LEAVE ‘ER, BEAVER

My personal battle to reduce soil erosion, improve stream water quality and combat global warming begins with a struggle against the beaver. A pyrrhic victory against an enemy I love. This is my Ode to the Beaver.

The Beavers of our Farm

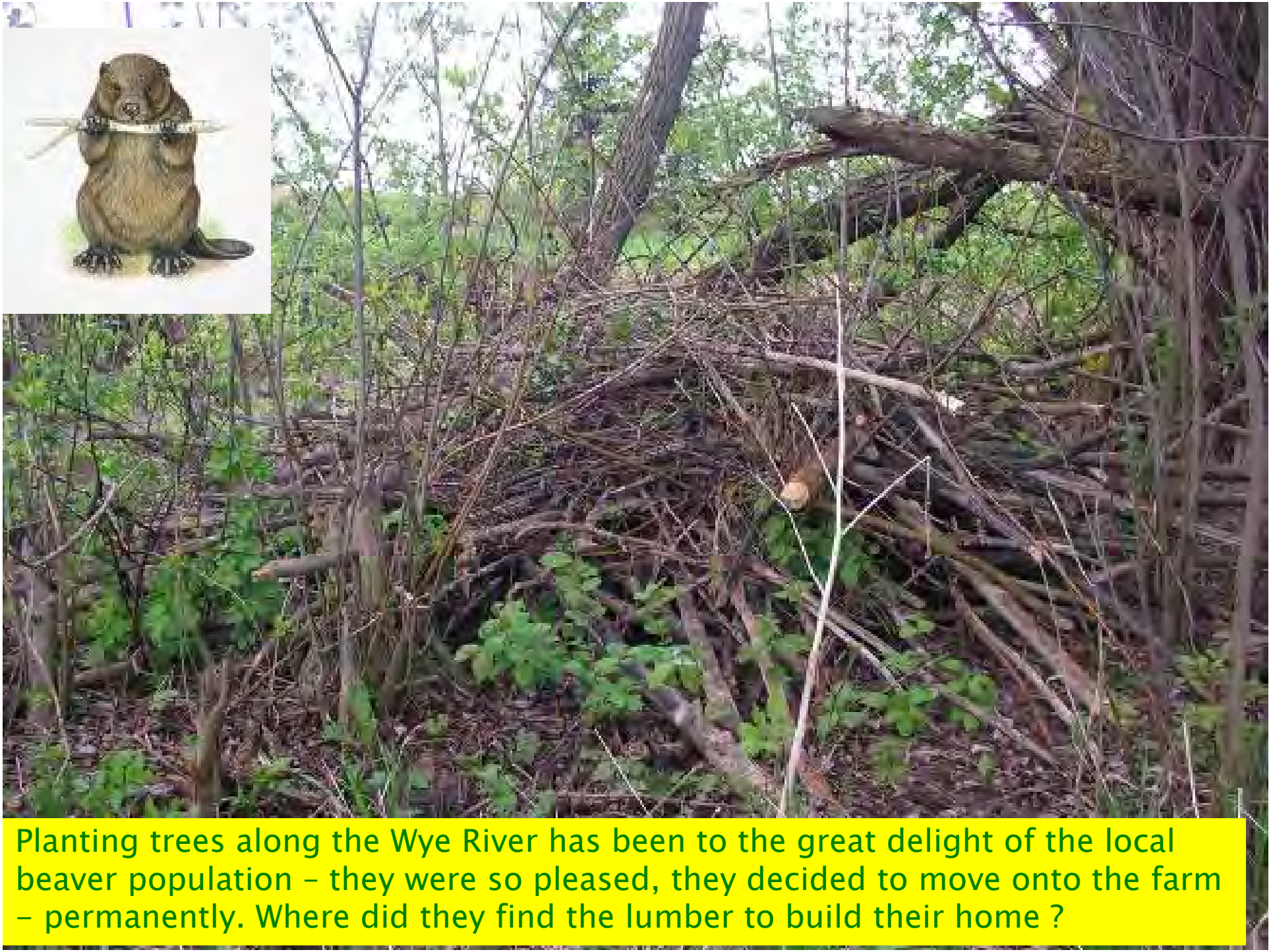
The Farm, Elmvale, 1938. There were almost no trees along the Wye River, having been cut when the original forests were cleared for agriculture. As a result, of deforestation, erosion of these fine-grained soils (derived from post-glacial lacustrine sediments) has been terrible, with obvious consequence for water quality and aquatic ecology.

The arrows show the remnants of a failed erosion control scheme installed by the Severn Sound Environmental Association, in the early 1990s, which was washed away by the river soon after it was installed. Approximately 2 m of river bank has since been lost. I have no idea how I will now remove these steel posts from the riverbed.

Along the sections of the river which do have trees, erosion is far less significant, testimony to the ability of roots to bind soil particles. Clearly, the secret to reducing soil erosion, improving water quality, and creating habitat for wildlife, lies in our trees.

The Farm, Elmvale, 2008

Since 1976, we have planted 24,464 trees (more than 10,000 of them by hand). Trees have been planted mainly around the perimeter of the farm property, but also along the Wye River. Species planted (more than 50) include White Spruce, Red Oak, Silver Maple, White Ash, Black Walnut, as well as several Carolinian species such as Kentucky Coffee Tree, Cucumber Magnolia and Blue Ash.



Planting trees along the Wye River has been to the great delight of the local beaver population – they were so pleased, they decided to move onto the farm – permanently. Where did they find the lumber to build their home ?

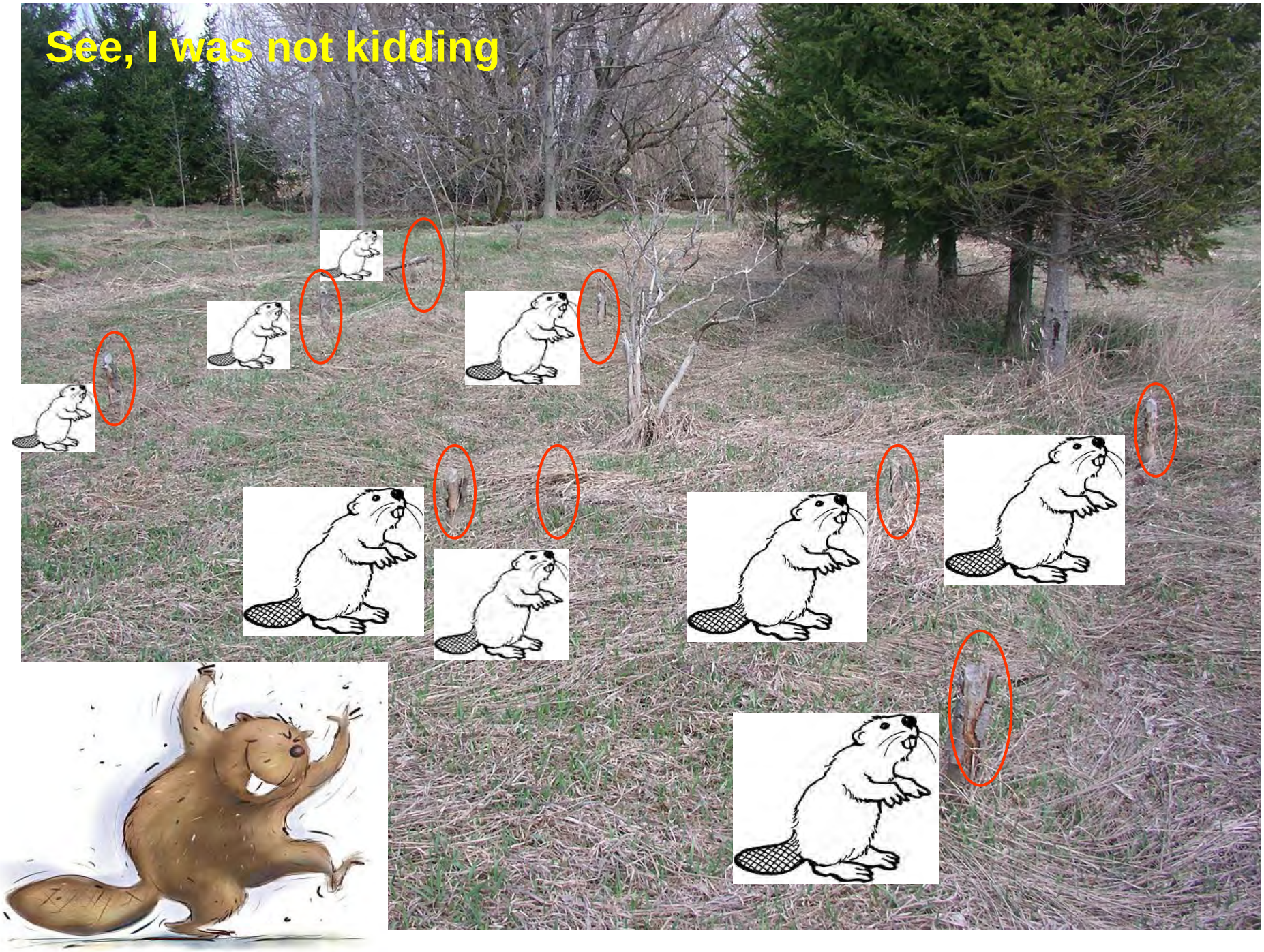

from the trees we have been planting !!!!!!!!

So much for the grove of Black Cherry we planted for the birds !!! During a winter visit to the farm property, I had been admiring how well these trees had done. During the next visit, in May to plant more trees, these were all gone……..

This aerial photo (2005), shows the White Spruce planted by the OMNR in 1991. Fourteen thousand, four hundred seedlings were planted by machine, around the perimeter of the farm, in a swath at the back, and along the Wye River.


Sadly, MOST of the spruce trees planted along these sections of the river had been pretty much cleared out by our friend the beaver (see next photo)

See, I was not kidding



After humans, beavers modify the environment around them more than any other animal.

The beavers must have been nibbling away at this ash (on our farm property) for decades….. despite the savage attacks over the years, the tree has not yet given up hope, and continues to sprout new shoots. In fact, being coppiced like this, either by man or by animal, a tree can conceivably live forever…….

Coppiced willow, Bammental, Germany, Dec 2010

Manitoba Maples are growing in profusion along the river. Not a useful wood and considered a nuisance tree for its ability to seed in profusion and grow so quickly, we have been cutting these trees along the river. But we do not kill the trees, rather allowing them to re-grow, in the hope of providing a food supply for the beavers while maintaining the root systems so important to combat soil erosion.

The branches cut from the Manitoba Maples are piled around the young spruce trees, in the hope of discouraging the beaver, and to make brush piles for wildlife (with thanks to Tommy Noernberg for skillful use of the chain saw).

Even though cages were built (by volunteers from the Elmvale District Secondary School) to protect some of the remaining spruce trees along the river, the beavers appeared to be pulling them down. Perhaps “our” beavers are particularly industrious ?

We learned that the cages must be tall enough to prevent the beavers from pulling them down, possibly in winter, when they are able to work from the top of the snow pack.

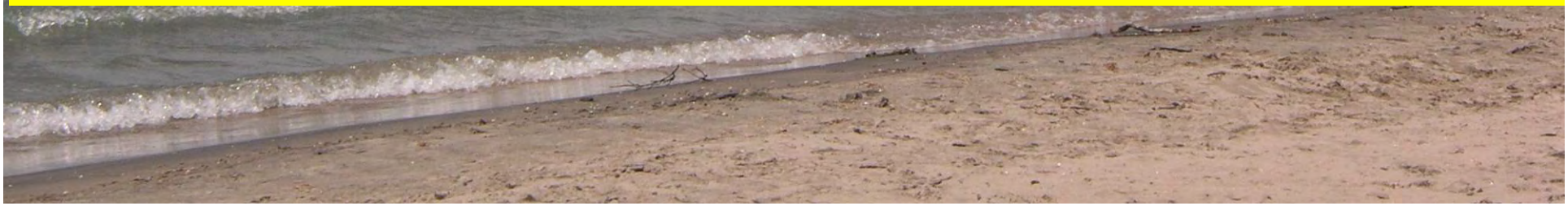
But how to provide cages for all of the trees we intend to plant along the river ?

And these cages do not prevent mice from girdling the young trees, another effective form of destruction. So, it became clear that we needed to find a more effective solution for protecting our trees…….

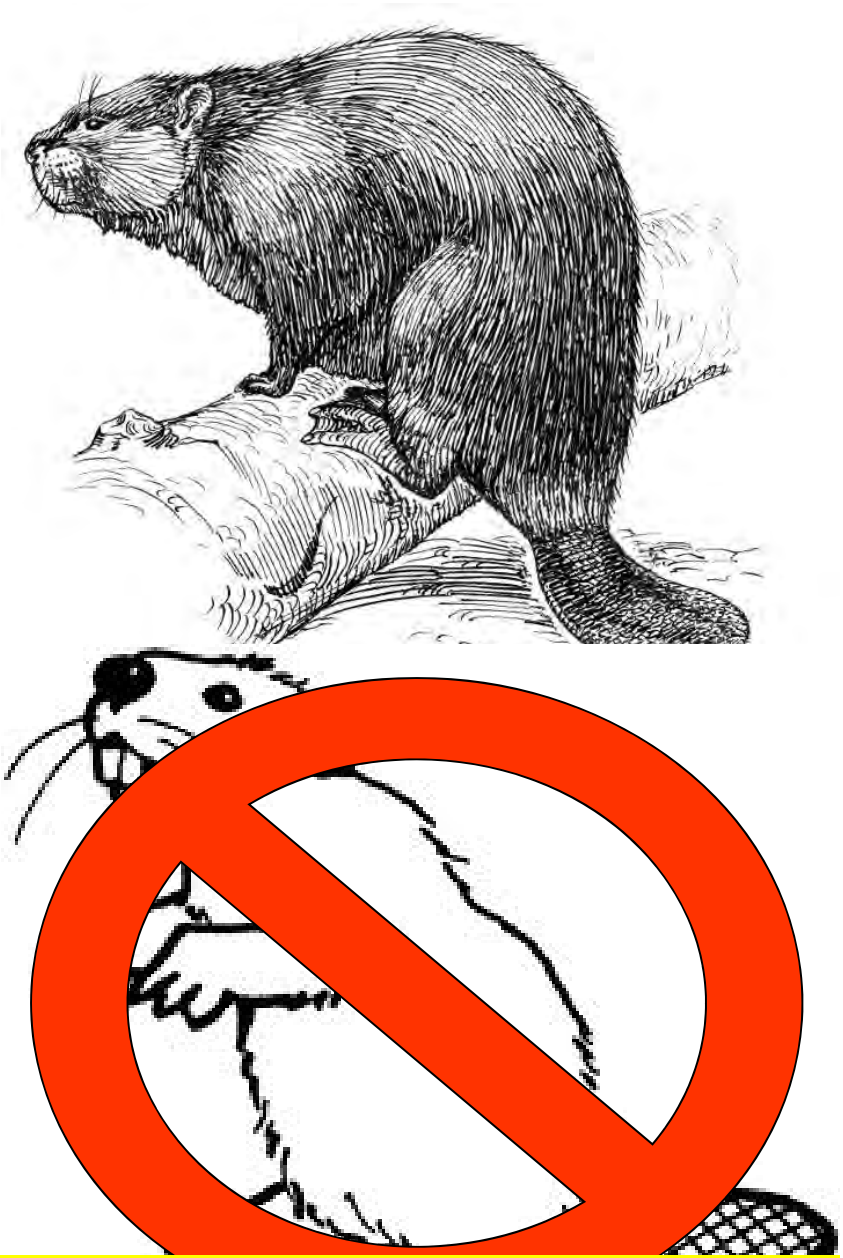
The solution to the problem is **"Beaver Leav'er"** which is nothing more than a 50:50 mixture of latex paint with beach sand. This is painted onto the trees, and the beavers are supposed to ignore them as the grit is found unpleasant.

The latex paint comes from leftover paints from our basement, as well as donations of leftover paints from friends and family.

The beach sand comes from Allenwood Beach which is just 6 km W of the farm. As this is part of the longest contiguous freshwater beach in the world, there is no risk of depleting these resources by collecting a pail or two every few decades (we have not yet used half of the first pail we collected five years ago).



This picture shows one of our volunteer field technicians applying the product to a young Black Walnut. We paint only the valuable hardwood trees such as this species, as well as White Ash, and Silver Maple. Red Oak are not planted near the river, but where we find beavers travelling to reach the oaks, we paint them too. Beavers are very good at finding the most delicious tree species !



Our first evidence that **Beaver Leaver** really works: in May of 2010, we found this White Ash that had been painted: the beaver had evidently taken a bite, then given up.

This picture was taken of the beaver, during a spring flood, as she swam under the footbridge I was sitting on, just beneath me – an experience I will never forget.

While we have lost many, many trees to the beaver, in fact we are proud to have them on our farm property as they are testimony to our efforts to restore the Wye River. We love our beavers, and they love us. On at least three separate occasions, while planting trees at the farm, a beaver has swam toward me, as if to say thanks, or at least to show appreciation.

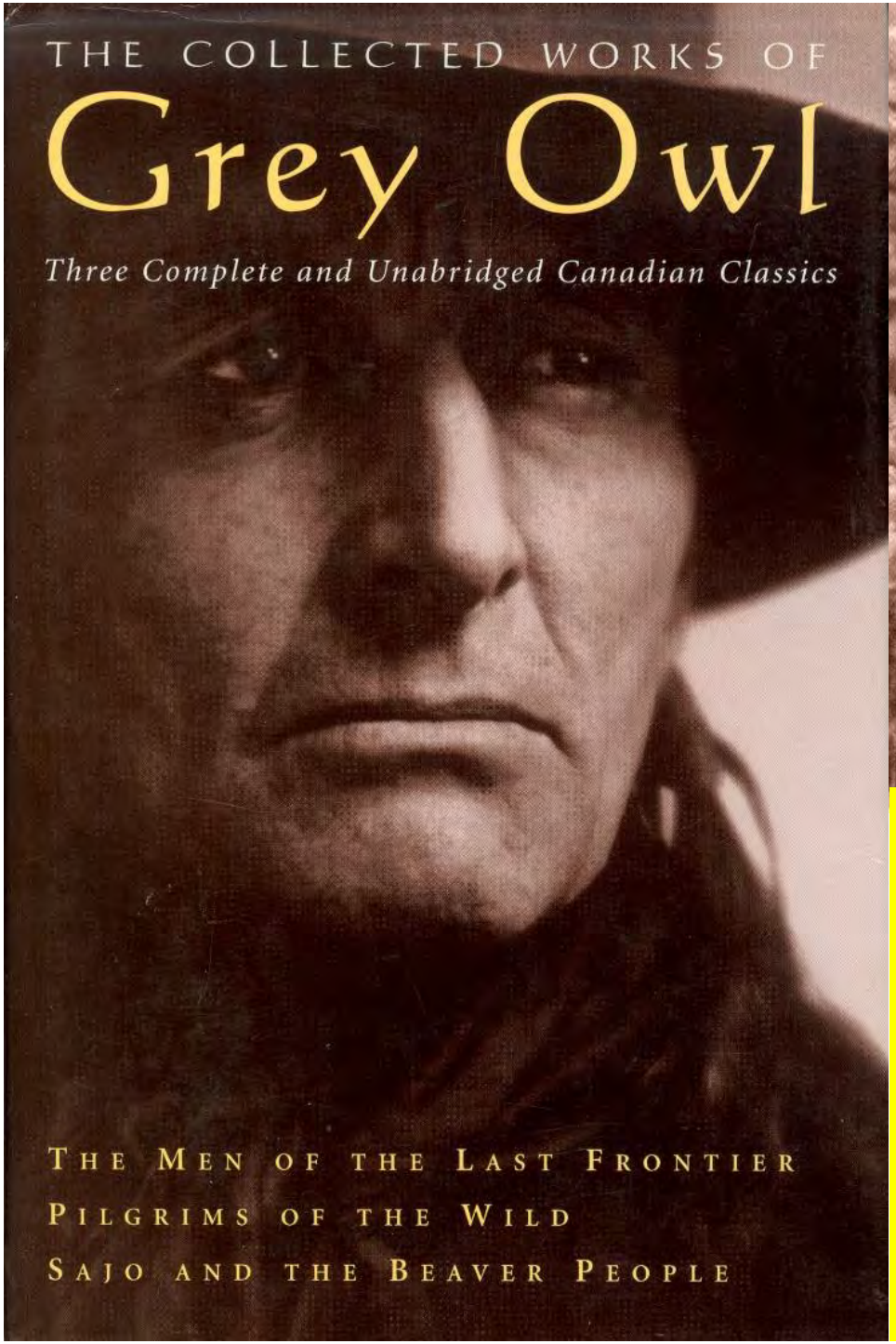
For example, in May of 2006, just after we finished planting the last tree, as the sun was setting on the Wye River, the mother beaver swam toward us, as if to thank us for our efforts…. I was so pleased my daughters could share this experience, and their friends.

The Natural History of the Beaver

The beaver is very intelligent, with amazing engineering skills which allow it to completely alter its environment, rendering the surrounding terrain more useful to its needs and making it one of the most remarkable members of the animal kingdom.

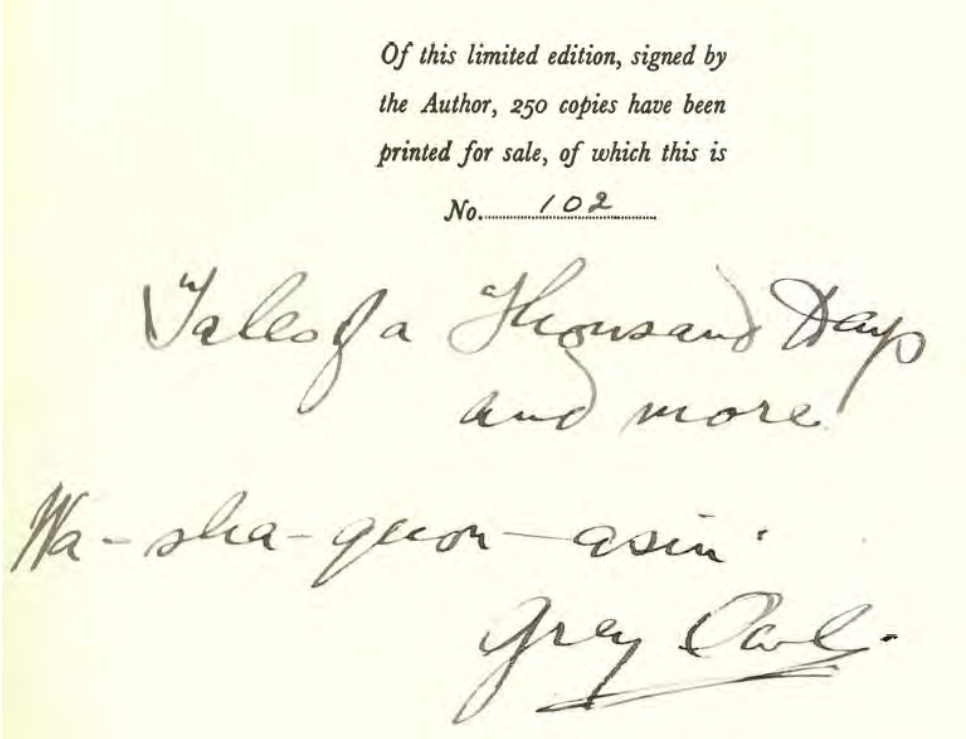
This wetland is between Crumby Lake and Kawagama Lake, in Haliburton Township. When I visited this area as a young boy, this was a beaver pond where I would collect minnows to use for bait during my fishing trips. Approximately forty years later, the pond is nearly completely filled by aquatic vegetation, creating a swamp. Prior to the arrival of Europeans, the beaver had completed altered riparian zones across North America, creating countless wetlands with their unique ecosystem hydrology and ecology.

The Beaver in the History of Conservation



It may be our national symbol today, but in fact the beaver had been hunted for its fur almost to extinction. A turning point in the fate of the beaver was the writing of Grey Owl (Archibald Belaney) in the 1930's who helped to educate the general public about these remarkable creatures, the need to protect them, and the natural environments they occupy.

Grey Owl (Archibald Delaney, b 18.9.1888, Hastings, England) first published "The Last Men of the Frontier" in 1931 and his writing was probably the catalyst for conservation in Canada. With the beaver rapidly disappearing because of over-trapping, Grey Owl used this in a brilliant illustration of the dangers, and tragic consequences, of over-exploitation of our natural resources. Ironically, his title of the book was "the Vanishing Frontier", placing an emphasis on the environment, but apparently this was changed by the publisher, for commercial reasons.



Of this limited edition, signed by the Author, 250 copies have been printed for sale, of which this is

No. 102

Tales of a Thousand Days and more

Wa-sha-geon-asin.

Grey Owl.

Special Edition, limited to 250 copies, with extra plate reproduced in colours from the portrait of Grey Owl by

SIR JOHN LAVERY, R.A.

At a used book store in Edmonton, I happened across a First Edition of “Tales of an Empty Cabin”, signed by the author. I was thrilled. The bookseller told me her mother used to travel to Prince Albert National Park in Saskatchewan, to help Grey Owl feed the beavers,,,,

Courtesy: National Parks of Canada

Jelly Roll; jovial, wayward and full of whims

The main characters in his book were Jelly Roll and Rawhide.

Courtesy: National Parks of Canada

Rawhide; calm, silent and inscrutable

The beaver has certainly been making a comeback, with the Wye River only one example. On a recent canoe trip in Algonquin Park, we met (and had to cross) 17 beaver dams along a single section of stream (Birchcliffe Creek). Beavers are now found as south in Ontario as Toronto and London, and are even found in the downtown areas of these cities.

The beaver is now found in Grenadier Pond, near High Park, in the neighbourhood where I grew up, now part of downtown Toronto. The arrow points to my childhood home. When I was young, there were no beavers in the pond, but there is certainly plenty of evidence of them there today.

skull of Giant Beaver (now extinct) found in glacial sediments of the Don River Valley, Toronto
Castoroides ohioensis

The Giant Beaver was less fortunate and reminds us that “extinction is forever”. I am so glad our *Castor canadensis* was brought back from the brink of extinction.

skull of adult beaver

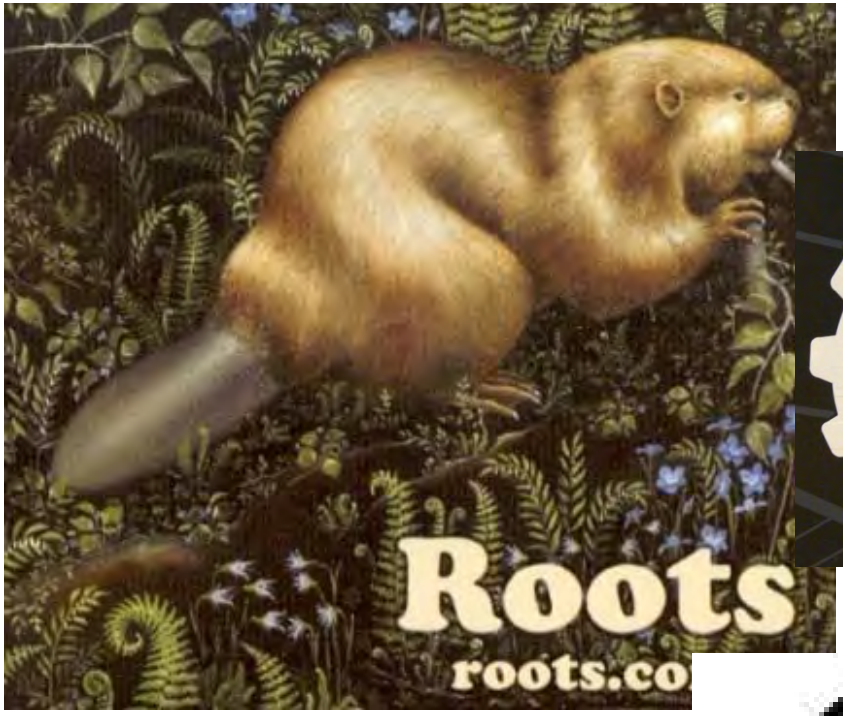
The Beaver in our History

Canada's first stamp, designed by Sandford Fleming and featuring a beaver, was issued in 1851; the first post-Confederation stamp, with a picture of Queen Victoria, was issued in 1868. A formal postal service was operating by the 1860s.

The beaver has also made a comeback on our postage stamp: the stamp on the right is from 2014

The beaver has also made a comeback on our nickel: it disappeared in 1945 to celebrate victory in Europe, marking the end of WWII; it disappeared in 1967 when a hare appeared in its stead, to help celebrate Canada's centennial. But as you can see, the beaver is back where it belongs,,, on our nickel

The Beaver in our Culture

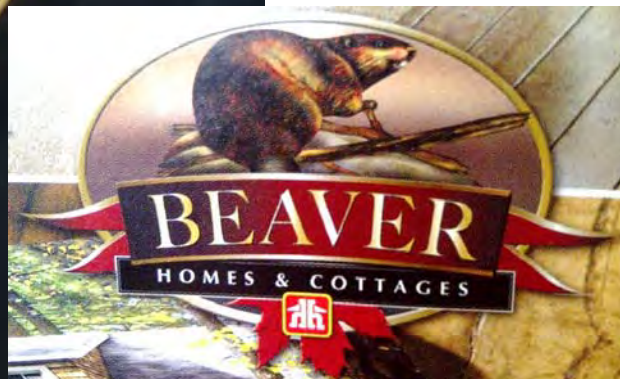


The beaver is on the logo of Parks Canada, and many Canadian companies and organizations


CANADIAN PACIFIC RAILWAY
1881


CANADA
CARTAGE
SYSTEM


ALBERTA TRAPPERS
ASSOCIATION


BEAVER
HOMES & COTTAGES


BEAVER
BRAND
The Original Since 1929
L'Original depuis 1929
Sweet Hot
Mustard
Moutarde
Sucrée Forte
Gold Medal Winner
Gagnant d'une Medaille d'Or
360 ml
BEAVER
BRAND
The Original Since 1929
L'Original depuis 1929
Olde English
Mustard
Hot/Forte
Moutarde
Vieux Anglais
Award Winning Condiments
Condiments Gagnants du Prix
360 ml
BEAVER
BRAND
The Original Since 1929
L'Original depuis 1929
JALAPEÑO
Mustard
Hot/Piquant
Moutarde aux
PIMENTS JALAPEÑO
Gold Medal Winner
Gagnant d'une Medaille d'Or
360 ml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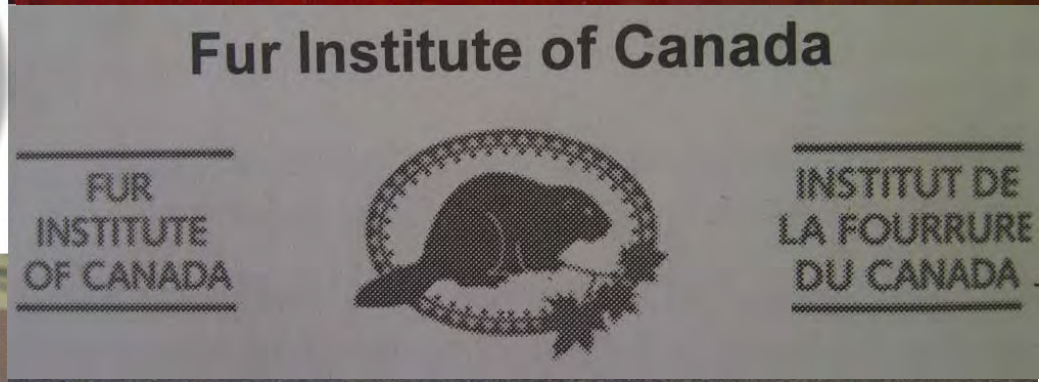
2014


SLEEMAN


Fur Institute of Canada
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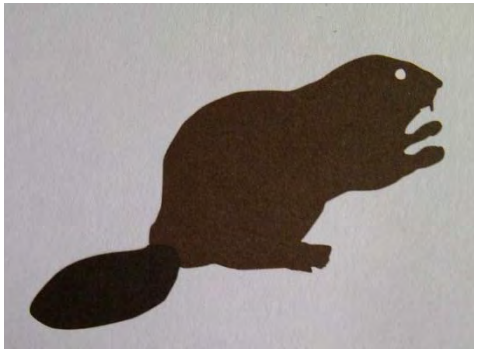
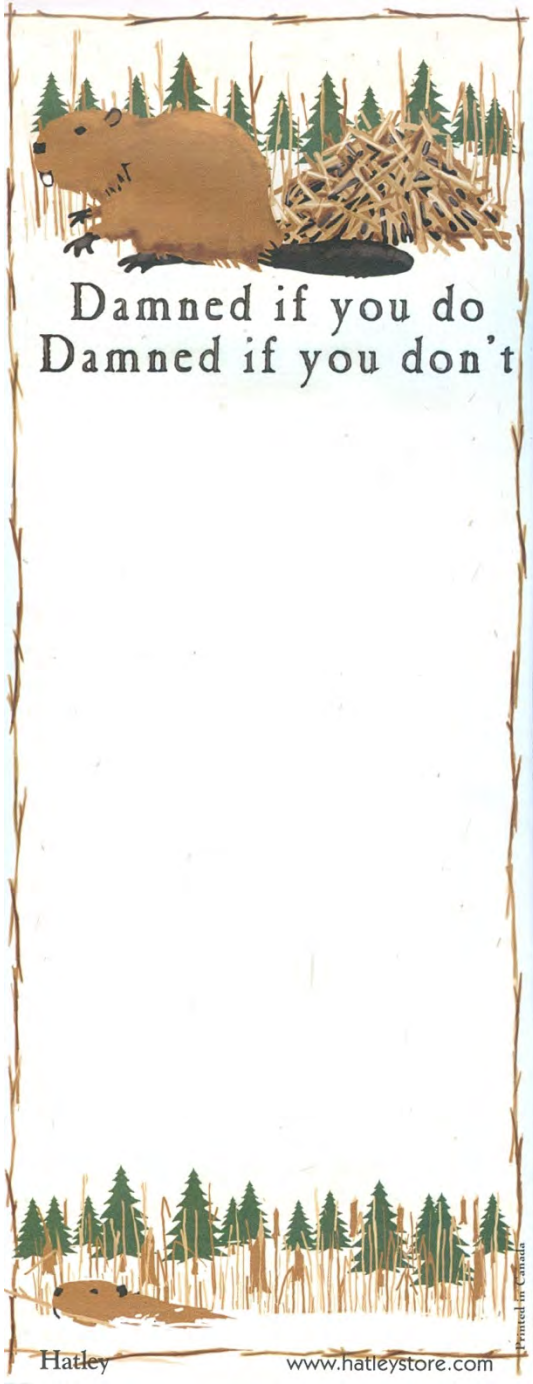
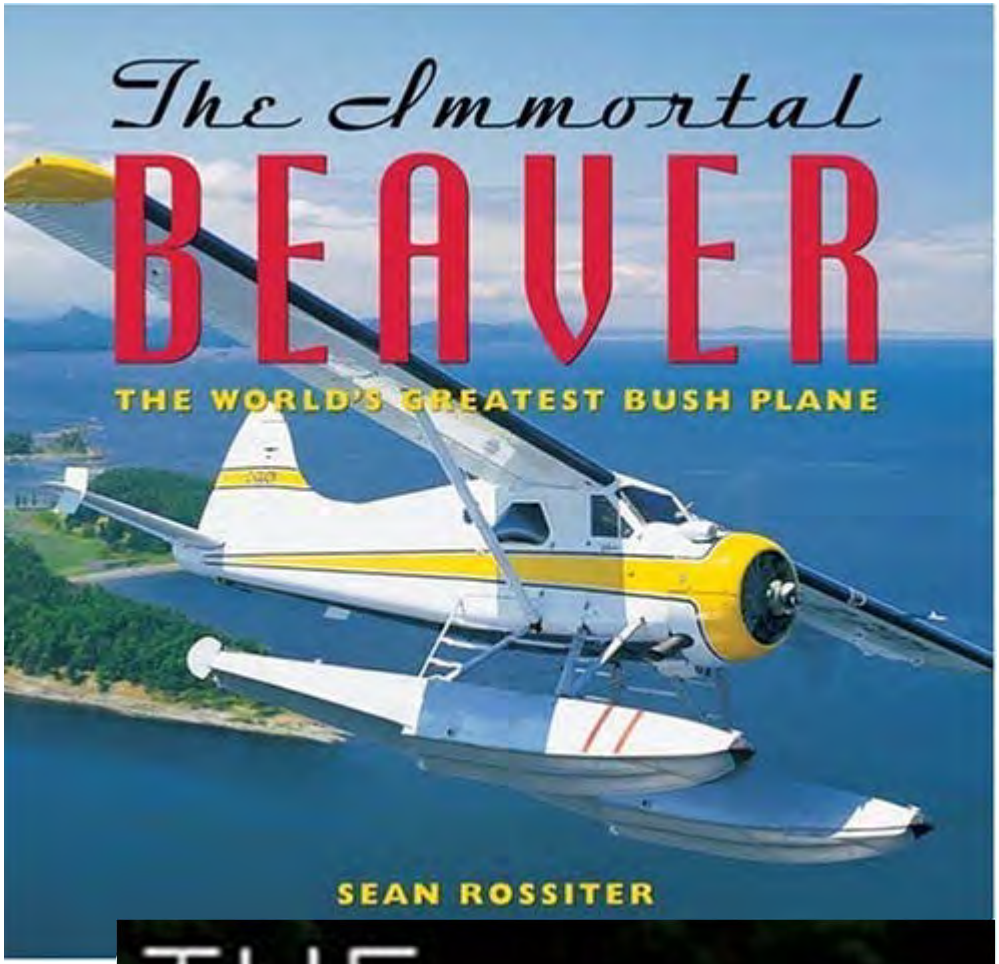
BEAVER
PROMOTIONS

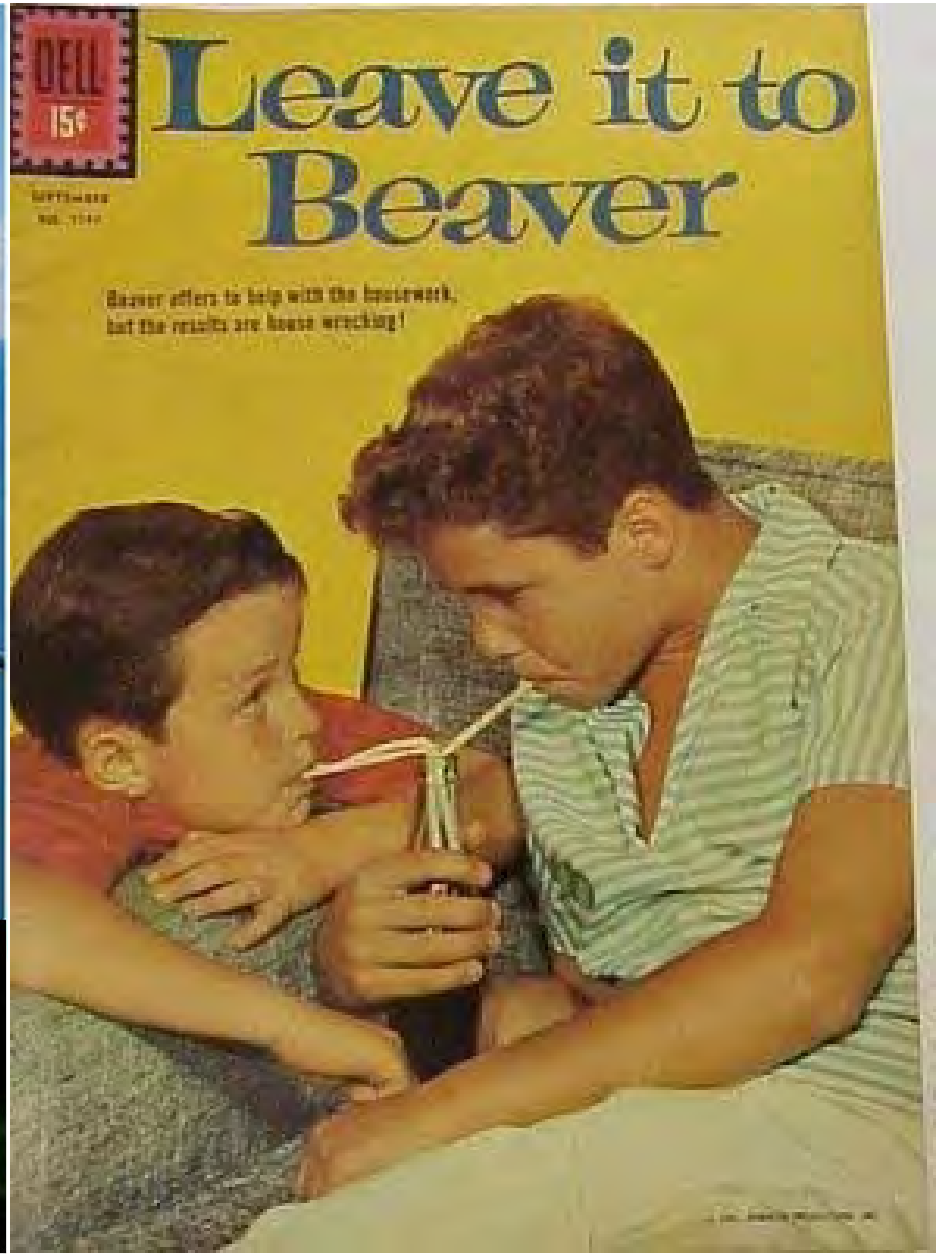




Haida Totem by Anne Hudec

The beaver is also on the logo of the University of Toronto, Toronto Metropolitan Police.





The beaver gave its name to a famous bush plane, a TV series, and the latest film by Mel Gibson

Beavers: too much of a good thing ?

THE LIFE STORY

OF AN OLD PIONEER

Fascinating to read this account of the “Return of the Beaver” by a pioneer living in Simcoe County, Mr. Cecil Knuff. The arrival of the beaver was met with disbelief at the end of the 1940’s. But the great intelligence of the beaver (below, red outline), has long been admired.

by CECIL KNUFF

THE RETURN OF THE BEAVER

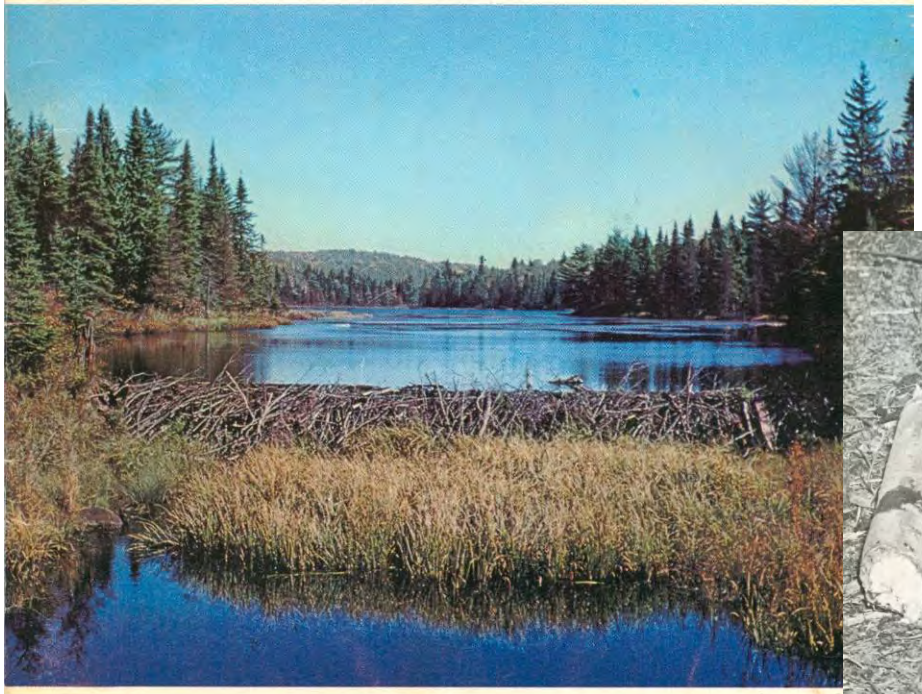
From the start of the 19th Century the beaver was very scarce in this part of the country. Very few people heard of them till the year 1946 or 1947. A gang of men were working in the bush about a mile from the mouth of the Nottawasaga River. When they had got cut back to the middle of the bush they came across those poplar trees with a big gouge or bite taken out of them near the butt. Well, none of them young fellows never saw the work of a beaver, but they figured thats what done it. When they told an old timer about it he laughed and said it was only a porcupine. Well, I saw a lot of work of a porcupine, they mostly bark a tree near the top.

That winter was one of the worst for snow. It got so deep they had to quit work, there was three feet of snow on the level. Well, in the spring when the snow went and the streams opened up and the weather got nice, a man by the name of Ruttle was out for a walk. He noticed along the bank of Sturgeon Creek some small trees had been cut. He just thought some children had cut them and thought no more about it. About a week after he was down that way and there was more cut. He went down along the stream and sure enough the beaver had returned and had started building a dam. So when the lads heard this, they went to the man who had laughed at them and said it was a porcupine. They told him they were right about the Beaver and told him the beaver was on Sturgeon Creek. He said "Don't that beat all! I have been here a long time and this is the first time I have heard of beaver around." He said that's a bank beaver, they don't build dams.

He said how there came to be a bank beaver. "The beaver is just the same as people. They have a family of good workers but sometimes there is one lazy one. He won't work, so they give him all kinds of chances but still he won't work, so the old boss beaver gives him a kick in the rear end and told him not to cross their trail again. Well, he is on his own then. Through time he will meet up with a lady beaver and they will have a family. But by him being kicked out of his home he never learned to build a dam, so where they build now is just along the banks of the streams."

It's too bad that they have got so plentyful that they have got to be done away with. The beaver is a very wise animal. A friend of mine was working on a roof near the river. He saw a large beaver trying to get a log down the hill. It had got stuck in the sand. The old beaver was alone. He walked around the log and looked at it from different angles. Then he shoved the log to one side. He went down to the river and brought a load of mud on his tail and plastered it on the side of the log. He did this different times then he went to the other side and did the same. Then he cleaned the sand away from the front of it and went to the river and brought more mud and greased ahead of the log. Then he got behind and shoved. At last the log let go and down the hill and into the river. He said that beaver had a smile on his face you could see a mile.

THE BEAVER IN ONTARIO



ONTARIO MINISTRY OF NATURAL RESOURCES

THE BEAVER
IN ONTARIO

By

MILAN NOVAK

Supervisor of Furbearer Management

Commercial Fish and Fur Branch

1972

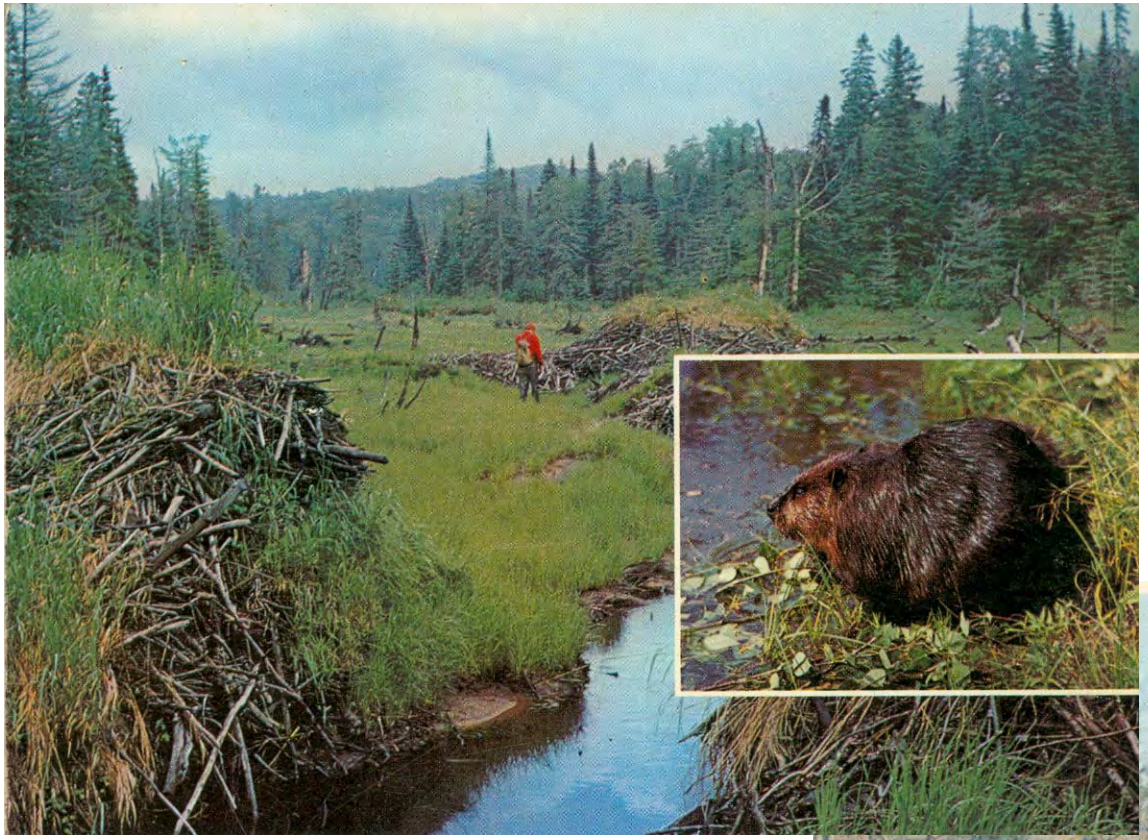
The beaver, valued highly for its fur, has a profound effect on the environment.

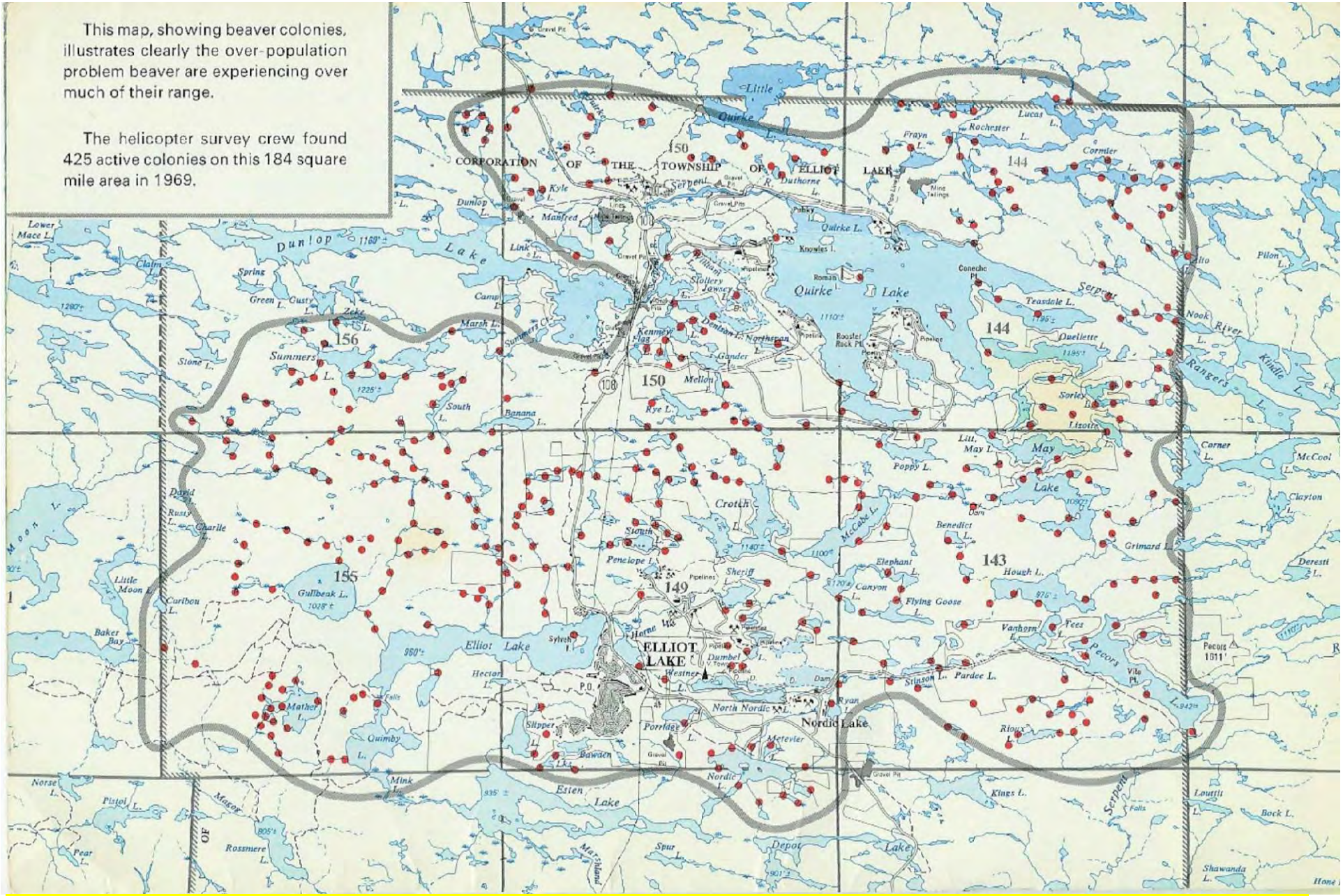
ONTARIO

MINISTRY OF NATURAL RESOURCES

Hon. Leo Bernier
Minister

W. Q. Macnee
Deputy Minister





By 1972, when this report was published, there were already parts of Ontario over-populated by beaver.

EPILOG: save a tree, eat a beaver

We have been very fortunate indeed to be able to experience the beaver as we have and to have developed a relationship with them. We have done our very best to try to find a way for them to live as they please, while at the same time allowing us to be able protect the most desirable, and useful, tree species for erosion control, and help to create habitat of many other animal species.

We left the Manitoba Maple for the beaver , but learned it really does not enjoy eating this species ! We learned to paint our trees using masonry sand (with its rougher edges and more angular particles), but it is very difficult to paint young trees. We are building as many cages as we can to protect our trees, but we cannot construct cages as fast as we need to plant,,,,

Finally, last year, when there was a tremendous loss of black walnut near the river, I felt I had no choice but to call the trapper. Ken Forget (L) came to the property and caught two very large beavers, using instant kill traps. Nothing will be wasted: Ken will feed the meat to his family, and I will be getting a pair of beaver mittens.

The liver and kidney of these animals have been kept frozen, and will be measured in my laboratory at the University of Alberta, for heavy metal contaminants such as arsenic, cadmium, and mercury. I hope to undertake similar studies of these same elements in liver and kidney of beavers from northern Alberta, to see if there have been any impacts of industrial development on the AB animals. So, the beaver from our farm near Elmvale, ONT, will not go to waste, but rather provide a helpful reference level, against which other animals may be compared.

DENTAL MATERIALS

Amorphous intergranular phases control the properties of rodent tooth enamel

Lyle M. Gordon,[1*] Michael J. Cohen,[1] Keith W. MacRenaris,[2] Jill D. Pasteris,[3] Takele Seda,[4] Derk Joester[1]†

Dental enamel, a hierarchical material composed primarily of hydroxylapatite nanowires, is susceptible to degradation by plaque biofilm–derived acids. The solubility of enamel strongly depends on the presence of Mg^{2+}, F^-, and CO_3^{2-}. However, determining the distribution of these minor ions is challenging. We show—using atom probe tomography, x-ray absorption spectroscopy, and correlative techniques—that in unpigmented rodent enamel, Mg^{2+} is predominantly present at grain boundaries as an intergranular phase of Mg-substituted amorphous calcium phosphate (Mg-ACP). In the pigmented enamel, a mixture of ferrihydrite and amorphous iron-calcium phosphate replaces the more soluble Mg-ACP, rendering it both harder and more resistant to acid attack. These results demonstrate the presence of enduring amorphous phases with a dramatic influence on the physical and chemical properties of the mature mineralized tissue.

746 13 FEBRUARY 2015 • VOL 347 ISSUE 6223 Corrected 13 February 2015; see full text. sciencemag.org SCIENCE

By the way,,, the orange colour of the teeth of the beaver (above) and the porcupine (left) ? That's due to some iron-containing minerals ! No wonder their teeth are so hard !