

MHS

Montana

pics of ~~Placer~~ Club, circa 1920

interior

953-297

" -298



MHS

**pics** of

excursion boats (motor launches) of 1910s-1920s

Tuttle family museum @ Gates of Mt. W.; call May 17, to see if they're open on 19th?

957.390

957.391

Pac 9554

Missouri River

✓ 947.545

955.159

947-564

947-575



MHS

pics of Fort Assiniboine - general layout

946-918 +

--black cavalry stationed there

--Lt. John J. Pershing

caption 946-947

946-913

-915

-921

-943

-947



to be researched: MHS

city directories and newspaper file: the Zanzibar



to be researched: MHS

city directories: "music academy", or what?



UW

PNQ 55, Jan. '64, pp. 9-15

"The Montana Woman Suffrage Campaign", by Ronald Schaffer



MHS or MSU

Doris B. Ward, MSU MA thesis, ✓ "The Winning of Woman Suffrage in Montana"



MHS

Lansing, Capt. Gerald W.

Papers, 1904-1918. 23 items.

Army officer in the 2nd infantry, Montana Nat'l Guard. Papers pertaining to his career, 1904 to 1918.



MHS

Anderson, Capt. Orville L. 1892-1918

Diary, 1917-18. 1 vol.

Infantry officer killed in action, Aug. 1, 1918, in Battle of Aisne-Marne, France.

Diary of war experiences from Jan. 1, 1918, to July 25, 1918.

to be researched: MHS

--The Klan in Montana, 1910s-20s

- Brian thinks they have a new collection



MHS/Helena

McCorkle (sp?) papers at Mont. His'l Society, for Bucking the Sun---  
1920's leftwing politics (Christian Socialist) in Montana

(recommended by Dick Hargesheimer, Dorothy Bradley's press sec'y? or Bill Lang?)



MHS June '02

T. Roosevelt clip file: 1886 Montana Stock Growers' AssN brand book lists  
TR of Medora, Dakota Terr.

--bylaws adopted '85; Granville Stuart prez; annual meetings always in  
Miles City

--'86, ran for NY Mayor @ age 28(?)



to be researched: MHS

*Hameret*  
When was ~~Holter~~ Dam built?

Would the Missouri be backed up, lakelike, at Gates of the Mountains in 1924?



Helena: hospital where Monty would have been taken?



MHS

Helena newspapers of 1924: Herand<sup>g</sup> and Independent?



from some point on WW land, can the Black Eagle stack be seen? (exist in '24?)



MHS

Helena, summer 2002: summer thunderstorms--where do they come from? If Susan  
"checks to the West" to see if the rain will last, what mountain or other geography  
would she be looking at from Highland St?



go through every scene from "colored person's" point of view

(i.e., wd JJ & Yancey be going to the Natatorium? Segregated pool?)



Montana

area of I&C Camp Disappointment?



Montana

Lower Two Medicine Lake, for geography & feel



Montana

Ft. Assinboine geography

--check over my version right after seeing it



UW/Suz

F 592.4

The Journals of the Lewis & Clark Expedition (Moulton)

1983

July 27, 1806



to be researched: MHS

pics & maps of 1920s Helena

--did Highland St. exist?

--Zanzibar Club? Clore St.?

--capitol bldg?

1900s (1906). Interviews.  
Completed 1902.

953-152 Exchange Solen, 101 S. Main

The Black Infantry in the West, 1869-91    Arlen L. Fowler



W. Sherman Savage

Blacks in the West



Kenneth W. Porter

The Negro on the American Frontier



service. Finally, twelve General Electric articulates were purchased immediately after World War II when the deal to sell them to the Soviet Union fell through. These were called "Little Joes" by the railroad employees, named for Joseph Stalin. The electrics owed the Milwaukee nothing when the electric system was abandoned in 1973, just in time for expensive diesel fuel.

Despite its many improvements the Milwaukee Railroad in Montana was not without its problems. There were none more serious than the earthquake on June 28, 1925. The epicenter of the quake focused upon Three Forks and Manhattan, but the damage was widespread in White Sulphur Springs as well. It was felt in a wide area, bringing people out of their homes and businesses throughout Montana.

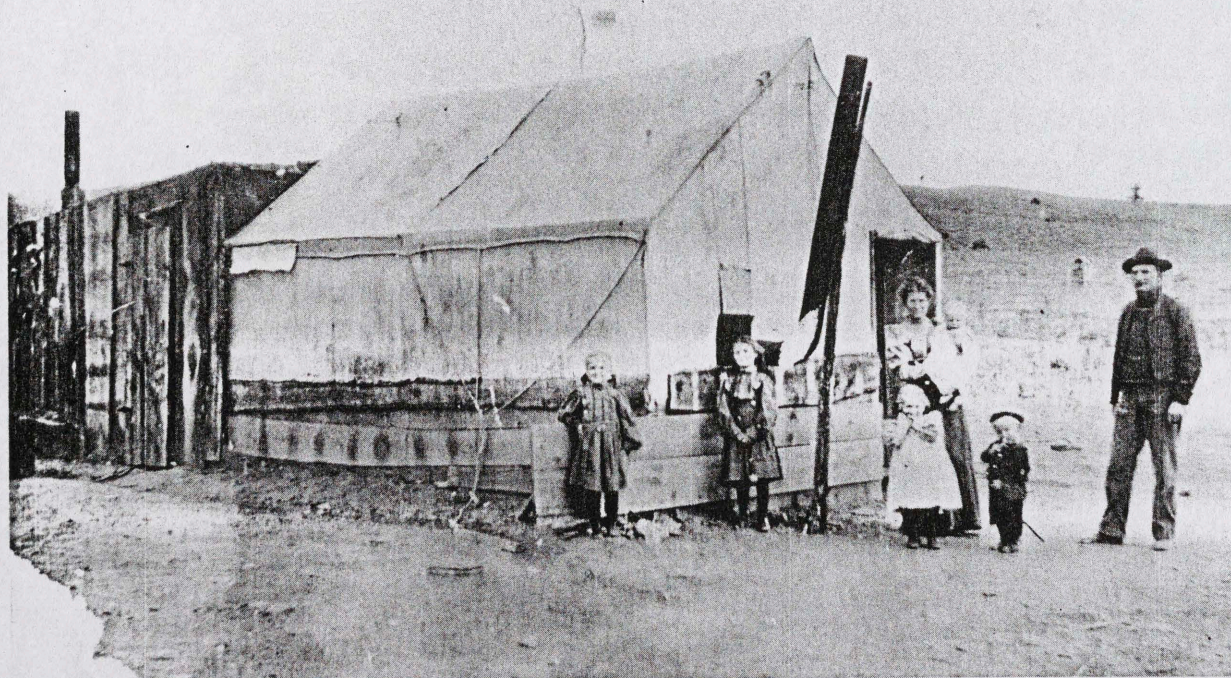
The courthouse and school were substantially destroyed in White Sulphur Springs, several buildings in Three Forks and Manhattan were leveled by the quivering

earth and the following aftershocks. Damage was estimated to be in the hundreds of thousands of dollars, ranging from cracks in the plaster of the capitol building at Helena to the crumbling of several brick buildings in the towns along the front range of the Rockies. Newspaper accounts were often in conflict because all telegraph services were disrupted in the affected areas.

An avalanche followed the earthquake at Lombard, sliding tons of the mountainside into the Missouri River, blocking the trackage of the Northern Pacific there. But the damage to the Milwaukee in the canyon was added to the financial railroad operating in a depressed economy. The tunnel at Deer Park was closed, an avalanche there dammed Sixteen Mile Creek, and continuing aftershocks frustrated the first attempts at keeping the lines open.

The sleepy village of Deer Park, home to a section foreman, was isolated from the rest of the world while the rising waters of

David Shearer, wife, and family camped at the construction camp at Sixteen, Montana, in 1907.





the creek swirled about it. Sixteen Mile Creek was also dammed by the force of the earthquake. Torrential rains followed the 6:30 p.m. shaker, creating even more problems for the shorthanded crews. It was soon apparent to all that there was no way to temporarily fix what nature had destroyed. The stream became a roaring torrent filling the avalanche created dam with sixty feet of water. The bridges and tracks were under water within hours after the first shocks.

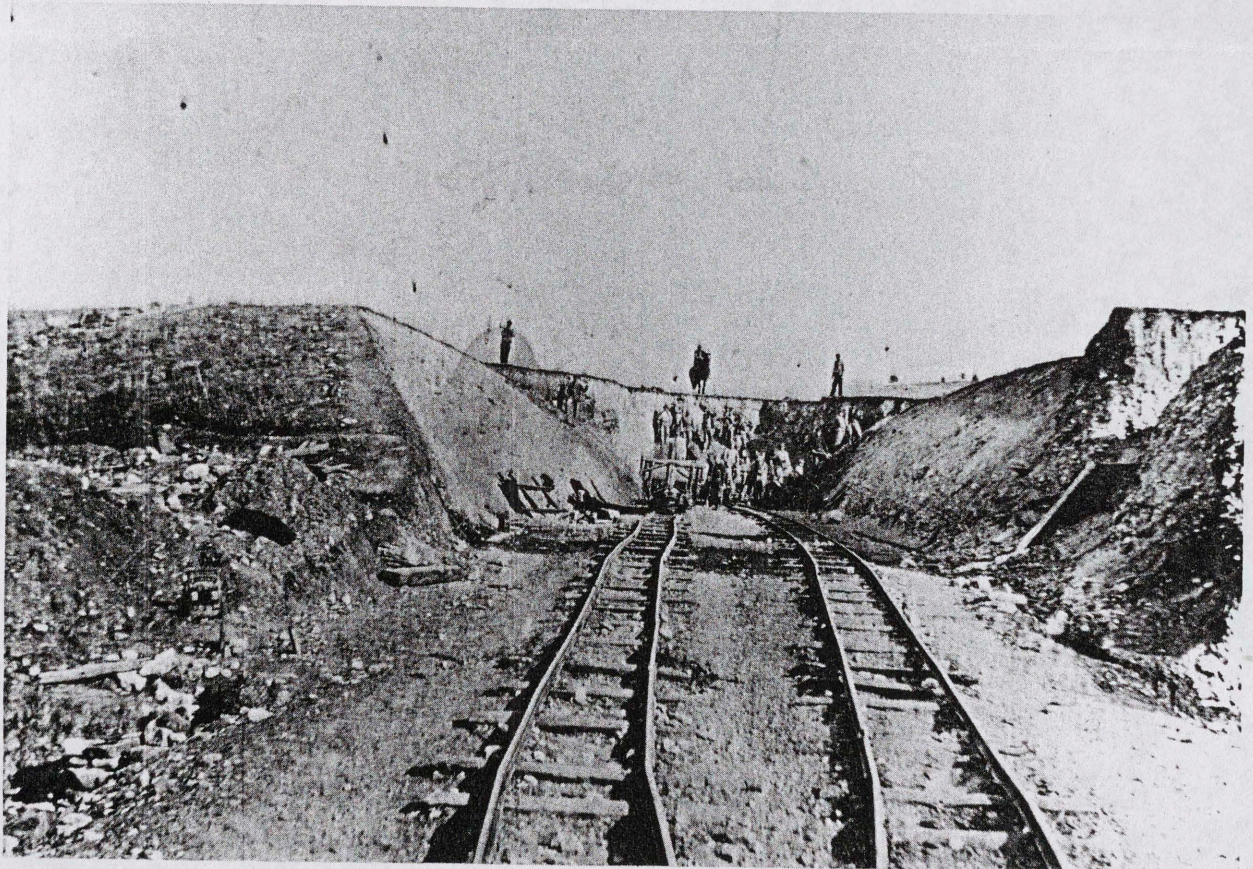
When daybreak revealed the damage, tons of rock had slid into the canyon bottom. The rains unloosened fragile soil conditions and continued to tumble into what had been a creek but now a growing body of water. There was little that remained of the original trackage.

The Milwaukee's first estimates of damage totaled a million dollars. This was soon revised to total a million, five hundred thousand dollars.

Twenty miles of the canyon trackage were destroyed, and while fifteen hundred men went to work repairing it, the Olympian and the Columbian were rerouted over Northern Pacific tracks from Miles City to Sappington. Freight trains were detoured over the Great Northern. What was originally thought to be a one week job became one that consumed the entire summer of 1925.

The resulting lake created its own kind of problem. Deep sea divers were brought into the task from Seattle. Their assignment was to reopen the channel along the creek bed, draining the impounded water. Weekly newspapers from the affected communities of White Sulphur Spings, Three Forks, and Manhattan reported that workmen of every nationality were soon dispatched to the scene. Lombard served as headquarters for the damage repair task. The Northern Pacific had its own landslide to

Rebuilding the main line after purchase by the Milwaukee Railroad. This was the box canyon. David Shearer on horse, 1907. Warren McGee collection





repair at that site.

A shoe fly was built around the mountain at the Deer Park tunnel. This was temporary trackage alongside the mountain. The tunnel had suffered enormous damage and the shoe fly was a temporary passage while tunnel repairs were made.

The embattled railroad, already beset by financial problems, pulled the throttle on the repair work. The tons of rock and earth that had collapsed into the creek were removed and hauled away, the rails were relaid, bridges were rebuilt, and the tunnel at Deer Park was essentially reexcavated. The telegraph system that paralleled the Milwaukee was restrung as was the electrification system.

The damage estimates grew as time passed during the summer. The theater, school, bank building, and telephone exchange were all ultimately condemned and demolished in the interest of safety in Manhattan. Three Forks witnessed the destruction of its school, the Methodist church, and both of its banks, the American National and

the Labor National banks.

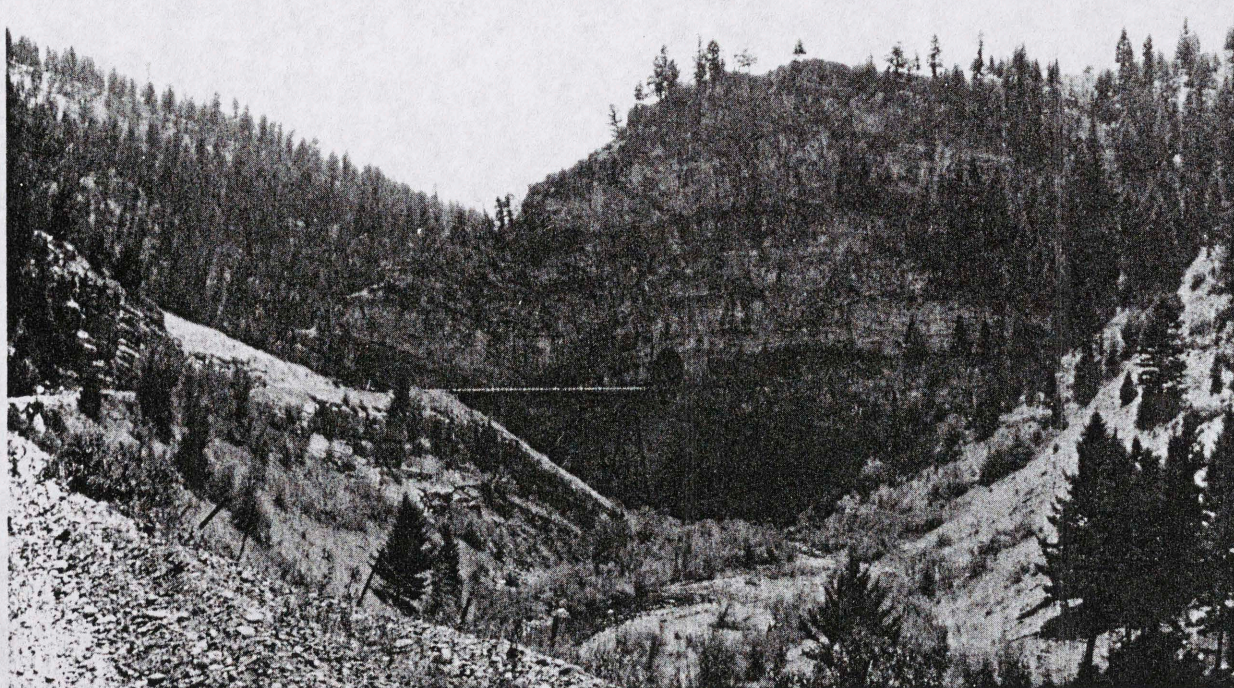
A massive crack appeared between the two towns that ranged from two to five inches wide with a depth of up to five feet. There was no such a thing as a Richter scale at the time, but a professor of geology at the University of Montana, Dr. C. D. Clapp, explained the phenomena with stories that were carried by all of the state's newspapers. "It was a slippage of the earth, a common thing along the Rocky Mountain front."

A total of forty-one shocks were felt during and following the major event on Saturday, June 28th, 1925. The area has long since been recognized as one of growing mountains and occasional severe shocks.

It was considered a miracle that no one was killed in the disaster that struck on that warm summer evening. The mines at Butte and Jardine were shaken but did not collapse. Yellowstone and Glacier national parks were rattled by the earthquake with some avalanche activity following it. But the earth's shaking had more lasting calamitous results on the Milwaukee Railroad than it

Don Baker

Sixteen Mile Canyon, Creek and tunnel





MHS

--Ft. Assiniboine in historic register



MHS

Helena earthquake of 1925(?) *June 28, 1925*



MHS

(take this article along for reference)

ftnte 23, p. 31, Montana Mag, spring '02 ("Learning about the weather...  
by Gary D. Libecap)

US Dept of Commerce, Weather Bureau, Climatological Data, Montana Section, vol 50, #13  
Helena, 1947



MHS

Joseph Dixon biog



MHS or elsewhere: Charley Russell pic of bronc bucking through ~~stuck~~ chuckwagon scene



to be researched: MHS

--radio in Montana by 1924? what stations? what programming?

MAS 791.44

"V" M146V

Voice in Big Sky....

C. Howard McDonald

p. 2 - 1922... KFBB Havre (moved to GF in '29)

KFBF Butte

KFCH Billings

p. 3 - 1922, KDYS Gt Falls: closed 1923



## Bronc in Cow Camp

1897 • 20 $\frac{7}{8}$  × 31 $\frac{1}{4}$  in. • Oil on canvas.

TO COMPARE THIS obstreperous scene with the earlier oils of cowboy life such as *Breaking Camp* (page 57) from twelve years before, is to find Russell in firmer control of the medium, using a wider and subtler range of color, and with an easier sense of movement in space. And though he still had problems in achieving naturalness and proportion—particularly here with the startled figure to the right—his people are now more convincingly worked into the scene and give less of the effect of being cut out and pasted on. As they move into the distance, too, their forms are softened and corroded by a surrounding atmosphere.

What he was rapidly learning through observation and his artist's intuition was, in a way, what had to be learned about portraying human reality at the start of the Italian Renaissance (for one big instance)—and notably in the evolving realism of the painter Giotto.

In each case the most important thing was to tell a story believably, with fullest appreciation of the subject. And Russell has had a marvelous time telling this one, with its stageful of entertaining characters: the intensely preoccupied bronc-riding of the expert Bob Thoroughman (Russell's close friend) as his outlaw horse "Pinto" crashes through the campfire like a bucking tornado; the outraged cook, whose gut response seems unlikely to calm the situation; and the onlookers, either amused or confounded, depending upon where they are vis-à-vis the tornado's path.

It was one of the many kinds of encounters depicted by Russell's storytelling gifts—visual or verbal—and he painted its comedy in many variations.





20 May '02

Brian Shovers  
Reference Librarian  
Montana historical Society  
225 N. Roberts  
Helena MT 59620-9990

Dear Brian--

Just another dab of early warning, in case it's helpful to you to know some of the items I'll be pestering you for when Carol and I hit the library on June third and fourth and maybe the morning of the fifth. Here, sir, is the kind of thing I'll be trying to sop up for my next book:

--Helena newspapers or any other source on the effects, particularly in Helena, of the June 28, 1925 earthquake epicentered in the Three Forks-Manhattan area. My reference on this is *The Montana Railroad: Alias the Jawbone*, by Don Baker; he describes the damage done to the Milwaukee railroad in the Sixteen Mile Creek area, but also cites "cracks in the plaster of the capitol building at Helena." And is my memory right that there was also a 1935 earthquake? If so, I'd also like to see sources on that.

--Any historic register stuff you have on Fort Assiniboine.

--Something cited in Gary Libecap's nifty dryfarming piece in the Spring '02 *Montana* issue (liked your piece, too; I did a college term paper on the history of the magazine) in his footnote 23, p. 31, if you have it: US Dept. of Commerce, Weather Bureau, *Climatological Data, Montana Section*, vol, 50, no. 13--I'm interested in rainfall data for north-central Montana, roughly the triangle from Great Falls to Havre to the Rocky Mountain Front, 1924-25.

--That pamphlet or booklet or whatever it is on early radio in Montana, *Voices in the Big Sky*, Howard McDonald, call no. 791.44 M146v.

--Helena city directories, 1924-25, although I think I can beeline to them myself unless you've moved 'em.

--A question: what Helena newspapers existed in March, 1924?

--Got anything about Teddy Roosevelt attending Montana Cattlemens' meetings?

--Lastly, I need to take a look at that Charley Russell pic of the horse bucking through the roundup grub-call--*Bronc for Breakfast*, is it? I suppose a CMR collections book would have that?

By the way, I'm still packing a portable typewriter on research gigs, if you need to set me up where I won't drive your other patrons nuts. Looking forward to catching up with you and the library once again.



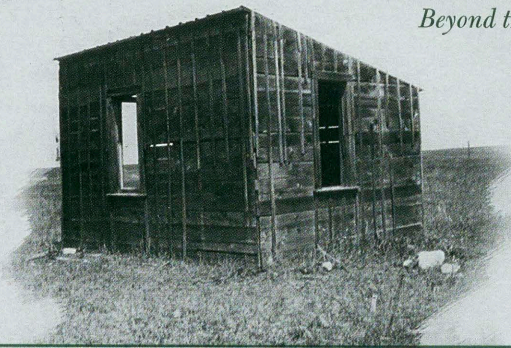
WITH LOCAL AND MINOR EXCEPTIONS, THE LANDS BEYOND THE HUNDREDTH MERIDIAN RECEIVED LESS THAN TWENTY INCHES OF ANNUAL RAINFALL, AND TWENTY INCHES WAS THE MINIMUM FOR UNAIDED AGRICULTURE. THAT ONE SIMPLE FACT WAS TO BE, AND IS STILL TO BE, MORE FECUND OF SOCIAL AND ECONOMIC AND INSTITUTIONAL CHANGE IN THE WEST THAN ALL THE ACTS OF ALL THE PRESIDENTS AND CONGRESSES FROM THE LOUISIANA PURCHASE TO THE PRESENT.

—Wallace Stegner

*Beyond the Hundredth Meridian<sup>1</sup>*

Alta Deen, photographer

Abandoned homestead,  
Choteau County, 1930



Optimism ran high in the early decades of the twentieth century as Montanans, including Cascade County's Greenfield Bench dryland farmers rallying near the Sun River circa 1910 to protest an expensive irrigation project, placed their faith in a new system of cultivation called dryfarming that offered a remedy to drought. Touted by virtually every Montana organization supplying information about farming conditions in Montana, dryfarming proved inadequate to counter the effects of a five-year drought that began in 1917.

Unless otherwise noted, photographs courtesy MHS Photograph Archives, Helena



explain away agricultural deflation nor gainsay the reality that demand for irrigated land in Montana had declined.<sup>46</sup> In part the association lost momentum for want of new leadership after Locke joined the Dixon administration. Though Locke remained supportive, Republican Party politics and his official duties for the Montana Industrial Accident Board, which he headed until 1927, preoccupied him.<sup>47</sup> National political conditions also contributed to the organization's demise: President Harding died in 1923, Calvin Coolidge's administration sanctioned Mather's closure policy, and Walsh failed to persuade Congress to override the NPS director. According to Secretary of the Interior Hubert Work, Yellowstone Lake and its environs constituted a "splendid wilderness" that should stay "intact in its natural state."<sup>48</sup>

At its demise, no new dams or ancillary irrigation works marked the YIA's crusade, but a diehard group kept alive the notion of a Yellowstone Lake dam.<sup>49</sup> About half a decade after the organization's collapse, Yellowstone County boosters and old YIA activists teamed together to lobby Congress. In 1927 and 1928 Congress enacted laws that permitted but did not require the United States Army Corp of Engineers to dam the lake. Although Calvin Coolidge's and Herbert Hoover's administrations prevented the Corps from exercising its new authority, droughts in the 1930s put new pressure on federal and state government. Montana governor Elmer Holt sup-

ported a new plan for a dam about four miles upstream from Livingston in 1935 and 1936. Holt, however, could not raise construction funds.<sup>50</sup>

Nonetheless, Locke and his irrigation movement bequeathed to the next generation a repeatedly revived water plan that proponents presented as an economical way of expanding Yellowstone Valley irrigation. To the dismay of environmentalists, advocates of large-scale irrigation and manufacturers of electricity proposed several reincarnations of the YIA's old plan in the 1960s and 1970s, and in 1992 a loose confederation of Livingston and Billings commercial interests revived the idea of a Yellowstone Lake dam for irrigation and the production of hydroelectric power. Those schemes floundered like all the others over the past century; meanwhile, drought in the late 1990s and into the new century has revived the phoenix-like discussions of dams on the Yellowstone River.<sup>51</sup> *M*

HUGH LOVIN is professor emeritus of history at Boise State University, Boise, Idaho. He has written articles about irrigation and arid-land development in the West for the *Pacific Northwest Quarterly*, *Arizona and the West*, *Annals of Wyoming*, and *Idaho Yesterdays*. In 2001 he presented the paper, "Dreamers, Schemers, and Doers of Idaho Irrigation," at the agricultural history symposium held at the University of Nevada, Reno.

Multiple factors contributed to the demise of the YIA and its irrigation plan: the loss of Jerome Locke's leadership, agricultural deflation, declining demand for irrigated land in Montana, and national political conditions that favored preservation of Yellowstone National Park and its features, including the popular Fishing Bridge (below). Gone, but not forgotten, the dam idea has been revived repeatedly in intervening years and remains a threat in the face of record drought that has spanned the turn of the new century.



Jack E. Haynes, photographer, Haynes Foundation Collection



**H**omestead failure is one of the most poignant episodes in the history of the Great Plains. In Montana alone, nearly 200,000 homesteaders founded new farms between 1900 and 1921, raising the population of eastern Montana to over 250,000 in 1920; yet, despite high hopes, a severe five-year drought that began in 1917 crippled wheat production and sparked an exodus from the state.<sup>2</sup> Ultimately, some 60,000 Montana homesteaders gave up, and land that once held such promise was taken out of production or auctioned off to pay loans and taxes.<sup>3</sup> The frame skeletons of deserted homes and empty schoolhouses that today dot the Montana landscape remain as testimony to dashed expectations, bankruptcies, and the depopulation of the region.

In the face of this calamity, the puzzle remains why so many settlers moved to a place that turned

out to be so inhospitable. After all, drought should not have been a surprise. Earlier in the century the Great Plains were known as the "Great American Desert," and by the turn of the twentieth century the optimistic notion that "rain follows the plow" had been fairly well discredited.<sup>4</sup> Most historians of the period have assigned blame to railroad propaganda and the gullibility of homesteaders: journalist Joseph K. Howard labeled Montana homesteaders naive fools while historian K. Ross Toole more diplomatically suggested that they were the victims of railroad hyperbole and outright lies.<sup>5</sup> A more likely explanation is that homesteaders were emboldened by advice from agricultural professionals who believed that a new scientific farming method called dryfarming offered a remedy to drought.<sup>6</sup>

Clarence Bull, photographer



## Learning about the Weather Dryfarming Doctrine and Homestead Failure in Eastern Montana, 1900–1925

by Gary D. Libecap



**D**ryfarming doctrine represented the Progressive era's optimistic belief in the power of practical science to tame nature and bend it to meet human needs. Proponents of "scientific soil culture" predicted that vast areas could be opened for settlement, not only in United States but throughout the world, and that farmers would grow wheat and other crops in "the natural habitat of cactus." Dryfarming "was moving onward to conquer the waste places of the earth, noted John Woldtsoe, a dryfarming proponent and president of Utah Agricultural College."<sup>7</sup>

After the turn of the century, the doctrine of dryfarming spread rapidly throughout the Great Plains. Although it was common knowledge that eastern Montana could be dry, dryfarming advocates claimed that if farmers followed certain cultivation techniques, sufficient moisture could be saved in the soil to pull a farm through any rainless period. "[T]he farmer will always have a crop: in the wet years his crop will be large; in the driest year it will be sufficient to sustain him," claimed Woldtsoe in 1911.<sup>8</sup>

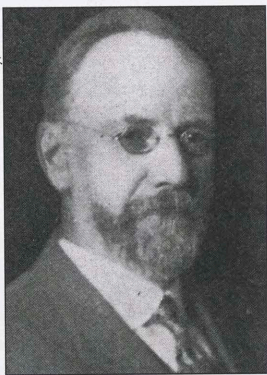
According to the theory, deep plowing in fall and spring captured precipitation and sent it far into the soil where it was saved for plants, rather than allowing the moisture to be lost as runoff as it would be with shallower tillage. Over time, the saved water percolated upward through capillary action toward plants' thirsty roots. Cultivating and subsurface packing after every rain prevented the soil from crusting and maintained a protective mulch that kept the moisture from evaporating. Indeed, advocates asserted that too much evaporation rather than too little rainfall was the critical problem in semi-arid regions. Crop failure occurred only

if a farmer did not perform the required work, an outcome attributable to an individual's shortcomings, not to the Great Plains' climate.<sup>9</sup>

Dryfarming doctrine was attractive to homesteaders not only because it offered a solution to the problem of drought but also because it promised high yields through intensive cultivation, which encouraged the formation of small family farms. There was a strong bias toward small homesteads among advocates, and their arguments were part of the debate over whether and how much the 1862 Homestead Act should be modified to meet the drier conditions of the Great Plains.<sup>10</sup> The opportunities made possible through dryfarming surely helped limit major changes in land laws. Rather than the 2,560-acre homesteads recommended for arid regions by John Wesley Powell in 1878, Congress made only minimal adjustments to the Homestead Act, allowing claims of 320 rather than 160 acres in 1909 and reducing the residency requirement from five to three years in 1912.

Virtually every organization supplying information to homesteaders on the Great Plains between 1900 and 1920 emphasized dryfarming principles, and many advocates had at least some scientific credentials, which gave their ideas an air of scientific credibility. The most prominent supporter was South Dakota farmer Hardy Webster Campbell. Campbell organized the Western Agricultural Improvement Society in 1895 to promulgate dryfarming techniques and wrote a series of monographs on the subject between 1902 and 1916.<sup>11</sup> He later supervised demonstration farms for the Northern Pacific and Chicago, Burlington and Quincy railroads and published a journal, *The Western Soil Culture*. Other prominent dryfarming supporters included B. C. Buffin, professor of agriculture at the University of Wyoming and director

Minnesota Historical Society, St. Paul



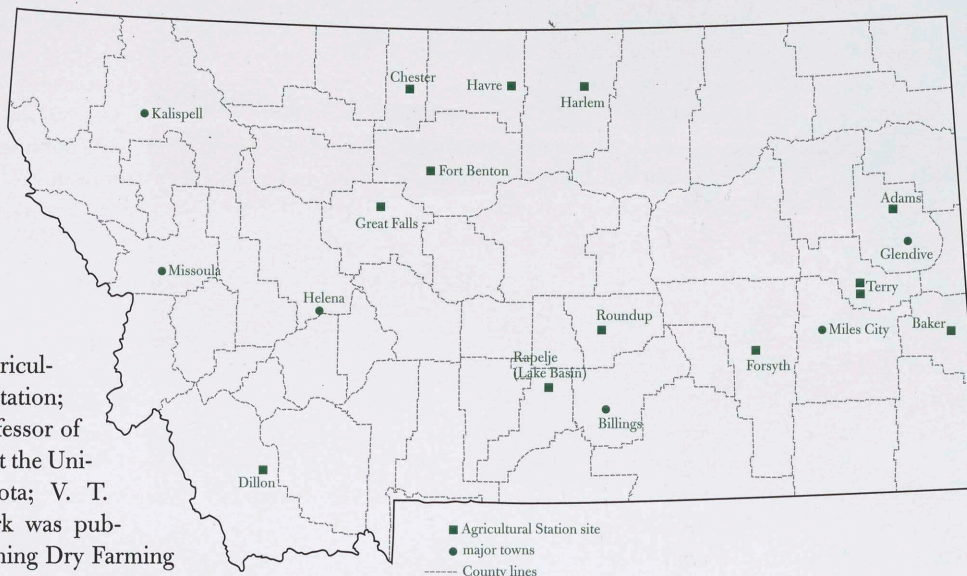
Author of four books on dryfarming and a frequent speaker at dryfarming congresses that provided the latest information on the subject, Hardy W. Campbell (left) was a tireless promoter of "scientific soil culture" and its application to the arid West. Below, a homesteader and her son near Glendive, Montana, in 1911 stand amidst the plenty that Campbell's principles seemed to guarantee.

Foster, photographer





## Montana Agricultural Experiment Stations



of the Wyoming Agricultural Experiment Station; Thomas Shaw, professor of animal husbandry at the University of Minnesota; V. T. Cooke, whose work was published by the Wyoming Dry Farming Commission; and F. H. King of the Wisconsin Agricultural Experiment Station.

For eastern Montana homesteaders, however, information about dryfarming came mostly from officials of the Montana Agricultural Experiment Station in Bozeman. Created by the Hatch Act in 1887, agricultural experiment stations provided general information about new crops and products and promoted new practical technologies. The Agricultural Extension Service, established by the

Smith-Lever Act in 1914, aided in these tasks. As a part of its outreach programs, the Montana Agricultural Experiment Station set up demonstration farms to showcase new crops, equipment, and dryfarming cultivation practices, and by 1910, thirteen of these farms were conducting dryfarming tests in the state.

To provide farmers the latest scientific knowledge, the Montana experiment station annually organized Farmers'

1. Wallace Stegner, *Beyond the Hundredth Meridian: John Wesley Powell and the Second Opening of the West* (Boston, 1954), 214.

2. Totals for original homestead entries are from *Annual Report of the Commissioner of the General Land Office* (Washington D.C., 1880-1925); populations from the 1900 and 1920 U.S. Population Censuses. Eastern Montana counties included follow the designation used by Mary W. M. Hargreaves, *Dry Farming in the Northern Great Plains, 1900-1925* (Cambridge, Mass., 1957). Between 1880 and 1925, the abundant free land, generally rich soil, and remarkable wheat yields of the central and northern Great Plains attracted migrants who filed over a million new homestead claims to government land.

3. The magnitude of homestead failure is described in K. Ross Toole, *Montana: An Uncommon Land* (Norman, 1959), 238; Joseph Kinsey Howard, *Montana: High, Wide, and Handsome* (New Haven, Conn., 1959), 207-8; Michael P. Malone, Richard B. Roeder, and William L. Lang, *Montana: A History of Two Centuries* (Seattle, 1991), 283; and Dan Fulton, "Failure on the Plains," *Agricultural History*, 51 (January 1977), 51-63. See also David C. Jones, *Empire of Dust: Settling and Abandoning the Prairie Dry Belt* (Calgary, 1987), 100-14, for a description of farm failure in Canada.

4. For discussion of "rain follows the plow," see Henry Nash Smith, "Rain Follows the Plow: The Notion of Increased Rainfall for the Great Plains, 1844-1880," *Huntington Library Quarterly*, 10 (February 1947), 169-93; Henry Nash Smith, *Virgin Land: The American West as Symbol and Myth* (Cambridge, Mass., 1950), 174; and Stegner, *Beyond the Hundredth Meridian*, 215-19.

5. Howard, *Montana*, 181-96; Toole, *Montana*, 232-34. Similar views of naive homesteaders and overpromotion by the railroads are provided in Malone, Roeder, and Lang, *Montana*, 238-40; and Richard White, "It's Your Misfortune and None of My Own": *A History of the American West* (Norman, 1991), 142-53.

6. This paper benefits from a larger study by Gary D. Libecap and Zeynep Hansen, "'Rain Follows the Plow' and Dryfarming Doctrine: The Climate Information Problem and Homestead Failure in the Upper Great Plains, 1890-1925," forthcoming in *Journal of Economic History*.

7. Quoted in Roy V. Scott, *Railroad Development Programs in the Twentieth Century* (Ames, Iowa, 1985), 33; John A. Widtsoe, *Dry-Farming: A System of Agriculture for Countries under a Low Rainfall* (New York, 1911), 361. Campbell claimed that the onetime American desert would be the greatest agricultural region of the world. Campbell, *Soil Culture Primer*, 9-10. Similarly, B. C. Buffin argued that "evolution always leads towards greater perfection." Buffin, *Arid Agriculture: A Handbook for the Western Farmer and Stockman* (Laramie, Wyo., 1909), 11-12.

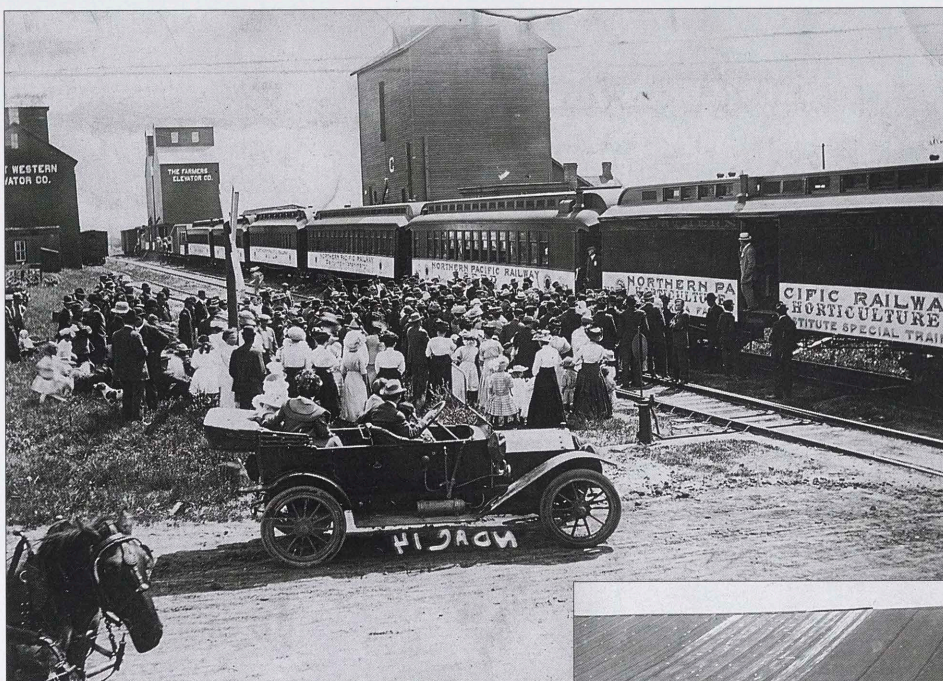
8. Widtsoe, *Dry-Farming*, 402.

9. See Hardy Webster Campbell, *Campbell's 1902 Soil Culture Manual* (Holdrege, Nebr., 1902), p. 6, for discussion of percolation and capillary action. For more on the key role of capillary action, see Widtsoe, *Dry-Farming*, 283; and E. B. Parsons, *Parsons on Dry Farming* (Aberdeen, S.Dak., 1913), 17, 44. See also Webster H. Campbell, *Soil Culture Primer* (Lincoln, 1914), pp. 66-83, for additional discussion of the principles of moisture storage. Campbell claimed that dryfarming cultivation in arid areas actually could result in yields three times higher than those found in humid areas because nutrients were not leached from the soil.

10. Campbell opposed larger farms, claiming that they were not family farms and were not productive. Campbell, *Campbell's 1902 Soil Culture Manual*, 5. Richard B. Roeder discusses Montana promoter Paris Gibson's emphasis on dense small farm settlement in "A Settlement on the Plains: Paris Gibson and the Building of Great Falls," *Montana The Magazine of Western History*, 42 (Autumn 1992), 4-19. See Stegner, *Beyond the Hundredth Meridian*, 219-42, for analysis of the political controversy over homestead size and efforts to adjust the federal land laws.

11. Campbell's books include *Campbell's 1902 Soil Culture Manual*; *Soil Culture Primer*; *1907 Soil Culture Manual* (Lincoln, 1907); and *Progressive Agriculture, Tillage, Not Weather Controls Yield* (Lincoln, 1916).





The Northern Pacific Railroad encouraged dryfarming and even sponsored special agriculture trains to provide instruction to farmers along its route, but for eastern Montana homesteaders, information about dryfarming came mostly from Montana agricultural experiment stations. By 1907, 12,000 farmers had attended Farmers' Institutes. At left, Professor H. L. Bolley gives a lecture on cultivating flax circa 1914. Below, Montana State College professors demonstrate the treatment of flax seed for farmers in Circle, Montana.

Institutes in most eastern Montana counties. During 1901-1902, the station held 17 institutes, and by 1907, 12,000 farmers had attended 154 such meetings. At Farmers' Institutes, experiment station personnel assured homesteaders that even in eastern Montana where annual rainfall was about 13 inches, irrigation was "not necessary" in many places and that good crops could be grown through the use of dryfarming practices. During droughts, lower, but adequate, yields could be maintained.<sup>12</sup>

As part of its effort to educate people about dryfarming, the Montana Agricultural Experiment Station distributed numerous short publications containing specific information about precipitation levels, farming techniques, and crop yields. Essays with titles such as "Cultural Methods Adapted to Dry Land Conditions," "The Dry Farm Unit," "Problems of Dry Farming in Montana," "Attend to the Fallow," "Dry Farming Principles," and "Suggestions to the Dry Farm Homesteader" explained what crop types grew best and what new varieties were under consideration, the use of summer fallow, the results of rotation experiments, and provided testimonials from established dryland farmers. Optimis-



tic in their prescriptions for the success of small dryland homesteads, these publications repeated or closely followed the principles advocated by Campbell, Widtsoe, Buffin, and others.<sup>13</sup>

Prospective settlers commonly wrote to the experiment station requesting a variety of information about the availability of land, cultivation practices, the weather (especially rainfall), the capital requirements to start a new farm, and how to locate other sources of information. For example, in a letter dated May 25, 1916, prospective homesteader B. D. Bundy, who had recently arrived in Glasgow, Mon-

12. Montana Farmers' Institutes, *Second Annual Report* (Bozeman, Mont., 1903), 201-3. See also correspondence from the Montana Agricultural Experiment Station to G. H. Carroll, January 5, 1911, file AC-F4, box 1, Collection 00004, M. L. Wilson Files, Plants and Soils, Merrill G. Burlingame Special Collections, Montana State University Libraries, Bozeman (hereafter Wilson Files); Montana Farmers' Institutes, *Third Annual Report* (Bozeman, Mont., 1904), 197-205; F. B. Linfield, *Bulletin of the Montana Farmers' Institutes: Organization of Farmers' Institutes and Announcement of Meetings for the Winter 1904-5* (Bozeman, Mont., 1905), 4; Montana Agricultural Experiment

Station, *Ninth Annual Report* (Bozeman, Mont., 1902), 17; Montana Farmers' Institutes, *Sixth Annual Report* (Bozeman, Mont., 1908), v.

13. Montana Agricultural Experiment Station publications, 1912-1913, file AF-F6, box 3, file AH-F2, AH-F7, box 4, Wilson Files. Other experiment results from demonstration farms and suggestions for crops and techniques were provided in Alfred Atkinson, "Crop Growing Suggestions to Dry Land Farmers," in *Montana Agricultural College Experiment Station Circular 45* (Bozeman, Mont., 1915), 121-38; and Alfred Atkinson and J. B. Nelson, "Dry Farming Investigations in Montana," in *Montana Agricultural College Experiment Station Bulletin No. 74* (Bozeman, Mont., 1908), 69-85.



tana, posed a series of questions to Alfred Atkinson of the Montana Agricultural Experiment Station: "Do you think a family can make a living on 160 acres of land in Valley Co. Mont? Which would be the best way to farm this land? What rotation would be the best for grain farming on this land? Should it be summer fallowed every other summer or every third summer? Or not at all? Would it be best to use the land for grazing? Would tame hay do well in the dry years?"<sup>14</sup>

In his May 30 response, Atkinson commented: "Replying to your letter of recent date in which you ask my opinion of the possibility of a family making a living on 160 acres of land in Valley county, [I] would say that I know of instances in the state where very good returns are being made on 160 acres of dry land." He suggested placing most of the land in wheat and some in alfalfa and offered to send a circular, *Crop Growing Suggestions to Dry Land Farmers*, adding: "You will note the methods of crop management which we recommend." If the homesteader followed these suggestions and added some livestock and garden "stuff," Atkinson promised "a pretty fair income." Similarly, in a 1909 letter Atkinson assured H. H. McKimney of Des Moines, Iowa, that "as a result of our observations and investigations on the Stations, we are convinced that dry farming has come to stay, and is just as reliable as any other class of farming."<sup>15</sup>

The Montana Bureau of Agriculture, Labor, and Industry, later known as the Department of Agriculture and Publicity, also provided homesteaders with general information on farming conditions. The agency's 1906 report declared that in fifteen years of wheat farming in Cascade County there had never been an entire crop failure on nonirrigated farms, although droughts could cut

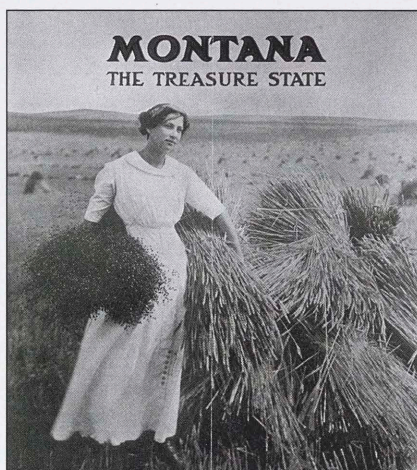
yields in half. Beginning in 1908, the bureau advertised dryfarming as the poor man's alternative to expensive irrigation provided by federal reclamation projects.<sup>16</sup>

Anxious to draw people to their area, local communities, land developers, and professional homestead locators advertised the advantages of their locale. The Glasgow Commercial Club claimed that the nearby land was "very productive without irrigation and the increased yields by irrigation makes it one of the richest valleys in the world." Miles City developer E. B. Milburn's flier "Eastern Montana Farm Lands" summarized the types of crops grown, comparative yields, rainfall, the availability of private and government land, and testimonials from satisfied farmers

"who are glad they came to Montana."<sup>17</sup> Such advertisements were distributed at agricultural fairs and traveling railroad exhibits and published in newspapers, farm journals, and railroad magazines.

Established in 1907 as a regional meeting of dryfarming proponents, the Dry Farming Congress introduced the latest information about dryfarming to thousands of farmers. At the meetings, speakers from throughout the Great Plains, and in some cases from foreign countries such as Australia, outlined the opportunities afforded through dryfarming and discussed new dryfarming techniques and crops.<sup>18</sup> Often leading dryfarm proponents, agricultural experiment station personnel, and local politicians, including the governors of Colorado, Montana, and Wyoming, addressed the assemblies. The annual conventions enjoyed wide appeal with

meeting sites including Denver in 1907, Salt Lake City in 1908, Cheyenne in 1909, Billings in 1909, Spokane in 1910, Colorado Springs in 1911, Lethbridge in 1912, Wichita in 1914, Denver in 1915, and El Paso in 1916. Five hundred delegates attended the third congress 1909, and in 1912, the Dry Farming Congress reported 15,000 members.<sup>19</sup>



A key component of propagating dryland farming principles was advertising, and the Great Northern Railway's *General Information about Montana: A Homesteader's Guide* (above) was typical of the genre.

14. B. D. Bundy to Alfred Atkinson, May 25, 1916, file AC-F4, box 1, Wilson Files. Atkinson was appointed president of Montana State College of Agriculture and Mechanical Arts in 1919.

15. Ibid.; Alfred Atkinson to B. D. Bundy, May 30, 1916, file AB-F9, box 1, Wilson Files.

16. Montana Bureau of Agriculture, Labor, and Industry, *Tenth Annual Report* (Helena, Mont., 1906), 311; Montana Bureau of Agriculture, Labor, and Industry, *Eleventh Annual Report* (Helena, Mont., 1908), 3.

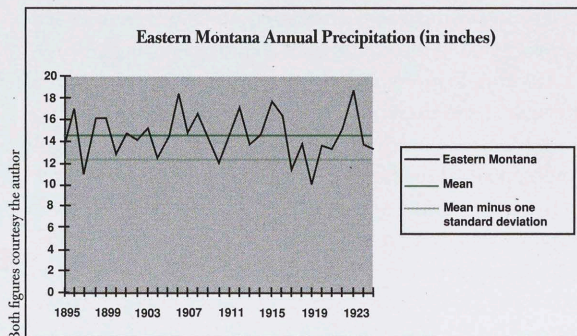
17. Glasgow Commercial Club, *Valley County: A Description of Location, Soil, Moisture, and Productiveness* (Glasgow, Mont., 1914), p. 3, pamphlet, PAM 406, Montana Historical Society Library, Helena (hereafter MHS); E. B. Milburn, *Eastern Montana Farm Lands* (Miles City, Mont., n.d.), copy in file AB-F6, box 4, Wilson Files.

18. Board of Control, *Third Dry Farming Congress* (Cheyenne, Wyo., 1909), 9-46.

19. Karl Quisenberry, in "The Dry Land Stations: Their Mission and Their Men," *Agricultural History*, 51 (January 1977), pp. 218-28, claimed that 10,000 attended the 1912 Dry Farming Congress in Lethbridge. Other sources claim that the congress had 15,000 members at the time. Board of Control, *The Seventh International Dry Farming Congress, 1912* (Lethbridge, Alberta, 1912), 31, copy in file AF-F4A, box 3, Wilson Files. Given the population of the region, the numbers are indicative of the movement's popularity. As a part of their effort, the congress's leadership lobbied the federal government for funding for dryfarming investigations.



FIGURE 1

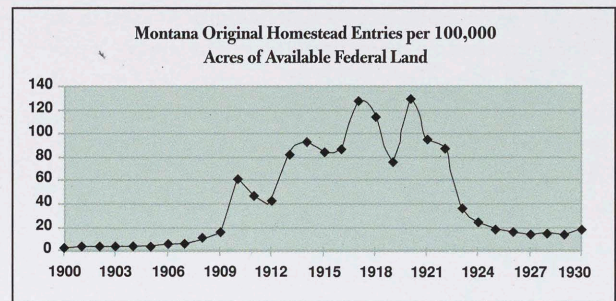


Railroads, such as the Northern Pacific, Great Northern, and the Chicago, Milwaukee, St. Paul and Pacific (known as the Milwaukee Road), were another important source of information about farming prospects in eastern Montana. As every student of Montana history knows, the railroads encouraged the state's homestead boom by assuring homesteaders that they need not fear droughts. "The fact has been demonstrated beyond any reasonable doubt that the yields . . . can be greatly increased and often doubled by the intelligent cultivation of the soil, and not only increased in amount but the yield rendered sure," asserted a 1911 Northern Pacific publication.<sup>20</sup> Buoyed by this belief, railroads disseminated fliers and brochures advertising farmers' testimonials and the results of dry-farming investigations throughout the United States and Europe.

Railroads also contributed funding for dryfarming investigations on both private demonstration farms and state experiment stations. In 1905 and 1906 the Northern Pacific Railroad and Great Northern Railway respectively allocated \$2,500 and \$2,000 for "cooperative tests on dry bench lands." The State of Montana soon joined the railroads in funding these efforts. In 1909 the State appropriated \$11,000 for demonstration farms with the Northern Pacific providing an additional \$5,000 and the Great Northern and the Milwaukee Road each \$2,000. By 1911 appropriations totaled \$16,250 and that figure rose to \$22,750 in 1913.<sup>21</sup>

But the railroads went beyond the development and dissemination of dryfarming doctrine. Railroad companies used experiment station research to sell Great Plains land through a major advertising blitz aimed at an international audience. In 1914, for example, the Chicago, Rock Island, and Pacific Railroad hired dryfarming authority

FIGURE 2



Henry M. Cottrell, director of the Colorado Agricultural Experiment Station and organizer of the Colorado Farmers' Institutes, to head its agricultural development department and spread word about the availability of fine low-cost farmland. To speed settlement, railroads created immigration departments and provided immigrant trains as a low-cost means of transporting household goods and farm equipment westward. They also provided, at cost, cuttings and seeds for crops such as alfalfa, corn, wheat, barley, and rye that seemed suited to the northern plains. Farmers received free transportation to Farmers' Institutes, and they visited demonstration trains such as the Better Farming Special the Chicago, Burlington and Quincy Railroad sent to sixty-five towns in Montana, Wyoming, South Dakota, and Nebraska in February 1914 to spread the word about moisture-saving techniques.<sup>22</sup>

**D**ryfarming doctrine and homesteading bloomed together and they jointly wilted between 1917 and 1921. The five-year drought of this period stands out for both the severity of the precipitation shortfall and for its length. The average rainfall in eastern Montana for the thirty years between 1895 and 1925 was a little above 14 inches (see FIG. 1). During the drought years, rainfall fell below 12 inches, far too little for most crops, particularly if dry weather occurred during the growing season, and well below what the United States Department of Commerce's Weather Bureau defined as a severe drought.<sup>23</sup> These statistics illustrate two important points about precipitation in eastern Montana in the early part of the twentieth century: Except for one-year droughts in 1904 and 1910, precipitation through 1916 was at or above average, and, indeed, the period between 1906

20. Northern Pacific Railroad, *Western North Dakota: Being a Description of a Land of Great Promise and the Opportunities It Holds for Homeseekers*, (St. Paul, Minn., [1911]), p. 15, pamphlet, PAM 2097, MHS.

21. Montana Agricultural Experiment Station, *Thirteenth Annual Report* (Bozeman, Mont., 1907), 109-13; Montana Agricultural Experiment Station, *Sixteenth Annual Report* (Bozeman, Mont., 1910), 65,

69-70; Montana Agricultural Experiment Station, *Eighteenth Annual Report* (Bozeman, Mont., 1912), 115-16.

22. Scott, *Railroad Development*, 8, 12-13; Richard C., Overton, *Burlington Route: A History of the Burlington Lines* (New York, 1965), 283-85. See also documents of support from the railroads for the Montana experiment station and dry farm substations in files AA-F8, AB-F1, AC-F1, AC-F4, box 1, Wilson Files.





Evelyn Cameron, photographer

Homesteaders with 160- or 320-acre claims could ill-afford the income shortfall that resulted from a dry growing season. With her finely crafted chairs and curtains, homesteader Rosie Roesler, pictured here with friends on August 31, 1913, exhibits her hard-earned domesticity. Even four years before the drought started making survival tenuous, Roesler walked to the town of Marsh, six miles away, to wash clothes and do other housework to earn extra money.

and 1916 was the wettest of the twentieth century. Conversely, during the five years that followed, the drought was so severe that nothing comparable occurred until the 1930s.

The drought appeared with a dry spring in 1917. Optimism among experiment station officials and homesteaders remained high, however, and farming continued as normal. Dryfarming doctrine inspired confidence that the drought could be withstood, and had it ended quickly, the doctrine probably would have been sustained much longer. Farmers endured droughts in 1904 and 1910 with little hardship, and this experience seemed to validate claims that the new techniques could successfully capture enough water in the soil to carry a small farmer through a drought year. In fact, Montana homesteaders made over 15,000 new land entries in 1917, more than in the previous year which had been much wetter, and settlers continued to arrive through the early 1920s (see FIG. 2).

By 1919, however, many observers, including Montana experiment station personnel, finally acknowledged

the unpredictability of drought. "Weather conditions beyond the expectation of any student of weather reports the past 40 years in this state have fallen upon Montana," noted the *Denton Recorder* in September 1919. For the first time, station officials doubted the ability of dryfarming techniques to guarantee a moderately successful crop.<sup>24</sup> In a further shift, by 1920 experiment station publications claimed that drought could be expected "rather frequently," and by 1921, they questioned the effectiveness of dryfarming doctrine.<sup>25</sup>

Moreover, the drought cast doubt on the feasibility of small dryland farms. Montana Agricultural Experiment Station director F. B. Linfield claimed in 1924 that the distribution of marginal lands via the homestead acts had been a mistake and that successful farming in dry areas required "two to four times the area of the land named in the National Homestead Acts."<sup>26</sup> Larger farms could diversify into livestock to help maintain income when wheat yields were down, and they could better afford to place land in fallow, which was an effective means of building up soil moisture. Homesteaders with 160- or 320-acre

23. Rainfall data for eastern Montana, 1895-1947, compiled from United States Department of Commerce, Weather Bureau, *Climatological Data, Montana Section*, vol. 50, no. 13 (Helena, Mont., 1947), 75. A common designation of a severe drought is precipitation one standard deviation (a measure of variability) below the average.

24. *Denton (Mont.) Recorder*, September 1, 1919; Montana Agricultural Experiment Station, *Twenty-Sixth Annual Report* (Bozeman, Mont., 1920), 8. The July 14, 1919, *Fairview (Mont.) News* said that the drought is "without precedent in the weather records of this state."

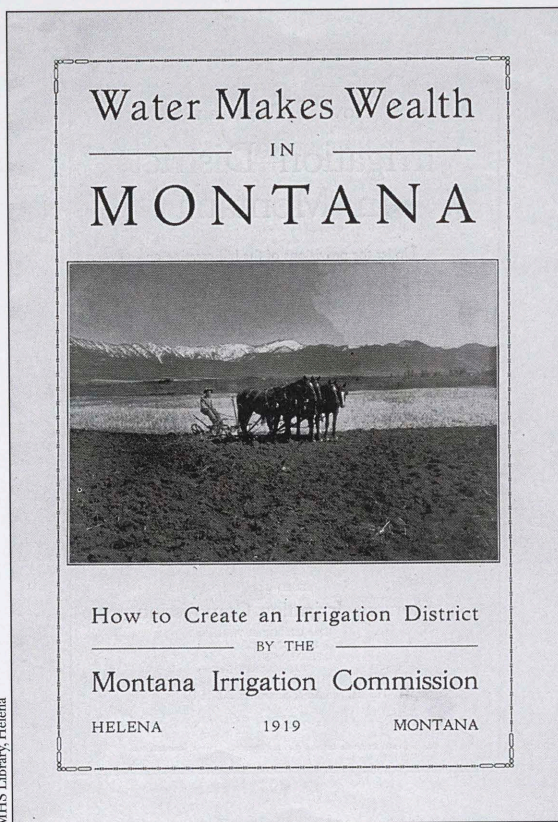
25. Montana Agricultural Experiment Station, *Twenty-Seventh Annual Report* (Bozeman, Mont., 1921), 7; Montana Agricultural Experiment Station, *Twenty-Eighth Annual Report* (Bozeman, Mont., 1922), 57.

26. Montana Agricultural Experiment Station, *Thirtieth Annual Report* (Bozeman, Mont., 1924), 8; F. B. Linfield, *Thirty-Second Annual Report* (Bozeman, Mont., 1926), 6.

27. John H. Rich, *The Economic Position of Agriculture in the Northwestern Grain Raising Area* (Minneapolis, 1923); Roland R. Renne, "Montana Farm Bankruptcies," in *Montana Agricultural Experiment Station Bulletin No. 360* (Bozeman, Mont., 1938), 20; Roland R. Renne, "Montana Farm Foreclosures," in *Montana Agricultural Experiment Station Bulletin No. 368* (Bozeman, Mont., 1939), 17.

28. Howard, *Montana*, 207-8.





MHS Library, Helena

farms did not have the luxury of leaving much land in fallow. They required continuous production from the entire farm to make a living.

The drought devastated homesteaders. Average wheat yields dropped from over 26 bushels in 1915 to less than 3 bushels per acre in 1919, and on many small farms, there was no crop at all. Between 1919 and 1921, farmers had difficulty producing enough to sustain their families, let alone sufficient income to pay banks for loans and local governments for accrued taxes. Plummeting wheat prices after the end of World War I meant that what little could be grown sold for much less than it had a few years earlier. Loan defaults and foreclosures followed.

Although these problems confronted farmers throughout the upper Great Plains, eastern Montana homesteaders were most affected. The region had the nation's highest rates of loan foreclosure, farm abandonment, and bank failure due to unpaid loans.<sup>27</sup> Howard, in his polemical *Montana: High, Wide, and Handsome*, estimated that over 11,000 farms, or one out of five, failed and approximately 2 million acres of land went out of production.<sup>28</sup> The remaining farmers consolidated the small landholdings into larger farms. Once-flourishing towns withered. School districts created in anticipation of growing enrollment instead closed facilities and consolidated. Not surprisingly, Montana became less attractive to immigrants. The number of

In a land subject to recurring droughts, irrigation offered a reliable, though by no means guaranteed, alternative to dryfarming. The pamphlet above proposed that irrigation could help alleviate the effects of a drought that was driving the homesteaders off their claims. Below, the Gardiner family poses on hard-used land.



Evelyn Cameron, photographer



new homesteads declined in 1921 and 1922 and then fell sharply in 1923, never to rebound.

The claim made by most histories of the period that railroads knowingly misled settlers with extravagant claims about dryfarming prospects is incorrect. The railroads were not mere publicists, indifferent to the outcome of homestead migration. The railroads funded scientific research in order to promote the settlement of their service areas and, in the case of the Northern Pacific, to sell land. Rather than duping fools, the railroads hoped to address the difficult conditions of the region and thereby create a permanent population of farmers who would ship and receive goods via their rail lines. The railroads had a stake in successful homesteads. Widespread agriculture failure reduced the attractiveness of the area and, hence, the value of railroad investment in the upper Great Plains. Like farmers, railroads had relied on the limited scientific information about dryfarming prospects and weather provided by the experiment stations. Unfortunately, their information proved to be too incomplete and optimistic for the drought conditions that unfolded between 1917 and 1921.

The legacy of the drought was a more somber assessment by all parties—farmers, experiment station personnel, local promoters, and railroad officials alike—of what it would take to succeed in farming in eastern Montana. Some dryfarming techniques such as the use of fallow were shown to be valuable tools for agriculture in a semi-arid region. But all agreed that practical science could only go so far in mitigating the weather of the Great Plains. No longer was it believed that dryfarming cultivation could store enough moisture in the ground to defeat drought. The risks of the region's climate remained, and farmers would have to adjust to it. *M*

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In the rural West dilapidated houses and outbuildings, weathering and usually forgotten, stand as reminders of how poorly homesteaders understood Montana's climate. Historians' claim that railroad officials unscrupulously lured homesteaders to land they knew to be too arid for farming is untrue; farmers, local promoters, experiment station personnel, and railroad officials had relied on the limited scientific information available and the result was a somber reassessment of what it would take to succeed in farming in eastern Montana.



State Historic Preservation Office, Helena





# Winter in the Rockies

## Winter Quarters of the Mountain Men

by Kerry R. Oman





## CHAPTER V

## ELECTION RETURNS, "A CASE OF JITTERS"

Joseph M. Dixon was elected governor of Montana in 1920 in an unprecedented landslide. Receiving 111,113 votes, the largest vote ever gathered by a political candidate in the history of Montana, Dixon won over 60 per cent of the total vote compared to Burton K. Wheeler's 40 per cent of the total vote, or 74,875 votes.<sup>1</sup> The Republican vote is even more striking when compared with the 1916 vote of the gubernatorial contest when Sam Stewart received 85,683 votes (53 per cent) compared to Frank J. Edwards who received 76,547 votes (47 per cent).<sup>2</sup> On the national level Harding collected 109,430 Montana votes and Cox won 57,375, figures considerably lower than the state major candidates, particularly that of Cox compared to Wheeler. Women voted in the general election of 1920, not in the primary, which may account for the fact that roughly five per cent more persons voted in 1920 than in 1916 in the major elections.

The Montana press was jubilant with the election results.

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<sup>1</sup>Waldron, op. cit., p. 177.

<sup>2</sup>Ibid., p. 174.



"DIXON SWEEPS MONTANA IN G.O.P. SLIDE"<sup>3</sup> headlined the Great Falls Tribune after the election counts seemed official in the capital. The Nonpartisans were engulfed by tidal waves,<sup>4</sup> the Tribune reported. Similar sentiments were echoed throughout the Montana press as editors wrote the League's eulogy with elation.

The Anaconda Standard wrote that "BUTTE KICKS OUT THE REDS AND ELECTS AMERICANS TO OFFICE,"<sup>5</sup> although Butte had overwhelmingly voted for Wheeler in the election. The Standard was not content to merely win the election but continued its harangue of Wheeler with an epitaph called the "Eclipse of Wheeler" typical of its abusive style of journalism:

A candidate cannot expect to climb into power by attacking one of its leading industries. Mr. Wheeler, an accident in politics, chewing the end of bitter reflection today, found this lesson an expensive one...Butte spat him out of her mouth with all the noisesome crew of red [sic] and wobblied who followed him...no door-nail was ever more dead than Townleyism.<sup>6</sup>

The state weeklies said little about the results of the election. The Judith Basin Farmer called the outcome

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<sup>3</sup>Great Falls Tribune, November 3, 1920, p. 1.

<sup>4</sup>Ibid.

<sup>5</sup>Anaconda Standard, November 3, 1920, p. 1.

<sup>6</sup>Ibid., November 4, 1920, p. 1.



"the defeat of radicalism".<sup>7</sup> Tom Stout of that newspaper wrote that the Non-Partisan League was dead and that the agrarian political movement contained too many radicals, which was the reason Wheeler was defeated in the election.<sup>8</sup> Stout felt that Wheeler was not an issue. On the other hand, the Miles City American commented on the campaign saying that "Outside of having a lot of bunk peddled to them about being good 'Americans,' the 'Democrats' who voted for the Republican reactionary ticket will get absolutely nothing for their treachery."<sup>9</sup>

The Butte Bulletin was more venomous in its remarks about the election than any other pro-Wheeler newspaper. Its indictment of the Standard was particularly bitter. Dunne wrote about the Standard that:

much has been published by the editorial leper who manages the Anaconda Standard...he speaks of the "reds" or radicals..he congratulated the people of Montana on being saved from the "blight" which is on North Dakota...the editor of the Anaconda Standard is like any street-walker--yellow.<sup>10</sup>

Dunne ended his contemptuous assessment of the Standard and of the Company influence with pledges to continue his

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<sup>7</sup>Judith Basin Farmer, November 4, 1920, p. 8.

<sup>8</sup>Ibid.

<sup>9</sup>Miles City American, November 4, 1920, p. 4.

<sup>10</sup>Butte Bulletin, November 5, 1920, p. 4.



harassment of them in the most inflammatory remarks of the campaign:

The cuttle-fish of privilege has been spreading its dirty black ink upon the political seas. The Anaconda Standard with its prostitute editor has become utterly discredited. It lied when the truth would have served better. Like the skunk, the fumes of its stinking lies rise to high heaven...from now on, the Bulletin will renew its efforts to smoke out the skunks and badgers of the tin-horn type of politicians who have made Butte their breeding place.<sup>11</sup>

The Helena Record-Herald, expressing what a majority of Montanans had done silently with their vote, said that the Dixon victory was a "return to sanity,"<sup>12</sup> hopeful for the "back to normalcy" reminiscent of Wilson's post-war desires. Other daily newspapers were unanimous in their beliefs that the farmer-labor party was dead and that Townley and Dunne would have no influence in the future.<sup>13</sup> The Helena Independent praised the Loyalty League for its attempts to expose Dunne, Townley, and the Non-Partisan League for the past thirty months. Moreover, the Independent continued that the League deserved a vote of thanks from the people of Montana.<sup>14</sup> The Independent indicated

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<sup>11</sup>Ibid.

<sup>12</sup>Helena Record-Herald, November 3, 1920, p. 4.

<sup>13</sup>Great Falls Tribune, November 6, 1920, p. 6; Butte Miner, November 4, 1920, p. 4.

<sup>14</sup>Helena Independent Record, November 4, 1920, p. 4.



MHS June '02  
Joseph M. Dixon of Montana  
--Gules A. Karlin

# introducing JOSEPH M DIXON

## CHAPTER ONE

One Sunday afternoon in February of 1919 a large crowd "filled" the seats of the Liberty Theater, a popular meeting hall in the small western Montana city of Missoula. The stage was occupied by a man of medium stature, with thin, graying hair, clean-cut features, a prominent jaw, rimless spectacles, and a respectable paunch. His voice, softened by lingering touches of a drawl, was a splendidly tuned and convincing instrument. This was Joseph M. Dixon, a former United States senator from Montana, eulogizing Theodore Roosevelt at a memorial service for that recently deceased ex-president.

Only the most insensitive members of the audience could have ignored the poignant conjunction of orator and subject. Seven years earlier, after Dixon had managed the colonel's unsuccessful pre-convention drive for delegates, he had sacrificed his first political life for Roosevelt when he became the lone Republican whose senatorial or gubernatorial term expired in 1913 to bolt the party. He had then compounded this crime by assuming the direction of the Bull Moose campaign. Moreover, in spite of his political vicissitudes, Dixon remained a fanatically dedicated Rooseveltian to the end of his days. Alert spectators listening to Dixon relate "intimate incidents" in the life of his subject might have reflected on the current retirement of their jovial fellow-townsmen. After almost three decades of unremitting activity, he was now dividing his time between his ranch on Flathead Lake and his home in Missoula, where he possessed varied business interests. Since the sale of his newspaper in 1917, he had abstained from politics. In fact, the act of disposing of that organ had seemed tantamount to a renunciation of a renewed public career. But, in view of the control of the party machinery by his foes and his bitter feud with the Anaconda Copper Mining Company, a dominant force in Montana politics, perhaps the gesture had been supererogatory.

As the eulogist wove varied historical strands into his address, some of the audience might have perceived another link between the Montanan and his deceased leader. Like Roosevelt, Dixon was an inveterate reader whose inability to refrain from buying books had resulted in his



amassing an unusually large private library. Although he was avowedly partial to works dealing with North Carolina and the West, his favorite was biography which, he explained in a letter to a friend, revealed with more insight than other kinds of literature "the story of life and painful progress."

Early in his lengthy memoir of Roosevelt, Dixon provided a rationale for his own biography. He asserted that men who have won places in history might be "...of interest and importance to posterity as individuals or as representatives of their time, or in both capacities."

<sup>1</sup>For the fullest account of the ceremonies as well as the complete text of Dixon's address, see Missoula *Missoulian*, February 10, 1919. (Hereafter cited as *Missoulian*.)

## young JOE DIXON

### CHAPTER TWO

In his tribute to Theodore Roosevelt, Dixon insisted that

...to understand intelligently any man who has achieved substantial results...we must first turn...to the accident of his birth. In the time and place of his birth, in the influences and atmosphere of his childhood and youth, we can often find the key to the mystery which every human life presents and obtain a better explanation of the character and career of the man himself.<sup>1</sup>

These words might well have been autobiographical, for an understanding of Dixon required a comprehension of the Quaker environment of his boyhood and of the towering presence of his father.

On the thirty-first day of July, 1867, a son was born to Hugh Woody and Adaline Murchison Dixon in their farm home near the cross-roads hamlet of Snow Camp, North Carolina. The infant was the third of four children and the only son. He was christened Joseph Moore after a Quaker educator who was then occupied in rebuilding the schools of that sect in North Carolina. The first name might also have been a compliment to the baby's paternal grandfather.

Snow Camp still slumbers approximately 25 miles from Greensboro in the west-central portion of the Piedmont. Time has dealt so gently with the landscape that it seems to have been hardly altered over the century. The area, which is still primarily agricultural, is rolling and heavily wooded. The old mills and factories, deteriorating and long closed, have blended into the countryside.

In 1867 Snow Camp was a predominantly Quaker enclave and its focal points were situated at a crossroads a half mile from town. On a hilltop site carved out of the surrounding woods sat the trinity to which members of the Society of Friends attached much importance: the meeting-house, the school, and the cemetery. Rude, upright and irregularly cut gravestones, dating back to 1764, indicate the longevity of the settlement. The carved names show a plentitude of

<sup>1</sup>Quoted in the *Missoulian*, February 10, 1919.



on customarily encountered at Helena in alternate winters. For a genial, ambitious man like Dixon, these relationships could produce dividends.

\* \* \* \* \*

The year of 1902 gave promise of being a relatively quiet year in Montana politics. Only two major offices would be contested: an associate judgeship on the state supreme court; and the sole Montana congressional seat, which was the long-term object of Dixon's ambition.

Dixon believed that divining when to launch one's candidacy was a high political art. Hence, in 1902 he must have examined closely both the political geography and the party alignments of Montana in an effort to determine whether the omens for his candidacy were propitious.

Montana presented a geographic challenge to a prospective candidate. Topography and climate influenced the economy. No politician could forget that the bulk of the state's income in 1902 was provided by mines and timber in the west, wheat and other grains in the east, and cattle and sheep-ranching in virtually every section. These were supplemented by meager manufacturing based almost exclusively on extractive industries. Copper, wheat, lumber, livestock, and wool influenced balance sheets and politics alike.

Nor could an aspiring politician ignore Montana's racial components. The census of 1900 estimated that the thinly populated state possessed fewer than two hundred and fifty thousand inhabitants, more than half of whom were either of foreign birth or parentage. The leading national groups were Canadian, Irish, English, German, Swedish, Austrian and Norwegian. Most of these European-Americans lived in local groups. The Irish and Germans gravitated towards the mining areas; the Scandinavians as in Minnesota and the Dakotas, thronged into farming country.

Dixon would also have to take account of the presence in Montana of powerful economic forces, which employed cash and other weapons in the attempt to obtain political control. While the two transcontinental railroads were not mere spectators, the copper titans were notorious participants. The Amalgamated Copper Company with its Standard Oil connections, William A. Clark, and F. Augustus Heinze indulged in ferocious three-cornered warfare during this era.

The predicament in which the Democrats found themselves must have pleased Dixon. Although they had dominated the last three elections they were suffering from the after-effects of the widely-publicized

feud between the recently deceased Marcus Daly and Senator Clark and from the bitter hostility between the political forces which split allegiance between the Amalgamated and Heinze. In addition, they would have the task of retaining the support of the independent voters who were suspicious of the brawling overlords of Butte.

In contrast, the problems of the Republicans had been alleviated by two auspicious developments. They were now at last superficially united, although the strife between the former Gold and Silver factions had left lingering resentments. Moreover, after his enthusiasm in Montana and Dakota, Theodore Roosevelt was popular, hence exploitable, in the state. Third, McKinley martyred was of greater symbolic value to the Montana G.O.P. than he had been in life.

The Republicans were not without sources of dissension, of course. Foremost among those was the commanding presence of Thomas H. Carter. Forty-eight years of age, small in stature, with white hair and brows and luxuriant whiskers, he had become the undisputed leader of Montana's Republicans and a national figure. A Helena lawyer by profession, he had served as the last territorial delegate and the first congressman, commissioner of the General Land Office in Benjamin Harrison's administration, chairman of the G.O.P. national committee in 1892, and senator from 1895 to 1901. Now he was president of the national commission for the St. Louis World's Fair, an index of his standing within the party. In addition, with a Republican in the White House and Montana's senators and lone representative Democrats, Carter continued to handle legislative problems of interest to the state and to allocate the federal patronage to which Montana was entitled.

Carter was complex. On the one hand, he was a tender and devoted husband and father, a loyal friend, a fancier of roses, a staunch Catholic and a proud Irishman, unquestionably able and shrewd. He was also hot-tempered, inordinately vain, overly punctilious, cynical, brutally hostile to deviation, arrogant, demanding, and ruthless in his relations with men whom he regarded as his political or intellectual inferiors. Given these characteristics, "Uncle Tom" was not an easy political boss. Hence, while he possessed devoted lieutenants, he had accumulated enemies who writhed under his domination and who would be only too willing to humble him if the opportunity beckoned even faintly.

Although later hailed as the legislative father of the postal savings system, Carter was a self-styled conservative. A member of the



dominant inner circle of the Senate and an associate of the rich, the well-born and other men with significant power, he was sympathetic to the Amalgamated Copper Company and to the railroads operating in Montana.

Obviously Carter and Dixon were virtually fated to clash. Carter was thirteen years older than the Missoulian and had been a national figure almost a decade before Dixon had even been elected to the state legislature. When Dixon failed to exhibit a willingness to become a protégé of Carter, it became apparent that their ambitions conflicted. Moreover, the two men differed in temperament and ideology.

When the estrangement between Carter and Dixon finally occurred, it was exacerbated by their lack of mutual associates. Carter was linked with the Nelson Aldrich group in Washington. In Montana his closest political intimates were Thomas A. Marlow, the cool, astute Helena banker-politician; John E. Edwards, the redoubtable ruler of Rosebud County, who combined banking, newspaper publishing and land speculation; and Charles M. Bair of Billings, a wealthy entrepreneur and sheep-raiser.

But not even Carter was a law unto himself. He was gripped by an overwhelming desire to return to the United States Senate in 1905. Since the state senators elected in 1902 would cast ballots in the legislative conclave three years later, Carter would be virtually compelled to work for the party nominees for both state and local offices, regardless of his preferences. Although he might with reason have preferred that a Democrat hold the congressional seat, a shrewd politician like Carter probably viewed the overt undercutting of a G.O.P. candidate as a dangerous practice.

September, 1902, with its scheduled state conventions, brought months of Democratic maneuvering to a head. It had been evident early that the Clark and the Amalgamated factions had become reconciled, at least temporarily, now that Daly was dead. As Miles Romney, the reform-minded editor of a western Montana weekly, phrased it: "After all these years of strife and turmoil, it is pleasant to see the Anaconda Standard and Butte Miner dwelling together in amity."

When the Democrats convened at Bozeman, the Amalgamated-Clark forces dealt summarily with the Heinze insurrection against their domination. When the central committee refused to seat the United Copper Company's delegation from Silver Bow County, Heinze's men were left without a political base.

The Democrats then nominated John M. Evans, a Missoula lawyer, for the congressional seat on the first ballot and district judge Jere B. Leslie of Great Falls for the supreme court on the third.

Unfortunately for the Democrats, the Heinze men, after being expelled from the convention, kept moving until they reached Helena. There, to the intense indignation of the local Clark newspaper, they formed the Labor Party. Then, with the remnants of the Populists, they nominated Martin Dee, of Butte, for Congress. They reserved a decision on the judgeship.

Even before the Bozeman events, Republicans had viewed the coming campaign with unusual "equanimity and cheerfulness...." No one at the Democratic convention had been more joyous than the Republican observers. One wrote Dixon that the Democrats were having "a monkey and a parrot time of it here this afternoon, and the fur will fly tonight." He was confident that their "disrupted appearances...would seem to make victory for our party possible and probable."

Given these auspicious signs, the Republican nomination for the House seat was to be coveted. Although he followed the political canon of displaying little public interest in the office, Dixon did not conceal his eligibility. In supporting Henry Thomson for sheriff of Missoula County shortly before the state convention, Dixon advanced a line of argument which was equally applicable to himself. He stressed that the Republicans required candidates who did not bear the burden of past defeats. He also claimed that "We must give the young men a chance."

Dixon could also realize that he had additional credentials. In his two exposures to a capricious electorate he had won heavily. He had served with distinction at Helena and demonstrated throughout western Montana his ability to make effective speeches. He was personable and in his decade of residence in Missoula he had built up a large acquaintanceship. Moreover, not only had he avoided entanglements in the continuing Butte imbroglio, but he was viewed favorably by the Amalgamated's political henchmen and by labor. Except for his flirtation with free silver, he was almost too perfect a candidate.

The most obvious obstacle to the fulfillment of Dixon's ambition was Carter. Although "Uncle Tom" had bestowed two signs of approbation on the Missoulian earlier in the year, he did not support Dixon's aspirations. Instead, shortly before the Republicans met, the editor of a new Carter organ announced that the party would probably nominate Judge



## CLIMATOLOGICAL DATA: MONTANA SECTION

AUGUST, 1925

## Daily Temperatures for August, 1925

Daily Temperatures																																	
Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Mean	
Agricultural College.....	Maximum	86	86	79	81	84	84	82	78	81	81	78	76	76	71	66	71	76	77	79	85	86	78	67	82	88	69	65	67	78	78	78.1	
	Minimum	52	56	52	47	48	50	50	54	56	56	47	47	52	40	35	33	43	54	48	60	49	51	56	41	41	51	49	45	39	42	48	
Big Timber .....	Maximum	95	92	94	92	95	94	93	92	86	82	88	93	85	80	84	80	87	80	83	88	95	98	84	74	85	97	84	78	75	84	90	86.6
	Minimum	45	50	60	55	50	50	52	50	52	50	48	48	52	47	40	43	40	45	45	48	50	57	45	40	45	40	45	38	38	43	47.1	
Billings .....	Maximum	87	94	95	89	93	92	86	82	88	91	83	79	89	86	80	82	83	82	81	90	94	92	86	77	81	89	80	79	81	86	86.1	
	Minimum	44	47	57	55	47	51	54	52	46	53	52	49	45	56	39	36	52	45	50	54	44	54	44	38	40	54	58	50	45	48.3		
Butte .....	Maximum	87	84	80	82	83	84	82	82	82	77	78	79	77	65	55	69	76	78	82	87	81	79	74	66	80	84	72	65	67	78	85.0	
	Minimum	44	47	57	55	47	51	54	52	46	53	52	49	45	56	39	36	52	45	50	54	44	54	44	38	40	54	58	50	45	48.3		
Culbertson (near) .....	Maximum	88	93	96	97	93	95	91	86	87	79	83	90	82	75	87	80	81	83	81	85	97	94	78	66	80	56	49	35	61	41	44	48
	Minimum	49	50	55	53	49	49	53	57	50	53	51	45	49	43	40	38	40	40	47	47	47	47	59	41	40	40	42	42	43	38	38	41
Cut Bank .....	Maximum	90	90	93	84	83	84	82	77	79	82	75	67	80	85	73	58	61	66	68	76	87	87	87	87	87	87	87	87	87	87	87	87
	Minimum	52	55	52	51	53	52	54	51	53	49	51	40	43	53	42	45	45	45	45	47	47	47	59	41	40	40	42	42	43	38	38	41
Dillon .....	Maximum	84	83	84	84	82	83	81	81	80	82	84	81	77	78	73	68	71	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73
	Minimum	44	55	50	48	47	49	50	52	50	48	50	51	48	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47
Fortine .....	Maximum	94	92	86	88	90	87	83	83	83	91	85	79	87	84	85	47	42	42	42	42	37	37	45	43	46	43	40	35	41	77	84	96
	Minimum	38	45	45	34	37	47	33	33	34	38	40	34	35	47	42	42	42	42	42	37	37	45	43	46	43	40	35	41	77	84	96	
Glasgow .....	Maximum	94	97	97	96	89	99	91	82	83	89	84	80	83	84	80	82	83	88	86	83	91	101	97	84	79	91	82	64	59	41	38	47
	Minimum	51	52	63	63	50	52	50	41	43	53	56	53	45	57	42	51	46	45	52	44	61	54	59	45	41	62	78	89	98	94	91	75
Glendive .....	Maximum	92	95	100	95	97	93	91	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87
	Minimum	48	56	59	62	58	57	53	53	51	85	85	78	80	87	80	79	74	75	82	93	92	87	57	77	70	85	84	81	68	72	81	82
Great Falls.....	Maximum	94	93	90	85	88	90	50	54	48	47	50	52	45	48	60	48	52	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
	Minimum	50	57	65	52	50	50	54	48	47	50	52	45	48	60	48	52	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
Haugan .....	Maximum	94	93	94	90	87	84	86	88	87	84	86	87	84	86	84	67	54	64	76	86	87	91	89	83	63	64	67	80	84	81	64	81
	Minimum	42	49	55	34	34	38	35	38	42	38	38	38	46	43	45	43	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
Havre .....	Maximum	92	96	99	95	89	90	79	82	83	86	76	81	89	73	66	50	45	45	42	39	40	36	38	43	40	29	29	49	28	33	26	31
	Minimum	50	54	55	34	34	38	35	38	42	38	38	38	46	43	45	43	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
HELENA.....	Maximum	90	91	85	85	87	84	79	83	80	71	73	68	66	56	48	47	51	44	50	52	55	55	52	49	48	41	51	53	53	66	64	69
	Minimum	54	61	61	54	37	59	53	53	52	58	54	51	53	47	47	51	44	50	52	55	55	52	49	48	41	51	53	53	53	66	64	69
Kalispell .....	Maximum	89	86	83	84	82	87	80	84	85	81	73	80	72	55	52	56	71	79	83	83	89	74	58	63	74	81	66	66	70	72	78	83
	Minimum	54	60	57	48	51	50	53	50	51	54	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46
Lewistown .....	Maximum	92	90	96	85	90	89	80	85	85	72	83	89	80	60	53	54	50	47	54	51	91	92	91	78	75	75	75	75	75	75	75	75
	Minimum	62	60	61	57	55	56	57	59	54	51	56	55	53	54	50	47	54	51	91	92	91	91	91	91	91	91	91	91	91	91	91	91
Malta .....	Maximum	89	97	88	91	92	92	74	79	84	92	76	77	89	83	66	70	75	79	84	83	81	82	82	82	82	82	82	82	82	82	82	82
	Minimum	49	59	55	51	52	58	46	46	54	58	49	47	62	49	50	49	47	53	61	89	83	86	99	94	92	92	92	92	92	92	92	92
Miles City .....	Maximum	90	92	97	96	94	96	79	81	84	87	76	76	85	87	78	82	84	83	81	82	82	82	82	82	82	82	82	82	82	82	82	82
	Minimum	49	52	65	62	59	63	60	52	62	69	56	51	62	52	48	50	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49
Missoula .....	Maximum	94	86	88	90	86	87	88	89	89	85	84	70	64	54	70	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
	Minimum	55	55	60	48	47	50	51	52	52	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54
Red Lodge .....	Maximum	79	82	82	78	80	82	78	72	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
	Minimum	42	49	50	48	45	49	48	49	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46
Snowbelt .....	Maximum	88	91	92	87	90	93	78	78	83	88	69	75	86	83	69	81	77	75	79	92	95	92	84	67	84	67	84	95	86	73	71	78
	Minimum	44	60	63	52	48	49	59	50	44	58	51	45	49	56	42	53	40	48	47	46	46	46	46	46	46	46	46	46	46	46	46	46

## Climatological Data for August, 1925—Continued from page 32

Climatological Data for August, 1906																				
Stations	Counties	Elevation, feet	Length of record, years	Temperature, in degrees Fahr.						Precipitation, inches			Number of days				Prevailing direction of wind	Observers		
				Mean	Departure from the normal	Highest	Lowest	Date	Greatest daily range	Total	Departure from the normal	Greatest in 24 hours	Total snowfall, unmelting	With precipitation of 0.01 inch or more	Clear	Partly cloudy			Cloudy	
Eastern Division																				
Baker (Y)	Fallon	2,600	2	69.3		98	22	40	161	48	0.39	0.20	0	3	24	7	0	se.	J. O. Hembre	
Ballantine	Yellowstone	2,092	6								0.40	0.18	0	3	27	4	0	ne.	U. S. Reclamation Service	
Barthelme Ranch #1	Custer	2,091	1			101	22	34	16	53	0.17	0.07	0	4	29	2	0	ne.	Casey E. Barthelme	
Biddle	Powder River	3,115	20	69.4	- 2.3	95	3	36	167	50	0.32	-0.76	0.16	0	4	22	5	4	nw.	John L. Scofield
Billings	Yellowstone	3,664	31	67.2	+ 1.1	98	21	36	147	52	0.05	-0.55	0.05	0	1	23	7	1	w.	Henry W. Peterson
Bridger	Carbon	3,050	16	68.4										0	1	23	7	1	se.	R. A. Thornton
Broadus	Powder River	3,041	22	67.5	- 1.3	100	22	36	16	54	1.19	+0.02	0.92	0	5	11	13	7	w.	Rev. Alfred Habegger
Busby	Bighorn	1,918	43	65.6	- 3.7	99	22	35	147	55	0.00	-0.98	0.00	0	1	25	6	0	e.	U. S. Indian Service
Crow Agency	Richland	1,918	21	68.2	- 0.6	97	31	35	25	50	0.19	-1.66	0.13	0	1	27	4	0	w.	W. A. Whitcomb
Culbertson (7 mi. SW)	Carter	27	72.4	+ 4.0	100	22	43	30	43	0.65	-0.36	0.23	0.11	0	4	21	10	0	se.	William Freese
Ekalaka	Petroleum	11	67.2	- 0.3	97	26	36	25	52	0.37	-0.62	0.11	0	0	5	18	12	1	nw.	W. C. Wiggins
Flatwillow	Rosebud	2,529	1	73.6		98	22	42	18	51	0.22		0.12	0	2	23	6	2	w.	P. W. Barthel
Forsyth	Big Horn	2,800	16	68.6	+ 0.7	99	22	37	167	57	1.07	+0.42	0.50	0	3	16	14	1	nw.	Mrs. John Bennett
Foster #1	Valley	2,068	1	68.0		100	3	36	25	52	0.54		0.27	0	5	14	13	4	nw.	William Brough
Frazier	Valley	2,600	3	69.8		103	22	39	25	57	0.50	0.32	0	2	22	9	0	nw.	P. T. Bennett	
Garland	Custer	2,092	30	70.2	+ 1.7	102	26	38	30	50	0.09	-0.99	0.09	0	1	20	7	4	nw.	Elmer Hall
Glasgow	Valley	2,091	36	71.9	+ 0.3	105	22	38	25	48	0.12	-1.18	0.07	0	5	24	7	0	w.	J. W. Heath
Glendive	Dawson	2,091	36	71.9	+ 0.3	105	22	38	25	48	0.12	-1.18	0.07	0	5	24	7	0	w.	John H. Herman
Hays	Blaine	3	66.6		96	25	30	20	64	0.37		0.10	0	0	2	24	5	4	w.	A. J. Plumer
Hysham (near) (Y)	Treasure	3,035	8	69.2		98	22	39	16	49	0.74		0.50	0	4	21	10	0	nw.	Ernest McCollum
Ingomar (near)	Rosebud	3,035	8	69.2		98	22	39	16	49	0.74		0.50	0	4	21	10	0	nw.	Harry A. Woodruff
Knowlton	Custer	10	70.3	- 0.5	96	20	44	18	41	T.	-1.19	T.	0	0	24	6	1	nw.	J. C. Wall	
Lustre #1 (S)	Valley	3	69.2		96	20	44	18	41	T.	-1.19	T.	0	0	24	6	1	nw.	U. S. Reclamation Service	
Malta	Phillips	2,250	19	67.6	- 0.8	95	26	42	29	43	0.06	-1.09	0.04	0	2	16	11	4	w.	W. F. Glauzke
Medicine Lake #2 (S)	Sheridan	1,969	14	67.0	+ 1.6	100	22	38	26	52		T.	0	0	25	6	0	nw.	Leon B. Clark	
Mildred	Prairie	2,364	16	70.3		102	22	40	15	47	T.		0	0	4	22	9	0	se.	U. S. Weather Bureau
Miles City	Custer	2,378	33	71.8	+ 0.3	99	22	47	30	39	1.68	+0.65	1.00	0	4	22	9	0	se.	Amund Johnson
Outlook	Sheridan	6	65.4		100	21	29	24	55	0.42		0.14	0	0	6	23	7	1	nw.	Nels Christensen
Paxton	Dawson	13	60.8		90	26	31	25	49	0.02		0.02	0	1	22	6	3	nw.	Griff. St. Jernian	
Pine Grove	Fergus	2,737	13	69.6	+ 1.6	102	22	36	25	49	0.24	-0.88	0.15	0	3	22	9	0	nw.	C. C. Conser
Plevna	Fallon	2,737	13	69.6	+ 1.6	102	22	36	25	49	0.24	-0.88	0.15	0	3	22	9	0	nw.	U. S. Forest Service
Poker Jim Ranger Station (X)	Rosebud	2,020	42	67.9	- 1.6	100	3	33	25	60	0.12	-1.05	0.09	0	2	24	7	0	w.	Howard Bogart
Poplar	Rosevelt	3,548	25	61.4	- 0.7	87	22	35	15	48	0.39	-0.61	0.24	0	2	25	6	0	ne.	I. A. Draper
Red Lodge	Carbon	1,968	10	69.0	+ 0.3	99	22	42	16	45	0.64	-0.51	0.27	0	3	24	7	0	nw.	Jacob M. Kruse
Rock Springs (6 m. E) #1	Custer	1,968	10	70.0	+ 1.6	100	31	36	25	51	0.26	-1.59	0.18	0	3	20	8	3	w.	U. S. Reclamation Service
Savage	Richland	1,985	19	70.0	+ 1.6	100	31	36	25	51	0.26	-1.59	0.18	0	3	20	8	3	w.	J. A. Peters
Scobey	Daniels	3	69.1		96	31	37	25	46	0.35		0.25	0	2	26	5	0	nw.	John Howard	
Sentinel Butte Pass #1	Garfield	2,850	3	70.4		97	21	41	25	46	0.40		0.31	0	3	16	15	0	nw.	Will Eggleston
Sioux Pass (near)	Richland	10	66.2	- 0.7	95	21	33	25	51	0.88		0.03	0	1	16	14	1	nw.	Harry Guyer	
Snowbelt #1	Garfield	2,580	23	69.7	+ 1.3	101	22	36	25	53	0.18	-1.76	0.12	0	3	12	19	0	nw.	Mrs. H. L. Miller
Springbrook #1	McCone	2,800	18	69.7	+ 2.5	96	21	43	9	50	0.29	-1.00	0.11	0	5	25	3	3	w.	B. M. Bean
Valentine	Petroleum	13	67.2	- 1.0	95	26	43	18	41	0.34	-0.94	0.18	0	4	23	8	0	se.	P. O. Balgord	
Wheaton #1	Musselshell	10	68.6	- 0.9	93	21	32	30	43	0.36	-0.93	0.16	0	3	26	3	2	se.	H. C. Kallen	
White Water	Phillips	2,674	23	73.0	+ 6.2	103	22	41	17	43	0.18	-1.20	0.12	0	2	23	4	1	nw.	J. D. Cullen
Wibaux	Wibaux	2,674	23	73.0	+ 6.2	103	22	41	17	43	0.18	-1.20	0.12	0	2	23	4	1	nw.	J. D. Cullen
Means and extremes				68.4	+ 1.4	103	22	29	24	64	0.37	-0.86	1.00	0	3	22	8	1	nw.	



## CLIMATOLOGICAL DATA: MONTANA SECTION

JULY, 1925

## Daily Temperatures for July, 1925

Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Mean		
Agricultural College.....	Maximum	78	72	78	81	79	78	77	85	89	86	88	92	96	83	93	90	87	83	79	73	73	73	77	77	77	82	85	81	76	76	80	81.6	
	Minimum	48	49	51	52	54	52	51	50	49	50	100	100	105	104	104	90	95	101	94	97	83	80	80	85	85	85	82	84	85	83	81	86.8	
Big Timber .....	Maximum	89	89	80	93	90	83	90	100	100	100	105	104	105	104	95	101	94	97	83	80	80	80	80	85	85	85	82	84	85	83	81	90.4	
	Minimum	53	53	50	50	50	55	51	45	50	52	60	65	65	52	70	69	65	50	50	50	50	50	50	50	50	50	50	50	50	50	45	53.3	
Billings .....	Maximum	89	84	82	92	85	86	87	88	93	103	100	102	97	103	98	95	94	89	88	79	84	92	84	86	83	83	81	87	88	79	83	87.1	
	Minimum	60	57	51	51	64	60	53	53	53	50	51	55	61	56	54	67	60	64	60	52	55	55	59	58	58	58	58	58	58	49	44	55.9	
Broadus .....	Maximum	82	81	86	89	78	81	80	89	87	91	106	104	96	108	98	79	81	85	76	79	83	91	83	77	81	87	84	86	80	86	91	86.5	
	Minimum	49	57	56	60	53	57	59	59	58	64	61	63	67	52	54	57	59	54	56	54	44	50	63	75	79	75	84	86	84	82	77	84.2	
Butte .....	Maximum	80	76	79	84	80	78	78	79	83	89	89	87	92	93	91	93	91	95	81	85	80	58	54	47	50	45	49	55	59	47	49	54.2	
	Minimum	51	51	52	54	53	54	51	47	50	56	60	62	54	57	61	61	64	64	54	50	50	58	54	47	50	45	49	55	59	47	49	54.2	
Calumet .....	Maximum	87	81	79	91	85	79	83	74	91	96	106	102	99	106	89	91	93	91	95	81	85	81	86	83	86	83	86	83	81	84	83	85.0	
	Minimum	56	58	50	53	63	60	59	47	50	56	57	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62.0	
Cut Bank .....	Maximum	82	77	85	87	79	79	71	79	83	91	92	91	96	92	82	94	90	93	77	73	77	74	80	67	67	78	75	80	82	78	79	85.1	
	Minimum	57	52	52	50	48	50	45	40	50	56	57	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62.0	
Dillon .....	Maximum	79	81	85	82	82	81	86	84	87	88	87	88	88	89	93	90	89	90	86	82	79	74	80	67	67	78	75	80	82	78	79	85.0	
	Minimum	43	51	54	50	48	53	52	46	54	54	56	58	60	60	61	63	60	61	55	49	51	52	52	52	52	52	52	52	52	52	52	52.0	
Fortune .....	Maximum	85	87	89	88	86	85	75	84	88	93	95	88	94	91	94	97	93	87	83	87	83	87	83	84	75	83	84	83	82	49	44	81.5	
	Minimum	49	34	37	43	38	48	45	34	42	49	52	42	37	39	37	38	47	37	29	32	35	34	54	70	84	82	83	77	83	80	83	85.8	
Glasgow .....	Maximum	85	81	86	97	90	86	59	58	56	53	53	59	54	54	58	57	46	59	46	39	47	46	59	59	57	84	82	83	76	83	80	83	85.8
	Minimum	61	51	45	54	60	59	58	56	53	53	59	54	54	58	57	46	59	46	39	47	46	59	59	57	84	82	83	76	83	80	83	85.8	
Glendive .....	Maximum	90	82	86	90	88	83	86	75	93	98	104	105	98	107	97	89	94	91	86	81	82	85	82	85	82	85	86	88	83	84	88	87.7	
	Minimum	64	63	54	54	65	58	61	52	54	57	59	71	62	56	68	51	59	65	63	64	81	80	81	79	76	83	82	85	86	88	83	84	88.0
Great Falls .....	Maximum	81	60	50	60	56	57	51	46	49	54	68	67	51	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55.0	
	Minimum	62	63	88	90	87	83	81	83	89	96	96	92	96	100	95	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96.0	
Haugan .....	Maximum	82	83	85	85	82	80	76	81	86	93	98	97	97	98	96	97	93	96	84	86	83	87	84	81	79	86	81	88	94	98	92	86.8	
	Minimum	45	45	39	39	40	39	38	34	34	37	48	48	37	38	41	43	52	38	32	34	37	48	54	46	48	38	40	45	53	44	42	41.8	
Havre .....	Maximum	87	76	86	93	85	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82.0	
	Minimum	63	55	49	66	57	59	46	40	50	59	99	93	97	99	85	94	97	81	83	77	83	64	68	81	78	78	81	83	79	81	88	84.2	
HELENA .....	Maximum	84	73	82	87	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85.0	
	Minimum	53	56	53	56	58	57	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53.0	
Kalispell .....	Maximum	82	78	82	85	86	80	76	81	86	93	98	97	97	98	96	97	93	96	84	86	83	87	84	81	79	86	81	88	94	98	92	86.8	
	Minimum	51	51	50	52	54	50	46	48	54	60	57	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50.0	
Lewistown .....	Maximum	85	85	80	88	86	78	72	81	90	95	98	93	97	99	97	99	97	99	97	99	97	99	97	99	97	99	97	99	97	99	97	99.0	
	Minimum	53	51	50	52	54	50	46	48	54	60	57	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50.0	
Malta .....	Maximum	86	85	81	91	83	79	85	77	92	96	102	103	98	97	93	96	97	93	96	97	93	96	97	93	96	97	93	96	97	93	96	97	93.0
	Minimum	56	51	59	59	58	56	40	49	59	58	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56.0	
Miles City .....	Maximum	86	85	81	91	83	79	85	77	92	96	102	103	98	97	93	96	97	93	96	97	93	96	97	93	96	97	93	96	97	93	96	97	93.0
	Minimum	56	51	59	59	58	56	40	49	59	58	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56.0	
Missoula .....	Maximum	85	85	80	88	86	78	72	81	90	95	98	93	97	99	97	99	97	99	97	99	97	99	97	99	97	99	97	99	97	99	97	99.0	
	Minimum	52	52	51	52	53	55	51	50	57	90	93	100	101	95	101	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88.0	
Snowbelt .....	Maximum	84	72	80	88	81	79	78	77	90	93	100	101	95	101	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88.0	
	Minimum	59	51	47	56	57	55	50	45	55	61	63	65	66	68	58	54	63	48	44	43	49	59	57	53	48	44	43	49	48	42	60	53.0	

## Climatological Data for July, 1925—Continued from page 23

Stations	Counties	Elevation, feet	Length of record, years	Temperature, in degrees Fahr.						Precipitation, inches				Number of days			Prevailing direction of wind	Observers		
				Mean	Departure from the normal	Highest	Date	Lowest	Date	Greatest daily range	Total	Departure from the normal	Greatest in 24 hours	Total snowfall, unmelting	With precipitation 0.01 inch or more	Clear			Partly cloudy	Cloudy
<i>Eastern Division</i>																				
Baker .....	Fallon	2,600	3	72.1	0.13	103	12	47	11	47	0.35	0.13	0	4	16	9	6	w.	J. O. Hembre	
Ballantine .....	Yellowstone	2,600	3	70.9	0.13	103	14	37	31	56	0.47	0.18	0	6	25	6	0	nw.	U. S. Reclamation Service	
Bartholomew Ranch .....	Custer	2,600	20	71.8 + 1.4	110	14	37	30	47	1.10	0.37	0.37	0	1	16	14	0	nw.	Casey E. Bartholomew	
Biddle .....	Powder River	3,115	31	72.3 + 0.7	103	10	44	31	52	1.80 + 0.74	0.66	0	7	20	3	8	nw.	John L. Scofield		
Billings .....	Yellowstone	3,664	16	71.7 + 2.1	108	14	48	21	49	1.28 + 0.54	0.90	0	5	18	13	0	nw.	Henry W. Peterson		
Bridger .....	Carbon	3,050	5	70.2	0.13	108	14	41	26	56	1.55	0.94	0	7	24	6	1	nw.	R. A. Thornton	
Broadus .....	Powder River	3,050	5	70.1 + 1.4	107	14	38	31	57	1.46 + 0.09	1.16	0	3	11	9	0	se.	R. W. Heidel		
Busby .....	Bighorn	3,043	48	71.4	0.0	104	14	42	27	56	0.20	0.06	0	3	31	0	1	se.	Rev. Alfred Habegger	
Crow Agency .....	Bighorn	3,043	48	71.4	0.0	104	14	39	30	54	0.53	0.08	0	3	22	3	2	nw.	U. S. Indian Service	
Culbertson (7 mi. SW) .....	Richland	1,918	21	68.7 + 1.0	106	14	42	32	50	2.13 + 0.48	0.82	0	6	18	13	0	nw.	W. A. Whitcomb		
Ekalaka .....	Petroleum	2,770	11	70.4 + 1.0	102	14	42	31	44	1.52 + 0.08	0.66	0	4	29	2	0	w.	William Freese		
Flatwillow .....	Rosebud	2,529	1	73.0	0.1	101	12	48	30	46	0.73	0.32	0	4	17	14	0	nw.	W. C. Wiggins	
Forsyth .....	Big Horn	2,800	16	71.8	+ 1.1	106	14	43	31	51	0.91	0.58	0	4	16	11	4	se.	P. W. Barshel	
Foster .....	Valley	2,068	1	68.3	0.1	104	11	40	19	50	1.77	0.40	0	8	16	11	4	nw.	Mrs. John Bennett	
Frazer .....	Valley	2,068	1	68.3	0.1	104	11	40	19	50	1.77	0.40	0	8	16	11	4	nw.	William Brough	
Garland .....	Custer	2,600	3	70.0	0.13	106	14	38	31	54	0.96	0.60	0	8	25	4	2	ne.	P. T. Bennett	
Glasgow .....	Valley	2,092	30	70.8 + 0.3	108	11	39	19	51	0.79	0.32	0.24	0	5	19	11	0	nw.	Elmer Hall	
Glendive .....	Dawson	2,091	36	72.5	0.2	107	14	45	31	51	2.43 + 0.79	1.48	0	3	23	7	1	w.	J. W. Heath	
Hays .....	Blaine	3	6	67.2	0.2	102	14	35	8	42	0.28	0.10	0	3	23	7	1	w.	John H. Herman	
Hysam (near) (Y) .....	Treasure	3,035	8	71.2	0.1	104	14	47	19	48	1.63	0.38	0	9	19	12	0	e.	A. J. Plumer	
Ingomar (near) .....	Rosebud	3,035	8	71.2	0.1	104	14	47	19	48	1.63	0.38	0	9	19	12	0	e.	Ernest McCollum	
Knowlton .....	Custer	2,600	10	68.9	0.1	105	14	43	19	46	0.62	0.48	0	3	19	12	0	nw.	Harry A. Wall	
Lustre .....	Valley	2,250	3	68.4	0.1	101	11	40	7	41	1.14	0.35	0	6	16	7	8	w.	U. S. Reclamation Service	
Malta .....	Phillips	1,969	14	70.1	0.1	103	14	43	19	55	1.01	0.59	0	8	16	15	0	nw.	W. F. Glanzek	
Medicine Lake .....	Sheridan	2,364	16	70.1	0.1	103	14	43	19	55	1.01	0.59	0	8	16	15	0	nw.	Leon B. Clark	
Mildred .....	Prairie	2,364	16	70.1	0.1	103	14	43	31	42	0.46	0.91	0	7	20	9	2	se.	U. S. Weather Bureau	
Miles City .....	Custer	2,378	33	73.0 + 0.1	105	14	50	31	42	0.46	0.91	0.17	0	4	23	4	3	w.	Amund Johnson	
Outlook .....	Sheridan	2,378	33	73.0 + 0.1	105	14	50	31	42	0.46	0.91	0.17	0	4	23	4	3	w.	Nels Christoffersen	
Paxton .....	Dawson	2,378	33	73.0 + 0.1	105	14	50	31	42	0.46	0.91	0.17	0	4	23	4	3	w.	Griff. St. Jermain	
Pine Grove .....	Fergus	2,378	33	73.0 + 0.1	105	14	50	31	42	0.46	0.91	0.17	0	4	23	4	3	w.	Griff. St. Jermain	
Plevna .....	Fallon	2,757	13	69.3	0.1	107	14	38	31	57	0.89	0.48	0	7	27	3	1	nw.	C. C. Conser	
Poker Jim Ranger Station .....	Fallon	2,757	13	69.3	0.1	107	14	38	31	57	0.89	0.48	0	7	27	3	1	nw.	U. S. Forest Service	
Poplar .....	Roosevelt	2,020	42	69.0 + 2.3	106	11	40	29	54	0.96	0.72	0.39	0	5	26	3	2	w.	Howard Bopart	
Red Lodge .....	Carbon	5,848	25	65.6 + 3.8	99	14	39	31	40	0.74	0.63	0.51	0	5	19	10	2	ne.	I. A. Draper	
Rock Springs (6 m. E) .....	Custer	1,985	10	70.6	0.1	106	15	46	8	42	1.68	0.47	0	9	20	11	0	n.	Jacob M. Kruse	
Savage .....	Richland	1,985	10	69.6	0.1	106	14	39	31	50	1.22	0.55	0	7	16	14	1	w.	U. S. Reclamation Service	
Scobey .....	Daniels	2,850	3	67.6	0.1	102	17	41	21	45	0.69	0.35	0	5	16	10	4	nw.	J. A. Peters	
Sentinel Butte Pass .....	Garfield	2,850	3	71.6	0.1	106	12	47	31	42	0.81	0.37	0	9	16	14	1	w.	John Howard	
Sioux Pass (near) .....	Richland	2,850	3	71.6	0.1	106	12	47	31	42	0.81	0.37	0	9	16	14	1	w.	Will Eggleston	
Snowbelt .....	Garfield	2,850	3	71.6	0.1	106	12	47	31	42	0.81	0.37	0	9	16	14	1	w.	Harry Guyer	
Springbrook .....	McCone	2,800	18	72.4 + 0.7	101	12	42	30	40	0.39	0.83	0.15	0	6	24	7	0	nw.	Mrs. H. L. Miller	
Valentine .....	Petroleum	2,800	18	72.4 + 0.7	101	12	42	30	40	0.39	0.83	0.15	0	6	24	7	0	nw.	B. M. Bean	
Wheaton .....	Musselshell	2,800	18	72.4 + 0.7	101	12	42	30	40	0.39	0.83	0.15	0	6	24	7	0	nw.	P. O. Balgord	
White Water .....	Phillips	2,800	18	72.4 + 0.7	101	12	42	30	40	0.39	0.83	0.15	0	6	24	7	0	nw.	H. C. Kaschan	
Wibaux .....	Wibaux	2,874	23	66.0	0.6	97	12	36	18	40	1.16	0.93	0	5	25	5	1	se.	J. D. Cullen	
Means and extremes .....				69.7	+ 0.6	110	14	35	8	57	1.99	0.50	1.48	0	5	21	8	2	nw.	



**Explanation of Reference Marks Used in This Publication**

Letters "a," "b," "c," etc., indicate respectively 1, 2, 3, etc., days missing from the record. † Also on other dates. T. Precipitation less than 0.01 inch of rain or melted snow.  
Instruments are read in the morning; the maximum temperature then read is charged to the preceding day, on which it almost always occurs.  
Precipitate dates of falls not recorded. ‡ Report received too late to be included in the means.

Post-office addresses of these stations are as follows: of Agricultural College, Bozeman; of Barthelmess Ranch, Coalwood; of Big Ox, Marysville; of Brenner, Grant; of  
Mayon Ferry, Helena Valley; of Conway's Ranch, Alder; of Dry Land Experiment Station, Cardwell; of Flathead Creek, Wilsall; of Foster, Hardin; of Hebben Dam, Cliff Lake; of  
Helena Valley, Route A.; Helena; of Holter, Wolf Creek; of Lustre, Frazier; of Lytle, Eads; of Madison, Park; of Minnetonka, Judith Butte; of Mystic Lake, Columbus; of Nye, Columbus; of Pipe-  
line Dam, Whitehall; of Pleasant Valley, Marion; of Rock, Jim B. S.; of Roseburg, Daniels; of Sunset Orchard, Stevensville; of Upper Yak River, Yaak; of Willow Creek Reservoir, Gilman.  
Note.—The departures from normal temperature and precipitation are computed only for such stations as have ten or more years of record, but all complete reports are  
used in determining State and division means.

Climatological Data for June, 1925—Continued from page 1																	Number of days		Prevailing direction of wind	Observers
Stations	Counties	Elevation, feet	Length of record, years	Temperature, in degrees Fahr.						Precipitation, in inches			Number of days							
				Mean	Departure from the normal	Highest	Date	Lowest	Date	Greatest daily range	Total	Departure from the normal	Greatest in 24 hours	Total snowfall, unmelting	With precipitation 0.01 inch or more	Clear	Partly cloudy	Cloudy		
Eastern Division																				
Baker.....(Y)	Fallon	6	2	64.7		99	29	40	11	44	5.01	1.85	0.28	0	14	15	10	5	nw.	J. O. Hembre
Ballantine	Yellowstone	1	64.0		97	20	39	9	46	2.42	0.82	0.47	0	15	16	10	4	sw.	U. S. Reclamation Service	
Barthelmess Ranch #	Custer	20	63.0	- 0.2	95	29	36	1	42	2.86	+0.32	0.84	0	11	18	8	3	nw.	Casey E. Barthelmess	
Biddle	Powder River	3,115	81	64.0	- 0.7	99	29	38	12	46	3.11	+0.67	0.52	0	17	13	6	1	nw.	John L. Scofield
Billings	Yellowstone	3,664	16	63.0	- 0.5	98	30	36	11	53	0.86	- 0.60	0.45	0	12	20	7	1	nw.	Henry W. Peterson
Bridger	Carbon	3,050	5	63.3		98	21	43	6	40	2.47	0.54	0	6	14	14	6	1	nw.	R. A. Thornton
Broadus	Powder River	3,050	5	63.3		98	29	36	9	43	1.56	- 0.90	1.10	0	5	20	7	3	ne.	A. W. Heide
Busby	Bighorn	22	61.6	+ 0.7	100	29	41	2	46	1.46	- 1.27	0.40	0	9	6	15	15	1	sw.	Rev. Alfred Habegger
Crow Agency	Bighorn	3,041	43	65.0	+ 2.3	92	20	34	9	40	3.84	+0.63	1.11	0	19	6	11	13	sw.	U. S. Indian Service
Culbertson (7 mi. SW)	Richland	1,918	21	62.0	- 0.7	96	20	39	9	40	4.89	+2.48	1.50	0	12	8	14	8	nw.	William Freese
Ekalaka	Carter	11	61.0	- 0.7	95	29	36	6	39	2.07	- 0.96	0.86	0	10	14	14	1	nw.	W. C. Wiggins	
Flatwillow	Fergus	2,329	1	65.2		98	29	40	2	39	3.73		1.98	0	10	10	10	3	sw.	P. W. Barthel
Forsyth	Rosebud	2,800	16	65.4	+ 0.4	97	20	39	9	42	1.54	- 0.85	0.77	0	13	9	12	9	sw.	Mrs. John Bennett
Foster #	Big Horn	2,068	1	62.1		94	29	37		42	4.15		1.42	0	13	9	12	9	sw.	William Brough
Frazer	Valley	2,600	3	64.3		96	20	41	4	48	2.38		1.28	0	9	13	9	8	nw.	P. T. Bennett
Garland	Custer	2,092	30	63.3	- 0.4	97	29	38	5	41	2.39	- 0.13	0.88	0	14	13	12	5	nw.	Elmer Hall
Glasgow	Valley	2,091	36	66.0	+ 0.1	98	20	39	9	43	6.99	+3.74	1.94	0	12	13	11	6	sw.	J. W. Heath
Glendive	Dawson	2,359	1	63.0		91	20	35	5	41	5.10		2.80	0	14	11	10	9	s.	Elston Sporenburg
Harlem	Blaine	3	59.7		91	20	35	5	41	5.10		2.80	0	14	11	10	9	s.	John H. Herman	
Hays	Blaine	3	59.7		91	20	35	5	41	5.10		2.80	0	14	11	10	9	s.	John H. Herman	
Hysham	Treasure	3,035	10	62.8		95	29	39	2	39	4.26		1.49	0	12	10	17	3	nw.	Ernest McCollum
Ingram (near)	Rosebud	3,035	10	62.8		95	29	39	2	39	4.26		1.49	0	12	10	17	3	nw.	Harry A. Woodruff
Knowlton	Custer	3	62.8		95	29	39	2	39	4.26		1.49	0	12	10	17	3	nw.	J. C. Wall	
Lustre.....#(S)	Valley	2,250	19	62.4	- 1.2	91	28	40	4	35	3.12	- 0.63	0.98	0	12	9	5	16	w.	U. S. Reclamation Service
Malta	Phillips	1,969	14	61.7	- 0.5	94	21	31	9	39	2.76	- 0.27	0.99	0	8	18	8	6	n.	W. F. Glenzke
Medicine Lake. ##(S)	Sheridan	2,364	16	63.2		96	20	37	9	43	4.13	+0.92	1.47	0	16	13	17	4	nw.	Leon B. Clark
Mildred	Prairie	2,364	16	63.2		96	20	37	9	43	4.13	+0.92	1.47	0	16	13	17	4	nw.	U. S. Weather Bureau
Miles City	Custer	2,378	33	65.3	- 0.7	98	29	44	9	38	2.69	- 0.08	0.94	0	18	13	5	11	nw.	Amund Johnson
Outlook	Sheridan	3	60.0		89	20	31	8	39	4.03		1.56	0	10	17	5	8	nw.	Neils Christoffersen	
Paxton	Dawson	3								2.76		0.65	0	10	17	5	8	nw.	Griff. St. Jernain	
Pine Grove	Fergus	13																		
Plevna	Fallon	2,757	13	61.4	- 1.9	95	20	35	9	38	4.74	+1.59	1.78	0	14	14	8	8	nw.	C. C. Conser
Poplar	Roosevelt	2,020	42	64.4	- 0.6	94	20	34	9	39	4.05	+0.96	1.65	0	12	15	5	10	nw.	Howard Bogart
Red Lodge	Carbon	5,548	25	56.2	- 0.7	88	20	32	5	37	2.45	- 0.01	0.71	0	14	11	10	9	nw.	I. A. Draper
Rock Springs (6 m. E) ##	Custer	1,985	19	62.6	- 0.7	97	30	38	2	39	3.19	+0.22	0.98	0	14	13	8	9	nw.	Jacob M. Kruse
Savage	Richland	1,985	19	64.8	- 0.5	94	20	36	9	41	4.54	+1.03	1.23	0	16	9	12	9	w.	U. S. Reclamation Service
Scobey	Daniels	3	62.6		97	26	38	5	37	3.16		1.15	0	13	10	8	7	sw.	J. A. Peters	
Sentinel Butte Pass #	Garfield	2,850	3	62.6		97	26	38	5	37	3.16		1.15	0	13	10	8	7	sw.	John Howard
Sioux Pass (near)	Richland	10	60.0	- 1.1	90	20	35	9	38	4.65		2.10	0	13	7	14	10	2	sw.	Will Eggeston
Snowbell #	Garfield	23	62.9	- 0.0	97	21	37	2	38	3.88	+0.29	1.47	0	15	9	17	4	nw.	Harry Guyer	
Springbrook #	Garfield	10	60.0	- 1.1	90	20	35	9	38	4.65		2.10	0	13	7	14	10	2	sw.	Mrs. H. L. Miller
Valentine	McCone	2,800	13	63.2	+ 0.9	96	29	37	2	44	2.65	- 0.06	0.83	0	8	20	3	7	ne.	B. M. Bean
Whetstone	Fergus	13	61.0	+ 1.0	94	29	37	1	39	2.97	+0.31	0.94	0	8	10	13	7	ne.	P. O. Balgord	
White Water	Musselshell	10	59.6	- 0.9	91	20	34	3	38	3.74	+0.34	1.48	0	12	16	8	6	nw.	H. C. Kaschan	
Wibaux	Phillips	2,674	23																nw.	J. D. Cullen
Means and extremes.....				62.8	- 0.5	100	29	31	8	53	3.31	+0.25	2.30	0	12	13	10	7	nw.	



## CLIMATOLOGICAL DATA: MONTANA SECTION.

## Daily Temperatures for July, 1924.

Daily Temperatures.																																	Mean	
Stations.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Mean		
Agricultural College.....	Maximum	88	89	90	85	83	76	72	73	84	80	80	66	70	88	88	76	80	65	67	53	73	57	63	76	84	86	87	85	84	86	78.1		
	Minimum	55	56	57	59	53	50	54	54	48	55	49	52	48	51	59	44	49	44	38	46	43	46	45	40	48	54	57	60	48	48	50.3		
Big Timber .....	Maximum	90	95	102	95	90	92	90	90	92	90	90	82	82	95	97	85	85	80	80	73	77	80	70	82	90	95	93	95	93	90	87.8		
	Minimum	45	50	50	65	60	55	60	50	65	65	50	55	50	55	50	45	48	55	50	45	50	48	40	45	50	50	48	50	48	50	51.7		
Billings .....	Maximum	85	88	91	90	95	95	84	75	91	95	84	75	91	95	84	75	91	95	84	75	91	95	84	75	91	95	84	75	91	95	84	80.5	
	Minimum	46	48	50	51	65	58	60	55	44	50	54	44	48	51	48	51	48	52	42	52	45	40	42	41	37	51	44	46	49	50	50.2		
Broadus .....	Maximum	78	86	86	91	91	91	84	82	47	48	61	57	56	52	49	50	47	42	39	42	41	37	51	44	46	49	54	54	66	62	56	57.8	
	Minimum	49	52	54	51	51	54	58	52	47	48	61	57	56	52	49	50	47	42	39	42	41	37	51	44	46	49	54	54	66	62	56	57.8	
Butte .....	Maximum	92	93	90	85	84	76	71	74	84	85	80	78	75	89	84	79	77	73	72	59	71	80	85	93	82	85	80	73	86	81.0			
	Minimum	49	52	54	51	51	54	58	52	47	48	61	57	56	52	49	50	47	42	39	42	41	37	51	44	46	49	54	54	66	62	56	57.8	
Culbertson (near) .....	Maximum	75	79	81	85	86	84	76	71	74	84	85	80	78	75	89	84	79	77	73	72	59	71	80	85	93	82	85	80	73	86	81.0		
	Minimum	56	60	57	58	52	50	45	46	58	46	56	48	52	56	46	46	45	45	40	42	43	40	45	40	45	40	45	40	42	42	47.1		
Cut Bank .....	Maximum	44	48	53	54	58	63	53	55	48	55	53	49	42	46	58	46	46	45	45	40	42	43	40	45	40	45	40	45	40	42	42	47.1	
	Minimum	47	55	55	60	59	59	40	42	45	55	40	45	49	48	51	42	44	48	48	46	44	41	45	50	57	55	54	50	48	48	50.3		
Dillon .....	Maximum	90	91	92	88	81	78	77	80	82	87	80	82	87	80	79	83	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89.6	
	Minimum	55	52	52	54	50	52	53	56	50	52	51	51	55	55	54	50	43	40	33	39	39	46	40	42	43	45	44	45	44	40	42	47.1	
Fortine .....	Maximum	98	102	94	97	95	85	77	83	92	86	86	91	87	95	90	84	80	77	74	70	75	71	80	85	93	82	85	80	73	86	81.0		
	Minimum	40	44	48	47	50	54	58	61	60	59	52	43	50	54	58	59	60	56	47	58	51	53	45	44	46	49	48	46	49	53	56	53.7	
Glasgow .....	Maximum	80	86	86	92	88	91	78	77	80	82	87	80	82	87	80	79	83	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89.6	
	Minimum	49	52	57	59	62	61	60	59	52	43	50	54	58	59	60	56	47	58	51	53	45	44	46	49	48	46	49	53	52	58	53	56.3	
Great Falls .....	Maximum	91	94	98	97	92	87	83	79	92	89	83	83	84	96	89	84	85	80	74	74	80	76	72	89	90	92	98	91	83	90	89	86.3	
	Minimum	51	54	58	64	60	63	48	49	45	46	46	56	53	52	51	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48.6	
Haugan .....	Maximum	98	101	99	94	91	84	79	81	91	88	82	83	87	94	88	80	75	75	67	65	61	74	70	78	88	89	94	94	89	88	89	84.6	
	Minimum	51	54	55	64	60	63	48	49	45	46	46	56	53	52	51	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48.6	
Helena .....	Maximum	90	89	94	85	92	83	71	76	93	85	78	85	84	95	88	80	75	75	67	65	61	74	70	78	88	89	94	94	89	88	89	84.6	
	Minimum	42	45	50	49	47	48	41	31	32	38	30	32	48	55	52	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48.6	
Havre .....	Maximum	90	89	94	85	92	83	71	76	93	85	78	85	84	95	88	80	75	75	67	65	61	74	70	78	88	89	94	94	89	88	89	84.6	
	Minimum	51	53	53	58	58	61	52	48	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46.3	
HELENA .....	Maximum	92	95	96	87	84	81	72	79	93	85	78	85	84	95	88	80	75	75	67	65	61	74	70	78	88	89	94	94	89	88	89	84.6	
	Minimum	55	60	62	63	58	57	51	51	50	92	61	79	83	81	91	74	73	74	65	61	67	75	63	71	79	84	89	94	94	89	88	89	84.6
Kalispell .....	Maximum	92	95	90	93	81	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73.3	
	Minimum	55	60	62	62	61	54	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47.3	
Lewistown .....	Maximum	87	88	92	85	85	84	91	85	78	74	88	90	79	83	90	98	79	83	90	98	79	83	90	98	79	83	90	98	79	83	90	98.3	
	Minimum	47	47	51	53	54	53	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51.3	
Malta .....	Maximum	81	82	88	84	91	82	85	78	74	88	90	79	83	90	98	79	83	90	98	79	83	90	98	79	83	90	98	79	83	90	98	94.4	
	Minimum	52	54	57	60	62	61	60	59	52	43	50	54	58	59	60	56	47	58	51	53	45	44	46	49	48	46	49	53	52	58	53	56.3	
Missoula .....	Maximum	93	99	61	65	66	66	64	57	51	57	57	87	84	80	76	89	88	82	64	63	57	53	58	54	57	54	48	54	63	61	68	62.4	
	Minimum	58	59	61	65	66	66	64	57	51	57	57	87	84	80	76	89	88	82	64	63	57	53	58	54	57	54	48	54	63	61	68	62.4	
Miles City .....	Maximum	100	102	94	93	84	77	80	84	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85.3	
	Minimum	50	53	58	62	61	61	58	50	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42.3	
Snowbelt .....	Maximum	77	83	85	84	84	85	77	72	82	88	75	39	49	50	63	60	50	63	60	50	52	40	48	46	50	45	45	45	45	45	45	45.3	
	Minimum	50	53	57	55	59	56	47	45	55	49	47	78	78	78	86	96	84	85	84	85	84	85	84	77	67	67	66	65	65	65	65	65.3	
Snowbelt .....	Maximum	74	80	81	85	90	91	88	76	83	97	81	77	78	89	97	88	74	82	80	74	82	80	74	82	80	74	82	80	74	82	80	74	82.3
	Minimum	40	40	45	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51.3	
Wibaux .....	Maximum	74	80	81	85	90	91	88	76	83	97	81	77	78	89	97	88	74	82	80	74	82	80	74	82	80	74	82	80	74	82	80	74	82.3
	Minimum	40	40	45	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51.3	

## Climatological Data for July, 1924—Continued from page 23.

Climatological Data.																			Observers.	
Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in degrees Fahr.						Precipitation, inches.				Number of days.				Prevailing direction of wind.		
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall, unmelting.	With precipitation 0.01 inch or more.	Clear.	Partly cloudy.		Cloudy.	
Eastern Division.																			J. O. Hembree.	
Baker (Y)	Fallon	2	70.5	101	15	44	9	49	1.38	0.46	0	10	17	9	5	sw.	U. S. Reclamation Service.			
Ballantine	Yellowstone	5	69.5	101	15	40	9	53	1.37	0.70	0	4	27	3	1	nw.	Casey E. Barthelme.			
Barthelme Ranch	Custer	19	69.0	-1.4	100	14	41	9	53	2.73+0.99	0.70	0	8	22	3	1	sw.	John L. Scofield.		
Biddle	Powder River	30	68.6	0	100	15	42	19	52	1.96	0.77	0	9	17	7	3	nw.	Henry W. Peterson.		
Billings	Yellowstone	3,115	30	68.6	0	100	15	42	19	52	1.96	0.77	0	9	17	7	3	nw.	R. A. Thornton.	
Bridger	Carbon	3,664	15	68.7	-0.2	98	15	37	22	48	2.42	0.95	0	1	28	3	12	nw.	A. W. Heide.	
Broadus	Powder River	3,050	4	67.6	0	99	15	39	22	48	2.42	0.95	0	1	28	3	12	nw.	Rev. Alfred Habegger.	
Busby	Bighorn	3,041	21	67.2	-1.9	101	15	43	24	49	2.25+0.99	0.60	0	4	28	3	0	nw.	U. S. Indian Service.	
Crow Agency	Bighorn	3,041	20	66.8	-2.9	94	10	42	13	41	1.59+0.97	0.66	0	4	20	8	3	nw.	W. A. Whitcomb.	
Culbertson (7 mi. SW)	Richland	1,918	20	66.8	-0.8	95	15	44	9	41	1.44	-0.21	0.70	0	5	16	10	5	nw.	William Freese.
Ekakala	Carter	26	68.6	-2.2	99	15	44	19	46	0.67	-0.76	0.32	0	5	16	10	5	nw.	W. C. Wiggins.	
Flatwillow	Fergus	2,529	10	67.1	-2.2	99	15	45	24	54	0.15	0.15	0	1	26	2	3	w.	P. W. Barthel.	
Forsyth	Rosebud	2,800	15	68.8	100	15	45	24	54	0.15	0.15	0	1	26	2	3	w.	Mrs. John Bennett.		
Foster	Big Horn	2,529	15	68.8	100	15	45	24	54	0.15	0.15	0	1	26	2	3	w.	William Brough.		
Frazer	Valley	2,068	15	68.2	100	15	41	24	45	0.72	0.86	0	6	14	13	4	nw.			
Garland (X)	Custer	2,600	2	69.5	99	15	45	22	52	1.23	0.90	0	4	18	10	3	sw.	P. T. Bennett.		
Glassgow	Valley	2,092	29	69.2	-1.4	104	15	43	9	49	1.01	-0.10	0.31	0	6	18	4	9	sw.	Elmer Hall.
Glendive	Dawson	2,091	35	71.4	-0.3	100	14	46	1	48	1.42	-0.24	0.30	0	6	18	4	9	sw.	J. W. Heath.
Harlem (Z)	Blaine	2,359	2	68.0	98	27	43	9	48	0.97	0.36	0	9	19	10	2	e.	Elston Spunenburg.		
Hays	Blaine	2	67.1	97	15	40	11	46	1.28	0.36	0	5	23	10	8	1	e.	John H. Herman.		
Ingomar (near) (Y)	Blaine	3,035	7	69.6	102	15	43	9	49	0.64	0.36	0	5	23	7	1	e.	Ernest McCollum.		
Knowlton	Rosebud	9	69.6	102	15	43	9	49	0.64	0.36	0	5	23	7	1	e.	Harry A. Woodruff.			
Lustre (S)	Custer	2	69.6	102	15	43	9	49	0.64	0.36	0	5	23	7	1	e.	J. C. Wall.			
Malta	Valley	2	69.6	102	15	43	9	49	0.64	0.36	0	5	23	7	1	e.	U. S. Reclamation Service.			
Medicine Lake (S)	Phillips	2,250	18	68.0	-1.7	98	15	42	8	41	1.08	-0.88	0.37	0	8	12	10	9	w.	W. F. Glazenck.
Mildred	Sheridan	1,969	13	65.3	-1.3	95	14	40	12	47	1.28	-0.82	0.44	0	7	20	8	1	nw.	Leon B. Clark.
Miles City	Prairie	2,364	15	67.2	100	15	42	1	48	0.63	-1.16	0.38	0	4	19	8	4	e.	U. S. Weather Bureau.	
Outlook (S)	Custer	2,378	32	72.2	-0.7	102	15	48	24	38	0.39	-0.98	0.14	0	4	19	8	4	e.	Amund Johnson.
Paxton	Sheridan	2	64.6	96	15	35	12	51	1.17	0.43	0	8	17	7	7	nw.	Nels Christoffersen.			
Pine Grove	Dawson	12	60.8	-0.8	91	15	33	19	48	0.57	-2.30	0.35	0	2	24	3	2	nw.	Griff. St. Jernigan.	
Plevna	Fergus	12	60.8	-0.8	91	15	33	19	48	0.57	-2.30	0.35	0	2	24	3	2	nw.		
Poplar	Fallon	2,757	12	67.8	-2.5	99	28	41	1	45	1.75	-0.22	0.58	0	7	22	6	3	se.	C. C. Conser.
Red Lodge	Rosevelt	2,020	41	67.8	-2.5	99	28	41	1	45	1.75	-0.22	0.58	0	7	22	6	3	se.	Howard Bogart.
Rock Springs (6 m. E) (S)	Carbon	5,548	24	69.2	101	15	45	21	44	0.31	0.12	0	6	22	5	4	se.	I. A. Draper.		
Roy	Custer	9	71.1	105	26	41	7	46	1.59	0.63	0	6	20	10	1	nw.	Jacob M. Kruse.			
Savage	Fergus	3	70.6	-0.8	98	15	45	1	46	2.41+0.64	1.29	0	6	15	15	1	nw.	M. C. Oster.		
Sentinel Butte Pass	Richland	1,985	18	69.2	101	15	45	1	46	0.72	0.30	0	8	21	7	3	nw.	U. S. Reclamation Service.		
Sioux Pass (near)	Daniels	2	69.2	101	15	45	1	46	0.72	0.30	0	8	21	7	3	nw.	J. A. Peters.			
Snowbelt	Garfield	2,850	2	69.2	101	15	45	1	46	0.72	0.30	0	8	21	7	3	nw.	John Howard.		
Springbrook	Richland	9	66.5	-2.7	97	28	39	12	44	0.62	-1.79	0.48	0	4	22	6	3	sw.	Harry Guyer.	
Valentine	Garfield	22	67.4	-1.0	95	15	42	1	43	1.17	-0.64	0.58	0	6	16	14	1	nw.	Will Engleton.	
Wheaton	McCone	2,800	17	67.7	-1.8	98	27	40	24	48	0.77	-1.06	0.33	0	5	25	3	3	sw.	Mrs. H. L. Miller.
White Water	Fergus	12	61.0	-5.8	97	15	39	19	59	1.11	-0.63	0.43	0	7	15	12	4	ne.	B. M. Bean.	
Wibaux	Musselshell	9	64.0	-2.7	94	15	41	1	46	2.37+0.83	1.63	0	4	19	11	1	ne.	P. O. Balgord.		
Wibaux	Phillips	2,674	22	67.3	-2.0	97	10	40	1	46	2.37+0.83	1.63	0	4	19	11	1	ne.	H. C. Kaschau.	
Wibaux	Wibaux	2,674	22	67.3	-2.0	97	10	40	1	46	2.37+0.83	1.63	0	4	19	11	1	ne.	J. D. Cullen.	
Means and extremes.																			nw.	



## CLIMATOLOGICAL DATA: MONTANA SECTION.

AUGUST, 1924.

## Daily Temperatures for August, 1924.

Daily Temperatures																																			
Stations.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Mean			
Agricultural College.....	Maximum	85	78	82	79	74	77	79	74	74	76	85	86	90	82	76	77	79	72	70	63	67	80	84	85	87	87	92	95	86	68	54	78.8		
	Minimum	50	53	47	45	52	45	48	41	43	49	45	52	52	41	45	52	45	48	42	41	44	40	50	46	49	52	54	55	48	32	45	47.1		
Big Timber.....	Maximum	91	90	90	80	75	82	85	85	80	85	90	92	98	90	85	80	85	85	80	73	70	85	90	92	91	95	102	105	90	80	80	86.5		
	Minimum	50	52	50	55	52	42	40	45	50	45	42	46	65	60	48	55	65	50	45	40	35	45	50	45	44	46	44	47	54	36	47	46.9		
Billings.....	Maximum	90	84	88	76	70	80	86	79	75	77	89	92	92	94	56	48	48	51	50	48	50	38	43	45	45	44	46	44	47	54	36	47	46.9	
	Minimum	49	52	49	51	54	42	42	51	41	42	42	42	92	96	84	82	76	81	85	85	83	78	88	88	85	85	91	93	97	101	97	85	69.5	
Broadus.....	Maximum	91	87	84	84	73	76	88	72	75	67	56	58	57	42	52	43	57	54	49	41	34	34	44	42	37	44	42	36	45	49	47	48	33	46
	Minimum	57	54	64	47	42	36	57	66	75	77	79	82	86	88	82	71	80	77	74	71	59	65	77	82	84	84	90	93	92	86	73	72	78.7	
Butte.....	Maximum	86	77	78	78	72	73	43	45	47	41	43	50	51	51	54	45	47	46	49	47	42	41	41	46	50	55	50	53	55	57	36	46	47.4	
	Minimum	53	48	48	47	43	43	45	47	41	43	50	51	51	54	45	47	46	49	47	42	41	41	46	50	55	50	53	55	57	36	46	47.4		
Culbertson (near).....	Maximum	80	78	65	66	78	77	81	65	70	73	81	75	94	81	75	68	71	79	85	76	73	80	83	91	92	85	96	100	92	81	69	79	81	
	Minimum	58	49	48	46	55	43	52	46	42	37	37	48	50	51	54	58	58	69	74	70	68	68	72	79	79	84	87	81	87	72	65	66	74.1	
Cut Bank.....	Maximum	80	86	60	56	68	75	80	60	68	75	81	86	87	78	69	68	69	74	70	68	68	72	79	79	84	87	81	87	72	65	66	74.1		
	Minimum	55	55	45	38	34	36	44	48	42	45	43	45	52	57	50	53	51	41	49	49	47	48	48	52	60	49	52	49	52	37	40	47.3		
Dillon.....	Maximum	80	86	60	56	68	75	80	60	68	75	81	86	87	78	69	68	69	74	70	68	68	72	79	79	84	87	81	87	72	65	66	74.1		
	Minimum	55	55	45	38	34	36	44	48	42	45	43	45	52	57	50	53	51	41	49	49	47	48	48	52	60	49	52	49	52	37	40	47.3		
Dillon.....	Maximum	87	80	79	84	80	79	76	75	77	78	77	78	77	82	86	88	85	81	75	94	81	75	68	71	79	85	76	73	80	83	91	92	83	46.7
	Minimum	40	43	45	40	39	38	37	39	38	40	42	48	45	43	45	52	57	50	53	51	41	49	49	47	48	48	48	48	48	48	48	48	48	
Fortine.....	Maximum	83	83	86	70	73	83	86	80	85	83	83	83	83	84	84	83	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	
	Minimum	44	37	49	42	34	26	31	47	31	33	33	34	34	53	48	37	51	40	48	48	48	47	48	47	48	47	48	47	48	47	48	47	48	
Glasgow.....	Maximum	89	84	78	72	67	79	84	69	71	77	87	84	95	88	77	77	82	84	84	78	74	83	87	87	87	87	87	87	87	87	87	87	87	
	Minimum	60	52	50	49	43	41	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	
Great Falls.....	Maximum	85	81	78	69	62	41	45	50	44	40	42	47	40	50	54	50	45	52	46	48	49	48	41	41	45	45	45	45	45	45	45	45	45	
	Minimum	55	47	43	46	42	41	45	50	44	40	42	47	40	50	54	50	45	52	46	48	49	48	41	41	45	45	45	45	45	45	45	45	45	
Haugan.....	Maximum	90	85	84	72	76	80	81	79	81	85	90	92	84	69	79	72	67	63	67	73	67	60	72	78	82	84	91	92	90	82	64	74	79.3	
	Minimum	39	35	36	38	31	32	29	44	34	33	33	35	41	51	43	48	41	51	49	42	35	34	34	37	38	40	43	25	38	39	42	40	40	
Havre.....	Maximum	90	75	68	68	72	81	83	61	70	78	87	90	90	87	64	73	77	79	79	74	73	80	85	88	92	90	91	93	89	67	70	75.0		
	Minimum	53	55	52	50	44	44	49	51	48	42	41	48	52	54	53	52	54	47	50	52	51	47	46	50	62	52	56	52	56	52	56	52	56	
HELENA.....	Maximum	84	79	79	75	72	79	81	61	71	77	86	89	89	77	70	80	76	72	70	63	68	82	85	88	91	89	91	93	89	67	70	75.0		
	Minimum	55	53	52	50	44	44	49	51	48	42	41	48	52	54	53	52	54	47	50	52	51	47	46	50	62	52	56	52	56	52	56	52	56	
Kalispell.....	Maximum	84	79	79	75	72	79	81	61	71	77	86	89	89	77	70	80	76	72	70	63	68	82	85	88	91	89	91	93	89	67	70	75.0		
	Minimum	61	55	51	48	44	45	50	54	47	48	50	54	56	56	54	48	53	54	51	49	47	43	42	44	45	48	48	48	48	48	48	48	48	
Lewistown.....	Maximum	77	76	74	65	73	75	82	69	77	79	83	87	87	72	66	76	71	72	58	60	69	71	82	82	84	84	89	87	86	67	62	70	75.2	
	Minimum	55	45	50	47	41	43	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	
Malta \$\$.	Maximum	86	80	77	75	67	87	88	46	88	80	87	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	
	Minimum	53	46	43	47	41	43	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	
Miles City.....	Maximum	84	79	79	75	72	79	81	61	71	77	86	89	89	77	70	80	76	72	70	63	68	82	85	88	91	89	91	93	89	67	70	75.0		
	Minimum	54	50	48	48	44	45	50	54	47	48	50	54	56	56	54	48	53	54	51	49	47	43	42	44	45	48	48	48	48	48	48	48	48	
Missoula \$\$.	Maximum	83	81	83	77	78	84	85	71	82	87	90	94	92	74	71	81	77	75	62	60	54	49	53	54	53	59	58	61	62	63	64	65	66	
	Minimum	54	48	48	48	45	42	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	
Snowbelt.....	Maximum	90	81	85	73	65	80	85	82	72	75	85	80	97	91	74	70	74	74	76	84	76	71	82	88	86	90	87	100	105	99	85	68	82.5	
	Minimum	58	56	44	49	48	37	43	48	33	34	35	41	49	48	51	48	51	45	41	56	47	46	44	42	49	53	46	49	53	46	49	30	45.5	
Wibaux.....	Maximum	90	81	85	73	65	80	85	82	72	75	85	80	97	91	74	70	74	74	76	84	76	71	82	88	86	90	87	100	105	99	85	68	82.5	
	Minimum	58	56	44	49	48	37	43	48	33	34	35	41	49	48	51	48	51	45	41	56	47	46	44	42	49	53	46	49	53	46	49	30	45.5	

## Climatological Data for August, 1924—Continued from page 32.

Climatological Data for August, 1932																			
Stations	Counties	Elevation, feet.	Length of record, years.	Temperature, in degrees Fahr.						Precipitation, inches.				Number of days.			Prevailing direction of wind.	Observers.	
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall, unmelting.	With precipitation 0.01 inch or more.	Clear.			Partly cloudy.
Eastern Division.																			
Baker.....(Y)	Fallon	2	5	68.6	103	28	41	6	50	1.20	0.41	0.18	0	4	20	10	1	se.	J. O. Hembre.
Ballantine	Yellowstone	5	5	67.1	106	28	33	31	56	0.22	0.11	0	0	4	24	9	2	sw.	U. S. Reclamation Service.
Barthelme Ranch	Custer	19	67.4	104	28	32	31	56	0.13	-1.70	0.13	0	1	28	2	1	sw.	Cassidy E. Barthelme.	
Biddle	Powder River	3,115	30	65.8	102	28	36	30	55	0.12	-0.96	0.10	0	3	14	14	3	nw.	John L. Scofield.
Billings	Yellowstone	3,115	30	65.8	102	28	36	30	55	0.12	-0.96	0.10	0	3	14	14	3	nw.	Henry W. Peterson.
Bridger	Carbon	3,050	15	65.5	104	28	33	31	55	0.21	0.14	0	0	3	28	2	3	ne.	R. A. Thornton.
Broadus	Powder River	3,050	21	65.5	104	28	32	31	52	0.12	-1.05	0.05	0	4	15	2	7	ne.	A. W. Heidel.
Busby	Big Horn	3,041	42	67.4	101	28	35	31	52	0.00	-0.98	0.00	0	8	26	2	3	w.	Rev. Alfred Habegger.
Crow Agency	Big Horn	3,041	42	67.4	101	28	35	31	52	0.00	-0.98	0.00	0	8	26	2	3	w.	U. S. Indian Service.
Culbertson (7 mi. SW)	Richland	1,918	20	64.4	100	28	37	10	47	1.23	-0.62	0.59	0	1	20	8	3	nw.	W. A. Whitcomb.
Ekakaka	Richland	26	67.4	100	28	35	10	47	1.23	-0.62	0.59	0	1	20	8	3	nw.	William Freese.	
Flatwillow	Fergus	10	64.7	103	28	35	31	56	1.12	+0.08	0.42	0	1	28	1	2	nw.	W. C. Wiggins.	
Forsyth	Rosebud	2,529	15	65.4	103	27	37	31	54	0.60	0.60	0	0	3	18	0	5	nw.	P. W. Barthel.
Foster	Big Horn	2,800	15	66.0	102	28	35	30	57	0.16	-0.47	0.07	0	9	11	16	4	w.	Mrs. John Bennett.
Frazier	Valley	2,068	15	64.8	98	28	35	10	46	1.46	0.34	0	0	9	11	16	4	w.	William Brough.
Garland	Custer	2,600	2	66.7	105	28	33	31	60	0.37	0.32	0	0	2	22	4	5	nw.	P. T. Bennett.
Glasgow	Valley	2,092	29	65.9	105	28	33	31	48	3.10	+2.02	0.96	0	5	18	8	5	nw.	Elmer Hall.
Glendive	Dawson	2,091	35	66.8	104	27	37	31	48	0.51	-0.79	0.31	0	5	18	8	5	nw.	John W. Heath.
Harlem	Blaine	2,359	1	63.6	94	28	39	6	41	0.81	0.53	0	0	9	13	11	7	sw.	El-ton Sponenburg.
Hays	Blaine	2	63.4	95	28	33	31	41	2.60	0.81	1.10	0	0	5	18	11	2	w.	John H. Herman.
Ingomar (near)	Rosebud	3,035	7	67.0	106	28	35	9	50	0.31	0.22	0	0	2	16	9	6	nw.	Ernest McCollum.
Knowlton	Custer	9	67.0	105	28	40	34	60	0.25	-0.91	0.13	0	8	13	8	10	w.	Harry A. Woodruff.	
Lustre	Valley	2,250	18	64.2	94	28	35	31	41	1.21	+0.06	0.32	0	8	13	8	10	w.	J. C. Wall.
Malta	Phillips	2,250	18	64.2	94	28	35	31	41	1.21	+0.06	0.32	0	8	13	8	10	w.	U. S. Reclamation Service.
Medicine Lake. §§ (S)	Sheridan	1,969	13	66.5	105	28	35	10	55	1.81	+0.54	1.38	0	6	11	19	1	nw.	W. F. Glaenzko.
Mildred	Prairie	2,364	15	68.2	103	28	42	31	43	0.66	-0.37	0.40	0	4	20	7	4	ne.	Leon B. Clark.
Miles City	Custer	2,378	32	68.2	103	28	42	31	50	1.76	0.64	0	0	10	13	12	6	w.	U. S. Weather Bureau.
Outlook	Sheridan	2	67.0	105	28	40	34	31	47	1.36	0.60	0	0	9	16	9	6	w.	Amund Johnson.
Paxton	Dawson	2	67.0	105	28	40	34	31	47	1.36	0.60	0	0	9	16	9	6	w.	Nels Christoffersen.
Pine Grove	Fergus	12	65.8	94	28	31	31	53	0.91	-0.34	0.75	0	3	15	2	7	sw.	Griff. St. Jernalm.	
Plevna	Fallon	2,757	12	65.6	105	28	32	31	52	0.83	-0.36	0.25	0	5	18	6	7	nw.	C. C. Conser.
Poplar	Roosevelt	2,020	41	61.2	94	28	38	30	40	1.10	+0.10	0.62	0	4	19	6	6	se.	Howard Bogart.
Red Lodge	Carbon	5,548	24	61.2	94	28	38	30	40	1.10	+0.10	0.62	0	4	19	6	6	se.	I. A. Draper.
Rock Springs (6 mi. E) §§	Custer	9	66.6	110	27	37	22	51	1.48	0.68	0	0	7	19	8	4	nw.	Jacob M. Kruse.	
Roy	Fergus	3	67.6	110	27	37	22	51	1.48	0.68	0	0	7	19	8	4	nw.	M. C. Oster.	
Savage	Richland	1,985	18	67.4	99	28	38	31	47	2.53	0.80	0	0	6	17	12	2	w.	U. S. Reclamation Service.
Scobey	Daniels	2	66.2	98	28	41	6	43	2.34	0.70	0	0	6	17	12	2	w.	J. A. Peters.	
Sentinel Butte Pass	Garfield	2,850	2	66.2	98	28	41	6	43	2.34	0.70	0	0	6	17	12	2	w.	John Howard.
Sioux Pass (near)	Richland	9	66.2	98	28	41	6	43	2.34	0.70	0	0	6	17	12	2	w.	Will Eggleston.	
Snowbelt	Garfield	22	63.8	100	28	28	31	50	5.04	+3.10	1.98	0	10	14	6	11	nw.	Mary Guyer.	
Springbrook	McCona	17	65.1	100	27	37	6	39	1.15	-0.14	0.54	0	4	23	4	4	nw.	Hrs. H. L. Miller.	
Valentine	Fergus	12	59.8	101	28	30	31	39	1.11	-0.24	0.60	0	5	15	13	3	ne.	B. M. Bean.	
Wheaton	Musselshell	9	61.0	101	28	30	31	39	1.11	-0.24	0.60	0	5	15	13	3	ne.	P. O. Balgord.	
White Water	Phillips	9	64.2	105	28	30	31	59	0.70	-0.68	0.44	0	3	15	15	1	nw.	H. C. Kaschau.	
Wibaux	Wibaux	2,674	22	64.2	105	28	30	31	59	0.70	-0.68	0.44	0	3	15	15	1	nw.	J. D. Cullen.
Means and extremes.				65.6	2.9	110	27	26	31	60	1.15	-0.22	1.98	0	5	18	9	4	nw.



## Daily Temperatures for June, 1924.

Stations.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Mean	
Agricultural College.....	Maximum 67	74	76	68	64	58	51	45	61	70	67	69	76	82	81	78	78	59	53	70	75	74	76	63	72	81	68	72	73	81	69.4		
	Minimum 41	43	42	46	35	32	29	32	35	43	45	48	38	41	50	48	45	42	39	37	45	48	45	48	48	48	40	41	49	42.2			
Big Timber .....	Maximum 68	78	80	75	65	60	58	65	60	78	75	80	90	90	90	85	70	80	76	80	76	80	78	82	68	55	88	85	84	85	72.2		
	Minimum 43	40	45	48	42	45	35	35	38	42	38	45	41	48	48	50	52	48	40	65	60	50	50	50	50	50	50	44	45	43	46.6		
Billings .....	Maximum 66	78	78	73	68	67	63	60	66	79	78	72	82	84	84	83	82	78	68	73	84	70	77	69	68	69	55	43	47	44	75.2		
	Minimum 49	38	52	44	46	54	41	41	49	61	80	80	77	81	87	89	81	87	79	72	81	86	70	79	68	69	85	80	73	70	71	70.4	
Broadus .....	Maximum 70	71	73	75	71	67	61	41	42	31	34	34	45	41	44	52	56	54	42	51	52	47	41	54	53	54	50	54	52	46	48	39	45.0
	Minimum 44	44	46	45	44	41	42	41	31	40	44	49	39	44	51	53	55	52	49	48	45	47	51	43	52	52	52	55	43	47	44	47.0	
Butte .....	Maximum 70	76	75	74	64	62	49	50	63	67	65	69	79	81	81	78	75	61	56	67	73	73	76	73	78	79	74	73	76	90	70.9		
	Minimum 42	44	46	48	38	38	24	32	34	39	44	43	40	46	49	47	51	41	39	34	42	47	42	45	42	48	43	42	41	51	42.4		
Culbertson (near) .....	Maximum 74	74	72	68	65	71	62	53	58	70	76	72	77	73	73	79	78	68	62	65	76	65	69	71	75	80	77	67	69	73	80	65.8	
	Minimum 46	42	50	43	40	39	43	43	40	35	44	46	48	48	50	46	53	50	49	45	48	49	42	43	47	54	50	53	44	47	47.1		
Cut Bank .....	Maximum 74	77	79	47	63	61	45	42	56	66	61	65	75	74	77	72	75	60	56	65	65	69	71	75	80	77	67	69	73	80	65.8		
	Minimum 45	43	41	36	35	44	35	34	37	36	48	40	42	48	47	45	57	45	43	41	43	35	42	38	44	45	53	40	43	47	42.4		
Dillon .....	Maximum 71	73	75	70	71	70	59	55	58	63	67	69	70	78	80	74	74	70	66	67	79	78	66	67	80	81	80	80	79	80	71.7		
	Minimum 44	40	45	44	32	38	30	32	36	36	34	35	39	50	54	53	42	39	38	42	45	43	45	43	42	40	48	47	49	41	41.6		
Dillon .....	Maximum 83	82	82	78	65	56	57	65	66	71	74	80	82	77	82	77	64	65	67	66	72	65	77	80	80	79	74	88	96	71.8			
	Minimum 31	32	30	41	29	37	32	37	29	39	45	38	37	38	41	35	42	43	45	43	42	38	36	29	32	40	32	32	35	36	73.5		
Fortine .....	Maximum 71	80	78	73	70	73	64	63	59	74	78	78	82	80	80	82	84	75	66	68	73	65	72	74	79	83	79	68	75	77	74.1		
	Minimum 39	38	38	47	33	43	41	40	45	38	47	46	57	55	54	47	55	51	48	49	49	50	47	43	46	53	56	54	52	48	47.5		
Glasgow .....	Maximum 73	83	81	78	70	68	51	48	61	74	74	72	79	79	85	84	80	70	65	71	71	65	68	68	69	86	80	76	74	85	72.9		
	Minimum 50	44	46	42	35	48	37	32	39	42	50	46	45	54	54	50	50	45	43	45	44	51	44	44	51	44	44	41	44	41	44	41.4	
Great Falls .....	Maximum 81	81	82	79	64	60	44	65	70	70	68	75	83	84	83	79	79	60	63	71	72	73	76	78	77	72	78	84	97	74.0			
	Minimum 33	33	33	40	34	40	32	37	33	31	44	36	33	73	81	80	79	80	79	82	82	35	35	41	39	37	49	31	33	36	87.4		
Haugan .....	Maximum 72	78	78	62	68	60	50	59	59	74	74	73	81	80	79	80	78	67	63	67	65	65	68	70	76	81	67	71	75	81	70.9		
	Minimum 48	42	44	41	41	46	36	36	43	40	50	47	52	55	54	51	57	52	49	47	47	45	48	44	46	49	54	51	47	50	47.1		
HELENA .....	Maximum 69	80	80	66	66	58	54	46	61	73	68	67	79	79	84	80	79	60	63	71	72	73	76	78	77	72	78	84	97	74.0			
	Minimum 40	45	48	43	35	38	34	34	39	40	48	44	48	57	54	53	51	45	47	47	48	44	46	51	46	50	48	48	44	47	47.1		
Kalspell .....	Maximum 78	81	81	63	58	49	40	42	52	55	56	40	47	45	47	51	49	46	45	44	39	43	44	44	48	52	44	45	50	44	41.8		
	Minimum 46	47	45	40	36	37	32	35	36	40	47	45	47	51	49	46	45	44	46	45	44	39	43	44	44	48	52	44	45	50	44	41.8	
Lewistown .....	Maximum 69	78	76	71	67	69	58	52	59	71	77	69	78	81	82	80	65	63	72	76	68	68	68	68	69	78	75	81	81	70	71.0		
	Minimum 47	35	34	32	31	51	32	29	36	36	44	39	40	53	56	41	50	40	40	30	39	40	44	40	40	40	40	40	40	40	40	40.0	
Malta \$\$. .....	Maximum 70	75	75	58	68	68	51	57	60	72	73	71	77	77	77	77	77	65	65	67	68	69	72	78	77	72	78	84	97	74.0			
	Minimum 43	48	52	36	44	44	38	44	38	48	53	55	52	51	55	52	46	46	48	46	45	47	52	59	55	52	52	50	45	45	45.2		
Miles City .....	Maximum 70	73	74	69	66	67	52	59	59	76	75	74	86	79	83	81	82	67	64	70	84	68	70	72	82	76	66	70	72	71	71.7		
	Minimum 46	48	54	50	46	51	44	38	46	42	55	50	56	61	60	61	57	53	51	47	53	53	58	55	60	56	52	54	50	45	52.0		
Missoula \$\$. .....	Maximum 81	82	83	72	69	51	50	63	70	72	70	73	85	86	83	83	80	70	64	63	74	79	78	78	78	84	73	80	86	96	71.8		
	Minimum 46	46	47	48	38	41	35	33	38	40	42	40	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44.0	
Snowbelt .....	Maximum 67	71	72	63	64	62	59	58	55	71	73	70	77	72	77	79	76	60	61	67	75	62	59	65	69	80	67	67	68	71	67.3		
	Minimum 43	50	46	45	37	36	36	39	40	48	41	44	53	56	53	51	49	46	40	40	40	40	40	40	40	40	40	40	40	40	40	40.0	
Wibaux .....	Maximum 71	73	70	72	67	66	57	59	56	78	75	75	82	88	73	81	82	90	77	67	82	65	64	70	71	81	83	66	69	71	72.5		
	Minimum 46	45	46	42	41	36	43	43	42	34	45	46	47	51	52	51	51	40	50	46	42	48	46	47	47	52	54	52	49	40	45.8		

## Climatological Data for June, 1924—Continued from page 24.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in degrees Fahr.						Precipitation, inches.			Number of days.				Prevailing direction of wind.	Observers.		
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall, unmelting.	With precipitation 0.01 inch or more.	Clear.			Partly cloudy.	Cloudy.
Eastern Division.																				
Baker .....	Fallon	2,092	2	59.6	-3.9	85	26†	35	8	36	2.58	-1.10	0.88	0	18	11	13	6	ne.	U. S. Reclamation Service.
Ballantine .....	Yellowstone	3,115	30	61.0	-3.7	87	26	31	7	43	1.70	-1.10	0.57	0	14	17	8	5	nw.	John L. Scofield.
Biddle .....	Powder River	3,664	15	59.0	-4.6	85	26†	30	8	40	1.74	-0.70	0.74	0	12	13	7	10	nw.	Henry W. Peterson.
Billings .....	Carbon	3,050	4	60.6	-4.6	89	15	31	8	43	0.69	-0.81	0.51	0	6	6	23	1	n.	R. A. Thornton.
Bridger .....	Powder River	3,041	21	59.3	-3.0	83†	14	30†	8	46	1.84	-0.53	0.53	0	13	15	5	10	nw.	A. W. Heide.
Broadus .....	Bighorn	2,159	3	60.4	-0.2	89	16	34	8	40	3.18	+0.45	0.80	0	6	21	5	4	e.	Rev. Alfred Habegger.
Busby .....	Bighorn	3,041	42	64.7	-0.2	89	16	34	8	40	3.18	+0.45	0.80	0	6	21	5	4	e.	U. S. Indian Service.
Crow Agency .....	Richland	1,918	20	58.2	-6.5	80	26	35	10	35	3.52	+0.31	1.61	0	14	20	5	5	nw.	W. A. Whitcomb.
Culbertson (7 mi. SW) .....	Carter	2,658	8	58.8	-3.9	83	14†	35	10	38	6.20	+3.79	1.13	0	15	11	15	4	nw.	William Freese.
Ekakala .....	Fergus	1,010	10	57.0	-4.8	79	16†	31	7	40	4.11	+0.99	1.07	T.	14	4	14	12	ne.	W. C. Wiggins.
Flatwillow .....	Rosebud	2,529	15	62.0	-	88	21	36	1†	40	3.54	-0.96	0.96	0	7	14	13	3	e.	P. W. Barthel.
Forsyth .....	Big Horn	2,800	15	59.4	-	82	26	34	5	37	5.21	-1.61	1.61	0	13	1	19	10	nw.	Mrs. John Bennett.
Foster †† .....	Valley	2,068	12	61.4	-	87	14	32	8	41	1.74	-0.60	0.60	0	12	14	8	8	nw.	William Brough.
Frazer .....	Custer	2,600	2	61.4	-	87	14	32	8	41	1.74	-0.60	0.60	0	12	14	8	8	nw.	P. T. Bennett.
Garland .....	Custer	2,600	2	61.4	-	87	14	32	8	41	1.74	-0.60	0.60	0	12	14	8	8	nw.	P. T. Bennett.
Central Division.																				
Glasgow .....	Valley	2,092	29	60.8	-2.9	84	17	33	5	42	4.84	-2.32	1.02	0	18	11	14	5	nw.	Elmer Hall.
Glendive .....	Dawson	2,091	35	61.2	-4.7	84	16	40	10	33	4.34	+1.09	0.87	0	15	10	12	5	se.	J. C. Leonard.
Glentana .....	Valley	2,091	35	61.2	-4.7	84	16	40	10	33	4.34	+1.09	0.87	0	15	10	12	5	se.	Guy J. Patterson.
Harlem .....	Blaine	2,359	2	58.2	-	81	26	32	5	38	4.15	-1.80	1.80	0	17	5	18	7	nw.	Francis Brady.
Hays .....	Blaine	2,359	2	57.2	-	84	15	32	5	38	1.53	-0.40	0.40	0	15	9	12	9	w.	John H. Herman.
Hercules Ranch† .....	Custer	2,650	8	59.8	-	84	26	34	8	36	3.60	-0.98	0.98	0	13	8	20	2	e.	Ernest McCollum.
Ingomar (near) .....	Rosebud	3,035	7	59.8	-	84	26	34	8	36	3.60	-0.98	0.98	0	13	8	20	2	e.	Harry A. Woodruff.
Knowlton .....	Custer	2,650	8	59.8	-	84	26	34	8	36	3.60	-0.98	0.98	0	13	8	20	2	e.	Ernest McCollum.
Lustre .....	Valley	2,092	29	60.8	-2.9	84	17	33	5	42	4.84	-2.32	1.02	0	18	11	14	5	nw.	Elmer Hall.
Malta .....	Phillips	2,250	18	58.6	-5.1	78	26	36	4	27	4.62	-3.84	1.35	0	16	5	2	23	w.	J. C. Wall.
Medicine Lake. §§ (S) .....	Sheridan	1,969	13	62.0	-10.3	69†	26	33†	9	25†	4.81	+1.67	1.44	0	10	12*	8*	5*	nw.	U. S. Reclamation Service.
Mildred .....	Prairie	2,364	15	61.0	-	84	21†	38	8	34	2.87	-0.30	0.69	0	14	1	25	4	nw.	W. F. Glauzke.
Miles City .....	Custer	2,378	32	61.8	-4.2	86	13	38	8	34	1.72	-1.05	0.66	0	13	10	10	10	ne.	Leon B. Clark.
Outlook .....	Sheridan	2,378	32	61.8	-4.2	86	13	38	8	34	1.72	-1.05	0.66	0	13	10	10	10	ne.	U. S. Weather Bureau.
Paxton .....	Dawson	2,091	35	61.2	-4.7	84	16	40	10	33	4.34	+1.09	0.87	0	15	10	12	5	se.	Amund Johnson.
Northern Division.																				
Pine Grove .....	Fergus	1,010	10	57.0	-4.8	79	16†	31	7	40	4.11	+0.99	1.07	0	14	4	14	12	ne.	Nels Christoffersen.
Plevna .....	Fallon	2,757	12	59.1	-4.3	88	18	36	10	38	3.31	+0.28	1.30	0	11	8	11	11	nw.	Griff. St. Jernain.
Poplar .....	Roosevelt	2,020	41	58.0	-3.9	80	17†	29	8	40	3.09	+0.63	1.32	T.	7	7	13	14	nw.	C. C. Conser.
Red Lodge .....	Carbon	5,548	24	53.0	-3.9	80	17†	29	8	40	3.09	+0.63	1.32	T.	7	7	13	14	nw.	J. Geo. Kurtz.
Rock Springs (6 m. E) §§ .....	Custer	5,548	24	53.0	-3.9	80	17†	29	8	40	3.09	+0.63	1.32	T.	7	7	13	14	nw.	I. A. Draper.
Savage .....	Fergus	1,985	18	61.4	-3.9	82	16†	40	10	35	3.97	+0.40	1.24	0	14	5	12	13	ne.	Jacob M. Kruse.
Scobey .....	Richland	1,985	18	61.4	-3.9	82	16†	40	10	35	3.97	+0.40	1.24	0	14	5	12	13	ne.	M. C. Oster.
Sentinel Butte Pass (S) †† .....	Daniels	2,850	9	58.2	-5.0	80	26	36	7†	33	4.85	+1.29	1.78	0	20	3	22	5	nw.	U. S. Reclamation Service.
Snowbelt † .....	Garfield	2,850	9	58.2	-5.0	80	26	36	7†	33	4.85	+1.29	1.78	0	20	3	22	5	nw.	A. W. Warden.
Springbrook †† .....	McCone	2,800	17	59.2	-3.1	85	26	34	5	43	3.65	+1.06	0.98	T.	15	15	4	11	w.	John Howard.
Valentine .....	Fergus	2,800	17	59.2	-3.1	85	26	34	5	43	3.65	+1.06	0.98	T.	15	15	4	11	w.	Harry Guyver.
Wheaton† .....	Musselshell	12	51.6	-8.3	85	16	27	28	46	2.99	0.00	1.06	0	10	8	15	7	ne.	Mrs. H. L. Miller.	
White Water .....	Phillips	9	56.6	-4.0	78	26	31	5	40	5.86	+2.49	2.30	0	16	17	5	8	nw.	B. O. Bean.	
Wibaux .....	Wibaux	2,674	22	59.2	-3.6	90	18	34	10	50	4.58	+0.31	1.26	0	17	6	20	4	nw.	P. O. Balgord.
Means and extremes .....																				
				58.7	-4.5	92	15	27	8†	55	3.59	+0.41	2.30	0.1	14	9	13	8	nw.	H. C. Keschau.



## Daily Temperatures for May, 1924.

Stations.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Mean		
Agricultural College.....	Maximum	66	73	78	71	60	46	59	60	55	69	73	76	66	72	77	76	70	72	61	62	69	63	62	70	62	58	60	60	51	60	60	65.1	
	Minimum	36	38	45	49	28	25	31	35	34	34	41	45	39	39	45	50	43	42	36	40	37	44	41	44	45	33	34	35	38	36	40	38.3	
Big Timber .....	Maximum	72	80	80	78	70	55	64	61	61	78	80	75	70	78	85	82	80	80	80	80	82	80	78	75	68	62	70	73	48	65	65	70.3	
	Minimum	30	35	35	36	32	25	29	25	25	35	40	35	30	35	30	35	46	35	38	35	32	40	40	40	37	55	28	40	42	40	36	36.8	
Billings .....	Maximum	76	80	85	82	68	51	64	59	59	72	78	72	64	73	83	84	72	66	58	59	75	74	65	74	64	70	59	62	66	66	69.8		
	Minimum	31	34	38	38	33	37	34	38	33	37	41	31	32	44	51	42	33	37	41	33	37	46	27	41	41	28	43	41	43	39	36.8		
Broadus .....	Maximum	70	74	86	86	69	49	54	51	54	63	72	69	64	68	81	78	68	64	60	61	68	61	68	61	68	61	68	61	68	61	68	69.8	
	Minimum	32	46	37	50	37	33	27	32	32	37	41	31	32	44	51	42	33	37	41	33	37	46	27	41	41	28	43	41	43	39	36.8		
Butte .....	Maximum	66	76	73	66	50	52	59	61	61	71	76	74	69	77	77	76	74	74	71	66	71	67	60	75	73	58	58	54	53	62	61	65.3	
	Minimum	34	35	42	39	25	23	32	33	33	34	40	42	39	40	43	49	46	42	40	37	41	43	40	41	42	34	35	36	37	36	43	37.9	
Culbertson (near) .....	Maximum	74	74	73	72	65	40	49	49	54	65	76	65	60	67	82	70	60	51	60	53	67	71	50	62	59	.....	65	71	65	66	70	66.1	
	Minimum	33	39	33	45	37	30	23	28	27	32	37	37	28	25	35	41	39	35	31	36	27	36	30	28	31	.....	34	43	36	33	31	33.2	
Cut Bank .....	Maximum	68	78	78	56	48	58	59	59	60	75	73	67	67	81	85	75	61	56	47	56	69	74	65	61	40	40	44	36	41	38	39	25	33
	Minimum	39	35	44	48	37	29	32	29	28	32	39	34	34	34	34	30	36	48	42	30	39	40	38	39	40	38	37	36	35	36	40	41	37.7
Dillon .....	Maximum	62	76	70	48	42	60	62	69	68	68	70	72	72	71	74	73	76	76	69	70	71	70	68	74	70	68	54	50	48	64	66	66.1	
	Minimum	35	36	36	35	32	30	34	38	37	37	39	41	38	34	34	38	48	42	40	38	39	40	38	39	40	38	37	36	35	36	40	41	37.7
Fortine .....	Maximum	77	85	86	62	68	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75.5	
	Minimum	21	25	30	42	34	18	27	18	24	27	18	24	27	18	24	27	18	24	27	18	24	27	18	24	27	18	24	27	18	24	27	18	24
Glasgow .....	Maximum	76	78	83	77	71	43	55	54	61	70	76	69	64	74	84	81	68	58	57	61	73	78	58	68	63	58	72	71	70	71	75	68.3	
	Minimum	31	39	37	47	35	32	26	39	32	34	35	36	31	34	43	53	46	34	33	31	28	37	35	37	39	38	30	37	46	32	41	36.4	
Great Falls .....	Maximum	73	81	85	78	50	59	64	61	62	78	78	75	70	79	89	84	79	64	51	60	76	72	62	78	75	64	59	65	59	67	75	70.4	
	Minimum	37	48	40	55	50	61	67	73	76	83	86	80	81	86	85	81	79	75	76	76	78	75	73	79	77	66	63	59	65	74	74	74.4	
Haugan .....	Maximum	75	82	80	65	50	61	67	73	76	83	86	80	81	86	85	81	79	75	76	76	78	75	73	79	77	66	63	59	65	74	74	74.4	
	Minimum	26	27	35	39	33	22	29	25	28	29	32	34	31	29	35	35	33	34	39	36	30	39	34	35	46	25	29	37	61	67	70	78	67.2
Havre .....	Maximum	73	80	85	66	48	48	63	58	63	76	77	68	68	76	83	84	79	64	51	60	76	72	62	78	75	64	59	65	59	67	75	70.4	
	Minimum	40	39	44	47	37	34	32	32	31	34	38	36	34	34	41	56	48	35	37	35	34	38	38	42	38	34	45	41	34	50	38.7		
HELENA .....	Maximum	69	79	79	60	47	58	63	62	62	74	77	77	77	81	85	82	74	80	68	72	74	65	64	71	65	63	61	59	62	65	74	69.5	
	Minimum	38	38	43	35	33	36	40	36	34	35	44	45	40	40	46	48	49	46	46	44	41	49	42	45	43	35	44	39	36	46	41.3		
Kalispell .....	Maximum	67	74	72	54	54	60	65	68	66	77	81	76	78	77	81	76	78	77	81	76	78	77	81	76	78	77	81	76	78	77	81	76	78
	Minimum	34	36	40	40	38	30	40	36	36	39	43	47	41	42	46	48	49	46	46	44	41	49	42	45	43	35	44	39	36	46	41.3		
Lewistown .....	Maximum	72	78	77	72	41	45	56	55	55	65	67	67	67	71	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77
	Minimum	32	36	36	37	32	31	30	28	30	25	26	34	36	31	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
Malta §§ .....	Maximum	71	77	83	74	44	44	56	55	57	64	67	67	67	71	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77
	Minimum	40	39	45	43	33	28	33	31	35	38	38	32	34	42	57	49	39	35	33	32	49	59	69	72	53	66	62	57	67	66	66	70	64.3
Miles City .....	Maximum	72	75	87	83	60	37	53	50	56	65	75	60	59	68	83	77	61	62	47	44	36	36	46	46	42	37	43	43	44	39	40	41	41.4
	Minimum	40	39	45	43	33	28	33	31	35	38	38	32	34	42	57	49	39	35	33	32	49	59	69	72	53	66	62	57	67	66	66	70	64.3
Missoula §§ .....	Maximum	75	85	76	57	52	64	68	70	73	83	87	79	80	84	87	83	84	81	75	76	81	71	70	81	63	68	65	57	66	72	73	73	73
	Minimum	35	35	39	41	39	27	27	35	34	38	39	42	50	42	44	45	46	46	50	42	57	66	71	55	65	64	52	65	57	61	62	67	67
Snowbelt .....	Maximum	70	74	84	72	43	36	56	51	55	64	71	57	58	66	82	88	66	50	42	57	66	71	55	65	64	52	65	57	61	62	67	67	67
	Minimum	36	43	47	42	34	29	26	32	31	35	38	39	42	50	42	44	45	46	50	42	57	66	71	55	65	64	52	65	57	61	62	67	67
Wibaux .....	Maximum	77	72	75	82	72	46	47	45	53	64	74	69	57	67	80	73	59	55	50	57	67	72	71	62	59	57	63	70	68	66	72	72	72
	Minimum	40	40	39	45	40	32	31	31	29	31	35	39	29	23	32	46	45	33	30	33	31	40	35	25	32	37	40	32	36	30	30	30	30

## Climatological Data for May, 1924—Continued from page 20.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in degrees Fahr.						Precipitation, inches.			Number of days.				Observers.			
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall, unmelting.	With precipitation 0.01 inch or more.	Clear.		Partly cloudy.	Cloudy.	Prevailing direction of wind.
Eastern Division.																				
Baker.....(Y).....	Fallon	2	54.6	87	15	29	10	50	1.43	0.22	0.14	0	11	11	9	9	ne.	U. S. Reclamation Service.		
Ballantine.....	Yellowstone	19	49.1	84	3	20	7	52	0.62	-2.07	0.14	T.	7	15	9	1	nw.	John L. Scofield.		
Biddle.....	Powder River	3,115	53.2	85	3	27	10	50	2.05	-0.80	1.34	0	5	19	7	2	nw.	Henry W. Peterson.		
Billings.....	Yellowstone	3,664	52.3	89	1	15	27	10	0.53	-1.32	0.35	0	3	12	17	2	nw.	R. A. Thornton.		
Bridger.....	Carbon	3,050	51.3	86	3†	27	7†	49	0.56	.....	0.26	0	6	19	4	16	nw.	A. W. Heidel.		
Broadus.....	Powder River	21	50.2	88	3	22	7	48	2.33	-0.17	1.20	T.	9	9	10	2	nw.	Rev. Alfred Habegger.		
Busby.....	Bighorn	3,041	42	53.8	2.4	76	11	31	1.95	-0.52	1.00	0	4	19	4	3	n.	U. S. Indian Service.		
Crow Agency.....	Bighorn	1,918	20	48.5	6.8	82	15	23†	1.16	-1.23	0.54	2.0	9	23	9	10	n.	W. A. Whitcomb.		
Culbertson (7 mi. SW).....	Richland	26	50.5	2.2	83	4	24	14	0.81	-1.46	0.27	0	5	12	9	3	nw.	William Freese.		
Ekalaka.....	Carter	10	50.5	1.4	85	3†	26	13	1.60	-0.57	0.88	2.0	6	14	10	7	nw.	W. C. Wiggins.		
Flatwillow.....	Fergus	2,529	54.6	89	2	27	7	51	1.07	.....	0.65	0	3	21	7	3	nw.	P. W. Barthel.		
Forsyth.....	Rosebud	2,800	15	47.9	5.9	88	31	26	0.78	-1.27	0.28	0	3	26	2	3	nw.	D. W. Carper.		
Foster ††.....	Big Horn	2,068	50.4	84	15	23	7	48	1.11	.....	0.60	T.	6	8	13	10	nw.	William Brough.		
Frazier.....	Valley	2,608	52.0	82	3	26	7	57	1.36	.....	0.60	0.2	5	16	1	14	nw.	P. T. Bennett.		
Garland.....(X).....	Custer	2,600	52.0	82	3	26	7	57	1.36	.....	0.60	0.2	5	16	1	14	nw.	Elmer Hall.		
Glasgow.....	Valley	2,092	29	52.4	-5.5	84	15	26	7	46	1.90	-0.65	0.89	T.	6	14	8	nw.	J. C. Leonard.	
Glendive.....	Dawson	2,091	35	53.0	-3.6	84*	2	32	7	46*	0.85	-1.66	0.29	0	6	16	8	nw.	Guy J. Pattison.	
Glentana.....	Valley	2,359	2	54.5	.....	88	15	29	9	47	1.66	.....	1.00	0	8	13	12	nw.	Francis Brady.	
Harlem.....(Z).....	Blaine	2,359	2	50.7	.....	86	3†	21	8	44	1.49	.....	1.10	T.	5	15	8	nw.	John H. Herman.	
Hays.....	Blaine	2,650	8	50.7	.....	86	3†	21	8	44	1.49	.....	1.10	T.	5	15	8	nw.	Ernest McCollum.	
Hercules Ranch††.....	Rosebud	3,035	7	51.9	.....	87	3	27	7	52	1.12	.....	0.40	T.	10	14	3	nw.	Harry A. Woodruff.	
Ingomar (near).....(Y).....	Custer	9	51.2	-1.5	87	3	22	7	43	0.58	-1.54	0.45	1.0	3	16	6	9	nw.	J. C. Wall.	
Knowlton.....	Custer	9	51.2	-1.5	87	3	22	7	43	0.58	-1.54	0.45	1.0	3	16	6	9	nw.	U. S. Reclamation Service.	
Lustre.....(S).....	Valley	2,250	18	51.3	-2.7	84	15	28	6	38	1.06	-0.90	0.58	0	10	12	3	nw.	W. F. Glaenzke.	
Malta.....	Phillips	1,969	13	44.2	-7.6	67*	5	26*	7	35*	1.06	-0.67	0.77	0	3	21*	1*	nw.	Leon B. Clark.	
Medicine Lake. §§ (S).....	Sheridan	1,969	13	44.2	-7.6	67*	5	26*	7	35*	1.06	-0.67	0.77	0	3	21*	1*	nw.	U. S. Weather Bureau.	
Mildred.....	Prairie	2,364	15	51.2	.....	87	30	27	61	0.55	0.25	-2.57	0.08	T.	4	9	18	4	nw.	Amund Johnson.
Miles City.....	Custer	2,378	32	52.8	-3.9	87	3	28	7	41	0.34	-1.64	0.17	T.	7	14	7	10	nw.	Nels Christofersen.
Outlook.....	Sheridan	2,378	32	52.8	-3.9	87	3	28	7	41	0.34	-1.64	0.17	T.	7	14	7	10	nw.	Nels Christofersen.
Paxton.....(S).....	Dawson	2	45.5	+0.1	80	3†	21	9	48	0.47	-1.58	0.19	0.5	4	20*	4	3*	nw.	Griff. St. Jermain.	
Pine Grove.....	Fergus	2,757	12	49.2	-3.1	82	4	26	14	47	0.47	-1.58	0.19	0.5	4	20	4	nw.	C. C. Conser.	
Plevna.....	Fallon	2,020	41	49.2	-3.1	82	4	26	14	47	0.47	-1.58	0.19	0.5	4	20	4	nw.	J. Geo. Kurtz.	
Poplar.....	Roosevelt	5,648	24	46.4	-1.7	76	2	20	13	41	1.93	-2.39	0.75	0.5	5	10	9	nw.	I. A. Draper.	
Red Lodge.....	Carbon	9	49.8	.....	87*	15	23	7	47*	0.82	-0.59	0.18	1.0	11	11	11	n.	Jacob M. Kruse.		
Rock Springs (6 m. E) §§.....	Custer	3	53.9	.....	93*	8	18	20†	62*	2.17	.....	0.27	T.	10	16	3	12	nw.	M. C. Oster.	
Roy.....	Fergus	1,985	18	51.8	-2.7	84	15	27	7	47	0.80	-1.87	0.35	3.0	3	18*	3*	nw.	U. S. Reclamation Service.	
Savage.....	Richland	2	51.4	.....	87	3	22	9	43	1.80	.....	0.80	4.0	9	13	12	6	nw.	A. W. Warden.	
Scobey.....(S).....	Daniels	2	51.4	.....	87	3	22	9	43	1.80	.....	0.80	4.0	9	13	12	6	nw.	John Howard.	
Sentinel Butte Pass(S) ††.....	Garfield	9	49.3	-2.3	88	16	20	13	49	0.96	-1.74	0.27	T.	7	13	11	7	nw.	Harry Gayer.	
Snowbelt ††.....	Garfield	22	50.7	-3.3	89	2	20	13	49	1.28	-1.01	0.51	T.	7	16	5	10	nw.	Mrs. H. L. Miller.	
Springbrook ††.....	McCon	2,800	17	52.0	-2.5	85	16	18	5	52	1.94	-0.43	0.56	3.0	5	15	14	2	ne.	B. M. Bean.
Valentine.....	Fergus	12	47.9	-2.8	88	16	18	5	52	1.94	-0.43	0.56	3.0	5	15	14	2	ne.	P. O. Balgord.	
Wheaton††.....	Musselshell	2	49.0	-2.2	82	4	23	14	48	0.84	-1.44	0.58	0	4	14	13	4	nw.	H. C. Kaschau.	
White Water.....	Phillips	2,974	2	45.6	-3.6	82	4	23	14	48	0.84	-1.44	0.58	0	4	14	13	4	nw.	J. D. Cullen.
Wibaux.....	Wibaux	2,974	2	45.6	-3.6	82	4	23	14	48	0.84	-1.44	0.58	0	4	14	13	4	nw.	J. D. Cullen.
Means and extremes.....				50.7	-3.3	93	8	18	5†	62	1.18	-1.19	1.34	1.0	6	15	9	7	nw.	



U. S. DEPARTMENT OF AGRICULTURE, WEATHER BUREAU.  
CHARLES F. MARVIN, Chief.

HISTORICAL  
OF MONTANA  
HELENA

# CLIMATOLOGICAL DATA.

## MONTANA SECTION.

WILLIAM T. LATHROP, Meteorologist.

VOL. XXVII. HELENA, MONT., MAY, 1924. No. 5.

### GENERAL SUMMARY.

It was cool for May in the eastern division, and warm over the rest of the State, especially west of the Continental Divide. Although the eastern division averaged  $3.3^{\circ}$  below normal in temperature, the average departure from normal for the entire State was nearly a degree in the positive direction. The stations west of the Divide averaged more than  $4^{\circ}$  above normal. With two exceptions it was the warmest May for the State as a whole since 1902. These exceptions were in 1910 and 1919. Neither the highest nor the lowest temperature recorded during the month is worthy of special note. The warmest day through most of the State was the 15th, but at many stations on the east slope of the Main Range the month's maximum was not reached until the 16th. West of the Divide the warmest period in some districts was the 2d and 3d. The coldest day was the 6th west of the Divide; in the central division it varied from the 6th to the 10th; in the east there was no period which could well be put down as the coldest generally, though the lowest temperature of the month occurred at more stations on the 7th than on any other day.

The lightest average total precipitation in Montana's record was recorded, and lack of moisture was seriously felt in several districts. Each division averaged more than an inch less than normal, while the central and western divisions averaged more than an inch and a half less than normal.

### TEMPERATURE.

The monthly mean for the State, as shown by the records of 109 stations, was  $52.4^{\circ}$ . The mean departure from the normal for 81 stations having ten or more years' record was  $+0.8^{\circ}$ . The highest temperatures recorded in the three divisions were as follows: West of Divide,  $93^{\circ}$  at Libby on the 15th; Central,  $92^{\circ}$  at Kenilworth on the 15th; Eastern,  $93^{\circ}$  at Roy on the 8th. The lowest temperatures by divisions were as follows: West of Divide,  $18^{\circ}$  at Fortine on the 5th and 8th and at Trout Creek on the 6th; Central,  $17^{\circ}$  at Brenner, Hebgen Dam and Virginia City on the 6th; Eastern,  $18^{\circ}$  at Roy on the 20th and Wheaton on the 5th.

### PRECIPITATION.

The monthly average for the State, as shown by the records of 119 stations, was 0.84 inch. The mean departure from the normal for 85 stations having ten or more years' record was  $-1.44$  inches. The greatest monthly amount was 2.63 inches at Adel. The least monthly amount was 0.10 inch at Kippen. The average snowfall West of the Divide was 0.4 inch; in the Central Division, 1.0 inch; in the Eastern Division, 1.0 inch; the general average for the State was 0.8 inch.

### HAIL DATA.

Hail was reported from stations and on dates as follows: West of Divide.—Fortine, 5, 22, 23; Philipsburg, 26. Central Division.—Brenner, 28, 29; Dunkirk, 18, 19; Lothair, 18, 28. Eastern Division.—Garland, 28.

### AURORAS.

The following stations reported auroras on the dates given: West of the Divide.—None. Central Division.—Hayre, Eastern Division.—Barthelness Ranch (southern Custer County); Rock Springs, 21, 27.

### PRESSURE, WIND, HUMIDITY, AND SUNSHINE DATA.

Stations.	Atmospheric pressure (reduced to sea level).					Wind.				Relative humidity.		
	Mean.	Highest.	Date.	Lowest.	Date.	Average hourly velocity.	Maximum velocity.	Direction.	Date.	Mean 6 a.m.	Mean noon.	Mean 6 p.m.
Havre .....	30.00	30.40	12	29.55	25	6.1	32	n.	5	83	40	39
Helena .....	29.98	30.38	29	29.54	22	8.9	31	sw.	22	70	40	34
Kalispell .....	29.94	30.40	29	29.50	24	6.3	27	w.	24	69	30	24
Miles City .....	30.05	30.40	6	29.47	4	5.8	30	nw.	17	74	39	33
Sheridan, Wyo. ....	30.03	30.38	6	29.49	8	6.0	46	nw.	6	79	41	44
Williston, N. D. ....	30.00	30.32	6	29.56	22	8.6	43	nw.	17	75	40	38
Yellowstone Park ..	29.98	30.43	15	29.51	22	7.2	39	n.	22	75	33	34

### COMPARATIVE DATA FOR MAY.

Year.	Temperature.				Precipitation.			Average No. of days.			
	State mean.	Departure.	Highest.	Lowest.	State average.	Departure.	Greatest in 24 hours.	Precipitation (or inch or more).	Clear.	Partly cloudy.	Cloudy.
1895 .....	52.0	+ 0.6	94	17	1.00	-1.60	.....	6	13	11	7
1896 .....	49.0	- 2.4	90	16	3.14	+0.54	.....	11	8	14	9
1897 .....	59.0	+ 7.6	98	20	0.89	-1.71	.....	4	17	10	4
1898 .....	50.4	- 1.0	90	10	3.56	+0.96	2.25	11	9	11	11
1899 .....	45.0	- 6.4	86	7	2.63	+0.03	2.48	6	11	11	9
1900 .....	58.1	+ 6.7	102	24	2.34	-0.26	3.65	7	14	10	7
1901 .....	58.8	+ 7.4	104	17	2.98	+0.38	3.29	8	13	10	8
1902 .....	53.4	+ 2.0	94	17	3.56	+0.96	2.75	10	9	12	10
1903 .....	49.0	- 2.4	98	10	2.14	-0.46	2.10	9	12	9	10
1904 .....	51.6	+ 0.2	86	18	1.44	-1.16	1.56	7	12	11	8
1905 .....	48.8	- 2.6	89	8	2.24	-0.36	2.14	9	11	9	11
1906 .....	50.2	- 1.2	96	9	4.06	+1.46	2.25	13	8	9	14
1907 .....	47.7	- 3.7	92	10	2.41	-0.19	2.85	8	11	10	10
1908 .....	50.0	- 1.4	89	12	5.00	+2.40	3.54	14	9	10	12
1909 .....	48.2	- 3.2	90	5	2.42	-0.18	5.04	10	11	11	9
1910 .....	53.4	+ 2.0	92	11	2.43	-0.17	6.00	8	15	9	7
1911 .....	50.1	- 1.3	95	11	2.92	-0.32	2.40	11	10	12	9
1912 .....	50.9	- 0.5	94	16	2.99	+0.39	3.30	10	13	9	9
1913 .....	50.8	- 0.6	96	10	1.84	-0.76	1.45	8	12	10	9
1914 .....	52.3	+ 0.9	91	15	1.89	-0.71	2.15	13	7	11	13
1915 .....	50.3	- 1.2	90	14	2.71	+0.18	2.28	12	8	12	11
1916 .....	46.9	- 4.2	92	10	2.24	-0.28	2.45	11	8	12	11
1917 .....	48.9	- 2.0	96	0	2.33	-0.13	1.87	9	14	8	9
1918 .....	49.3	- 2.0	94	11	1.30	-1.22	1.84	7	12	9	10
1919 .....	53.6	+ 2.4	102	11	1.46	-1.05	1.75	8	15	8	8
1920 .....	50.0	- 1.2	92	11	2.02	-0.37	2.14	8	13	9	9
1921 .....	51.5	+ 0.3	88	17	1.94	-0.32	2.07	9	11	10	10
1922 .....	50.5	- 0.3	96	18	2.40	+0.03	2.30	10	12	10	9
1923 .....	51.8	+ 0.5	96	9	2.14	-0.22	2.45	11	11	11	9
1924 .....	52.4	+ 0.8	93	17	0.84	-1.44	1.34	5	17	8	6

### Explanation of Reference Marks Used in This Publication.

§ Instruments are read in the morning; the maximum temperature then read is charged to the preceding day, on which it almost always occurs. Letters, a, b, c, et indicate respectively 1, 2, 3, etc., days missing from the record. † Also on other dates. ‡ Precipitation less than 0.01 inch of rain or melted snow. § Separates dates of falls not recorded. †† Report received too late to be included in the means. § Post-office addresses of these stations are as follows: Of Agricultural College, Bozeman; of Big Ox, Marysville; of Brenner, Grant; of Canyon Ferry, Helena; of Ft. Head Creek, Wilsall; of Foster, Hardin; of Hebgen Dam, Cliff Lake; of Helena Valley, Route A., Helena; of Hercules Ranch, Beebe; of Holter, Wolf Creek; of Luster, Frazee; of Lytle, Brady; of Minnesota, Rudyard; of Pipestone Dam, Whitehall; of Pleasant Valley, Marion; of Renova, Whitehall; of Sentinel Butte Pass, Phon; of Snowbelt, Edward of Springbrook, Circle; of Sun River Canyon, Gilman; of Sunset Orchard, Stevensville; of Upper Yaak River, Troy; of Wheaton, Emory; of Willow Creek Reservoir, Gilman. Note.—The departures from normal temperature and precipitation are computed only for such stations as have ten or more years of record, but all complete reports are used in determining State and division means.



HISTORICAL SOCIETY  
OF MONTANA  
HELENA

MONTANA SECTION.

VII. HELENA, MONT., MAY, 1924. No. 5.

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U. S. DEPARTMENT OF AGRICULTURE, WEATHER BUREAU  
CHARLES F. MARVIN, Chief

# CLIMATOLOGICAL DATA

## MONTANA SECTION

LIAM T. LATHROP, Meteorologist

HELENA, MONTANA, ANNUAL, 1925. No. 13

### GENERAL SUMMARY

49.0° at Livingston to 37.8° at Hebgen Dam, a temperature for Montana in 1925 averaged which only one other year in the record (1910), exceeded. Highest mean annual temperatures those of the upper Yellowstone and Missouri basins between the Bitter Root Mountains and Sapphire Ranges; while the few stations annual temperatures lower than 40.0° lie in the overhead County and the district west of Yellowstone in northern Phillips and Sheridan Counties on plains, with secondary cool areas extending south down the Main Range and its east slope, sections of west-central Montana. Every station warmer than in 1924.

For River County, recorded the extreme maximum for the year, 110°, on July 14th, and Garland, Custer County, extreme minimum, -46°, on December 27th. There was a marked departure above normal temperature. While the variation, +8.8°, was not as great as it was the greatest monthly departure of 1925, combined with a departure of -8.0°. During the course of 1925 the monthly average variation from normal was in each case to above normal. Followed by departures in August and September came after which the remaining months again varied in the positive direction, with the warmest December

precipitation for stations with a complete year's record from 38.05 inches at Adel, Cascade County, to 10.00 inches at Eartheness Ranch, in southern Custer County. Uneven distribution of rain and snow over Montana by the manuscript chart of total precipitation for the year. The usual pronounced maximum, aside from localities, is seen in western Sanders and Mineral Counties exceeding 20 inches for the year appear at the south-central and southwestern parts. Part of Montana (east of the 109th meridian) averaged precipitation than the rest of the State. The whole of Montana was 16.34 inches for the year, considerably greater than the average of 1924 and of 1916, excepting 1923, although in the east the fall of 1925 at numerous stations were lower than in the average number of days with .01 inch or more, 85, in the general average of the last 30 years. The number of cloudy days was 111, and of clear days, 150. All for the year averaged 49.4 inches, or about 6 inches less than last year, notwithstanding this year's greater precipitation. The cold and wet October was a greater snowfall (averaging 11.0 inches) than for the year. Heavy, moist snow fell on the east Main Range during the night of September 18-19, damage to telegraph and telephone wires, grain, shade trees, which had not yet cast their leaves, caused the loss of at least one life. The heavy snow-

fall was repeated in districts on the east slope on the night of September 26-27, but with much less disastrous effects.

Two ranches suffered damages by high wind to buildings, etc., near Pendroy, Teton Country, on January 18th. Losses were estimated at \$1730. This wind was locally classified as a tornado, and there was testimony of a funnel-shaped cloud. We should hesitate, however, to classify it as a tornado, not so much because it occurred in a season in which tornadoes have been unknown in Montana, as because prevailing temperature conditions would not appear to justify it. On July 26th, high winds unroofed some buildings west of Circle. This storm was thought by some persons in the locality to be a tornado, but we have been unable to verify it as such.

### WEATHER BY MONTHS

JANUARY began with Montana just recovering from the great cold wave of late December, 1924. The mean temperature for the month was well above normal in each division, with precipitation light east of the Main Range and averaging much above normal west.

FEBRUARY was a comparatively mild month. Only two other Februaries in the record, 1924 and 1896, have had higher mean temperatures. Precipitation was near normal.

MARCH temperatures averaged well above normal in each division, and it was the warmest March in seven years. Precipitation was ample. At the end of March the winter's accumulation of snow proved 5.5 inches greater than last winter.

APRIL continued the succession of warmer than normal months, with pronounced departures above normal in each division and no station dropping as low as zero during the month. A greater April total precipitation has occurred but twice.

MAY is notable as the warmest month of that name in 24 years. The rains were much under normal, on the average, in each division, with generous rains in the closing days.

JUNE faltered in the march of warm months; temperatures averaged just normal in the central division, above normal in the west, and half a degree below in the east. The rains were above normal east of the Main Range, and, although averaging over two inches, a little below normal west of the Main Range.

JULY registered the warmest weather of the year, the means being above normal in all divisions, with the rains decidedly less than normal, and less hail than in June.

AUGUST went into the record with mean temperature near normal, slightly above normal in the east, and below in the other divisions and for the State, but with a wide range in extreme temperatures. Rainfall was light in the east, near normal in the central division, and above in the west.

SEPTEMBER as compared to normal was warm west of the main divide, and cool towards the east, though only slightly so in the eastern division. Precipitation was heavy.

OCTOBER turned out to be as cold as any October in the record of 31 years, being coldest in the east. Precipitation was much above normal in the central division, and moderately so elsewhere, with heavy snows, especially on the east slope.

NOVEMBER furnished a marked and pleasant contrast to October. The western division was slightly lower than normal in temperature, the other divisions well above. Precipitation was light in each division, with snowfall averaging 2.6 inches.

DECEMBER brought the year to a close with the highest December mean temperature since 1900. Not a single station reported below normal. Precipitation was a little below normal west of the Main Range, but above normal to eastward.



# CLIMATOLOGICAL DATA.

## MONTANA SECTION

WILLIAM T. LATHROP, Meteorologist

VOL. XXVII. HELENA, MONTANA, ANNUAL, 1924. No. 13.

### GENERAL SUMMARY.

Highest mean temperatures for the year were those of the valleys of the southern and western parts of the State. The coldest stations, with annual mean temperatures under 40°, were scattered—a few in the northern tier of counties, a few in central portions of the State, and a few others in elevated sections of the south and southwest. Big Timber, Sweet Grass County, with 46.2°, was the warmest station; and Hebgen Dam in southern Gallatin County, averaging 34.6°, the coolest.

The average for Montana was 41.8° for 1924. This was considerably cooler than 1923, and slightly warmer than 1922, as the table of comparative data shows. Areas in which temperatures were above normal were small. The general departure from normal was -0.6°. Only one station east of the 109th meridian, Glasgow, went above normal for the year, but west of the Main Range eight stations out of sixteen for which departures could be calculated had mean temperatures higher than average.

Three months were warmer than normal—February, May and October. Of these, February, warmer than the March following, is especially notable as being the warmest February in the state-wide records of Montana weather. Of the nine months below normal in temperature December's departure was greatest. The month, by a slight margin, set a new record for December cold in Montana. Thus the year 1924 produced the warmest February and the coldest December in the period covered by the records. December was really the more remarkable of the two months.

Each of the crop season months, April to September, exclusive of June, had less precipitation than normal; each of the colder months, excepting January, had more than normal. The annual state average, 13.71 inches, was almost two inches below normal. Lighter state averages have been recorded but four times since 1895. Adel, Cascade County, measured 29.74 inches, the greatest annual total, and Brenner, in the uplands of Beaverhead County, the least, 5.52 inches. Adel had the greatest excess over normal in the State, 8.23 inches. The greatest departure under normal was 8.31 inches at Libby. Except along and near the Milk River, and in western Glacier and Pondera counties, there were only scattered small sections where the annual totals exceeded normal amounts.

Snowfall for the year averaged 55.6 inches, which was about 11 inches more than in 1923. March was the month of heaviest snowfall. From September 1st to the end of the year 1924 the total fall was 23.2 inches; for the same period in 1923 the fall was 13.3 inches.

There were more cloudy days than in any year since 1897.

Tornadoes, as last year, were of unusual frequency for Montana. One occurred on June 15th in extreme northern Cascade County. On the same date (but erroneously given in the July issue as June 22d) another tornado occurred in Secs. 17, 19 and 20, T. 11 N., R. 17 E., in Fergus County. A small tornado struck ten miles west of Broadus on July 18th, and another seven miles west of Harlem on July 25th. Still another appeared in southeastern Carter County on August 17th. All of these damaged or destroyed ranch buildings, but no human lives were lost. A violent windstorm on September 8th, four miles north of Deer Lodge, could not be authenticated as a tornado.

### WEATHER BY MONTHS.

JANUARY opened in a general cold wave carried over from December, 1923. Customary oscillations followed, with no close approach to the very low temperatures of the first few days. The month ended with mild weather. Precipitation was light.

FEBRUARY had but one brief interval of zero weather—on the 19th and 20th. Limited oversteppings of these dates were offset in other sections by failure to sink at all to zero. It was a remarkably mild month. Precipitation slightly exceeded the normal, but the average snowfall was less than 5 inches.

MARCH was a cold, cloudy month, with precipitation well above normal and more snow than in any other month of the winter. There was very little subzero weather. The highest temperature, 58°, was lower for the State than previously since 1895.

APRIL nearly escaped zero weather. It was a moderately cool month, however, and deficient as to precipitation. Such precipitation as was received was fairly well distributed, except that there was little west of the Divide after the 20th.

MAY averaged 3.3° below normal in the eastern division, 1.6° below in the central, and 4° above in the west. Each division reported minimum temperatures below 20° and maxima above 90° during the month. Rainfall was the highest of any May.

JUNE rains in the north and in a southeastern locality gave a small excess over normal precipitation for the State, but not enough rain fell to meet urgent needs in other portions of the State. The month was a cool one, nearly three degrees below normal. A remarkable snowfall occurred in the northwest, where Columbia Falls, on the 7th, recorded 14 inches. Freezing temperatures occurred in western localities.

JULY, warmest month of the year, had mean temperatures below normal over the greater portion of the State, and a pronounced shortage of rain. Minimum temperatures below 32° occurred.

AUGUST showed declining temperatures and a continuation of relatively dry weather. Montana's highest temperature of the year, 110°, was registered at Roy, Fergus County, on the 27th. Killing frosts damaged vegetable growth in numerous localities.

SEPTEMBER in the east end was below normal but warmer than in the other divisions, which were below normal. Precipitation was about half an inch less than normal, yet rain and snow interfered considerably with threshing, field work, and hauling.

OCTOBER presented very pleasant autumn weather over most of Montana. Temperatures were well above normal, and weather conditions generally favorable for fall work. Precipitation was above normal in the east, but continued below in the west.

NOVEMBER ushered in the first below zero temperatures of the season in a cold wave on the 12th and 13th. The mean temperature was below normal east of the Main Range and above to westward. Precipitation departures changed to an excess of 0.76 for the month west of the Divide, with a deficiency in the east.

DECEMBER, coldest of all Decembers in the record, was mild until about the end of the first week, when below zero temperatures appeared in the north. Moderately cold weather spread over the State during the next day or two, but on the 10th there was a return to mildness which continued until the 14th. This warm interval was suddenly broken up by the onset of a cold wave of extreme severity which rapidly covered the State, with exceptionally great falls in temperature, gales, and severe blizzards. Cold weather lasted generally until the last few days of the year, and in some sections to and beyond the 31st, carrying the December mean temperature lower than ever before, notwithstanding the warm weather of the first two weeks. Precipitation was more than normal except in the west.



## "In The Beginning"

Montanans are a history minded people. Even a cursory survey of the shelves of any major library in the state reveals a wealth of books dedicated to telling the Montana story or some portion of it. The Montana Historical Society, founded in the state's earliest days, bulges with artifacts and documents from the Big Sky Country's past.

The classic tales of the Treasure State, such as the Vigilantes, Gold Rush days, conflicts of the Copper Kings, the early days of statehood, trappers and cowboys along with the discovery and development of the grand Yellowstone region have been told and retold.

However, there are at least two areas in Montana history that have not been adequately reported by historians: transportation and communications.<sup>1</sup> While this treatise will not attempt to document all aspects of the state's communications industry, we will focus on at least some of the more significant events in the history of radio and television broadcasting within the past seventy-five to eighty years.

Very little is in print concerning Montana's broadcasting stations. Ronald P. Richards, in his master's thesis at the University of Montana, documented the early days of the Treasure State's broadcasters,<sup>2</sup> but the work was not published and therefore was not circulated. Brier and Blumberg<sup>3</sup> devoted two chapters to broadcasters, but both simply began to scratch the surface. Malone and Roeder, in their monumental work, assigned two paragraphs to broadcasting, mentioning two pioneer radio stations and one early television outlet.<sup>4</sup>

While this work is by no means exhaustive, an attempt will be made to document Montana broadcasting's post World War I evolution, as well as the advents of FM and TV following the Second World War, along with the many and varied developments of the present era.

At the close of 1995, government records showed 138 broadcasting stations (AM, FM and TV) in Montana, including construction permits at various points.<sup>5</sup> This is in sharp contrast to the days sixty years ago when radio stations existed only in the major cities, each community able to support only a single broadcast outlet. Montana was the last state in the



Union to be authorized an FM station, yet when its first AM (KDYS) began, only 38 others were on the air in the United States.<sup>6</sup>

No one knows when the first radio signals originated in the state. In the years between 1916 and the early 1920s, various radio experimenters or amateurs, both licensed and clandestine, filled the airwaves with an assortment of squeaks, squawks, whistles and whines, and on occasion, some music or speech. It was a wide-open era, and the Federal government had just started controlling communications, but had little, if any authority to enforce regulation of the new medium called radio.

However, radio historians have determined that experimental radio signals were sent from an area near Stevensville as early as 1919. Ashley C. Dixon, a local banker who had moved from Chicago, reportedly set up a radio transmitter at his Ravalli County home near the "Three Mile" Trading Post and was broadcasting local musical talent and talk. This endeavor was short-lived and came to an end when Dixon moved to Spokane. The station, like many others of its time, was never licensed and no records were kept of the broadcasts.<sup>7</sup>

Other unlicensed broadcasters followed in Dixon's footsteps all across Montana.

The history of Montana is vague concerning many of the early-day licensed stations. Then, as now, the Federal government kept no records of deleted facilities, and it fell to the newspapers to document pioneer broadcast endeavors and record them for posterity. Unfortunately, the papers seldom mentioned anything except their own broadcast undertakings.

From the beginning, broadcasting in Montana has been different! The immense distances and small population made both radio and TV a real challenge. In a state with an area of 147,138 square miles and less than one-half million population, radio began in the 1920s on very shaky and unstable ground. Only Alaska offered a greater challenge to broadcasters.

An early-day radio map indicated there were several stations on the air in the years around 1922. The map showed KFBB at Havre, along with KFBB at Butte and KFCH in Billings. KFBB was reportedly licensed to the "Butte School of Telegraphy," but nothing else is known about the school or station.<sup>8</sup> There have been reports of a KFBA operating at Butte in the 1920s, but this was probably a misprint of the KFBB call letters. KGIR was the first permanent radio station in the Mining City.

KFCH, a station promoted by the Billings Gazette, began November 7th, 1922 and lasted at least into the following month when all references to the station disappeared from the newspaper's radio page.<sup>9</sup>

About the same time, the call sign KFED was issued to the Billings Polytechnic Institute (now Rocky Mountain College) for an experimental station.<sup>10</sup> It is doubtful the station ever broadcast more than test programs

in the form of phonograph records for the benefit of students who built radio receivers in a class at the Institute.

Controversy has arisen in recent years concerning the "first" radio station in Montana. Today, KEIN at Great Falls (formerly KFBB) uses the slogan, "Montana's First Radio Station," and letterheads for KFBB carried this motto for many years. Available documentation indicates KFBB/KEIN is the oldest station in the state, but was not the first.

The claim has been made that a station using the call letters KFDO, operating out of Bozeman, was the first in Montana, but little or no real documentation has been offered. The station reportedly received responses "from every state in the Union," and was "operated by Everett Cutting who acted as engineer, business manager, trouble shooter and announcer."<sup>11</sup>

Several old-timers in the Bozeman area recall that in the early '20s, a station was operating out of the living room of a fellow who lived in the Sourdough section of Bozeman. This station reportedly used the call sign KBOZ, but no records have been found to indicate it was ever licensed. There is a possibility the early-day KBOZ was the successor to KFDO.<sup>12</sup>

Nearly every Montana city had some sort of pioneer broadcasting station. Most of them were never licensed and ceased operation after a short time. A clandestine station operated out of the Wilma Building in downtown Missoula, sometime in 1923. The station's demise came during a local political broadcast when the participants became so rowdy and obscene the police confiscated the transmitter, put the station off the air and the operators in the county jail. Radio transmitters were simple to build in those years, and many unlicensed stations operated for a short while in nearly all Montana's major cities and towns.

### +KDYS+

KDYS at Great Falls, was in every sense, Montana's pioneer broadcast station. Under the sponsorship of the Great Falls *Tribune* and its publisher, O. S. Warden, KDYS opened officially at 7:30pm on May 19, 1922, to become the first station in the state to be licensed by the Federal Government. Test broadcasts the previous week resulted in a number of reception reports, including one from as far away as Los Angeles.

The actual dedicatory broadcast on the 19th generated reports from the states of California, Idaho, Utah and Nevada, causing the *Tribune* to boast in the next morning's edition

".....in its initial program, the Tribune's radio station blazed the trail of wireless telephony in the Intermountain states....."



reports came from lonely cabins in the heart of the mountains, where the program was heard plainly."<sup>13</sup>

Following opening remarks by *Tribune* publisher Warden, the station offered a musical program that was interrupted by a voltage drop in the city's power system. There were also problems with some of the hastily constructed receivers around the city.

In spite of the early problems, KDYS went on a regular schedule the following day, Sunday the 20th, that featured a service from First Christian Church in Great Falls in the morning, and a bedtime story program at 7:45 in the evening. Both programs became mainstays in the new station's schedule for its 18 month lifetime.

The daily schedule was always abbreviated by modern standards, but featured many "live" programs that originated in the KDYS studios at the *Tribune* office building, where the customary "flat top" antenna was perched on the building's roof, between two poles. At times, the city's phone system was over loaded by listeners calling in requests to the performers.

KDYS, along with KFBB at Havre, which began in the fall of 1922, broadcast one of the first "remotes" in Montana radio history. Both stations aired the Dempsey-Gibbons boxing match that was staged in Shelby on July 4, 1923. However, this was no co-operative effort. Each station sent staff members to the fight scene, and the individual broadcasts were sent to the respective stations over telephone lines.

While KDYS operated only three or four days a week with accompanying promotion and program schedules in the *Tribune*, the offerings were very consistent until about October 1, 1923. Then, the station, for all practical purposes, ceased broadcasting due to equipment problems, spawned by the lack of components for the transmitter. About this time, the *Tribune* announced the station would be silent about 10 days "for repair." On November 25, a news story clearly indicated the station might return in six months, but cautioned that the resumption of the broadcasts would "depend upon the state of affairs in the radio world."<sup>14</sup>

KDYS never returned to the air, and Great Falls did not see the resumption of local radio until September 1929 when KFBB moved to the city from Havre. However, this short-lived endeavor made the residents of the Electric city aware of radio and paved the way for KFBB and others.

The *Tribune* did not venture into radio again until 1948 when they were part of the endeavor that spawned KMON. Had KDYS prospered and remained on the air, Montana radio history might have been very different. KFBB probably would not have moved to Great Falls, and may have been the station that perished instead of KDYS. As Great Falls' pioneer radio station, KDYS might have ventured into television in the

1950s in place of KFBB. However, speculation profits little. The KDYS call sign was never used by another station in the U-S-A.

Newspaper ownership of radio stations was a pattern that began early in the history of Broadcasting in the United States and has continued into modern times. Some examples are: WGN (*Chicago Tribune*), WQXR (*New York Times*), KSD (*Saint Louis Post-Dispatch*), KRON (*San Francisco Chronicle*), WMT (*Waterloo, Iowa Morning Tribune*) and KOWH (*Omaha World-Herald*). In Montana, it was not a popular combination except for the *Tribune's* early association with KDYS and their later affiliation with KMON, along with the *Miles City Star's* ownership of KRJF (later KATL).

### +KFBB+

In October of 1922, several months after the beginning of KDYS, F. A. Buttrey opened KFBB at Havre on the top floor of his department store. The home manufactured transmitter had a rated power of fifty watts and fed the antenna atop the store.<sup>15</sup> The station's first broadcasts were intermittent, but once things got on a regular schedule, it was credited with having been "constantly in service for more than 2,600 days, a record unequalled by few stations."<sup>16</sup> The first broadcasts were mainly weather and market reports, along with some music, mostly on phonograph records.<sup>17</sup>

Buttrey moved KFBB to Great Falls in 1929. He believed the larger market would offer more opportunity for service and station revenue. Havre did not have local radio service again until 1947 with the advent of KOJM.

In spite of contrary predictions, Buttrey's station prospered in Great Falls, and became an integral part of the community and area. For a time, the relocated station maintained studios at the old Park Hotel in downtown Great Falls, a site that was later used by its first competitor, KXLK. The two steel towers were erected on the hotel roof, with the station's "clothesline" antenna strung between them. In later years, when the studios were moved to the First National Bank building, the transmitter was located west of the city on the Vaughn highway. A residence next door to the transmitter building served as a home for the station engineer.

In 1936, after many years of offering either locally produced or syndicated programs on acetate discs, KFBB became a part of the Columbia Broadcasting System (CBS), and maintained that affiliation until 1961, when the management felt the station was "tied too close" to the network. In the years between, KFBB kept high standards of local programming, and developed its famous "Farmer's Noon Hour," which is discussed in another section of this treatise. For a while, in the years before network affiliation, KFBB produced its own soap-opera. It was entitled "Frank and



## A Chronology Of Montana Broadcasting

- 1919 Charles Ashley Dixon broadcasts music and talk from his home near Stevensville.
- 1922 KDYS, Montana's first licensed station begins broadcasting on May 17 from the offices of the Great Falls Tribune. In October, F.A. Buttrey begins KFBB in his store at Havre. KFCH begins on November 7 under sponsorship of the Billings Gazette. An educational license is issued the same day to KFED at Billings Polytechnic Institute. KFDO operating at Bozeman. KFCH ceased broadcasting on December 10.
- 1923 Montana's first "remote" broadcast, the Dempsey-Gibbons prize fight was broadcast on both KFBB and KDYS from Shelby on the Fourth of July. KDYS ceased broadcasting sometime in the fall. An unlicensed station broadcasting at Missoula with numerous other clandestine operations on the air across the state.
- 1925 KUOM at Missoula begins on February 17 from the University of Montana campus on 1230 kHz with 250 watts.
- 1926 KGCX begins occasional broadcasts on October 5 from the First State Bank at Vida.
- 1927 March 21, KGEZ opens at Kalispell with a basketball broadcast.
- 1928 June 8, Charles Campbell starts KGHM at Billings, using the slogan, "The Northwestern Auto Supply Company Station." The first day of broadcasting features a remote broadcast from the governor's office in Helena. On September 24, KUOM broadcasts a speech by presidential candidate Al Smith.
- 1929 F.A. Buttrey moves KFBB from Havre to Great Falls. January 21 E.B. Craney opens KGIR at Butte. August 21, KGCX moved to Wolf Point and power increased. October 31, KUOM ceases broadcasting and license is allowed to expire. Missoula without radio service.

- 1931 On January 17, KGVO begins broadcasting from studios in the Union Block (later Radio Central Building) in Missoula.
- 1936 KFBB increases power to 5,000 watts and joins the Columbia Broadcasting System. KGVO affiliates with CBS the same day.
- 1937 KPFA begins at Helena on October 1st. KGIR and KPFA form the Z Bar Network. KGIR moves to Nissler Junction and increases power to 5,000 watts. White's Radio Log lists KGIR as being "near" Butte, Montana.
- 1939 October 15, KRBK opens at Bozeman and becomes the third station in the Z Bar Net.
- 1941 KRJF (1340) begins at Miles City on September 4th. World War II puts a freeze on any new stations or expansion.
- 1946 On September 8th, KBYU (1240), Billings' second radio station and Montana's first post-war station begins. KANA (1230), Anaconda November 6th, featuring a part-time hook-up with KGVO. KGCX and KRJF join Mutual (MBS).
- 1947 Montana's post-war radio boom begins as new stations sign-on the air: KPRK (1340), Livingston, January 10th; KBOW (1490), Butte on February 14th; KXLK (1400), Great Falls (fourth station of the Z Net; KXLO (1230), Lewistown on June 24th; KIVI (1230), Shelby on August 4th and KXLL (1450), Missoula (fifth station of the Z Bar); KOJM (730), Havre begins October 31st followed by KAVR (1340) a few weeks later in the same city.
- 1948 Three new stations in Montana: KMON (560), Great Falls starts on May 30th; KOPR (550), Butte, June 9th and KXGN (1400) at Glasgow on September 23rd.
- 1949 KBMN (1230), Bozeman begins September 14th and KFDW (1340), Helena in October.
- 1950 Palatial downtown studios of KGVO burn on February 10th. KLCB (1230), Libby starts December 23rd.
- 1951 Fairmont Corporation, a subsidiary of the Anaconda Company, attempts to purchase KFBB. A flood of protest follows. Fairmont seeks dismissal of the application to purchase. KOOK (970), Billings, begins March 20th with 5,000 watts and brings CBS to Eastern Montana.
- 1953 KXLF-TV (Ch.6), Montana's first TV station begins at Butte on August 14th, followed by KOPR-TV (Ch.4) on August 28th. KOOK-TV (Ch.2) begins in Billings on November 9th.
- 1954 KFBB-TV (Ch.5), Great Falls starts March 21st. KGVO-TV (Ch.13), Missoula opens July first. KLTZ (1240), Glasgow on the air August 14th. KOPR-TV closes September 20th.



# STEER'S HIDE WITH ROOSEVELT BRANDS TELLS TALE OF HIS DAYS ON THE RANGE

3/21/19

When Theodore Roosevelt died, one of the possessions that he valued most highly hung in his trophy room at Sagamore Hill, his home near Oyster Bay. It was a certificate of ownership of his old Montana cattle brands, which were borne by many a steer on the eastern Montana cattle ranges in the 80's when Teddy was a stock grower and a member of the Montana Livestock Association. Below the certificate was stretched on the wall a fine steer's hide bearing the two Roosevelt brands—an elk horn on the right ribs and a triangle on the left.

The story of these relics of Roosevelt's old range days is an interesting one to every Montanan, for it had to do with a little act of kindness and thoughtfulness that touched the Colonel deeply and more than ever cemented the bond of affection that bound him to this state, where some of the finest days of his life were spent.

It will be remembered that some years ago the Montana legislature passed a bill that obliged all owners of stock brands in the state to re-record them. This was done to clear the records of old or unused brands, the accumulation of which had made such action necessary.

Frank B. Linderman, now of Somers in Flathead county, was at the time living in Helena, and one day while he was out at the capitol, D. W. Raymond, the wide-awake secretary of the Montana Livestock Association, happened to mention to Linderman that Colonel Roosevelt's Montana brands would pass into the hands of strangers unless he re-recorded them as required by law.

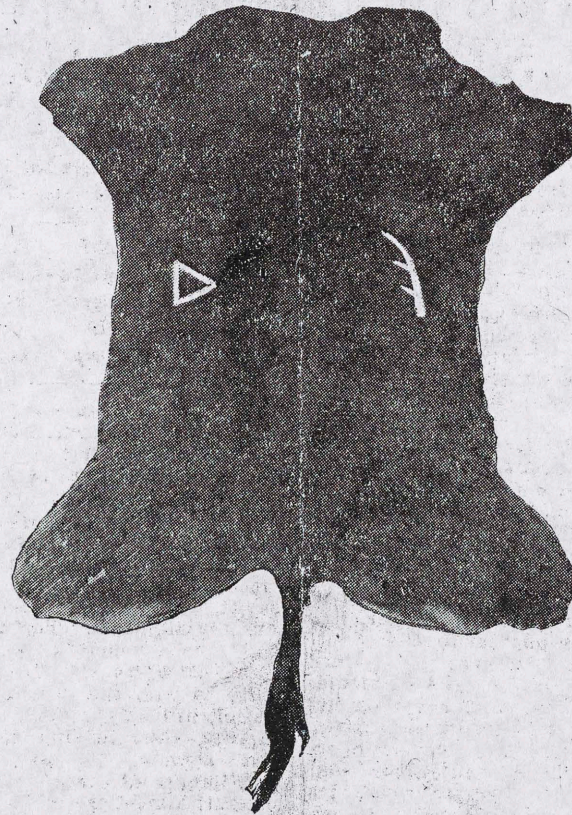
"Leave that to me," said Linderman. "Teddy was a charter member of the Montana Livestock Association and he wouldn't want to lose his old brands."

Linderman, therefore, proceeded to pay the small fee necessary and thus saved the ownership of the

brands in the name of the man who loved Montana first among all states in the union and said so. But he did not stop there. In order to express appreciation for Roosevelt's Americanism and his old association with Montana, Linderman bought a splendid beef hide from a furrier. It was a beauty and had never been branded. It had been tanned "with the hair on," and the furrier was instructed to cut the critter's tail from

the hide and substitute a buffalo tail in its place.

Going to Gilman Bullard of Helena, Linderman secured his services in burning the Colonel's brands on the "hair side." Then with a hot point, Bullard burned a loop of a rawhide rope around the hide on the "flesh side" as a border, running the design of the rope through a "hondo" and off the hide after making a circle around the border. At the top



Cattle Brands of Theodore Roosevelt

of the robe was a brand, "U. S. A.," with the "S" lazy. Inside the border were these verses by Linderman:

You bet we know ye, Teddy,  
Like the tinhorn knows his pack;  
Ye're marked an' easy readin',  
An' we know ye by the back,

We know ye like the puncher  
Knows the iron he's ridin' fer;  
Like the Injins know the sign-talk  
An' the trader knows the fur.

We know ye like the blue-coat  
Knowed the Springfield, forty-five,  
Like the pack-mules knowed their  
bell-mare,  
An' we'll stick while ye're alive.

A gun that snaps is p'ison,  
Like a friend ye call in vain:  
We're bankin' on ye, Teddy,  
Fer a trail that's straight an'  
plain.

In driftin' on the ranges  
With Princes ridin' herd,  
Ye wore yer brand a-gleamin'  
An' they didn't git it blurred.

Ye smoked yer pipe in line-camps  
Of outfits on yer way,  
An' shorely rode the circle  
Fer the U. S. A.

Following the above was an arrow pointing to the buffalo's tail that had been sewn to the robe, with this explanation:

## THE TALE

I know ye're as wise as an Injin  
In the ways of the camps an' the  
trail,

But here on this hide is the tale of  
the range:

It begins and it ends in the tail.

"I sent the robe to Colonel Roosevelt as a certificate of ownership of the old brands and received a splendid and characteristic acknowledgment from him," said Linderman. "He said it was 'perfectly bully.'"



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Theodore Roosevelt in 1883

ROOSEVELT AND THE STOCKMEN'S ASSOCIATION\*

By RAY H. MATTISON

INTRODUCTORY NOTE

This report is one of the research studies made by the writer for Theodore Roosevelt National Memorial Park. It was written in answer to the question, "What were Theodore Roosevelt's relations with the stockmen's associations in western Dakota and Montana during the years he spent in the Little Missouri region?" Some of the material in this report appeared recently in "Lessons in Democracy in the Badlands of North Dakota," *The North Dakota Teacher*, April-May, 1949 by the late Regional Historian Olaf T. Hagen, National Park Service.

In preparing this monograph, the writer wishes to express his deep gratitude to Mr. Russell Reid, Superintendent, State Historical Society of North Dakota, and the members of his staff for their generous assistance; also to Mrs. Lucinda B. Scott, Librarian, and Mrs. Anne McDonnell, Assistant Librarian, of the Historical Society of Montana: Mr. Wallis Huidekoper, past president, and Mr. E. A. Phillips, Secretary, Montana Stockgrowers Association, both of whom are very much interested in the history of the organization, have also been most cooperative in helping the writer obtain information.

No other person associated with the Badlands of the Little Missouri River has received more attention from biographers than the late president, Theodore Roosevelt. Much has been written about the brief periods he spent in that region as a rancher. His skills as a cowboy, hunter, naturalist and general outdoor man have been subjects for much speculation. He has, in short, become very much of a legendary character. In spite of the fact that several books have been written about Roosevelt in the Badlands, his many activities there remain somewhat obscure. In the words of one writer, Roosevelt's years as a rancher have given the Little Missouri region "a fame inversely proportionate to their importance in the history of the cattle frontier."<sup>1</sup>

\*This paper by Ray H. Mattison, Historian of the Theodore Roosevelt National Memorial Park, is published through the courtesy of the National Park Service.

<sup>1</sup>The most comprehensive account of Roosevelt's Dakota years is Hermann Hagedorn's *Roosevelt in the Bad Lands*, (Boston, 1921). Other worthwhile books on the subject are Lincoln A. Lang's *Ranching With Roosevelt* (Philadelphia, 1926) and William Wingate Sewall's *Bill Sewall's Story of T. R.*, (New York, 1919). See also Bruce Nelson's *Land of the Dakotas* (Minneapolis, 1946); Lewis Pelzer, *The Cattleman's Frontier* (Glendale, 1936); A. T. Volwiler, "Roosevelt's Ranch Life in North Dakota," *Quarterly Journal of the University of North Dakota*, Vol. IX, No. 1; Olaf T. Hagen, "Lessons in Democracy in the Badlands of North Dakota," *The North Dakota Teacher*, April-May, 1949.