

---

## Si tibi lanitium curae... If wool be in thy care ...



BY CHARLES CAPALDI

*If wool be in your care, let not your flock go,  
Where bushes are, where burrs and thistles grow,  
And of the purest white select your breed  
Perchance a snowy ram you do behold  
Select him not in haste as husband to your fold  
Search his mouth and if a swarthy tongue  
Beneath a humid palate hangs  
Reject him! Lest he darken all your flock  
And search out another from your numerous stock...*  
**VIRGIL'S GEORGICS – BOOK III – 29 B.C.**

*Si tibi lanitium curae, primum aspera silva  
Lappaeque tribolique absint; fuge pabula laeta,  
Continuoque greges villis lege mollibus albos.  
Illum autem quamvis aries sit candidus ipse,  
Nigra subset udo tantum cui lingua palato,  
Reici, ne maculis infuscet vellera pullis  
Nascentum, plenoque alium circumspecte campo...*  
**P. VERGILI MARONIS - GEORGICON LIBRI III**

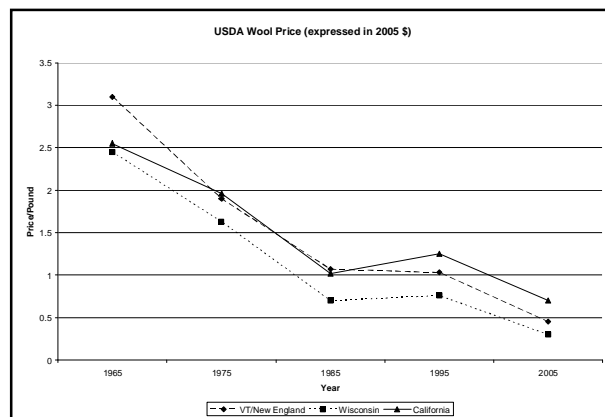
**W**e stood under the pre-dawn sky of Quebec, stamping our feet in a futile attempt to keep warm. The street lights cast their yellow pall onto the sacks of wool waiting in the snow like giant bean bag chairs. The cold nibbled mercilessly at every inch of exposed flesh until finally, the truck was loaded and we could retreat to the warmth of the cab. I had driven north, late the night before, to pick up Alastair MacKenzie and four hundred pounds of fleece from his flock at La Moutonnière, the sheep dairy and artisan cheese plant he runs with his partner, Lucille Giroux. Our mission was to cover the 650 miles to MacAusland's Woolen Mill on Prince Edward Island (PEI) to get his wool washed and dried. The last scouring plant in Quebec had closed its doors months earlier, and the company that makes La Moutonnière's socks could only work with clean fiber. I was along for the ride to uncover the mysteries of raw wool and its processing.

**R**aised in New Zealand where sheep outnumber people, Alastair has more experience with sheep than anyone I've ever met. Each fleece in these bags had passed through his hands at least twice. For the first time on shearing day when he sheared the fleece from each sheep in one large piece, and for the second time when he skirted, or tore away the lower quality wool from the back, neck and rump. His hands are those of a shepherd, calloused and worn from years of hard work; hands that can read a lock of wool in the same way that a blind person reads Braille. I've shipped many samples to a testing lab in Denver in order to measure the fineness of my wool in microns. Alastair can provide a close guesstimate with a single touch.

Over the years, selling the clip from my own flock has proven a challenge. In years where the wool pool paid \$0.75 per pound, we loaded our skirted fleece onto the shearer's pick up and happily banked the check. In years where the price was \$0.15/pound, we reasoned that it was more valuable on our own backs, or on our beds in the form of blankets. That sounds great in principle, but is a whole lot more challenging in practice. That's the irony of raising sheep. We carefully cultivate the skills necessary to shepherd our flocks through the year, yet most of us lack the time and ability to transform our wool into a usable product.

**W**ith the advent of synthetic fibers in the 1940's and the burgeoning popularity of permanent press in the 1950's, the demand for wool began a steady decline that continues to this day. In 1870, woolen mills paid New Hampshire farmers the equivalent of \$14.25 per pound (in 2005 dollars). By 1965, the price had dropped to \$2.70 per pound. By 2005, wool in the grease (unwashed) was bringing a paltry 48¢ per pound - not enough to cover

the cost of shearing. It is no small wonder that the number of sheep on U.S. farms is on the decline.



The market for hobby and craft wool seems to tell a different story. On average, it costs \$3.75 to wash and card 1 pound of raw fleece. After the grease is washed out, the clean fleece typically weighs 50% less – your pound of wool now weighs 8 ounces. So, we need to wash another pound (for a total of \$7.50) so that we end up with a full pound of clean fiber. Carded into rovings or clouds, your clean wool could bring \$18-\$24 per pound, if sold to a hand-spinner or felter – more if it is the “right” breed (e.g. fine wool), and if the sheep has a name. It seems like a no-brainer, but may actually be a wolf in sheep's clothing.

**A**lastair MacKenzie is quick to explain, “*The problem with added value is that it's really just added cost until you get the product sold. To get the benefit of that added value, our cash flow is out the window and marching down a one way street. Ideally, we could trade wool to the scouring plant in exchange for washing it, trade it with the mill to card and spin it, and trade it to the sock plant in exchange for turning it into socks. But then hey, who has done the hardest work here? We back ourselves to sell those socks and get the full return - or go under trying.*”

---

Chick Colony of Harrisville Designs in New Hampshire echoes the same sentiment, “A guy called me saying he had all this Merino wool to have spun into yarn. I asked him what he wanted to do with it, and he said, “I don’t know.” So, I said, “Where do you store it now?” He told me it was all in his barn. If the farmer is already stockpiling raw wool, is it better for him to go and spend another \$1.90 per skein, only to stockpile that instead?”

**T**hey both make a good point. When we decide to farm, how many of us think about the need to market what we produce? La Moutonnière’s primary business activity is the production of artisan cheese. It is sold in shops across Quebec, at Marché Jean Talon (North America’s oldest open-air market), and in their on-farm boutique. Wool socks, gloves, fleece filled pillows, and knitting yarn adorn every vertical surface where their products are sold. These ancillary products also piggy back on the popularity of their cheese. Since most of us don’t have that kind of outlet, we rely on selling our raw product to a middle man who (theoretically) adds value to it.

The U.S. and Canada each raise less than 1% of the world’s wool. 60% of the U.S. domestic clip is exported and the military remains the single largest purchaser of the remaining domestic wool. At least somebody at the Pentagon still understands that there’s nothing like wool for winter comfort.

**L**a Moutonnière’s 225 sheep yield 1,732 pounds of wool, about half of which (866 pounds) is destined to be washed, carded, and otherwise processed into value-added products. Washing, or scouring, was the reason we were en route to MacAusland’s Woolen Mill.

The island is located in the Gulf of Saint Lawrence. The landscape, notable for its distinctively red soil, yields some of Canada’s finest potatoes, which are followed in rotation by small grains. With each bend in the road, the panorama shifts from flat fields of wheat stubble, to rolling hills, to secluded ocean coves. After 45 minutes of passing through tiny hamlets, and past farms with large fishing trawlers up on blocks for the winter, we arrived at MacAusland’s.

Travel-weary and ready to stretch our legs, we found Dale MacAusland and his 10 employees already hard at work. A large bay garage door opened as if on cue, and we backed the truck up through the huge bellows of steam that escaped from within. The steam and its accompanying odor of wet sheep issued from the three-stage scouring train that consisted of three vats of wash water.

**C**anada’s small woolen mills of the Atlantic Maritime Provinces have been disappearing at an alarming rate. So too have the small woolen mills of New England. In February 2007, the Sheep Industry News reported that Australian “*raw wool imports to the United States have sharply declined, largely due to the loss of U.S. mills.*”

100 years ago, water-power fed mills that dotted the countryside of both countries, and MacAusland’s was no exception. When Dale’s great-great-grandfather started the mill in 1870, it processed lumber, flour and wool. But, when a fire destroyed the mill and its equipment in 1948, the MacAusland’s reopened it as a woolen mill. By the 1920’s and ‘30’s, many mills had already closed. Those that remained focused their activities on the washing, carding and spinning of wool. By the dawn of the 21<sup>st</sup> century, most of them were gone too. Today,

---

MacAusland's is the only mill in Atlantic Canada that still produces 100% virgin wool blankets from the wool of small flocks in Canada and the U.S. It was also the only place within 700 miles of his farm where Alastair could get his wool scoured.

*"I wish you had gotten here 20 minutes ago,"* Dale MacAusland yelled by way of greeting over the noise of the machinery. He readjusted his hand knit cap with one hand, and extended the other to shake our hands. *"We just finished a batch and could take yours right in."*

Alastair lunged for his gloves, I for my camera, and the unloading started without delay. No sooner did the wool land in the bay than the door slammed shut on the arctic cold outside, and people sprung into action.

MacAusland's is a small woolen mill. They only wash a couple of days each week. The rest of the time, Dale's crew is carding, spinning, and dying wool, much of which will be used in the weaving of blankets – their signature product. Dale weighed the wool which Alastair helped him haul to a behemoth of a machine whose gaping maw waited to be fed.

**F**leece by fleece, wool was tossed in. A series of teeth attached to a rotating wooden band carried it up and gently deposited it into the first of three baths, carefully maintained at 110 degrees. If you look at wool under an electron microscope, you see a protein fiber comprised of overlapping scales. The temperature-controlled wash water encourages these scales to relax, or open up. An oil-based industrial soap and soda ash added to the first bath help break down the grease, releasing the suint (dried perspiration, aka, sheep sweat), dirt and lanolin that are part and parcel of a raw wool. Agitate it too much and the fibers mesh together, leaving you with a matted pile of felt.

**A** series of rods, perpendicular to the plane of the water gently submerge the wool. Once a point of critical mass has been reached, a mass of wet wool extends all the way through the first vat. A series of curved tine rakes pick up the soapy fiber, depositing it at the base of a large rubber roller. This squeezes out the water (and dirt), and the wool is transferred to the next vat. The process is repeated, once more with plain soap, and a third time with clear rinse water.

Within a few short hours, all the wool has traveled through the scouring train and is now piled on the clean concrete floor in front of the dryer. A 15 foot long metal "box", it has a hopper at one end for wet wool, which is carried on a conveyor that runs the length of the machine. Dry wool is deposited onto a pile at the other end. It was visibly cleaner although small amounts of chaff and vegetable matter were still stuck in the fibers.

Larger, modernized commercial mills use a carbonizing process to burn out the vegetable matter that remains in the fleece. However, this process uses sulphuric acid (or other corrosive acids) which denatures the microscopic fibers in the wool and some believe, may be the source of skin irritation. MacAusland's doesn't use a carbonizing process to get rid of any extraneous vegetable matter – and that discovery came as a surprise to me.

**I** had always thought that inferior yarn had chaff in it. Judging from the complaint letters received from knitters and weavers by every mill in this article, so do most consumers. In fact, the opposite may well be true. The wool of rotationally grazed flocks tends to be relatively free of vegetable matter, manure and other debris - a compelling reason to let sheep harvest their

---

own feed, spread their own manure, and grow a higher quality wool clip with fewer inputs. Chaff in the yarn is proof positive that the fleece was *not* subjected to an acid bath. This is just one more aspect of farming that has been impacted by consumer expectations that fail to grasp the reality of growing quality wool. Ancient Roman consumers expected a relatively clean fiber – and Roman shepherds washed their fleece by herding the flock into the running water of a stream or river. In our technologically advanced society, we have replaced the care our wool receives on the farm, with an acid bath at the woolen mill.

Mills like MacAusland's that refuse to carbonize their wool, struggle to find alternatives. *"We tried using organic soap,"* said Dale, *"but it just wasn't cost effective. In the end, finding enough wool of a consistent quality, staple length, and fineness has been more of a problem."* As we talked, he referred to a British manual for wool processing (circa 1746) from which he quotes: *"The biggest problem with colonial wool is the absence of uniformity."* 261 years later, the same problem continues to plague MacAusland's, and the other mills I visited.

Gumming up the equipment isn't just a matter of staple length. Dale tore open a sack of wool he had received. At first blush, it looked like barn litter, manure and chaff. We pulled some out and I quickly realized that it was a whole fleece that appeared to have been dragged through the barn by a dog. The sack was filled with several hundred pounds of the same.

As we loaded up the bales of wool that had been dried, and pressed into tight cubes using a hydraulic ram, I couldn't resist asking Dale why he did it. Why continue to run the mill after so many others had already folded?

His answer caught me by surprise: *"It's probably a combination of stupidity and punishment - the very definition of sadomasochism."* I'd venture to say that he continues to do what he knows how to do well. Through a combination of good luck, hard work, and fierce determination, MacAusland's Woolen Mill is still in operation today serving small farmers in both Canada and the U.S. Our job as farmers is to grow the fleece and get it to him in good condition – Dale's job, and that of his staff, is to shepherd it through the transformation from raw fleece to clean wool, to yarn and ultimately into blankets.

The truck was once again laden with wool and the open road beckoned. The return trip to Quebec took us through the province of New Brunswick and by design, through the village of York Mills. Briggs & Little, Canada's oldest woolen mill, has been turning out quality yarn since 1857. That's 150 years of yarn, made in a place where the winters are harsh and wool is always in fashion. These are people who know wool, know the woolen industry, and aren't distracted by current fads like eyelash yarn, or obscure synthetic blends.

John Little, the 3rd generation of his family to run this mill, is quick to explain, *"Once you get south of New York state, you don't really need a lot of wool content in your clothing in order to survive the seasons, so it's no big deal if the fiber is short or shoddy. In New York, wool is only popular when it is in fashion – but in northern climates, wool is fashionable any time it is cold."* Fishermen in the Atlantic Maritime provinces traditionally wear wool because it stays warm when wet, and because they may need to pull on a wool sweater, even in the middle of summer, when they are out on the open Atlantic.



---

*“They are doing some pretty fancy things with synthetics for keeping you warm,” says Little, “but if you get wet, a synthetic loses its thermal properties. If it gets too hot, synthetics don’t breath and can feel like a sweat suit.”*

This hasn’t stopped him from making an 80% wool/20% nylon blend for people who knit socks, mittens and other garments that will be subjected to hard wear. But the primary focus at Briggs & Little is 100% virgin wool yarn – and it shows.

**L**ike MacAusland’s, the mill’s direction and primary business activity has been molded by fires over the years. In fact, this mill has burned down and been rebuilt 4 times over the past century and a half. When it burned to the ground in 1994, Little says that he and his partner took a good hard look at their business plan and rebuilt a mill that was 30% smaller. In this case, smaller is definitely better.

Briggs & Little introduced their first colored yarns in the 1940’s; yarns which sported names that belied a British colonial past: Scarlet, Royal Blue and Paddy Green. Today, 50 colors flesh out the Briggs & Little palette, and true to form their names evoke the colors they represent: Sea Foam, Grey Heather, Lilac and Evergreen. There are no specialty yarns here, no yarn with sparkles, and nothing made out of obscure luxury fibers. Their market niche is 100% virgin wool – in other words, wool that has never been used for any other purpose. The Canadian Textile Journal quoted Little in 1982 as saying that, *“It appears the demand for quality wool yarn resembling homespun is growing.”* That’s exactly what you’ll find in their mill outlet, serious yarns for serious knitters who make stylish garments intended for use in a harsh northern climate.

At 5\$CAN (\$1 Canadian = \$0.85 US) per skein, their yarn is pricey in Canada and middle of the pack in the U.S. Buy it directly from the mill at 3.75\$CAN and it’s a bargain, as anyone who buys wool at yarn stores will quickly recognize. In fact, that’s a challenge that Briggs & Little faces regularly, *“The perception for a lot of people is ‘I can’t afford to knit with wool.’, but there are synthetic yarns out there that cost just as much, and that are just crap. If you are going to spend 40-60 hours knitting a sweater, \$10 difference is really not that much. At the end of it, you are going to knit something that is going to last, and that’s cheap.”* Little likes to tell the story of the lady who wore the same sweater for years and just got sick of it. She ripped out the knitting and made herself something new.

He is troubled by the fact that the average consumer assumes something is wrong with his yarn if the price is lower than they expect – a perception that Briggs & Little has opted to gamble with as they introduce their special 150<sup>th</sup> Anniversary Twist Yarn which sells at 1.50\$CAN when you buy two other skeins at the normal price. *“We’ve developed a really nice blend of blues that we just started producing this week. It’s a thank you to people for helping us stay in business for as long as we have.”*

**W**hat wool Briggs & Little doesn’t buy directly off the farm, they purchase from the Canadian Wool Grower’s Coop, or take in trade from the likes of Dave Hinman, a New Hampshire shearer who swaps raw wool for yarn which he then sells in the U.S.

We had arrived without an appointment, but York Mills is a rural community where folks are genuine, handshakes are firm, and eye contact is steady. John

---

Little himself came out to greet us and when he realized that we were interested, quickly agreed to demystify the process of spinning yarn from wool.

**M**ost mills dye the raw wool and blend the colors together before spinning. Before the wool can be spun, the fiber needs to be opened up and blended in preparation for carding. The picker is a machine designed for that very purpose.

The wool is fed into the carder, a machine comprised of a series of interlocking rollers. Each roller is covered in carding cloth, a mat of flexible material with embedded wire teeth. The rollers pick up the fibers little by little, and align them cross-wise so that when spun, they will form a lofty, woolen yarn. A thin, continuous veil of fiber, called roving, comes out of the card and is transferred to the next carder in line.

During this process, most of the remaining chaff in the wool falls out. As the wool winds its way through each successive carder in turn, it slowly begins to resemble yarn. After the final carding is complete the roving is put through a series of dividing rollers which cut it into 120 pieces across the width of the roll. This is called pencil roving. The pencil roving will be ready to spin after passing through a series of rub aprons that roll it first in one direction and then back in the other to help remove any lingering vegetable matter. The roll takes on the characteristics and color of the finished yarn – but if you look closely, you’ll find that it has no twist – give it a tug and the piece of roving separates easily.

**S**pinning yarn, whether in a commercial mill, or on a spinning wheel, is nothing more than the application of twist (measured in the number of twists per inch) and tension. The rolls of pencil roving are affixed above the spinners. One by one, each of the

120 strands on a roll is brought down, through a series of orifices and between rollers which put it under the correct amount of tension, inserting a pre-determined amount of twist. The resulting yarn is automatically wound onto bobbins.

Besides setting up the rolls of pencil roving, the spinner operator must replace full bobbins with empty ones, and manually join new roving to the old as a roll is depleted. Make no mistake, this is a highly skilled job that has hardly changed since the turn of the century.

The yarn on bobbins is collected into carts and steamed to help set the twist. Depending on the type of yarn desired, it can be twisted (or plied) with another strand, forming a multi-ply yarn. Regardless of how the twist is set, the yarn needs to be skeined and washed for knitters, or put onto cones for weavers.

**M**y tape recorder had been sitting on the counter as we talked – leaving my hands, and eyes free to wander across the rainbow of hues that packed the mill store from wall to wall. During the past two hours, I had managed to pile some 50 skeins of yarn onto the counter. The moment of reckoning had arrived and John’s staff was tallying up my order. John shook our hands and thanked us for coming – it was clear the visit was wrapping up, but I had yet to pay for my yarn. Alastair, seeing my confusion, gave a quick wink and said, *“Don’t worry about it mate, you missed out when we were going through the mill. We’ll settle up later.”*

As we turned the truck back toward Quebec, he explained, *“You got 12 ½ pounds of yarn in skeins. I gave John 25 pounds of wool and got the yarn at a reduced price. You can pay me back when we get home, if that works for you.”*

---

**M**y smile was genuine, but I was still preoccupied. While I now had a better grasp of how raw wool was processed into yarn, I had been left with more questions than I had found answers. We spent four days traveling almost 1,300 miles just to wash 400 pounds of wool. Why was it necessary to travel so far? What was amiss with the North American woolen mills? Why were the few

remaining mills closing? And more importantly, what is the small farmer to do about it?

After dropping off Alastair and his wool at La Moutonnière, I pointed my truck back into the driving snow. Little did I know that I would spend the next 30 days in search of answer – answers that were littered across more than 2,800 miles of coastal highway and back country roads in both the U.S. and Canada.

### **Follow-up article**

#### **“Whither North American Woolen Mills”**

**available on this site at**

**<http://www.scribo.biz/ArticleWhitherNorthAmWoolenMills.htm>**