiding business. I have already discussed an example of Tim's leadership on our canoe trip on the St. Croix River; imagine if Tim had remained silent throughout the entire trip and then went to sleep as soon as we made camp. The trip would certainly not have been as enjoyable, as morale would be low and everyone would have remained physically exhausted and dehydrated. I was lucky enough to have a strong background leadership positions prior to enrolling in this course. From the time I was fifteen years old I have worked as a counselor for an overnight summer camp. My last summer at the camp I worked as a camp coordinator, planning field trips and placed in charge of four counselors and forty

inner-city children. Since my sophomore year in college I have worked as a resident assistant in the same dormitory, enforcing policy, interacting with my residents, and building community on my floor. Immediately following my job as the camp coordinator, I found that I was one of the most experienced resident assistants in my residence hall; all but three of the other resident assistants had left the building, and the three who were returning were very quiet people. I received phone calls at all hours of the day and night from other resident assistants, and even the residence director was asking me policy- and procedure-related questions. Since I had just come back from a summer working with children, I spent the fall and spring semesters of my junior year making a fool of myself in front of crowds, using the bullhorn during fire drills, and basically doing the most obnoxious, gregarious work possible. I learned that none of my colleagues wanted to do that type of work, and that since I had no real problem with it, I volunteered myself for the position. I believe that experience opened my eyes to one of the truths of leadership: you do what needs to be done, regardless of the situation. Act decisively and with confidence, and people will recognize that and follow willingly.

At Jack Mountain, our group was so small and so frequently on the same proverbial page that nobody truly acted as the leader. The closest we came to "leading" anything was on the St. Croix trip, when two people each day were chosen to be the guides for the day, preparing dinner and working with Tim to plan the day's route. I learned about trip planning from that experience, but the cooking was not a new concept to me. Since the first day of the course I was a permanent fixture in the kitchen, cooking meals for the group with great enthusiasm. One other student and I were more or less in charge of the kitchen; we planned and cooked the meals, and we helped with the communal cleaning afterwards. Nobody asked us to cook, but seeing that nobody else

truly wanted to be responsible for preparing the meals, we took charge and set about making the most delicious meals possible from the staple foods available. I did notice that this structure fell apart after our series of excursions, and that everyone was so focused on projects that we dissolved the group meals for an "every man for himself" eating arrangement. I do not think that happened due to any poor planning or implementation on the part of the chefs, but because everyone was tired from the trips and we saw that the end of the course was fast approaching and we still had a good deal of work left ahead of us.

On the Jack Mountain Bushcraft website, it is stated that the course is low-technology, high-skills. "The more you carry in your head, the less you carry on your back" is Tim's motto. From the very first day, the students were thrown into a whole world of new information. The first two weeks were a period of adjustment to a new lifestyle and to an entirely new set of skills we were about to possess. I remember vividly how shocked I was that a small knife can cut down a sapling in seconds, the awe I felt when I cut down my first sapling – a red maple – and the confidence I gained when I cut down the next ten without incident. For two weeks straight we all must have looked like children at a magic show, so in awe were we of what we were being shown and what we were about to learn. Words cannot accurately describe just how high-skills this course is, so rather than attempt to describe, I will enumerate and explain. Hand tools were a major component of this course. We could have gone into the woods with chainsaws in our hands and chaps on our legs, but at Jack Mountain the work is entirely human-powered. The feeling one gets when looking at a pile of bowstaves after two full days' labor with a

crosscut saw, maul, wedges, and axe simply cannot be experienced when the job is done in twenty minutes with power tools.

Knifecraft, as Mors Kochanski calls it, was the very first manual skill we learned. The definition of a good survival knife is a knife with a fixed blade of carbon steel about the length of the palm and with a handle that is indestructible. The blade should have a steep bevel and it should be able to easily shave feathers off of a piece of wood; it should definitely not have a micro-bevel like the majority of the commercial survival knives on the market. We also learned that the definition of a survival knife in a survival situation is "any knife you have on you." Once we learned how to choose a good knife, we covered safety and technique: always cut away from yourself, never cut or carve down a piece of wood resting on your leg, and be careful not to start the cut too high, or you may manage to cut yourself as well as the wood. The curved part of the blade is most useful part of the knife for general-purpose cutting and carving, while the straight section of the blade closest to the handle can be used for any job, from simple tasks such as splitting a round section of wood to a task that may damage the blade, such as cutting through wire. A few weeks into the course, I broke the very tip of my knife off while limbing a sapling. Tim suggested that I file the edge down into a chisel point, and that the knife may become more useful that way. While I could not puncture things as easily, I did find that the knife did become much more versatile after I filed the tip down. With our knives we learned to remove the limbs off of saplings, cut saplings down using only the knife, and how to carve all manner of small objects from netting needles to spoons.

Other hand tools we became proficient with over the course of the semester were the spokeshave and the drawknife, both of which I hated with a fiery passion when I was first introduced to them. The spokeshave looked thoroughly unfamiliar to me, with its

razor-esque blade poking out of the bottom and its gull-winged handles and adjustment screws all over the place. Its complexity was menacing. When I saw the drawknife, it looked to be the spokeshave's counterpart: simple and sinister. Here, sitting next to a marvel of cast-iron technology (which I had no idea how to use) was an eight-inch long blade with a wicked bevel on one side, a flat back, and two wooden handles coming down at right angles from the blade. The spokeshave scared me because of its small size and complexity, and the drawknife frightened me because of its length and simplicity. I had no idea what a spokeshave was intended to do, but the drawknife said very plainly, "I cut things." I had no idea how it was supposed to be used, but its purpose was clearly stated in the design. After learning that both tools are used as planes, one for fine work and the other for rapid wood removal, I struggled through my axe handle, cursing the inventor of that wretched spokeshave and abandoning the drawknife for removing too much wood too fast for my slow, careful taste. After many hours of practice with both tools, I have become so comfortable using them that I cannot imagine working without them. In my experience the best technique is to pull or push the tool diagonally across the surface being planed. Once I understood that the blade acts in the same fashion as a razor blade, I came to realize that trying to shave the wood the way I shave my face – pulling straight down with no horizontal deviation – would not be the most efficient way to remove wood. With this method, the blade skips over bumps and then dives into the wood, giving me little control and removing only a very tiny layer of wood. It dawned on me that if I pull the blade diagonally when shaving my face I get three parallel cuts and proceed to bleed for hours. What works out poorly for my face worked out excellently for wood removal: use a spokeshave or drawknife in exactly the way you would never use a razor, and the job will go smoothly.

The use of a saw greatly expedites a number of jobs in the bush. Sectioning a log is more than twice as fast with a saw, as is felling trees in particularly tricky locations. We used a large crosscut saw to section white and black ash trees that we used for bowstaves and pack baskets, cutting the logs into sizes we could carry out of the forest. Use of the two-man crosscut saw required coordinated teamwork and knowing never to push the saw, just to pull and let the other person pull the saw when it is his turn. Smaller crosscut saws were used for quite a few tasks, including splitting the eye of our carved axe handles so we could hang the head. Nothing teaches proper technique and caution than being told to saw through a piece of wood that one has worked on for over ten hours. When we realized that the kerf from the crosscut saw's blade was too wide, we decided to use the pullsaw to finish cutting the eye. Pullsaws cut only on the pull, making them a little counter-intuitive, but once we became accustomed to using this type of saw, it quickly became everyone's favorite saw in the barn. I used a ripsaw, which cuts on the push, to cut with the grain of the wood when splitting my section of white ash into two sections so I could get two bowstaves from the wood.

An axe is the most useful tool a person can carry in the bush. An axe can be used as a walking stick (if the handle is long enough), as a hammer, as an anvil. It can cut firewood, make a shelter, and split logs. The axe is used to fell a tree, limb it, section it, and split it. Our first project was to carve our own axe handles from white ash using spokeshaves, drawknives, and farrier's rasps. We decided the length of the handle, which affects how likely the axe is to cut the user's leg – the longer the handle, the less chance of bodily injury. If a blow is deflected, the axe head will travel towards the user. The axe with a long handle will drive the head into the ground; the hatchet-sized handle will drive the head into the user's thigh. Everyone decided that longer handles seemed prudent, as

most of us were not very familiar with the use of an axe. We also learned about the different shapes of axe heads and their functions: some heads are designed for splitting, so they are made with very wide cheeks. Others are designed for limbing, and are very narrow. Carpentry axes are generally flat on one side with a bevel on the other.

Another very important feature we were taught to notice is the presence of two different pieces of metal in the axe head. If the head is forged from a single piece, the chances are that the temper is either too hard and the axe will be next to impossible to sharpen, or that the temper is too soft and that the blade will never hold its edge. When axes were made for use in the logging industry, the heads were forged from two pieces of metal. The blade was made from a piece of hard steel that held an edge well, while the poll (counterweight in the back) was made from softer steel, so the head would not fracture due to stress. We made daily use of the axe starting the day the last person in the group hung their axe head on the handle. Hanging the axe is somewhat of a lost art, though not a terribly difficult one. The eye of the handle is cut and the axe head is placed onto the eye. It slides down until the bottom of the head is flush with the cheeks of the axe handle, and then a wooden wedge is driven into the cut in the eye. A metal wedge may also be driven in to keep the head secure, although this is unnecessary when using hand-carved handles. The axe is then soaked in a mixture of boiled linseed oil and turpentine, allowing the wood to absorb the oil and swell, creating an even tighter fit in the eye of the axe head.

The subject of felling a tree is quite complicated and the repercussions of a shoddy job could possibly be fatal, so it is important to know how to safely make a standing tree land exactly where one wishes. When felling a tree, the first cut should be in the direction of the intended fall. The cut should also be placed as close to the ground

as possible; it makes no sense to waste any part of the tree. The cuts should be made at a forty-five degree angle, as this is the best angle for the blade of the axe to slice through wood fibers. A tree can be felled with any angle, but a forty-five degree angle cuts fastest, cleanest, and most efficiently. Once the front-cut has reached the center of the tree (this can be determined by examining the growth rings inside the cut) the back-cut must be started. The back-cut should start a few inches above where the front-cut started and should cut into the tree until the tree begins to shake noticeably with each cut. The tree may also be swaying with the breeze; at this point, a strong wind could knock the tree over in a direction other than originally intended, so it is important to note the wind and get clear if the tree begins to fall. Once the tree is at this point, it should be pushed after each swing of the back-cut. As soon as the tree starts to fall, the safest place to be is on a line drawn forty-five degrees from the direction of the fall, preferably far away. Once the tree is down, it can be limbed, sectioned, and split, then dragged or carried out of the woods. Covering the stump with dirt, moss, and debris from the forest floor helps the stump to decompose faster and with luck might promote mushroom growth on the stump.

"Once you forget your matches and have to light a fire without them, you will never leave home without them again." Tim told us that when we started learning friction fire techniques. After laboring for days just to get a coal with a bow drill, I have to agree with him. I still have been unable to make a coal with a hand drill, although I am getting closer. Tim showed us the qualities of the wood needed to make a bow drill set – dry, straight-grained, and non-resinous. He also taught us that mullein stalks and horseweed stalks make excellent hand drills, although my experience tells me that technique is more important than the materials. After struggling with hand drills and bow

drills, the commercial magnesium and steel fire starters were a breeze to use: just scrape the steel across the magnesium and hundreds of sparks fly into the tinder bundle and almost instantly start a fire. We learned to use flint-and-steel to produce sparks, which can be caught in a tinder bundle to start a fire. Our knives provided the steel, and we practiced on some pieces of flint from Texas, though we also learned which local stones worked as good flints. In short, no local stones work well as flints, so we needed to improve our technique quite a bit in order to produce sparks with quartzite and the unknown purplish rock we found in the White Mountains. By the time we were in the White Mountains experimenting with the purple stone, one of the students commented that the stone was making sparks even easier than the Texas flint. He thought about what he had just said for a minute, then amended, "Actually, I think it's more our technique than the stone!"

Primitive and alternative fire-starting techniques aside, matches are the most convenient way to start a fire, especially when the weather is wet. Wet-weather fires were practiced at every opportunity. Most of the time we implemented the "feather sticks" method, which is to split a piece of wood and shave feathers down one plane of the piece. Five to ten feather sticks are then placed into a teepee-shaped structure with the feathers facing the inside. The feathers are then lit and the wood soon begins to burn. It takes time to prepare the feather sticks, but it would take considerably more time to locate dry tinder; the feathers act as the tinder and the sticks act as kindling. What happens when it has been raining for three days and everything in the forest is soaked? The options are either to freeze or to find wood that is still dry. To do that, we learned that the heartwood from a vertical dead tree usually is bone-dry at a height of fifteen feet or so. We cut the tree down, sectioned and split it, then found the pieces that had

heartwood that was still dry. We split those pieces further and carved feather sticks from them and proceeded to light a fire with one match. That fire burned through the rain with no sign of being affected by the weather.

When I first read the chapter on fire in Mors Kochanski's *Bushcraft*, I almost laughed at the amount of information present about fire. Now that I look back and see how much I have written on the subject of fire and how much more I have yet to write, I am beginning to understand. Mors writes about the different ways to arrange the wood in a fire, known as firelays. Of the firelays that I have used, the most efficient – and in my opinion, best – method is to lay the logs parallel to one another and stacked one on top of the other, making a pyramid shaped base for the fire. This is usually implemented once the fire has burned long enough that the larger logs have caught and can burn without smaller logs under them. Arranging our fire this way produced more heat and burned longer with less maintenance than the normal haphazard method of throwing logs in the fire any which way. I have also used a star firelay in which the logs are arranged into a crude asterisk shape, burning only the middle portions of the logs. This fire is more utilitarian than warming, as it sections the logs but does not necessarily produce much heat. We also used fire to serve a constructive purpose by taking the coals and using them to make burned-out bowls and spoons, and by burying the coals with a pot of beans, letting the beans cook all day. One other student and I slept outside in the twenty-degree air on a bed of coals covered with dirt and a piece of plastic. We had our sleeping bags over us, the plastic under us, and the best night's sleep in months.

We spent the first few weeks working on shelter construction techniques, beginning on the first day when we made three of the semi-permanent "hoop house" shelters, which we lived in throughout the semester. Before we started building shelters

for sleeping in the woods, we had a lecture on the mechanisms of energy transfer, complete with a power point presentation. Once we understood how energy is lost, we learned to make small temporary shelters using three basic building styles: dome, cone, and A-frame. Each week on Friday we built a new type of shelter and spent Friday, Saturday, and Sunday night sleeping in that shelter, improving it each night until we knew what worked and what did not. After experiencing a shelter for three or four nights, you own that shelter. You know what to do to build it properly the next time you build it, and your technique can only get better. I have spent some miserable nights in temporary shelters, but by the time we were in the White Mountains I was sleeping better in my temporary domes and cones than I was in my permanent hoop house back at base camp.

Whenever anyone I know pictures building a shelter, they think of building a roof. Nobody ever thinks about building a bed to keep you off the ground, even though that is the most important component in the shelter. True, a roof keeps you dry, but even with no rain in the forecast, sleeping on the ground is a miserable experience that leaves you chilled, cramped, and tired. One of the most important lessons I have taken from Jack Mountain is to always build my bed first, and to construct it with a "box spring" of thick sticks and a "mattress" of hemlock or fir boughs.

The correct and safe use of a canoe was highly stressed throughout the course. We learned the lost art of poling, and after a few days of practice standing in the canoe and pushing off the bottom of the lake with only a twelve-foot long stick, we were prepared to be up the creek without a paddle, so we took a day trip to the Saco River to pole up- and down-stream in light rapids. There we learned the basics of snubbing – slowing and controlling the canoe with a pole while going downstream – and ferrying horizontally across the current. We learned to stop in moving water and the importance

of picking the lines of travel when poling. Hopping from eddy to eddy is much easier than fighting the current upstream the entire way. We worked on paddling techniques, learning to paddle the canoe on only one side of the boat, not having to alternate from port to starboard to correct our course. The way most people attempt to do this is with a J-stroke, where the paddle is pushed towards the stern and then swings out and towards the bow in a J shape. The J-stroke has the tendency to slow the canoe and can be rather awkward, so we learned to use a knifing J-stroke, slicing the paddle through the water on its trip towards the bow and prying a little to correct course. Proper trim of the canoe was also stressed, and the simple phrase "upwind and downstream heavy" saved all of the students from being at the mercy of the winds and currents. Learning to read the water was taught to us on our whitewater trip, and after bouncing off of the first two or three rocks, everyone became very proficient at figuring out what was happening below the water's surface, allowing us to pick the fastest and safest lines for poling.

Our long-term projects were the brain-tanned deer hide, the wooden longbow, and the black ask pack basket. We started wet scraping our hides, which took a few days. Once we scraped the hair and flesh off the hides, we let them dry into rawhide. Then we soaked them in vinegar and put them in the braining solution. The next clear, dry day we stretched the hides and pulled them in every possible direction to break down the glue bonds being formed as the hide dried. Our bows came from a white ash tree we found in the forest that had about twenty feet of straight, even grain. Each stave is just longer than I am tall, which is ideal for a bow; "long is strong." I used a drawknife and a spokeshave to turn my stave from a chunk of wood into its rough dimensions. Once the weather got nice, I began tillering, or bending the bow and removing wood where the bow was not

bending evenly. Tillering took almost a week, after which time I braced the bow with a reverse-wrapped Flemish twist bowstring I made myself on a special jig.

The black ash pack basket required more hard work than any other project I had attempted throughout the course. Simply finding a suitable black ash tree is difficult enough, as it involves trekking through swampy ground until you come across a large tree with good, straight grain. After felling the tree and bringing the sections back to base camp, we learned how critical it is to keep the sections soaked in water. Black ash will separate along its growth rings when it is pounded with enough force, and it separates much easier when the wood is green and wet. When our pieces began to dry out, the pounding took much longer and the wood tended to crack under the force. After about eight hours of pounding, I had collected enough strips to split into weavers and uprights. I though the hard part was over, but the actual weaving of the basket was more difficult than I had ever imagined. Weaving took two whole days, but I finally finished the project with a short, squatty basket that looked nothing like the mold I was working from. Once I made straps and a handle out of leather and the basket was finally complete, it began to grow on me and I was less inclined to throw it into the fire, although if anyone ever makes a comment trivializing basket weaving, I will most assuredly have a colorful reply.

Navigation with map and compass makes up a significant part of the test required to obtain a guiding license in Maine, so Tim was sure to cover the basics with us in case we were interested in becoming guides in the future. We learned how to take a bearing, travel in a straight line to that bearing, and to use three points to find a line, which makes traveling to your bearing in dense forests infinitely simpler. Using intermediate landmarks on the way to the bearing keeps you walking in a straight line, and in the forest, those landmarks often have to be very close together. We learned how to check

back to ascertain that we were traveling on our original bearing and had not veered off to one side or another, and after watching a brief video we learned the "common-sense" practice of walking around an obstacle and returning to your original path by counting steps taken away from the original line of travel. The next day we worked with the map and compass, learning how to plot a course on a map. We also went over emergency search and rescue coordination in a lost person scenario, which we practiced with a former Jack Mountain student who was studying for her guiding license. Though we did not study barehand navigation intensively, it was taught to us over the course of the ten weeks. The basic rule is to know your surroundings and know the "habits" of the area. In Wolfeboro, New Hampshire, for instance, winds generally blow from the southeast between ten and eleven AM. Using this knowledge with the combination of the sun's position, presence of moss, and other clues, you can guess which direction you are traveling in.

As a small group of students on more or less the same level, if one person is endangered by a situation, chances are that the entire group is in the same predicament. There are discrepancies in the group, however: some rapids on the rivers were too strong for some people, for example. In this situation, if the person poling the canoe did not feel comfortable, he or she could ask the person in the bow of the canoe to take control of the canoe for the duration of the rapid. Moderate risk is essential to the learning process, especially outdoors. If you turn down the opportunity to pole a rapid because you are worried you will hit a rock, or because you hit a rock the first time you tried and ever since have been terrified of rocks, you will never become more proficient at poling in whitewater conditions. One must assess the situation and decide what is an acceptable

risk to take. In a small rapid, the chance that the canoe will break in two when broached on a rock is generally very slight, although it is present. If you feel you are not confident with a pole, the small rapid might be the most appropriate place to practice and work out the kinks in your technique. Passing up the opportunity to pole a small, calm rapid and opting to pole down a class three ledge is an example of poor risk management with possible (even probable) injury or death resulting. Risk avoidance as a group in the White Mountains: for more than twelve hours the sky was unsettled. Clouds were rolling in and just as quickly moving out. The air was very warm and dry followed by a cool and damp breeze, which was then replaced by warm, dry air again. Cirrus clouds, blue sky, and low, dark cumulus were performing an elaborate dance in the sky above our heads. It rained that night, but in the morning the sky was still showing the same unsettled signs. Our original plans for the day were to take a day hike up to the ridge some six miles out, spend the afternoon there, then hike back to camp. We voted as a group to hike out of the forest instead, noting the unsettled weather and lack of any cover above the tree line at the ridge. Less than twenty minutes after we arrived at the van and started our drive home, the skies opened up. From inside the van it looked like buckets of water were being thrown on the windshield.

When traveling in a small group, communication and interpersonal relations are essential.... unless the trip is short. One week in the bush with a handful of strangers could potentially be annoying, but in such a case it is very possible to overlook a person's character traits that are incompatible with your own. Spend ten weeks living with five people, however, and good communication skills are priceless. The flexibility to adapt to different personalities is critical when you see only these five people every single day, not

counting your instructor. We were six people with a small piece of common ground when we started the course: we all were so interested in bushcraft that we would spend ten weeks in the bush learning the skills. As one student put it, we had "a sponge-like quality" and wanted to get as much information as possible in the ten weeks we had together. This set us apart from the majority of the general public, whose interest in the subject is satisfied by watching Ray Meers on television. Learning to communicate respectfully in a small group is also important. On our river trip, I saw examples of good and bad communication within the group. One needs to know when to speak up and when to hold back. The rules seem to be as follows: shouting, "Look out! There's a rock!" every time a ripple appears in front of the canoe gets old fast. However, if you think the person in the stern might miss the rock without you pointing it out, by all means, tell him. He will be glad you did, especially if you mentioned it casually, as though reminding him. If he gets offended that you would mention the presence of that rock to him when "of course I saw it," wounded pride hurts much less than slamming into a rock.

More or less, every time we were in the bush we were all on the same page; communication was a breeze. I noticed that when we went into town our communication broke down. Four students, counting myself, took one car into town for an hour. We stopped at one store, and the driver and another student made another stop. No plans were made as to where or when we would meet, and we had no way of contacting one another. We misjudged the time it would take for them to return to the first store and left for a few minutes. We then proceeded to spend twenty minutes looking for everyone; the two in the car were looking for us, while we on the street had split up and were jumping up and down above the tourists, waving to each other to keep in visual contact. Had this

happened in the bush, we could possibly have had a serious situation on our hands. The humor of the ordeal is that it never would have happened in the bush. We knew that the best thing to do when lost is to stay put and wait, and if it looks like no one is coming, build a fire and a shelter and stay hydrated until you are found. In town, we had let our guard down and failed to make plans and we paid for it in lost time. To this day that occurrence baffles me; our group was always on-point in the bush, where it mattered, but we could not manage to navigate a town's main street without incident.

"Leave no trace." What does that really mean? Does it mean packing up your five-pound nylon tent with its aluminum poles and packing everything into your REI trail backpack, including the plastic wrappers from your water purification tablets and your freeze-dried camp rations? Not to me. While this style of camping leaves as close to no physical evidence that anyone was camping in the area, where does that nylon tent with its aluminum poles come from? Scars in the earth from bauxite mines and huge oil wells seem like "traces" to me. Yet, someone who camps in this way is perceived to be more ethically conscious than the camper who hikes in with his gear lashed to a pack frame made from three sticks. Why is that? It has something to do with the idea that cutting some saplings and pruning the lower boughs off hemlocks and firs damages the forest. Building a fire is dangerous and leaves charcoal; everyone can see where you have been. A propane stove is more discreet, one might argue. If this is your argument, read back a few sentences. Maybe you missed my note on gouges in the ground and towering oil wells.