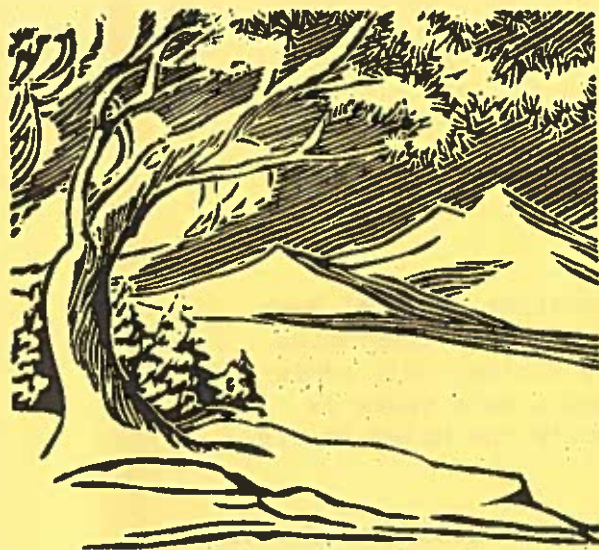




THE YELLOWSTONE INTERPRETER

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The purpose of this publication is to provide scientific and historical data for the use of Park personnel engaged in interpretive activities.

Issues will appear bi-monthly and employees are urged to contribute articles and items of lasting interest. The Park Historian will serve as editor. Contributions or inquiries concerning published material should be addressed to him.

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A BIOGRAPHICAL SKETCH

PATRICK HENRY CONGER

The third Superintendent of Yellowstone National Park was Major Patrick Henry Conger, whose personal attributes were not equal to the demands of the position. His administration of a little less than two and a half years is memorable chiefly for its weakness, while the Major is virtually unknown.

Conger was born at Hinesburg, Vermont, December 22, 1819. At the age of 22, he migrated westward to Galena, Illinois, but, after only a short time there, he moved on across the Mississippi River into Jackson County, Iowa, where he farmed for a time. He later engaged in business in Dubuque and was there when the Civil War started.

Conger's first attempt to enlist was balked by a lung weakness, but he did obtain a position as a Deputy United States Marshal. In that capacity, he worked with the Army Provost Marshal's Office in the enlistment of troops for the war. Later, he was accepted for a six-month enlistment with Company A, 44th Regiment, Iowa Volunteer Infantry.

After the Civil War, Conger settled permanently at Waterloo, Iowa, in 1869. He supported his large family--three children by his first wife, Sarah Brasher, who died in 1854; and five by his second wife, Julia Bruigher--by holding a succession of patronage positions. He was the agent for the Yankton (Sioux) Indian Reservation for four years, there gaining the military rank of "major"; and he was connected with various government surveys in the West.

From March 1, 1882, until September 9, 1884, he was Superintendent of Yellowstone National Park, of which service, Historian Chittenden has the following to say:

"Of this Superintendent, it need only be said that his administration was throughout characterized by weakness and inefficiency which brought the Park to the lowest ebb of its fortunes, and drew forth the severe condemnation of visitors and public officials alike. This administration is an important one, however, for it marks the period of change in public sentiment already referred to, and the commencement of reform in the government of the reservation."
[Yellowstone National Park (1895), pp. 131-132].

A statement of George L. Henderson, one of the ten assistant superintendents, or "rabbit-catchers" who served under Major Conger, is particularly revealing with regard to the basis of his troubles. Henderson says: "I recollect that Supt. Conger was bitter against his predecessor Norris and all who spoke of him with respect. His ill will was manifestly shown to all employees who had been under Norris." In that way Conger alienated those who could have helped him, and he was left to mire himself in ever-greater difficulties.

After his replacement as Superintendent of Yellowstone National Park, Conger returned to his home in Waterloo, Iowa. There, according to his biographer, "he lived in comfortable and honorable retirement" until his death on June 29, 1903, in his 84th year.

ALH

* * * * *

In his History of Civilization, H. G. Wells has defined the essential position of the scientist in a brief statement which comprehends perfectly the spirit that must motivate all searchers for truth. He says:

"For the true scientific method is this: to trust no statements without verification, to test all things as rigorously as possible, to keep no secrets, to attempt no monopolies, to give out one's best modestly and plainly, serving no other end but knowledge."

III:860

* * *

Science, as we know it, is really very young. While it has roots which run back into classical times, it was not until men banded together in the pursuit of knowledge that we were in a fair way to make the astounding material progress which is the hallmark of our age. The first such group of "scientists", was the Royal Society of London, chartered by King Charles II of England in the year 1662--a brief 302 years ago. If we may be so presumptuous as to mark the beginning of our time, it would seem but right to coincide it with the founding of that organization which has served as prototype for all our proud scientific societies.

ALH

* * * * *

THERMAL FEATURES OF THE NORRIS GEYSER BASIN

June 8 - September 1, 1964

by

William J. Lewis*

Change has always characterized the thermal features located in the Norris Geyser Basin and 1964 was no exception. Steamboat Geyser Broke several records with its increased activity, Sunday Geyser was "born" on July 12 and a check of comparable features showed an increase in temperature of 5.6° over measurements taken by Mebane in 1959, just to mention a few. (All temperatures in Fahrenheit)

Temperatures taken of 65 thermal features in August showed some interesting comparisons with previous records. Perhaps the most significant finding was that Norris is apparently hotter now (189.4°) than at any time in its recorded past. (See attached chart for details.) The highest temperature recorded was at Harding Geyser--215°. The thermometer was dropped nearly 15 feet into this visually unimpressive feature in an attempt to find water, but none was located.

Lack of abundant ground water may tend to account for greatly increased temperatures in the following features: Black Hermit's Cauldron, Cradle Mud Spring and Dr. Allen's Paint Pots.

A significant increase in thermal energy is certainly apparent at the eastern end of the Porcelain Basin. Witness the increased temperatures in Colloidal Pool, Congress Pool, Feisty Geyser, Iris, Onyx, the "birth" of Sunday Geyser and the thermal destruction of the lodgepoles along the Howard Eaton Trail east of Vermillion Springs.

Increase in temperatures at Steamboat Geyser and Cistern Pool may be related to Steamboat's rejuvenation. Increase in temperature of Monarch Geyser raises the possibility of a rejuvenation of that long dormant giant, while increased heat

* Seasonal Ranger-Naturalist stationed at Norris Geyser Basin. Bill has served ten seasons with Yellowstone's Interpretive Division.

in two of its neighbors, Fearless and Spiny Pebble may also be significant. A careful watch of these features should be kept.

It is a well known fact that Pinwheel Geyser is seasonal because overflow water from other features keeps it too cool to erupt except in mid-summer. This fact is well-illustrated by Mebane's 100° taken in December, 1959, compared with 184° measured in August, 1964.

A decrease in temperature was noted in the Gray Lakes area with the lakes and Little Alcove showing significant declines. Dark Cavern and Little Whirligig were nearly continuous in their eruptive patterns despite drops in temperature. Cinder was surprisingly declined steadily in temperature since Watson's measurements in 1952-54, although no apparent change in its floating cinders has been noted. Hurricane Vent has declined to the point where a family of chipmunks has used one of its vents for a home this summer. Drops of several degrees were also noted in Corporal Geyser, Palpitator Spring, and Primrose Spring.

While essential facts regarding temperature, height, duration and interval are included in an attached chart, the following additional facts may be of interest:

Arsenic Geyser - Active several times daily all summer, it is apparently connected to the Fireball Geyser. They would often start erupting simultaneously.

Blue Geyser - Active several times a week all summer, its overflow would prevent Pinwheel Geyser from erupting. Its massive bursts continue to erode the crater and pile up a rim of broken sinter. Many steaming cracks are apparent in the bowl of the geyser.

Cinder Pool - Sometimes overflowing, sometimes ebbing, the amount of its cinders varies considerably--from 3/4 of the pool covered to less than 1/3.

Cistern Pool - It has often been the catch-basin for debris washed down the hill above it by water from a major eruption of Steamboat Geyser. The pine needles, twigs and other vegetation make a smelly brew after being cooked at 200°. On at least two occasions this summer, enough water has flowed into Cistern from Steamboat to completely stop the boiling action.

Colloidal Pool - While this pool was delightfully blue early in the summer it became so agitated, beginning July 15, that it turned grey (apparently from the clay stirred up from its

crater). It continued boiling heavily the rest of the summer--sometimes as high as 5-10 feet.

Congress Pool - Like Colloidal, Congress turned from a blue to grey color, probably because of increased agitation. This began August 14, and remained grey when August ended.

Constant Geyser - About half of the eruptions were followed by a second burst 1 or 2 minutes later. On August 27, it had 3 bursts in succession.

Crown Jewel Springs - Erupting daily, they are geysers, not springs.

Dark Cavern Geyser - This is certainly one of the most interesting geysers in the Park. It begins with a steam phase which continues out of one vent until water from the other vent chokes it off. Then it spews water as does its sister vent. It is noisy, frequent and wildly active.

Double Bulger - One vent was dry all summer, apparently the object of vandalism, while the other sprayed muddy water around its orifice.

Ebony Geyser - Full details on this geyser may be found in a report made by Britt Lewis to Bryan Harry. Among other things, the report shows that Ebony is connected to a new feature nearby, which is unnamed. The name Bear Den Geyser has been suggested and seems appropriate.

Echinus Geyser - The daily average intervals varied between a high of 1 hour and 35 minutes and a low of 1 hour and 1 minute. The geyser was carefully studied to see if it had a sympathetic relationship with nearby Steamboat.

Feisty - An unusual blue mineral deposit is being made in this area which looks like azurite or copper sulphate. A sample has been sent off for analysis.

Flotsam and Jetsam - These names are suggested for the two pools between the walk and Ledge Geyser--Flotsam being closer to the walk. It seems there is a good possibility of interconnection between them and Ledge. Since it is easier to relate observations to named features, it is suggested these names be used for at least research purposes.

Ledge Geyser - Active every 1 to 5 days in June, it had only 1 eruption in July and another in August. The inactivity from July 1 to August 18 resulted in abundant growth of algae in the runoff channel.

Little Whirligig Geyser - Active all summer, it drained briefly on at least two occasions. On August 21, it was dry for about 20 minutes, and on August 24 for 5 minutes.

Sunday Geyser - Called Milky Geyser at first, because of its milky water, it was "born" July 12. Since this was a Sunday, and since its water may clear (making the name Milky inappropriate), and since it promises to be a geyser of considerable interest, the name Sunday Geyser is suggested. It is located across the walk from Hurricane Vent in an alcove west of Colloidal Pool. When it first began, its water was muddy and full of rocks and was shooting 15-20 feet. The water cleared to a milky color and the eruption was continuous for several days 3-4 feet high. Then it became intermittent at 3-4 feet until August 21, when it began erupting 25-30 feet every 12-15 minutes. A vent across the walk by Hurricane Vent is associated with Sunday. At the conclusion of an eruption, this vent roars for about 3 minutes.

Root Spring - As one leaves Echinus Geyser proceeding to the Green Dragon Spring, the second pool on the left of the trail is muddy and has fluctuated widely in its level during the summer. Since it is straight down the hill from Steamboat and might be connected, it is suggested that the name Root be used to designate this pool so it can be easily referred to for research purposes. It has a root system in the bank nearest Steamboat that is quite prominent.

Splutter Pot Geyser - Seen 3 times on August 6, this was the extent of its activity during the summer.

Steamboat Geyser - More active and more regular than ever before in its history, Steamboat had 12 eruptions during the months of June, July and August. They varied between 5-9 days with three 9-day intervals in a row in August. The water phase of the North Vent varied from 3 to 30 minutes, while the water phase in the south Vent varied from 1 to 2 hours. As usual, the steam phase continued for many hours. Many attempts were made to find means of predicting the geyser more accurately. At first, gas vents above the geyser seemed promising, but failed to be consistent. Attempts to relate short intervals of Echinus were inconclusive and more data needs to be gathered in this area. It is possible that height of water in the North Vent might be an indicator. It appears that the higher the water is in the North Vent, the more likely an eruption is.

Valentine Geyser - It averaged a daily eruption all summer. Most of them were at night. The eruptions, both water and steam phases, were very weak and lackadaisical.

Veteran Geyser - Inactive all summer until August 28, it had an unseen eruption that emptied the pool next to the active vent. On August 27, it erupted again.

Vixen Geyser - A real crowd-pleaser early in the season, a damper was put on its activity in July when vandals choked its throat with a log that was still clogging it at the end of August.

ACKNOWLEDGMENTS

Many of the observations included in this report were made by my colleagues at the Norris Geyser Basin, George Algard and Frank Mitchell. Riley McClelland supplied much helpful data. Frank Rentchler gave the benefit of his many seasons of observation at Norris. Don Follows' observations at Norris in May and early June were very helpful.



TABLE I

GEYSERS AT NORRIS GEYSER BASIN (1964)

NAME	HEIGHT	DURATION	INTERVAL
Arsenic	6-10'	Variable	Several daily
Big Alcove	5-10'	Almost steady	(Dormant)
Blue	15-26'	Several hours	Several per week
Constant	30-40'	5 seconds	10 minutes
Corporal	Boils up	5 minutes	Several daily
Dark Cavern	20'	7 minutes	10 minutes
Ebony	50-75'	4 minutes	20 hours
Echinus	50-75'	4 minutes	75 minutes
Fearless	Boils	Constant	None
Feisty	4-15'	Almost steady	Few seconds
Fireball	5-10'	Variable	Several daily
Harding	2-3'	2-3 minutes	(Dormant)
Ledge	125'	Several hours	Infrequent
Little Whirligig	10-20'	Almost steady	Few seconds
Minute	3-4'	8 minutes	15 minutes
Monarch	100-200'	6-20 minutes	(Dormant)
Pearl	2'	Variable	Several daily
Pebble	50'	Few minutes	(Long dormant)
Perpetual Spouter	1'	Steady	None
Pinwheel	15-20'	1 minute	Irregular*
Spiny Pebble	1'	5 minutes	(Dormant)
Spring			Filled with sand
Splutter Pot	10'	2 minutes	Seldom
Steamboat			
Minor Eruption	20-60'	1-3 minutes	Few seconds to several minutes
Major Eruption	300-400'	Several hours	5-9 days (June-September, 1964)
Sunday**	20-30'	2-3 minutes	12-15 minutes
Valentine	50-75'	1-2 hours	Daily
Veteran	1'	Variable	Seldom
Vixen	15-30'	Almost steady	Erupts about 90% of the time
Whirligig	5-10'	1-4 minutes	(Dormant)

* If Pinwheel Geyser has one eruption, it is often followed by by several more at intervals of 30-60 minutes.

** Commenced activity July 12, 1964 (on a Sunday). It is located across the walk from Hurricane Vent in the alcove west of Colloidal Pool.

TABLE II

TEMPERATURE CHANGES AT NORRIS GEYSER BASIN

NAME	FAHRENHEIT TEMPERATURES		
	1952-54	1959	1964
Arch Steam Vent	192-198	---	200
Arsenic Geyser	203	not found	201
Bathrub	194	198	200
Big Alcove Geyser	199	199	200
Black Growler	203	200	201
Black Hermit Cauldron	194	196	203
Black Pit Spring	190	---	190
Blue Geyser	200	200	200
Cinder Pool	196	192	188
Cistern Spring	191	190	200
Colloidal Pool	164	150	198
Congress Pool	143	167	198
Constant Geyser	167	161	170
Coral Spring	125	126	Dry
Corporal	199	199	182
Cradle Mud Spring	---	189	202
Crown Jewel Springs	---	---	198
Dark Cavern Geyser	198	197	188
Double Bulger	190	196	198
Dr. Allen's Paintpots	---	184	198
Ebony Geyser	---	202	202
Echinus Geyser	189	178	187
Emerald Spring	194	188	189
Fearless Geyser	190	184	200
Feisty Geyser	---	184	198
Fireball Geyser	201	200	200
Firecracker Spring	---	---	200
Flotsam	---	---	184
Gray Lakes	196	193	160
Green Dragon Spring	189	185	182
Growler Spring	196	201	201
Harding Geyser	198	---	215
Horseshoe Spring	192	---	191
Hurricane Vent	201	180	169
Hydrophane Spring	188	158	166
Iris Spring	167	172	201
Jetsam Pool	---	---	192
Ledge Geyser	204	201	200
Little Alcove Spring	201	100	112
Little Whirligig Geyser	181	185	174
Locomotive Spring	199	196	not found
Medusa Spring	172	197	198
Milky Geyser (Sunday Geyser)	---	---	198
Minute Geyser	199	197	198
Monarch Geyser	190	182	199

NAME	TEMPERATURES		
	1952-54	1959	1964
Onyx Spring	162	166	198
Opal Spring	197	---	188
Orpiment Spring	156	---	not found
Palpitator Spring	178	188	166
Pebble Geyser Cone	198	---	199
Pearl Geyser	180	172	179
Perpetual Spouter	192	200	194
Phillips Cauldron	198	170	195
Pinwheel Geyser	---	100	184
Primrose Spring	199	200	154
Realgor Spring	---	---	117
Receptacle Spring	---	---	200
Recess Spring	183	178	181
Rock Spring	199	---	not found
Root Spring	---	---	146
Reservoir	88	---	82
Sieve Lake	68	---	Dry
Spiny Pebble Spring	127	100	198
Splutter Pot	---	203	200
Steamboat Geyser	---	194	201
Steamvalve Spring	---	---	---
Valentine Geyser	---	200	199
Verma Spring	210	---	not found
Vermillion Spring	---	---	198
Veteran Geyser	196	199	200
Vixen Geyser	199	199	194
Whirligig Geyser	181	150	170
Yellow Crown Crater	Barely Warm	---	not found
Yellow Funnel Spring	160	147	176

The average temperature of 43 features in 1952-54 was
185.5°F. (Watson)

The average temperature of the same 43 features in 1959
was 180.5°F. (Mebane)

The average temperature of 41 of the 43 features (one was
dry and the other was not found) in 1964 was 186°F. (Lewis)

The average temperature of 60 features in 1927 was 185°F.
(Allen & Day)

The average temperature of 64 features* in 1964 was 189.4°F.
(Lewis)

* Reservoir was not included as it is not really a hot
spring or geyser.

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