

## A HISTORICAL REVIEW ON THE ORIGIN AND DEFINITION OF THE WORD BLIZZARD

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Abstract: This paper highlights the different definitions and origins that the word 'blizzard' has taken over time.

### ORIGIN OF THE WORD 'BLIZZARD'

The etymology of the word is still speculative (Talman 1914, 1920; Gove 1961). A number of sources suggest that the word is a noun (Funk 1956), an adjective (Barnhart and Barnhart 1984; Simpson and Weiner 1989); and an onomatopoeic, like suggestive words such as blow, blast, blister and bluster (Schwarz 1989; Simpson and Weiner 1989). One source suggests that the French word *blessure* 'to wound' has been conjectured, but there is nothing to indicate a French origin (Murray *et al.* 1961; Simpson and Weiner 1989). It was once believed that the Blizzard family of Buckinghamshire, England had migrated to the western United States and gave their name to northern storms (Lockhart 1988). Others believed that it came from the English word 'blizzer' once used to describe a knock-down fight with a 'blizzard of blows' (Lockhart 1988), a shot (Gove 1961; Burchfield 1972), a blaze (flash/flame) (Klein 1971) (Hank 1976) (Partridge 1990) or choking (Barnhart and Barnhart 1984). It has also been connected to the French word 'blizz' meaning violent rainstorm (Klein 1971; Barnhart and Barnhart 1984; Partridge 1990). The origin of the word 'ard' has also been connected describing an intensive force 'meaning hard' (Klein 1971; Sudsex 1994).

According to Greely (1888), Henry Ellis was the first person to mention the word blizzard on his voyage to Hudson Bay in the ship *California* in the year 1746. He speaks of the north-west wind as being exceeding 'trying' not only on account of intense cold, but owing to the air being filled with fine hard particles of snow, which made it almost unbearable. According to Talman (1914), Greely's account of Henry Ellis is ambiguous. Talman suggests that Greely did not intend to give the impression that the word 'blizzard' was used by Ellis, but merely to state that Ellis described the storm without calling it actually a blizzard.

In 1829 a Virginia Literature Museum described a blizzard as a violent blow (Onions *et al.* 1966; Burchfield 1972) (Simpson and Weiner 1989; Sudsex 1994), while in 1834 Davy Crockett wrote about taking a blizzard at some deer (Murray *et al.* 1961; Tufty 1987). He also quoted, 'a gentlemen at a diner asked him for a toast, and supposing he meant to have some fun at my expense, he concluded to go ahead, and give him and his likes a blizzard' (Simpson and Weiner 1989). By 1846 a blizzard meant a cannon shot, and in the Civil War it meant a volley of musketry (Tufty 1987; Wild 1995; Wild 1996a; Gribben and Gribben 1996). In 1856 in Sacramento City it was quoted as 'when some true archer, from the upper tier, gave him a 'blizzard' on the nearest ear'. In 1859 L. B. Wolf wrote in his diary on 1 December that a blizzard had come upon us about midnight.....shot seven horses that were so chilled they could not get up (Simpson and Weiner 1989). Schele de Vere (1872) quoted in Burchfield (1972) 'Blizzard.....means in the west a stunning blow or an overwhelming argument'.

The strongest source of origin was indicated to come from the early settlers of the mid west of the United States especially the states of Iowa and Virginia (Talman 1920; Bridgwater and Kurtz 1963; Tufty 1987; Lockhart 1988; Wild 1995; Wild 1996a). The earliest settlers to this area came from Germany. These Germans witnessed severe winter storms brought down by north-westerly winds following winter depressions or low pressure systems, and would call them with the following German expression 'Der sturm kommt blitzartig', meaning 'The storm comes lightning like'. The transition from *blitzartig* to blizzard seems to be a natural progression (Talman 1920; DeCourcy Ward 1925; Tufty 1987; Lockhart 1988; Wild 1995; Wild 1996a; Gribben and Gribben 1996). According to Murray *et al.* (1961) and Simpson and Weiner (1989) the transfer from blast or blow to a meaning of a snowstorm has not yet been determined.

## FIRST METEOROLOGICAL USE OF THE WORD 'BLIZZARD'

There are many suggestions when the word was first used in a meteorological sense. The word blizzard does not seem to have been used as a meteorological term before 1860 (Talman 1914; DeCourcy Ward 1925). Abbe (1900) suggests that the newspaper called the 'Dakota Republican' was the first newspaper to call the word 'blizzard' to mean a meteorological term in the winter 1867-1868, however according to an article in the Weekly Record (6 January 1899), published at Sturgis, South Dakota, the word 'blizzard' was also in use as early as 1867 in another newspaper. In 1867 the Hutchinson County Herald gave an account of the blizzard that suddenly approached the town of Vermilion. The word was used to describe the sudden change from warm and balmy weather to a blinding snow with cold north-west winds. Another suggestion is that the first time the word was used in a meteorological sense was by the Signal Service in its publication the Monthly Weather Review in December 1876, to describe the storm of the 8th in Iowa and Wisconsin. According to the old settlers of South Dakota, the word 'blizzard' originated with a Chicago newspaper, called The Advance, on the 8 January 1880 (Greely 1888; Abbe 1899; Burchfield 1972; Wild 1995; Wild 1996a; Gribben and Gribben 1996). According to the Milwaukee Republican of the 4 March 1881 the word 'blizzard' first appeared in the newspaper Northern Vindicator of Esterville, Iowa between 1860 and 1870 to describe a snowstorm (Murray *et al.* 1961; Onions *et al.* 1966; Tufty 1987; Lockhart 1988; Simpson and Weiner 1989; Sudsexe 1994). According to Simpson and Weiner (1989) it was apparent that the word blizzard was in colloquial use in the western USA much earlier than the dates mentioned above.

The word was also applied to describe the snow squalls in the American newspapers during the severe winter of 1880-81 (Murray *et al.* 1961). In 1881, The Standard newspaper quoted that the state of Manitoba was swept by those fearful blasts known as blizzards which sent the 'poudre' of dry snow whirling in icy clouds (Simpson and Weiner 1989). By 1880 the word had spread to the rest of the USA and to England (Tufty 1987). An anonymous writer states that the snow storm of January 1881 was the first time the word was used in England (Anonymous 1888). According to Eden (1995) the word blizzard was probably used for the first time in England to describe the storm of March 1891. The first official use of the word in the United Kingdom was to describe the snow event of 27 February-1 March 1937 (Brooks 1954; Bowen 1969; Wild 1995; Wild 1996a; Gribben and Gribben 1996). According to Ogden (1996) the word blizzard was first used by the BBC, when himself and others at the Meteorological Office used it during the winter of 1962-63. He comments on how he defended himself, internally to the Meteorological Office directorate and externally, responding to the public and police when using the word blizzard. He used the word blizzard to describe conditions when moderate or heavy snowfall coincided with strong to gale force winds.

## LITERATURE DEFINITIONS OF THE WORD 'BLIZZARD'

As is the case with any scientific term which has a definite meaning, the word blizzard should not be used indiscriminately to describe any particularly heavy snowstorm accompanied by high winds. Snowy weather by the news and media are so often exaggerated, even when conditions are far from reaching blizzard conditions, in any sense of the word, as regards wind strength, snowfall, drifting, temperature and duration (Hudson 1979). The word is used quite generally to describe violent north-east snowstorms in the USA and in other English speaking countries as true blizzards in these regions are rare, however they are quite common in the interior of the American Continent (Talman 1920; DeCourcy Ward 1925).

This broad use of the term impairs its utility for purposes of exact description and should be discouraged. As an anonymous writer stated, England should have never adopted the term to describe the snow storm of January 1881, as a true blizzard is an American phenomenon and rightly has an American name. The accurate identification of blizzards from the climate record can be a difficult process especially in relation to earlier events (Wild *et al.* 1996). Hudson (1979) states that according to the media, blizzards are not uncommon, however they are rarely forecasted. He quotes that a forecast gives snowfall, wind strength, drifting and air temperature as separate statements. The problem however with this, is that a layman does not receive a clear picture of forthcoming severe conditions.

Blizzards are generally described by low temperatures, strong winds, large quantities of snow (Bostwick 1916; Breton 1928; Huschke 1959; Bozman 1970; Hank 1976; McLeod and Hanks 1982; Whittow 1984; Barnhart and Barnhart 1984; Gretz 1986; Sinclair 1992) and with long duration (Funk 1956). While the words 'blizzardy',

'blizzardly', 'blizzarded' and 'blizzardous' (adjectives) are terms to describe a blizzard tending to occur or to produce a blizzard (Gove 1961; Klein 1971; Barnhart and Barnhart 1984; Schwarz 1989; Simpson and Weiner 1989; Schwarz 1993). Sometimes a blizzard is called a 'white-out' where blizzard conditions occur with a total snow cover. Under these conditions it is extremely difficult to find one's direction. The impression is of being swathed in a white opacity (Monkhouse 1970). White-outs are common in polar regions and leads to loss of balance and sense of balance (Whittow 1970). Today, in general terms the word means a severe snowstorm in nearly every English-speaking country (Tufty 1987). According to Barnhart and Barnhart (1984) a similar storm of wind-blown sand or dust is also called a blizzard.

In the Savoy (SE France) the cold north wind with snow is termed a blizard (Huschke 1959), while in Russia it is termed a buran. The word buran is either a Russian or Turkish origin (Gove 1961; Hank 1976). This violent snowstorm occurs in all seasons and derives itself from the north-east over south Russia and central Siberia and fills the air with snow (Funk 1956; Huschke 1959; Monkhouse 1970; Burchfield 1972; Monkhouse and Small 1976; Holford 1982; Simpson and Weiner 1989). In northern Siberia and Asia a snowstorm is termed a purga or a burga. This snowstorm sweeps down from the north or north-east tundra regions, and sometimes blows into southern Russia (Huschke 1959; Holford 1982; Whittow 1984; Gretz 1986; Tufty 1987).

In Antarctica, blizzards are associated with winds spilling over the edge of the ice plateau at an average velocity of 160 km/hr (Anonymous 1915; Monkhouse 1970; Monkhouse and Small 1976; Hudson 1979; Gretz 1986). In the USA, the US Weather Bureau in 1958 defined a blizzard as one characterised by winds of 56 km/hr or more, a temperature of -7 °C or less and driving snow to limit visibility to 150 m, while a severe blizzard is one where winds exceed 72 km/hr, visibility near zero and temperatures of -12 °C or lower (Huschke 1959; Considine 1976; Gretz 1986; Tufty 1987; Ahrens 1991; Meteorological Office 1991). The Canadian Weather Service describe a blizzard as winds of 42 km/hr (Force 6) or above; visibility 0.8 km or less; temperatures 22 °F (-7 °C) or less and to last six hours or more (Hudson 1979).

In general parlance in the United Kingdom it is a 'loosely used' (Bostwick 1916; Meteorological Office 1991) or 'freely employed' (Bonacina 1927) word to mean any remarkably heavy fall of snow. According to Bostwick (1916), Dines (1916) and Bonacina (1916) they argue that in the British Isles, with the exception of mountains like Ben Nevis, a real blizzard can rarely be produced. They state that there is no comparison with a blizzard in North America and the polar regions with the occurrence of one in England. Dines (1916) stated that the only incidence of a real blizzard was in the United Kingdom on the January 18th, 1881. While Bonacina (1916) commented that the only real blizzard to have occurred in the United Kingdom was the 9-13 March 1891. All the criteria of an America blizzard definition occurred with the exception of the low temperatures. Few Englishman knew what a blizzard was in the United Kingdom in the nineteenth century, as the word did not appear in many dictionaries (Anonymous 1888). In 1978, Senior Meteorological Office officials were convinced that a word like 'blizzard', was needed to frighten motorists off the roads at times of danger from snow. At that time blizzards had no meteorological existence, weathermen simply talked about heavy snow, strong winds and severe drifting. Mr Harold McKellar officer in charge at Glasgow Weather Centre said "there may now be a case for introducing a strong emotive word such as blizzard" (Mather 1978). According to Brown (1979) the Meteorological Office did not use the term blizzard in its weather forecasts for the blizzard in the north of Scotland in January 1970. The storms of January and February 1978 however, prompted the Meteorological Office to devise a blizzard definition for use in its warnings and forecasts. The criteria used by Bushey (Bracknell, August 1978) to define blizzards is now the definition used by the Meteorological Office. Listeners to the BBC will have noticed its use in the winter of 1978/1979 in its forecasts.

In forecasts issued by the Meteorological Office a blizzard is defined as the simultaneous occurrence of moderate or heavy snowfall with winds of at least force 7 (approximately 56 km/hr) causing drifting snow and reduction of visibility to 200m or less, while a severe blizzard implies winds of at least force 9 (approximately 80 km/hr) and reduction of visibility to near zero (Meteorological Office 1982, 1991). Brown (1979) states that these specifications are quite reasonable, however argues that the wind speed may be slightly lower at 46 km/hr or Force 6 (42 km/hr). Brown (1996) states that the official definition is a bit too restrictive. He quotes that meteorologist are nervous about saying the word 'blizzard'. Forecasters want to say the word blizzard, however they hesitate and say 'blizzard like conditions' or 'near blizzard conditions' instead.

Other blizzard definitions found in up to date research include one where a blizzard was described as a rapid fall of temperature to a point below 0 °C; the formation of ice needles, instead of snow and a steep barometric gradient causing a gale from a polar quarter. All these features are requisite to produce a blizzard. Cold alone, wind alone, snow alone or any two of them alone, will not produce the full discomfort of a genuine blizzard (Anonymous 1888). Bonacina (1927) described a blizzard as a storm of dry and powdery snow with a fierce gale. He points out that the United Kingdom in comparison to the United States does not experience extreme cold (less than 0 °F) with squalls of powdered ice rather than ordinary snow.

Kershaw (1979) described the Wuthering Heights region of the West Riding of Yorkshire from 1920 to 1930, stating that people who lived approximately 450 metres above mean sea level, have no difficulty in defining a blizzard. The children were told that a blizzard is not a snowstorm. They were told that a blizzard was a fine, choking snow, blowing like dust from a vacuum cleaner, stressing that the most important word with relation to blizzards was 'choking'. Hudson (1979) was unable to find a descriptive criteria for the term blizzard for the British Isles or Europe, so he devised a criteria for the British Isles for himself. He suggested that a blizzard for the British Isles is a wind force 6, gusting 7; moderate or heavy snowfall; temperature wet bulb 0.0 °C or below (dry bulb +1.0 °C or below); drifting much snow along the surface and moderate to severe airborne to 1.5 metres; visibility 1 kilometre or less at 2 metres above ground level and to last 2 hours or more. He described a full or whole blizzard as a wind force 7 or above, gusting 8 or more; moderate or heavy snowfall; temperature wet bulb -0.0 °C or below (dry bulb +0.5 °C or less); drifting severe or extensive airborne to 3-4 metres above ground level and to last one hour or more.

Holford (1982) states that a blizzard is a snowstorm with strong winds causing drifting and poor visibility. She also emphasised that snow blowing across open ground may remain suspended in the air so that very little settles. Stirling (1982) terms a blizzard as snowstorms or notable snowfalls which cause chaos to traffic with snow depths greater than ten centimetres. File (1991) described a blizzard as a combination of falling snow and strong winds which cause the snow to drift and blow about. He stated that after a snowfall has ceased, blizzard conditions could be produced simply by the wind increasing to such an extent that the air is again filled with snow lifted from surface. Under these circumstances, it may be impossible for the observer to tell if snow is actually falling or whether all of the airborne snow particles have been raised from the ground. Winds of about 25 km/hr will lift dry snow from the surface and send it across roads or fields near ground level. This is termed drifting snow or a ground blizzard (Tufty 1987; Ahrens 1991). Winds of 40 km/hr are necessary to raise snow high into the air and produce a significant reduction in visibility at head height and above. This is termed blowing snow. Dry powdery snow with a temperature below freezing will be lifted more easily than old wet snow which has compacted over a period of days (File 1991).

Eden (1995) mentioned that the features of a blizzard are the strength of the wind and the extreme cold which allows dry powdery snow to be blown into drifts. He continues to say, that the air must be laden with snow, some of which must have been lifted from the ground. John Thornber (personal correspondence) suggests that a blizzard commences during a snowfall when lying snow due to wind and low temperature begins to form drifts irrespective of the amount of snowfall. Finally, Brown (1996) terms a blizzard as snow and wind together. He states that this is what causes it, and this is what defines it.

## REINTERPRETING THE DEFINITION OF THE WORD 'BLIZZARD'

After reviewing fifty four articles all related to past snowstorms and/or major snow events across the British Isles from a wide range of journals comprising *Weather*, *Journal of Meteorology* and the *Meteorological Magazine*, most authors referred to blizzards as 'outstanding snowfall events', 'snowspells', 'heavy snowfalls', 'snowstorms' or 'notable snowfalls' by using meteorological specifications such as snow depths and how much transport was affected etc., with no clear definition proposed. Most authors described a blizzard event by the depth of snow, how they affected transport mobility, settlement access, strength of the wind and height of snow drifts, while the Meteorological Office definition of a blizzard is clearly different to those based in the literature. From this review of literature a proposed definition of a blizzard, by incorporating some or all of the meteorological parameters mentioned previously was done (Wild 1995; Wild 1996a).

It was suggested that a blizzard was a wind of at least force 6 to 7; moderate snowfall (up to 4 cm/hr-1); dry bulb temperature above or at 0 °C; snow depth 10-25 cm; snow drifts up to 1 metre; visibility 100-400 metres (at eye level); outdoor sporting events cancelled and communications difficult (minor roads blocked). A severe blizzard could be defined as a wind greater force 7; heavy snowfall (greater than 4 cm/hr-1); dry bulb temperature below 0 °C; snow depth greater than 25 cm; snow drifts greater than 1 metre; visibility 0-100 metres (at eye level); major roads blocked, rural settlements isolated, power failures, fatalities, absentees at work and school and rescue work undertaken by air (Wild 1995).

In the early part of 1996 this definition of a blizzard was further revised, after further research and after receiving personal correspondence in response to a previous publication (Wild 1995; Wild 1996a). The new definition proposed that a blizzard is when snow intensity (greater than 4 cm per hour) coincides with a wind speed of at least force 6. Snow being lifted from the surface to add to the blizzard conditions should be included as well as some form of time duration (say 2-3 hours). If a severe blizzard needs to be defined as well, then the only difference to that of the above definition should be that a wind speed greater than force 7 coincides with a snow intensity of 6 cm or more per hour (Wild 1996a).

The old definition (Wild 1995) was altered, because Mr McNaughton (personal correspondence) suggested that the definition needs to be brief and specific. Accompanying consequences of the blizzard such as villages being cut off, roads blocked etc. should be disregarded (Brown 1996), as it would be too difficult for the meteorological forecaster to predict an episode of a blizzard with more than a handful of parameters. John Thornber (personal correspondence) suggested that warnings of a blizzard occurring could be flashed upon radio and TV channels, as well as illuminated signs on motorways and roads. Mr McNaughton questioned how would the author determine that a blizzard was a blizzard or a severe blizzard. The author would determine this by which of them was the most dominant one over the area it affected. The temperature parameter was also eliminated because Tucker (1996) suggested that as long as it is cold enough either above or below freezing for snow to settle, that is all that is required.

Mr McNaughton also suggested that the term blizzard should be universal. This was accepted, however it would be rather difficult for this definition to be put into practice, especially when Tucker (1996) comments that a blizzard that occurs over a land mass the size of central Europe does not have the same characteristics as a blizzard that occurs over an island the size of Great Britain, especially as we are surrounded by warm seas.

It appears that the word blizzard will continue to be used loosely, emphasising the comments from the anonymous writer of 1888 who suggested that we should not have adopted the term for ourselves, because it seems that no one can agree on a definition for it. In the final analysis, the public and the media determine how bad a blizzard is, either by the damage the storm does to the area concerned, or by personal memories, or on how it was publicised. Improving the response by local authorities in clearing the snow off the roads and pavements and implementing a suitable gritting procedure during the actual event would cause less hazards for the public and perhaps lessen the number of perceived blizzards (Wild 1996a).

In conclusion, the most important meteorological parameters of a blizzard, are wind speed and snow intensity. These two parameters alone will result in other meteorological parameters emerging, such as poor visibility, drifting etc., which being secondary effects should not be included in the immediate definition (Wild 1996a). The Meteorological Office definition is a robust interpretation of the term, however at times it should include some mention of previous snow being lifted from the surface and some form of time duration. For instance is it problematic to classify a snow event as a blizzard which lasts for just five minutes, or does the duration need to be longer, say one hour (Wild 1996).

From the foregoing analysis, the term blizzard remains problematic. Because of this, it is suggested that a blizzard needs to have snow falling, coinciding with wind speed of at least force 6. Nevertheless, because of the lack of agreement concerning the scale and type of meteorological parameters needed for a blizzard definition, the term will continue to be used in a general sense to describe a major snow event.

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