

The Butterfly Effect

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Harnessing the spirit of residents, schools, organizations, places of worship,
and businesses to create a greener community.



An Introduction to This Journal

In mathematical chaos theory, the butterfly effect is the concept that a *very small difference in the initial state of a physical system can make a significant difference to that state at some later time*. What can this theory offer to the communities in which we live? We think it offers a lot. The cumulative effort of individual actions can positively impact the local ecosystems that comprise our lakes, streams, wetlands, yards, gardens, recreational areas, open spaces, roadsides, schools, and places of worship. Margaret Mead’s powerful idea, “Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it’s the only thing that ever has,” informs the articles you will read in this journal.

Neighborhood Greening, a non-profit organization dedicated to environmental education and stewardship, publishes *The Butterfly Effect* four times each year. In the journal, we celebrate community successes, examine small but impactful changes we can make to become better stewards of our local ecosystems, and tell the stories of those who are striving to green their neighborhoods. By harnessing the spirit of community, we believe focused efforts will make our neighborhoods better places to live for both humans and wildlife. There is much we can do to positively impact our shared environment—together. House by house. Block by block. Neighborhood by neighborhood.

We hope you enjoy *The Butterfly Effect* and that you look forward to receiving this free publication in your inbox four times per year. You can sign up by visiting www.neighborhoodgreening.org.

Cover photo: The monarch butterfly on one of its favorite nectar sources: meadow blazing star. **Photo credit:** Vicki Bonk. **Left:** The common pondhawk dragonfly. Most dragonflies spend the majority of their lives underwater as larvae. There are about 140 species of dragonflies in Minnesota. Look for these fascinating creatures in your garden and yard. **Photo credit:** Dave Crawford

The Meeting of the Waters: Stories From Our Community

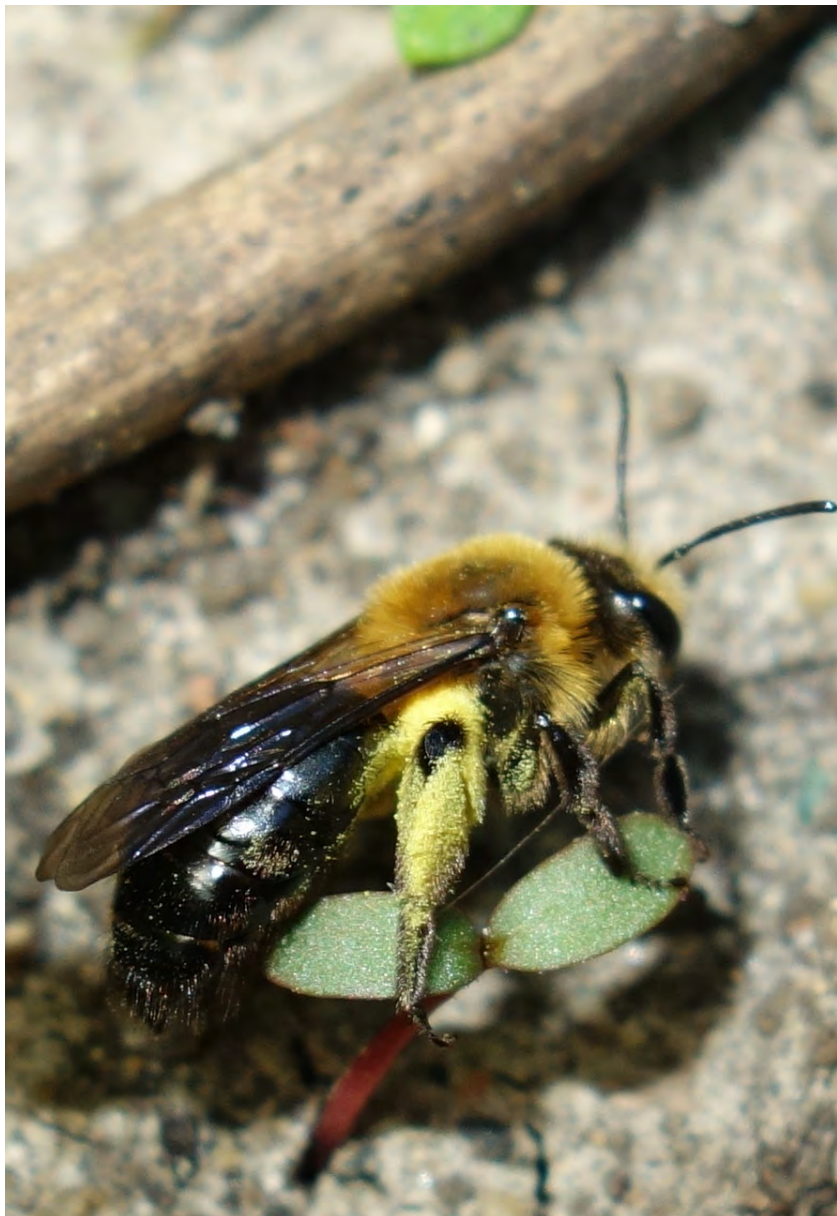
MaryJo and Charlie Skemp: The “Accidental Beekeepers”

About 15 years ago, MaryJo and Charlie Skemp started noticing unusual activity in a hosta planting that runs along the back side of their home. Beginning each spring, the garden would become an energy-filled flurry of what appeared to be bees, or perhaps wasps or hornets, hurriedly flying in and out of [anthill-like holes](#) in the ground. “We had no idea what these insects were,” recalls MaryJo, who grew up in West St. Paul and has been an elementary school teacher in School District 197 for over 30 years.

While the insects were never bothersome, Charlie and MaryJo nonetheless had an exterminator make a visit to their home after their daughter Laura was stung one year. They were told ground-nesting bees had made their nests in the perfect conditions—exposed bare soil—that existed on the side of the house. The exterminator recommended they leave the bees alone. Because the bees were docile, and stopped being active once spring ended each year, the Skemps decided not to explore other options to eliminate the bees and to instead coexist with them. The friendly partnership with these “buzzing” neighbors continues to this day. “The bees never stung anyone ever again,” states MaryJo. “They don’t bother the dog. We’ve gotten used to them.” Charlie, who has been a teacher at Henry Sibley High School for 17 of his nearly 30 years in education, doesn’t mind the bees either. “My family owns an apple orchard near LaCrosse, and bees are a strategic part of that operation,” he explains. “So I understand their importance as pollinators.”

While living side-by-side with ground-nesting bees may not be for everyone, the Skemps have been surprised at how uninterested the bees are in *them*. Minnesota is home to [over 400 species of native bees](#)—70 percent of which build their nests underground. Minnesota ground nesting bees include species of mining, cellophane, sweat, digger, and long-horned bees. All are important pollinators. These unassertive creatures can sting if they feel physically threatened, but it takes a lot to get them agitated. Some of the ground nesting bees’ stings, such as the mining bee, often do not even penetrate human skin.

Left, clockwise from top: “Accidental beekeepers,” MaryJo and Charlie Skemp, in their backyard garden, **below, right:** The mining bee makes its nest in sandy soils. This bee seems to be waiting for the photographer to leave before making its exit. **below, left:** This Minnesota native bee species, the mining bee (possibly *Andrena dunningi*), has had a friendly coexistence with the Skemp family for nearly 15 years. Seen here in the Skemp’s side garden in early May, the mining bee is a solitary bee that makes its nest in the ground. Note the yellow pollen gathered high on its hind leg.



Because habitat loss and other environmental stressors threaten many species of bees in Minnesota, as well as around the world, homeowners interested in inviting ground-nesting bees into low traffic areas of their yards are encouraged to keep some areas of exposed bare soil in the yard or garden and offer ground-nesting bees some of their favorite nectar and pollen flowers.

The insects flying near the Skemps’ home might have turned out to be yellow jackets, which often make their nests in the cavity of an old mouse hole, as well as insects other than bees. However, the signature [anthill-like mounds](#) with larger than ant-sized holes, combined with the bees appearing in the same place each year, and their gentle nature, provided clues that they were native mining bees and not wasps.

Not knowing what they were dealing with, the Skemps were wise to get an outside opinion regarding their fascinating neighbors. While wasps can pose a nuisance and are a threat to those with allergies, they are nonetheless also pollinators, beneficial as an insect predator, and have their own important place in our ecosystem. The [University of Minnesota](#) offers further information on wasps and bees, safety considerations, habitat, and options for removal or coexistence. [The Cariveau Native Bee Lab](#) at the University of Minnesota is also an excellent resource for any homeowners interested in better understanding what type of native bees may be in their yard.

While the Skemps aren’t really “beekeepers,” because native bees aren’t managed (unlike non-native honeybees that are managed in hives), they are doing their important part in helping wild bees stay wild. Offering a safe zone so that the bees can emerge each year for a few weeks indeed makes the Skemps the keepers of bees.

Above, right: A view of the Skemp’s hosta garden. A safe haven for native bees for 15 years. Wildlife thrives where it has suitable habitat. **Below, right:** At first glance these may appear to be anthills. However, the larger holes indicate a native bee has likely made its nest below.



Some Great Vegetation for Native Ground Nesting Bees*

Be sure to provide a succession of blooms from early spring to late fall. [Click here for an excellent podcast on native bees:](#) “[Bees and Native Forage with Heather Holm](#).”

- [Aster](#) (*Symphyotrichum* species)
- [Black-eyed Susan](#) (*Rudbeckia hirta*)
- [Blue lobelia](#) (*Lobelia siphilitica*)
- [Blue vervain](#) (*Verbena hastata*)
- [Chokeberry](#) (*Aronia melanocarpa*)
- [Chokecherry](#) (*Prunus virginiana*)
- [Coreopsis](#) (*Coreopsis lanceolata* or *Coreopsis palmata*)
- [Culver’s root](#) (*Veronicastrum virginicum*)
- Dogwood (such as [redosier dogwood](#), [pagoda dogwood](#), [gray dogwood](#)/*Cornus* species)
- [Golden Alexanders](#) (*Zizia aurea*)
- [Goldenrod](#) [there are many species of goldenrod, including zigzag goldenrod (*Solidago flexicaulis*) for shade, and showy goldenrod (*Solidago speciosa*) for sun]
- [Hyssop](#) (*Agastache foeniculum*)
- [Mountain mint](#) (*Pycnanthemum virginianum*)
- [Nannyberry](#) (*Viburnum lentago*)
- [Penstemon](#) (*Penstemon grandiflorus*)
- [Partridge pea](#) (*Chamaecrista fasciculata*)
- [Prairie clover](#) (*Dalea purpurea*)
- [Purple coneflower](#) (*Echinacea purpurea*)
- [Pussy willow/Willows](#) (*Salix discolor*)
- [Red maple](#) (*Acer rubrum*)
- Viburnum species (such as [American highbush cranberry](#), [downy arrow-wood](#), [nannyberry](#))
- [Wild geranium](#) (*Geranium maculatum*)
- [Wild onion](#) (*Allium stellatum*)
- [Wild rose](#) (*Rosa blanda*)

* [Bees: An Identification and Native Plant Forage Guide](#), by Heather Holm, is a good resource for learning more about native bees and the profiles of native trees, shrubs, and perennials that our native bees rely on to survive.

What We Plant Matters

Reimagining Our Yards as a Bird Haven

Living Next Door to the Avian Superhighway

Those who live near rivers in our metro area are fortunate to live alongside one of the world’s most amazing bird migratory routes: The Mississippi Flyway. Every year, over 325 bird species migrate from their breeding grounds in Canada to their wintering grounds in the Gulf of Mexico, and Central and South America. Living within this avian superhighway—**about 40 percent of all North American waterfowl use the Mississippi River Valley as a migratory flyway**—means great opportunities to spot a wide range of birds in our communities as well as our yards. As we well know, not all birds in our yards are seasonal visitors. Some birds—such as the chickadee, cardinal, and blue jay—live here year round. **Whether sustaining special bird guests as they pass hungrily through our yards, or helping full-time avian residents that rely on our yards year-round, how we care for our yards is surprisingly important to many bird species’ short and long-term survival.**

Due to rapidly vanishing bird habitat and other environmental stressors, many bird species are in decline. According to Doug Tallamy in his book *Bringing Nature Home*, “Neotropical migrants, such as wood thrushes, warblers, catbirds, hawks, wrens, vireos, flycatchers, kingbirds, nightjars, swallows, tanagers, orioles—species that fly thousands of miles to Central or South America to spend the winter—have declined an average of 1 percent per year since 1966. **For some species that is a reduction in population sizes by nearly 50 percent.**”

Insects are Crucial to Bird Survival

While helpful, birdfeeders alone do not a bird habitat make. **Ninety-six percent of land birds raise their young exclusively on insects.** If a sufficient quantity of insects is not available, birds can’t switch to food from the bird feeder to feed their young. It takes a huge number of insects to raise a single nest of baby birds (called a clutch). A [University of Delaware study](#) found that the Carolina chickadee needs to find between 5,000 to 9,000 insects to feed to a single clutch from the time the babies hatch to the time they can fly. Consider how many insects a larger bird might need to feed a clutch of babies. **How many clutches of birds does *your* yard support?**

The birds in our yards need grasshoppers, crickets, bugs, beetles, caterpillars, moths, flies, spiders, and more to feed to their young. To survive, winter birds need to eat the hibernating critters that are hidden in the leaf litter, twigs, mulch, thatch, tree bark, and other natural debris in our yards. Small birds, such as the hummingbird, rely on spider webs to build their nests. **In short: birds need insects, bugs, and spiders to survive.**

Above, right: Goldfinch on [meadow blazing star](#) (*Liatriis ligulistylis*). Many areas in the Twin Cities are located within an [Important Bird Area](#) (IBA). The goal of an IBA, according to the National Audubon Society, is to ensure the survival of wild bird populations through the identification and protection of their most important habitats. **Photo credit:** [Travis Bono](#). **Below, right:** While pictured here resting in a small tree, the dark-eyed junco spends most of its time foraging on the ground. This bird is found throughout the United States from Alaska to Mexico, California to New York, as well as our back yards in Minnesota. **Photo credit:** Travis Bono





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Grow Your Own Birdfeeder

Consider your yard a part of an important ecosystem. The concept of the hanging birdfeeder is evolving to the concept of transforming the *entire yard* into a “bird feeder.” Homeowners can make an important contribution to bird survival by supplementing their traditional ornamental landscape plantings with Minnesota native plants (trees, shrubs, flowers, grasses, and vines). Native plants provide important bird food sources far more robustly than non-natives. As an example, consider one of the most important insects for bird survival: the caterpillar. Native plants support 35 times more caterpillars (in terms of biomass) than traditional non-native landscape ornamental plants.

Attracting Insects to Your Garden May Seem Surprising

The majority of insects in our yards are beneficial. And they are the lifeblood of the food chain. According to the National Pesticide Information Center, out of nearly one million known insect species, only about one to three percent are ever considered pests. So, more often than not, insects are not “bad.” Even irritating mosquitoes, pesky boxelder beetles, and bothersome wasps and deerflies play a role in the food chain. It's just sometimes hard to appreciate their value.

While the eradication of insects through pesticide and herbicide use, and the “cides” effects on our food chain will be discussed in a future issue of *The Butterfly Effect*, it will just be mentioned here that homeowners can be quite focused on insects. **Each year nearly 80 million pounds of pesticides are applied to lawns in this country. That's 10 times more pesticides per acre than farmers use on their crops.** As stated by Eric Grissell in his book, *Insects and Gardens. In Pursuit of a Garden Ecology*, “If we gardeners can understand the complicated, living structure that insects bring to the garden as a whole, then we should have a better perspective from which to judge these mostly maligned creatures.”



Above, left: Bird watching is particularly gratifying in the flyway. It is not unusual to see the bald eagle soaring above the Mississippi, Minnesota, St. Croix and other regional rivers, or gliding on a [thermal](#) above the rooftops in our own neighborhoods. **Photo credit** Travis Bono. **Below, left:** Birds need winter shelter. Offering dense layers in your yard helps birds survive the season.

Birds Need Shelter, Food, and Water

When it comes to sheltering and feeding wildlife, Mother Nature does it best. **Providing a variety of vegetative layers in your yard will help a variety of bird species.** Some birds prefer the tall tree canopy in your yard for food, nesting, or shelter. Other birds forage or nest along the ground.

Thoughtful planting of a range of native shrubs, trees, and flowers will provide host plants for insects (which are bird food) as well as a continuous supply of fruits and seeds for adult birds. For example, American plum offers fruits for birds in the summer and is also the host plant for a wide range of insects such as the eastern swallowtail, viceroy, spring azure, and summer azure butterflies. Blackcherry bears fruit in the fall. And the berries of the winterberry can be a food source for birds well into winter. In pondering what you might plant in your own yard, the National Audubon Society offers a great [list of native plants for birds by zip code](#).

Birds also need clean water. Your birdbath offers a source of often surprisingly scarce drinking water, as well as a place for birds to take a quick bath—an important aid in keeping feathers healthy. Be sure to clean your birdbath often!

Emerging research indicates that native vegetation is more nutritious than non-native vegetation for a wide range of wildlife. [In one avian study](#) comparing the nutritional value of native and non-native fruits, the highest fat content and energy densities were found in fruits of native shrubs, which ranged from **6.57 to 48.72% fat and 18.83 to 28.68 kJ/g of energy. In contrast, the invasive fruits had just ≤0.99% fat and ≤17.17 kJ/g of energy.** These differences in nutritional value have implications for bird populations. As stated in the study, “*Our results suggest that fruits of native shrubs are of greater nutritional value to migrating songbirds than the fruits of invasive shrubs during fall migration, which is supported by the higher removal rates by songbirds of native dogwood fruits than fruits of the 4 other invasive fruit species.*” The implications of this for birds can be serious: when natural areas are filled with a monoculture of non-native vegetation such as [buckthorn](#), and residential yards are predominantly landscaped with non-native trees and shrubs, birds can suffer from the lack of proper nutrition.



Consider your yard a part of an important ecosystem. The concept of the hanging birdfeeder is evolving to the concept of transforming the entire yard into a “bird feeder.”

Right: The lovely winter fruit of the appropriately named [winterberry](#) (*Ilex verticillata*), a Minnesota native shrub.

Round About Our Community

Where's this? When was the photo taken?

Photo credit: Minnesota Historical Society



Building Pollinator Pathways in Our Communities

Anyone can join the effort to help bring back pollinators. Across the metro area, citizens are working together to create [native pollinator habitat in their yards](#), at their places of worship, on their boulevards, in their school yards, and more. Some U.S. cities have created [Pollinator Pathways](#) to connect forage areas in urban and suburban landscapes. The [Monarch Mile](#) in South Minneapolis was launched in the summer of 2017. More of “the mile” will be planted in 2018. We can do the same in our own neighborhoods and communities. Creating a pollinator or [monarch waystation](#) is a great place to start. Be sure to proudly “plant” signage in your yard and send a picture of your native garden—large or small—to Neighborhood Greening (green@neighborhoodgreening.org). Let’s start a metro-wide Pollinator Pathway map!



Right, clockwise from top: A “pocket prairie” [native wildflower garden](#) on a street corner. **Below, right:** A [certified pollinator habitat](#) in a homeowner’s garden. **Below, left:** A [monarch waystation](#) at an elementary school.



Going Native: Groundcover

What Native Groundcover Possibilities Await Your Yard?

To add a fresh dimension to your yard, native groundcover plants can be incorporated into traditional landscapes that feature plants such as hosta. Groundcovers and low-growing vegetation frequently used in native plant naturoscapes include [Pennsylvania sedge](#) (*Carex pensylvanica*), [Sprengle's sedge](#) (*Carex sprengelii*), [wild ginger](#) (*Asarum canadense*), [Ohio spiderwort](#) (*Tradescantia ohiensis*), [pussytoes](#) (*Antennaria neglecta*), [purple poppy mallow](#) (*Callirhoe involucrata*), [Jacob's ladder](#) (*Polemonium reptans*), [path rush](#) (*Juncus tenuis*), [violets](#) (*Viola* species), [prairie smoke](#) (*Geum triflorum*), and [wild geranium](#) (*Geranium maculatum*). An easy way to learn more about the characteristics and preferred conditions of these plants is to peruse the websites of regional native plant nurseries such as [Prairie Moon Nursery](#), [Prairie Nursery](#), or [Prairie Restoration](#). Planting natives in the fall will give you a head start on next year's garden.

Above: A trio of violets (*Viola*, left), prairie smoke (*Geum triflorum*, middle), and wild strawberry (*Fragaria virginiana*, right) form a lovely springtime groundcover tapestry. **Photo credit:** Vicki Bonk

“A wonderful harmony arises from joining together the seemingly unconnected.”

—Heraclitus, c. 500 B.C.



Do You Know About Medicine Disposal?

Did you know that unused medicines flushed down the toilet cannot be fully removed by our water treatment facilities? According to *Scientific American* (“External Medicine: Discarded Drugs May Contaminate 40 Million Americans’ Drinking Water”), “Millions of us are flushing unused medications down the toilet....” According to the report, our sewage treatment plants and septic systems have not been designed to treat these contaminants. [Testing by the Minnesota Pollution Control Agency indicates that medicine is ending up in our waterways.](#)

While throwing unused medicines in the trash is better than flushing, medicines in landfills can still make their way into our waterways through landfill “garbage juice” that is collected and brought to water treatment plants. In the same way we take used motor oil or paint thinner to special recycling facilities, unused medicines should be disposed of at “take back” locations, where they are securely removed and disposed of—usually by incineration. Many of us are fortunate to have a [take back drop-box in our communities](#). (See below for a partial list.) It’s free, available 24 hours per day, and no ID is required. Feel free to peel off or obscure the patient’s name on labeling before placing the packaging in the receptacle. Sharps, needles, and thermometers are not accepted.

- *[Anoka County](#)
- [Carver County](#)
- [Dakota County](#)
- [Hennepin County](#)
- [Ramsey County](#)
- [Scott County](#)
- [Stearns County](#)
- [Washington County](#)



Right: Unused medicine can be dropped off in secure receptacles located throughout the Twin Cities. While it is not necessary to obscure your name or prescription information, you may prefer to do so. Keep medicine in the container. Do not flush medicines down the toilet or throw into the trash.

Beholding Beauty in Everyday Spaces

While this stunning spider may appear scary, it is actually quite harmless and should be welcomed into our yards. This beneficial insect predator eats mosquitoes, flies, wasps, and more. Seen here waiting for lunch to get caught in her web, this spider is known as an “orb weaver.” The rounded, orb-shaped webs spun by this spider include a signature zigzag band of silk. A common visitor to our Twin Cities gardens, you can search for and observe this delicately patterned spider in tall grasses.

Right: The Black and Yellow Garden Spider





Notice Nature Everywhere

Orange Lichen

You know this is lichen. You’ve seen it everywhere your entire life. That’s because there are over 14,000 species of lichen in the world. Yet, what do you know about lichen? Here’s a secret: it’s one of the most fascinating organisms on Earth. And you’ve barely noticed it.

Lichen have a lifespan that ranges from 30 to 4,500 years, depending on the species. Lichen is a symbiotic organism of fungi and algae. The algae make the food, the fungi make a home for the algae. Together, fungi and algae make a completely new organism—lichen. The rootless lichen is not a plant. It survives on nutrients from air, humidity, rainwater.

The oldest lichen are found in Russia. The Arrowhead region of Minnesota supports one of the highest areas of lichen diversity in the world. Lichen in this region can live to be a 1,000 years old. Next time you notice lichen in Minnesota, you may be connecting with an organism that was alive when Nordic explorer Leif Ericson left his footprint on the coast of North America.

Left: Orange, green, gray, and black lichen. Most likely genus *Xanthoria*.

**“We are stardust. We are golden. We are
billion year old carbon. And we got to get
ourselves back to the garden.”**

—Joni Mitchell

Did You Enjoy This Edition of *The Butterfly Effect*?

Don't miss the next journal! Sign up to receive your free e-version of *The Butterfly Effect* at www.neighborhoodgreening.org/the-butterfly-effect.

Do you have a story or idea to share about how you or someone you know is making your neighborhood greener, more environmentally sustainable, or wildlife friendly? Please send your ideas to Green@neighborhoodgreening.org.

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Explore our website and sign up to receive *The Butterfly Effect* at www.neighborhoodgreening.org.

Events, Classes & Volunteer Opportunities

Be sure to visit Neighborhood Greening's Resources page at <http://neighborhoodgreening.org/resources/>.



Answer to Round About Mendota Heights



“Road to Mendota, 1915.”

If it's hard to get your head around where this might be, make note of the steeple off in the distance. That's the historic Church of St. Peter—the oldest church in continuous use in Minnesota. A log chapel was built in 1842. The “new” stone church, built in 1853, is seen in the distance in this photo. It's a good guess that the dirt path pictured is today's Highway 13 near Lilydale, a suburb in the east metro.

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