

# Snow? Who Knows.

*When a Pacific low battles an Arctic front, the result—snow—is hard to predict.*

*Researchers are starting to understand the factors that conspire to produce historic snow events in the western lowlands. In the following pages, Paul Dorpat chronicles some of the all-time “big snows.”*

*Fountain on the grand front  
lawn of Seattle pioneer  
Charles Kinnear’s Queen  
Anne Hill mansion, 1926.*

**T**he challenge of forecasting snow in the Pacific Northwest differs greatly depending on where you are, says Cliff Mass, atmospheric sciences professor at the University of Washington.

In the western lowlands of the Pacific Northwest, we get a lot of weather that’s warm and wet.

Occasionally, says Mass, we have cold and dry.

But what’s difficult to have at the same time is cold and wet: the recipe for snow.

Snow is rare in the coastal areas because the prevailing winds bring relatively warm air from the Pacific Ocean over the region. The air off the Pacific typically is about 45° to 50° F, explains Mass—relatively warm compared to the much colder temperatures of the interior air masses, which can filter through passages like the Fraser Valley in British Columbia and the Columbia Gorge between Washington and Oregon.

Mass has worked over the past two decades to better understand the factors that lead to snow events in the western lowlands. He categorizes them into three basic scenarios.



Looking east on W. Galer Street in Seattle, Ambrose Kiehl recorded this view of the 1916 “Big Snow” and his home, far right, at the corner of Galer and 5th Ave. West. Photo: Courtesy of Frederick Mann

The “classic snow event” occurs when a cold, high pressure air mass is parked over the Northwest interior, and a low pressure system approaches the coast at about the latitude of the Columbia river.

by Deborah Illman

# Our Mediterranean of the Pacific

by Paul Dorpat

**"CHAPTER 1 — BELIEVE IT OR NOT!... Seattle has been visited by a gale so strong that it blew seven railway cars off a trestle in to the bay, has had a snowfall six and a third feet deep, has seen a winter temperature of four degrees below zero and a summer heat of 114 degrees in the shade."**

Believe it? Most likely, the school children who read of these sensations on the first page of the 1936 Seattle School District #1 little book on Seattle history did believe it.

The author, local theatre critic J. Willis Sayre, managed to accumulate between its orange covers a delightful horde of community trivia. Some came from the usual sources, but much of it was strange and not attributed—like "114 degrees in the shade."

In chapter 13 of *This City of Ours*, Sayre reveals that the record heat was reached in June 1866, a quarter century before any official meteorological records were kept in Seattle. Almost certainly this statistic is shadier than the shade within which it was recorded.

The coldest day, however, probably dropped on Seattle during what pioneers unanimously called the "big winter" of 1861-62. Arthur A.

Denny, "the Father of Seattle," recorded a low that was two degrees warmer than Sayre's.

But that is quibbling. They agree upon the year. In his "Pioneer Days on Puget Sound," Denny writes that he "carefully observed my thermometer and the lowest

point reached by my observation was two degrees below zero." Feed was exhausted, and statewide there was "a great and general destruction of live stock."

The "Big Snow" of January 1880 was also well described by locals, and there are at least six surviving photographs. The pio-



The nearly-new Occidental Hotel, center, fills the flatiron block between Mill (Yesler Way) and James Streets in Seattle during the 1884 snow. Photo: Courtesy of Seattle Public Library

neer accounts corroborate Sayre's claim that the five-day snowfall drifted in places to over six feet. That makes the 1880 "Big Snow" still Seattle's really biggest snow 121 years later.

It is certainly easy to imagine the first settlers joyfully measuring their drifts and accumulations. Without a Weather Service—

it was first established here in 1893—keeping a weather diary was almost commonplace.

It also made survival sense in what was then still a remote community on the wild edge of who knew what. Later, when the patterns of Puget Sound weather became familiar and recognized as exceedingly temperate, these dairies were continued as one of the delights of leisure. With hardly any media to distract them, diletante meteorologists might twice daily record in their journals with terse and/or picturesque prose what is still our mainstay of small talk: the weather. Like joining the toast at a neighbor's wedding with a single small glass of sweet wine, a snowfall of six or eight inches will not upset sobriety nor make one slip or swoon.

By contrast, the attraction of Sayre's shady statistics is how they fulfill a yearning for the curious on the shores of what early Puget Sound boomers described as "The Mediterranean of the Pacific." Rarely does anything happen here in a big way except temperance.

True to his sensations, Sayre included in his orange book of trivia even a few extremes of our Edenic salubrity. For instance, did you know that "in January 1870 strawberries and green peas were

ripening in the open air on Thanksgiving Day"?

A revealing (I might have written "wonderful," but can there be anything wonderful about moderation?) testament of our mildness was published in 1949 by meteorologist Lawrence C. Fisher. The 38-year

Cold air is drawn through the Fraser Valley, while moist ocean air moves up and over the cold air, dropping its precipitation as snow.

The second recipe for snow derives from a phenomenon called the Puget Sound convergence zone, in which a northwesterly flow of air off the ocean splits, moving around the Olympic mountain range in opposite directions. The two flows collide roughly in the area of central Puget Sound, often between Everett and Seattle; the air is forced up and drops its moisture under unstable

weather conditions that can produce thunderstorms. In the snow scenario, cold air moves in aloft over the region, and then a cold, unstable northwesterly flow sets up the convergence zone effect. The resulting precipitation then takes the form of flakes.

It was this second scenario that caused the infamous thundersnow of December 1990 that caught forecasters and city officials off-guard.

"I got it wrong too," admits Mass, grinning. "This one really tricked us." The sud-

den snowstorm dumped over a foot of snow in some locations, paralyzing traffic, dropped the temperatures into the teens within a matter of hours, and whipped up a bitterly fierce north wind.

The third category includes the events that start out as snow and quickly turn over to substantial rain. This scenario is similar to the first case, except that a much larger low pressure moves in and pushes out the colder air, replacing it with rain.

It is the nature and location of this

veteran of the Weather Service served up a warm cocoa of statistics for his *Seattle Times* readers: "Based on 56 winters of official records (our) annual winter snowfall is but 11.2 inches. This is less snow than for any place eastward across the continent of the same parallel of latitude... Six winters in the 56 recorded have had no measurable snowfall, only traces... In the 26 winters since the 16-inch fall of Feb. 14, 1923 the average winter snow has been only 6.9 inches."

Had we wished to join sentiment to his statistics, the weather man might have also listed the seven years Seattle had a white Christmas in the 38 years he worked for the Weather Service: 1909, 1911, 1915, 1916, 1933, 1937, and 1946.

By one newspaper account, the big snow of 1893 began on January 27th and kept up almost steadily dropping 45 inches before it stopped on the 8th of February. On the 3rd of February, a reading of 5 degrees below zero was claimed at Woodland Park on Phinney Ridge in Seattle—that's a degree colder even than Sayre's record!—while nearby on Green Lake the ice was six inches thick.

In his book *Seattle*, long-time *Post-Intelligencer* contributor Nard Jones notes of the 1893 snow and cold that "it frightened a good many Seattleites nearly to death; they thought the end of the world was on its way and not in accordance with the Bible." The following fall the world seemed to end again for the religious and secular alike with the great economic panic of 1893. Those "last days" held until 1897.

Although born 22 years after the big snow of 1916, I admit to feeling covered by it. There may have been more cameras in

the hands of amateurs than shovels in 1916. The flurry of snapshots of this big snow is astounding. I have exploited them perhaps too often for winter features illustrating how our second greatest snow stopped streetcars, closed schools, libraries, theaters and bridges, clogged

the waterfront, collapsed roofs, and—most sensationally—also the great dome of St. James Cathedral. The peculiarly cold January already had 23 inches of snow when on the last day of the month it began to fall relentlessly.

Between 5pm on the first of February and 5pm on the second, 21.5 inches accumulated in the Central Business District at the Weather Bureau in the Hoge Building. This is still a record: our largest 24-hour pile.

At its end, the 1916 snow was a wet snow. Like the storm of late December 1996, the 1916 big snow came to a foul end. Both were succeeded by a mayhem of mud that broke bridges and carried away homes.

If we rate a snowstorm not merely by its depth but also by how it is driven, then we can introduce the blizzard of 1950. It was a concluding irony to meteorologist Fisher's 1949 sermon on moderation. With a mean temperature of 28.7 degrees, January 1950 was colder even than that of 1916. The bliz-



1930 is a likely date for this Green Lake Freeze in north Seattle. The Recreation Center, far right, was constructed in 1929, and the 1930 freeze was one of the very few "modern freezes" when the ice reached the six-inch thickness required for skating. Photo: Courtesy of Lawton Gowey

zard blasted in from the ocean on Friday the Thirteenth. It continued through the night and into Saturday while the temperature dropped to 11 degrees. High winds lifted the waters of Elliott Bay onto the Seattle waterfront and the frozen salt water instantly stuck to anything it could reach. On the first day of February, a *Seattle Times* reporter noted, "Last month apparently was designed to make the old settlers forget all about the 'big winters' of 1916 and 1893." Supervising district forecaster Tom Jermin consoled, "We should remember that this is only the third extremely cold winter in 60 years."

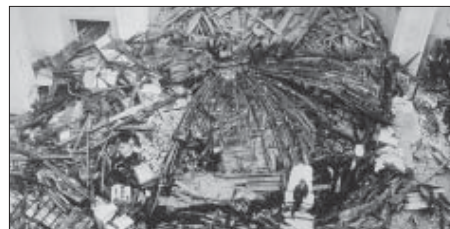
This nearly completes the list of the untoward big snows that have been dumped here since the Denny Party first spilled itself on Alki Beach in the fall of 1851.

To the 19th-century winters of 1861-62, 1880, and 1893 we have added the 20th century "Big Snows" of 1916 and 1950. Somewhat timidly, we may wish to add to

battle between the low pressure air mass and the Arctic front that determines the nature of snow events in Western Washington and Oregon.

Snowstorms in the region remain hard to predict, despite advances over the years in weather forecasting technology.

There are several critical factors to take into account: where the rain-snow line is, how cold the atmosphere generally is, the influx of cold air, either through the Fraser Valley or Columbia Gorge, and



The grandest casualty to the Big Snow of February 1916 was the Dome of the Saint James Cathedral in Seattle. The heavy wet snow detected a flaw in the iron work of the cupola and sent it crashing. This view looks into the chancel through the hole in the roof. Photo: UW Libraries, Northwest Collection

where the low is located and how warm and how much moisture it contains.

Compounding these factors are terrain and rain shadow effects. And, Mass adds, the lack of meteorological data from the vast ocean area to the west doesn't help.

But perhaps it is the unpredictability of snow in the western lowlands that makes residents—children and grownups alike—appreciate this wonder of nature when conditions favor us with a blanket of white. ■