

# Probing the Mystery of the Medicine Wheels

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Photographs by  
THOMAS E. HOOPER



**E**ARLY PROSPECTORS first found the strange structure on a remote peak high in Wyoming's Bighorn Mountains: an elaborate pattern traced out in stone on a flat shoulder near the top of a 10,000-foot mountain. It resembled a large 28-spoke wheel, 80 feet across, with six rock piles, or cairns, spaced unevenly around its rim.

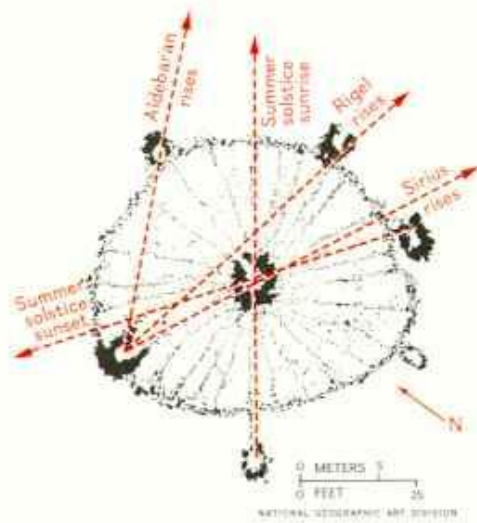
The range, rich in game and tumbling streams, was a favorite summer hunting place for Indian tribes—Crow, Cheyenne, Shoshone, Arapaho—and so the medicine wheel, as it came to be known, was deemed the work of one or another of these.

But no one really knew who made it, or when, or why. When archeologists came to see the site early in this century, they asked the local Crow tribesmen what they knew of

the formation. The answers were enigmatic: "It was here when we came." "It was built by people who had no iron." "The sun built it to show us how to build a tepee."

In time, legends grew. Fanciful explanations attributed it to Aztecs, Hindus, errant Chinese, Phoenicians, even to pre-Columbian members of the Masonic lodge. To the Shoshone Indians it was the home of the "Little People," who supposedly lived in caverns beneath the wheel and survived on the meat of bighorn sheep.

In 1922 ethnologist G. B. Grinnell offered a more reasonable explanation, noting that the pattern of the Bighorn Medicine Wheel resembled the floor plan of a Cheyenne medicine lodge—a temporary wooden structure built for the traditional sun-dance ceremony.



Like a cosmic rifle sight, two rock cairns of Wyoming's Bighorn Medicine Wheel zero in on the rising sun, just as they have for perhaps 300 years. Time: sunrise of summer's first day—the summer solstice—when the sun reaches its northernmost rising point on the horizon.

Aided by a National Geographic Society grant, the author, a Boulder, Colorado, astronomer, finds evidence that medicine wheels were used by early Indians as primitive instruments to set the time for ritual ceremonies, such as the sun dance. Alignments of other cairns (left) point to the solstice sunset and the rising points of three bright stars.



In one Cheyenne version, 28 pole rafters, like the 28 spokes of the medicine wheel, radiated from a central post. Grinnell felt that the wheel could be a symbolic replica in stone, built where wood was scarce.

More recent investigations have found evidence of use of the medicine wheel in the past few centuries. From the thin layer of soil between the spokes came a handful of arrow points and beads dating from before white settlement of the West. The same survey found indications of a small cavity in the soil beneath the central cairn. But had it been made by early pothunters, or by the original builders to make a socket for a vertical pole?

A broken branch in one of the cairns has been dated by tree-ring analysis to about 1760. It could not have been put in the cairn before that date; but was it there originally or added later?

#### Wheel Hints of Astronomical Use

Was this wheel used in even earlier times? And if so, for what purpose? As an astronomer, I became interested in it as possible evidence of the early Indian's use of the sky. The number of spokes, 28, is close to the number of days in a lunar month—a "moon"—by which the Indian reckoned time. And two of the cairns are placed symmetrically on either side of a north-south line, making it possible that they served as horizon markers for sunrise and sunset. Could it be that they were placed to mark distinctive directions where the sun rises and sets, just as parts of Stonehenge are thought to have been used on another continent and in another age? If so, it would shed some light on a dim and distant people—the early Indians of the plains—about whom we know but little.

In fact, we know less about the early plains dweller than about many of his contemporaries on the continent, including the Mesoamericans of Mexico and Central America. Both were here for about the same period. Both are presumed to have been descended from Asians who crossed the Bering land bridge more than 10,000 years ago. Both were briefly observed in situ by Europeans in the 16th century.

But unlike the Mesoamericans, the Indians of the plains left no written language and little well-developed art. Unlike their neighbors to the south—the cliff-dwelling Anasazi,

or "Old Ones"—the plainsmen didn't build much. And intensive observation of these Indians did not begin until more than two hundred years after their first contacts with Spanish explorers. Between Coronado and Lewis and Clark, the life of the plains people changed dramatically, and the ways of the equestrian Indians may shed little light on the ways of their pedestrian ancestors.

These nomadic people did leave behind a great many—perhaps five million—stone circles, 5 to 30 feet in diameter, which we now call tepee rings. They are simple circles, made with loaf-size rocks, sprinkled on all the Great Plains and foothills from Texas to southern Canada.

Most archeologists accept that they are stones that were used to hold down the hide covers of tepees—like tent stakes today—and were left behind when the camps were moved. The inhabitants also left a few large effigy figures traced out in fieldstone on the surface of the ground, and a number of enigmatic large wheel patterns, of which the Bighorn wheel is a good example.

#### Sun Stands Still Twice a Year

It seemed to me that the Bighorn wheel could have been used as a rudimentary observatory. To test that idea, I needed to measure the positions of the cairns and note their directions from the central hub. These could be compared with directions of sunrise and sunset for any day of the year.

In the course of the year sunrise and sunset shift along the horizon. On the first day of both spring and autumn, the sun rises exactly east and sets exactly west. As spring wears on, sunrise moves farther north each day until late in June, when it slows, stops, and begins to move southward again.

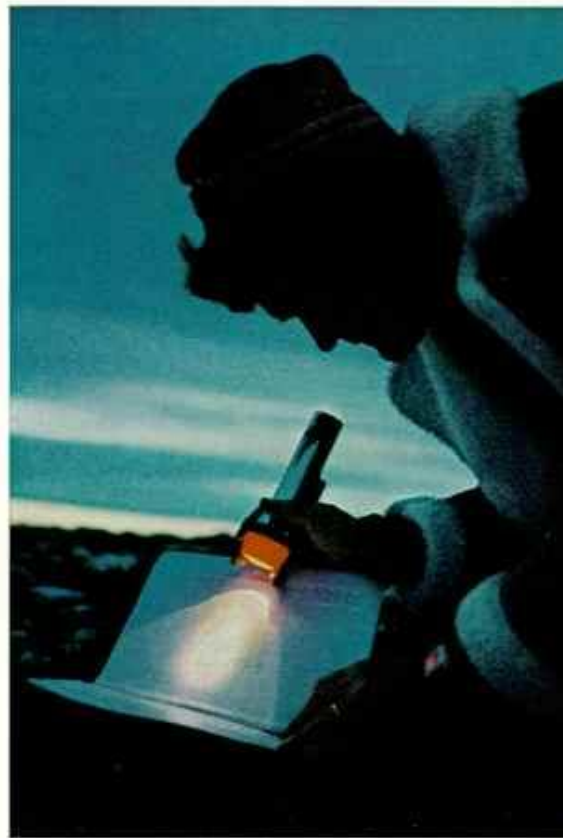
The day its northward motion stops, June 21, is the summer solstice. The winter solstice, six months later, marks the end of its southward march along the horizon. The two solstices are the only times of the year when sunrise and sunset directions mark a single, definite day—reference points for a solar calendar. It seemed clear to me that if a solstice had been marked on this mountain, where winters are severe, it must have been in summer.

Unraveling the case was a family adventure. My wife, Marjorie, and our four children would help make our survey in June, a few

days before the summer solstice. But when we awoke on our first morning in the Bighorn Mountains and looked out our lodge window, our hearts sank. During the night ten inches of snow had fallen. The 30-mile road to Medicine Mountain was closed.

But the sun likes the Bighorns, and within a day we picked our way to the top. A surprise awaited: The old rock wheel was clear of snow—scoured by the winds that sweep the mountaintop and bleached by a high sun that knew it was summer.

Together we measured the cairns and wrote



Predawn rising of stars, pinpointed by two cairns, may have helped Indians determine the time of solstice. In a time exposure, the planet Venus (facing page) rises at the point on the horizon where the star Aldebaran—the solstice harbinger—rose when the wheel was probably built. Dr. Eddy (above) consults his data at day's first light.

down the numbers that told the secret of the wheel. A distinctive lonely cairn that lay at the end of a spoke outside the rim marked a line with the central hub that would point to the exact place of sunrise on the first day of summer.

In darkness the next morning we trudged up the snowy slope again. We followed our own cold trail in boots still wet from the day before. Three hours later, as a pink sky slowly brightened, we crouched nearly frozen behind the lonely outer cairn and awaited the coming sunrise. The direction of the first glow told us we could not be far wrong. And then, in majestic quiet, the great red ball of the sun appeared, exactly in line with the cairns. In the biting cold we felt happily warm. For all the summers since the wheel was built, sunrise had moved along the horizon to perform this striking solstice spectacle—with no one there to watch.

#### Could Stars Presage the Solstice?

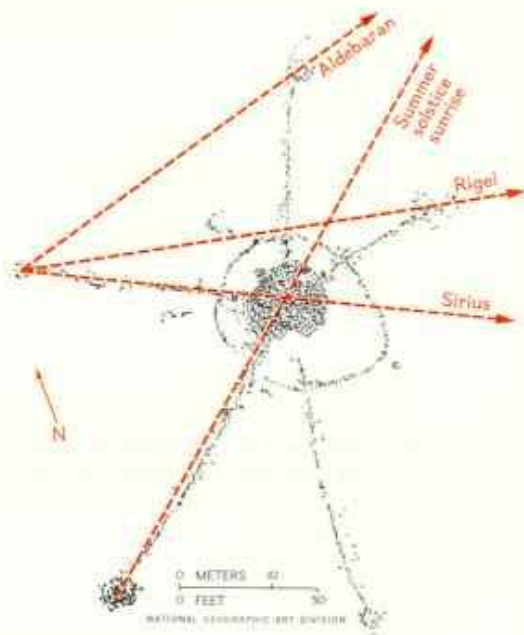
How many had known what we now knew? Was it the secret of a few who climbed the trail, as we did, to note the time of solstice, when, as the Indians noted, "the sun is highest and the growing power of the world is strongest." Did it signal the sun dance with a message from the sun itself? Perhaps this medicine wheel and the others like it were models for the sun-dance lodge—instead of the other way around.

During evenings of the following winter I tried to work out the possible functions of the other cairns. I now think that one of them, a "sighting" cairn, was aligned with three others to mark the rising of three of the brightest stars that shine on the medicine wheel: Aldebaran in Taurus, Rigel in Orion, and Sirius in Canis Major (page 141). These three stars are also the brightest in the region of the sky through which the sun passes in summer.

In the years between 1500 and 1900—in agreement with what archeologists know of the age of the wheel—the rising of Aldebaran could have announced summer's first day. Throughout most of that time there was one day and one day only—the summer solstice—when Aldebaran's rising was just near enough in time to the sun's that the star was visible only momentarily, almost as a flash, before the brightening eastern horizon extinguished it from view. The same phenomenon would

Like a sun symbol built by a child, the Moose Mountain Medicine Wheel in Canada spans 200 feet on a hilltop in Saskatchewan. Yet no child shaped this sophisticated pattern of stones, whose alignments (below) closely match those of the Bighorn wheel in Wyoming. The author estimates that this wheel, one of many laid out by the plains people, was in use more than a thousand years ago. Others may be as old as Egypt's Pyramids. All are relics of an Indian heritage eclipsed and forgotten after the white man's arrival.

GEORGE DEWEY



have occurred with Rigel 28 days later—the same as the number of wheel spokes—and with Sirius after an additional 28 days.

Were these alignments chance, or the work of early Indians who knew more of the sky than we may have thought? The answer might be found in examining similar medicine wheels. I learned that a number exist all along the eastern slope of the Rockies and on rolling plains to the east. More of them lie in Canada, in the Prairie Provinces of Alberta and Saskatchewan. If we could find other wheels that also marked the solstice, the case would be that much stronger.

Archeologist Dick Forbis at the University of Calgary knew the wheels in Canada well. Aided by a National Geographic Society grant



in support of the research, we have now studied about twenty of them.

The popular term "medicine wheel" describes a catchall collection of stone patterns, mostly on the plains. Many are simply huge central cairns, surrounded by rings of stones 100 to 200 feet across. Some have spokes—in almost any number—and others do not. The central cairns can contain as much as a hundred tons of piled rocks.

#### Circles Date From Pharaohs' Time

The Majorville wheel on the grassy, treeless plain of central Alberta is a good example. Much like the Bighorn wheel, but somewhat larger, it has a high central cairn, a rim of rocks, and remnants of spokes; through the years it has been badly damaged, and it is almost impossible to define its original form or spoke alignments. Several years ago Dick Forbis and his colleagues, examining the cairn, found artifacts establishing that its building had probably begun as early as 4,000 or 5,000 years ago. The first stones of the Majorville cairn had been laid when the Egyptian Pyramids were under construction!

All the wheels that we examined had one point in common: They were built on the highest land around, with clear, commanding views of the horizon.

Many of the other, simpler wheels with only a few spokes fit another pattern that Dick and I think significant. Nearly always the spokes point to other medicine wheels and cairns, from ten to as many as fifty miles away. These rock mounds on distinctive hills on the bald plains could have served as a simple network of landmarks in a land where distinctive features do not exist.

Tom and Alice Kehoe, archeologists in Milwaukee, showed me the most interesting medicine wheel of all. It lies atop Moose Mountain, in the low, rolling hills of southern Saskatchewan, where Tom was once the provincial archeologist. Legends tie it to the sun and sky. Although 425 miles from Wyoming and Medicine Mountain, it bears so strong a resemblance to the pattern of cairns in the Bighorn wheel that it could have been built from the same set of plans. To my mind it confirms, without much doubt, the astronomical use of these mysterious structures.

A large central cairn, typical of all the Canadian wheels, is at the middle of five long

spokes; at the end of each, as at the Bighorn wheel, is another cairn. Their positions match, like fingerprints, the cairns of the Bighorn wheel. At the end of the longest spoke, the largest and most prominent cairn lines up with the hub to mark the direction of sunrise at summer solstice. Other cairns, just as at the Bighorn wheel, mark where Aldebaran, Rigel, and Sirius rose (page 144).

At the time of summer solstice, with the Kehoe family, I walked up the mountain in the gathering light of dawn. What we saw confirmed our transit measurements: The line of sunken stones was directed to the first flash of summer's first sunrise. The directions indicated by the star-alignment cairns were a few degrees off the present location of the three bright stars, but would not have been in an earlier age; time had shifted their relative positions.

If we presumed that the Moose Mountain wheel had been built about 1,700 years ago, the alignments were nearly perfect. And at that time, about A.D. 300, Aldebaran would have served as a perfect harbinger of the summer solstice at the site. This meant that for more than 1,000 years the early Indians of the plains were using the same star risings, and the sun's, to mark the summer solstice.

#### Did New Ways Kill Old Customs?

We know that early man walked the plains of western North America for thousands of years before Coronado first saw him hunting buffalo. We know that with the horse, and other acquisitions from later Europeans, the life of those Indians was drastically altered and modernized. In this revolutionary change did they lose an astronomical heritage?

Depositions taken from their descendants in this century and the last recall little practical use of the sky. Yet in the Bighorns, and on Moose Mountain, and at a number of other sites, relics remain that more strongly than words seem to prove that the early Indians of the plains made use of the sun and stars in fairly sophisticated ways. The absence of this sky lore in historical records of the American Indian of the plains surely tells us how fragile is learning without the written word, and how quickly it can be forever lost. This may be the message of the strange, mute wheels that were left on western mountains and the highest hills around. □