

Dan Botkin's Newsletter

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The Ecology of Halloween: Why Bats and Jack-O-Lanterns?

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Milling grain using traditional methods, Mindanao, Philippines in the 1960s

When agriculture was much more primitive, well before our own scientific and technological age, it was common around the world for people to hold harvest festivals during which they would use magic in the hope that this would ensure a good harvest the next year.

People have always been deeply connected with nature, but before our modern times, before the scientific and technological age, back when most people lived on farms and grew their own food and provided much of the materials of their lives from their own work or the

work of their neighbors, the connection with nature was daily and seasonal.

Those were times, early in the invention of agriculture, when growing crops was even chancier than it is today, and lacking modern science, people believed their only control over farming lay in magic and religion. Day-to-day work in farm fields was heavily based on what people had learned over many generations, and people were directly in touch with what we think of as the basics of farming. But around the world, from Borneo to Poland, magical ceremonies accompanied celebrations of the harvest.

Halloween goes back to ancient Celtic traditions on the British Isles, as the celebration of the harvest and the hope that next year's crops will be bountiful.

According to the American Folklife Center of the Library of Congress, *"Halloween had its beginnings in an ancient, pre-Christian Celtic festival of the dead. The Celtic peoples, who were once found all over Europe, divided the year into four major holidays. According to their calendar, the year began on a day corresponding to November 1st on our present calendar. The date marked the beginning of winter. Since they were pastoral people, it was a time when cattle and sheep had to be moved to closer pastures and all livestock had to be secured for the winter months. Crops were harvested and stored. The date marked both an ending and a beginning in an eternal cycle. It was the biggest and most significant holiday of the Celtic year."*

Why bats as part of Halloween?

Part of the Celtic belief was that at the celebration of harvest the dead walked and mingled with the living---ghosts, fairies, and demons.

People lit bonfires, both to honor the dead and to keep them away. The bonfires attracted insects and the insects attracted bats, which were feeding at night, hence bats became associated with the harvest holiday---and hence people dressing up in costumes of fairies, ghosts, and devils.

Why has Halloween become mostly a children's holiday?

In his classic book *The Golden Bough*, about myths and folk tradition, Sir Gordon Frazer showed that many early civilization rituals, especially those connected with the cycle of crops --- birth, growth, harvest, and therefore death -- began as the way they could influence the future. But over time, what began as human sacrifice was reduced to sacrificing a domestic animal and then just a puppet of an animal. Eventually, as the practice became no more than a folktale, it would become a children's game. And this is how Halloween, once believed to be the way people could help their crops for the next year, was reduced to our trick-or-treat evening.

Why hollowed-out pumpkins with a face and a light glowing from inside?

The name "jack-o'-lantern," from Great British folk history, was also a popular nickname for the natural phenomenon known as *ignis fatuus* (fool's fire), or "will o' the wisp" — those then mysterious, flickering blue lights seen sometimes over wetlands at night. Before modern science, those flames were part of British folklore, said in folk stories to be caused by mischievous ghosts or fairies.

In modern times, some scientists have tried to explain what causes these some flames over

wetlands. The fuel is simple---methane gas (which we know also as natural gas) given off by bacteria as they decompose plant organic matter in wetlands. But what lights the methane? Not quite so clear. One explanation: There are also certain phosphorus compounds, which can ignite when in contact with the oxygen available in Earth's normal atmosphere. These in turn might ignite methane when both are released from wetlands.



New York's Empire State Building in Halloween pumpkin colors October 2014

The pumpkin is American, so the Celts didn't have them. In Britain, they used turnips, which they hollowed out, carved faces in, and lit with candles from the inside, representing some of those mysterious and to them magical events of the harvest celebration and also as a way to scare the ghosts, fairies, and devils.

In my previous newsletter, I wrote about Ebola and invasive species, pointing out that some non-native species have had great benefits. We can add pumpkins to that list. They have been spread widely by people, providing one advantage to Halloween back in Great Britain and wherever it is celebrated---much better to cut out faces.

Halloween’s history tells us how closely people used to be in direct, daily contact with nature.

The origin of Halloween seems to us moderns of the scientific, technological and social media age to be primitive and completely misunderstanding of how nature works. But there were aspects of that earlier life that also helped people to know about nature in ways that are much rarer for us, with only 2% of Americans involved in agriculture.

Scurvy, the disease caused by lack of vitamin C, used to plague European sailors. The story is told that the captain of one of the first British ships to explore the St. Lawrence River (bordering eastern U.S. and Canada today) met with the Indians living along that river. They showed the captain that nibbling on the needles and bark of hemlock trees cured and prevented scurvy---there was enough vitamin C in those needles and bark, otherwise not very good food, to make the difference. Hence the later use of limes and other citrus fruits on British ships and the traditional name “limeys” for British sailors.

It was also known to American Indians that chewing on willow bark helped headaches and fever --- the bark contains what we call aspirin and scientists named *Acetylsalicylic Acid*, from the Latin word for willow, *Salix*, also the name of the genus of willow trees. Like Halloween, the scientific name of aspirin has its origin in folk traditions.

Although as an ecological scientist I deeply want us to know a great deal about nature, and want to avoid being immersed only in folktales of the imagination, daily contact with nature did have its advantages.

Where did the name “witch hazel” come from?

Witch hazel is another chemical made from a tree, and its medicinal benefits were known to peoples in pre-scientific times. The name came about because this small tree flowered late in the fall after most other plants, and its fruits matured much later, sometimes in the spring, and still hung on the plant at the same time it was flowering. This was the opposite pattern to most other plants, including the crops that peoples depended on, which flowered in the spring and fruited in the fall. Since this seemed backwards and wrong, it was attributed, as with other harvest events, to be the work of fairies or witches, hence the name (the size and shape of the tree was like hazel).



Witch hazel flower (New York Botanical Garden photograph)

It was that day-to-day contact with nature and the direct dependence on nature and nature-knowledge that led to the naming of witch hazel. While I’m of course glad we

have moved into the scientific age with modern medicine and agriculture, I regret that we have lost that daily, intimate contact with nature. Without that contact, we are easily misled about what is actually known and makes sense about environmental issues and about environment and people.

There is an irony in comparing our modern nature-knowledge with that of ancient civilizations. People knew the particulars about some things in daily contact but were wrong in their general understanding of cause and effect. With our science we know so much more about cause and effect, but without that daily contact with nature, we are, as individuals, more easily confused about what is good, accurate, science and what is not. I wish we could find ways to bring back that greater daily personal contact with nature in combination with our modern scientific and technological expertise.

It's a very Thoreauvian wish --- Henry David Thoreau sought both kinds of contacts, doing good science and on his daily four-hour walks in the woods becoming intimately familiar with nature in this personal sense. He did good science when Agassiz hired him to do a study to prove that the regeneration of vegetation was spontaneous – coming about without seeds or any propagules. Agassiz, European-born, became America's first professional scientist in that, as a professor at Harvard, he was paid to do scientific research and to teach it.

Thoreau did his usual. He listened to what somebody else said, in this case Agassiz, and then went out and searched carefully, through observation, for his own answer. He showed that seeds were spread by wind and animals---in animals' fur, by their feeding on fruit, and so forth, and that there was no such thing as spontaneous generation of plants, contrary to what Agassiz believed and had hired him to prove.

At the same time, Thoreau came to know nature directly, intimately, to the point that one day he wrote, "I caught a glimpse of a woodchuck stealing across my path, and felt a strange thrill of savage delight, and was strongly tempted to seize and devour him raw; not that I was hungry then, except for that wildness he represented."

Are we originators of future children's folktales and holidays?

We think of ourselves as the scientific and technological civilization, divorced from ancient rituals, folklore, and mythologies such as the day when the dead walk the Earth and we can walk around with effigies and puppets of spirits, fairies, and animals and affect our future. But are we? Perhaps some things we take seriously and use in our forecasting will in some future century become things to amuse children on a winter's eve.

Putting It All Together, Briefly

- Halloween began as an ancient celebration of crop harvests. Like so many other ancient rituals, once it became

clear that it held no truth it devolved into a children's holiday or game.

- In ancient times, people had a wrong general understanding of nature, but knew a lot of details about nature observation. Today the opposite is true; scientists can tell us a lot about cause and effect, but because we lack that detailed day-to-day contact with nature, we are easily fooled about what is correct and what are folktales.

Who Said That? A Regular Newsletter feature.

A lot of pundits make assertions that are supposed to be true, but don't back them up. For those who want to check what I write about, here are the sources for this issue:

Thoreau's study of the spread of seeds

Thoreau, H.D., *Faith in a Seed: The Dispersion Of Seeds And Other Late Natural History Writings* ed. B.P. Dean. 1996, Washington, D.C.: Island Press.

Thoreau and the woodchuck and much else about him and nature

One of my books, *No Man's Garden: Thoreau and a New Vision for Civilization and Nature* (ebook and hard copies)

Ancient beliefs and festivals about harvests

The classic book is Frazer, J.G., *The Golden Bough (volumes 1 and 2)*. 2012 (reprint): Library of Alexandria.

More can be found at the American Folklife Center's website.

<http://www.loc.gov/folklife/halloween.html>

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