EVEREST: A COMPARATIVE STUDY OF HEIGHT AND HUMAN ACHIEVEMENT

INTRODUCTION

Mount Everest, the highest point on Earth, lies 8,848m above sea level on the border of Nepal and China. Towering 1,886m above Aconcagua in Argentina, the next tallest peak, and over 17 times the height of the tallest man-made freestanding structure above sea-level, the CN Tower in Canada, Everest has remained the benchmark of achievment of mankind's triumph over nature. At the end of the 2004 climbing season, humans have successfully summitted a total of 2,238 times while Everest claimed 186 lives.

Through a careful study of fatality rate on the 18 routes to summit Everest, a timeline detailing events leading to the first successful ascent to the summit, a height and geographic comparison of Everest to the 49 most prominent peaks in the world, and a timeline tracking human architectural progress, judge for yourself the winner of the competition between human and nature.

18 ROUTES TO ASCEND EVEREST

Routes are traced in black, with line-width in proportion to the number of successful summits, and transparency in proportion to the fatality rate (calculated by fatalities / summits); the more summits, the wider the line, the higher the fatality rate, the darker the line.

A detailed figure breakdown appears below for each of the 18 routes (numbered in chronological order).

1 **SOUTH-EAST RIDGE STANDARD**
FIRST SUMMIT: 1953
SUMMITS: 1140
FATALITIES: 80
FATALITY RATE: 7%

2 **NORTH-EAST RIDGE STANDARD**
FIRST SUMMIT: 1960
SUMMITS: 655
FATALITIES: 62
FATALITY RATE: 9%

3 **WEST RIDGE/HORNBEIN COULOIR ROUTE**
FIRST SUMMIT: 1963
SUMMITS: 5
FATALITIES: 9
FATALITY RATE: 180%

4 **SOUTH-WEST FACE**
FIRST SUMMIT: 1975
SUMMITS: 15
FATALITIES: 4
FATALITY RATE: 27%

5 **WEST RIDGE DIRECT**
FIRST SUMMIT: 1979
SUMMITS: 10
FATALITIES: 11
FATALITY RATE: 110%

6 **JAPANESE COULOIR**
FIRST SUMMIT: 1980
SUMMITS: 7
FATALITIES: 4
FATALITY RATE: 57%

7 **SOUTH PILLAR**
FIRST SUMMIT: 1980
SUMMITS: 45
FATALITIES: 1
FATALITY RATE: 2%

8 **MESSNER SOLO ROUTE**
FIRST SUMMIT: 1980
SUMMITS: 1
FATALITIES: 0
FATALITY RATE: 0%

9 **SOUTH-WEST PILLAR**
FIRST SUMMIT: 1982
SUMMITS: 11
FATALITIES: 0
FATALITY RATE: 0%

10 **EAST FACE: AMERICAN BUTRESS**
FIRST SUMMIT: 1983
SUMMITS: 6
FATALITIES: 0
FATALITY RATE: 0%

11 **THE GREAT COULOIR (WHITE LIMBO)**
FIRST SUMMIT: 1984
SUMMITS: 2
FATALITIES: 1
FATALITY RATE: 50%

12 **NE RIDGE – N FACE: NORTON COULOIR II**
FIRST SUMMIT: 1984
SUMMITS: 1
FATALITIES: 0
FATALITY RATE: 0%

13 **WEST RDIGE FROM TIBET TO HORNBEIN COULOIR**
FIRST SUMMIT: 1985
SUMMITS: 4
FATALITIES: 1
FATALITY RATE: 25%

14 **EAST FACE – S SOL: NEVEREST BUTTRESS**
FIRST SUMMIT: 1988
SUMMITS: 7
FATALITIES: 0
FATALITY RATE: 0%

15 **BELOW N COL – N FACE: NORTON COULOIR**
FIRST SUMMIT: 1988
SUMMITS: 2
FATALITIES: 0
FATALITY RATE: 0%

16 **THE COMPLETE NE RIDGE**
FIRST SUMMIT: 1995
SUMMITS: 6
FATALITIES: 3
FATALITY RATE: 50%

17 **N-NE (ZAKHAROV'S) COULOIR**
FIRST SUMMIT: 1996
SUMMITS: 3
FATALITIES: 0
FATALITY RATE: 0%

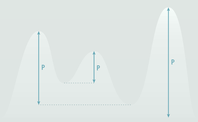
18 **CENTRAL NORTH FACE DIRECT**
FIRST SUMMIT: 2004
SUMMITS: 8
FATALITIES: 0
FATALITY RATE: 0%

MEASURING PROMINENCE

For all peaks except Mount Everest, if the peak's prominence is *P* metres, to get from the summit to any higher terrain, one must descend at least *P* metres, whatever route is taken.

Note that this implies that the prominence of any island or continental highpoint is equal to its elevation above sea level.

Mount Everest is a special case: its prominence is considered to be equal to its elevation, as no higher summit exists.



PROMINENCE COMPARISON

50 highest peaks on Earth measured by their topographic prominence, plotted by their geographic location and prominence compared to Everest.

▲ Everest ▲ Top 2–10 ▲ Top 11–50

ACLIMATIZATION OF THE HUMAN BODY

The human body functions best at sea level (atmospheric pressure is measured at 1 atmosphere), where hemoglobin (red pigment in red blood cells) is nearly 100% saturated with oxygen.

As humans venture to higher altitudes, air pressure drops and the amount of available oxygen plummets.

At 8,848 meters (summit of Mount Everest), only one third of the oxygen is available, compared to sea level.

DEATH ZONE

In the "death zone" at 8,000 m and higher, the human body can no longer acclimatize to adjust to low oxygen levels. Staying longer than necessary will result in deterioration of body functions, loss of consciousness, and death.

At extreme altitudes (above 7,500 m), sleeping and digesting food becomes difficult, and the risk of high-altitude pulmonary edema or cerebral edema increases significantly.

At 5,000 metres (height of Mount Everest base camp), the amount of oxygen is only half that at sea level.

TIMELINE OF EVEREST SUMMITS AND DEATHS PER YEAR FOR 50 YEARS SINCE FIRST SUMMIT IN 1953

History to First Summit in 1953

- 1841 — Sir George Everest, Surveyor General of India records the location of Everest.
- 1852 — Peak B is surveyed by the British; the height is calculated at 9,205 meters from measurements taken 110 miles away.
- 1853 — The Great Trigonometrical Survey of India determines Peak B is the highest mountain in the world.
- 1854 — Peak B is renamed Peak XV.
- 1856 — Surveyor Andrew Waugh completes the first height measurement, declaring Everest to be 8,840 meters high.
- 1865 — Peak XV re-named Mt. Everest to honor Sir George Everest. Everest is known as 珠穆朗玛峰 (Chomolungma) in Tibet and Sagarmatha in Nepal.
- 1907 — Natha Singh, a member of the British Indian Survey, obtains permission to enter the Mount Everest region from the Nepalese side. Singh maps the Dudh Kosi valley — gateway to the southern route up the mountain — to the end of the Khumbu Glacier.
- 1907 — The Royal Geographic Society and the Alpine Club hold a joint meeting to discuss how to proceed with an expedition to Mount Everest after the Dalai Lama opens Tibet.
- 1921 — First British Everest Reconnaissance Expedition to the mountain, reaching the North Col of Everest at an altitude of 23,000 feet (7,000 meters). The northern route up the mountain had now been established.
- 1922 — Second British Everest Expedition. Seven Sherpa climbers die in an avalanche becoming the first reported deaths on Everest.
- 1924 — Third British Everest Expedition.
- 1933 — The Fourth British Everest Expedition.
- 1934 — The eccentric Maurice Wilson attempts to solo Everest, having no mountaineering experience but possessing an inner faith to succeed.
- 1935 — Fifth British Expedition (Reconnaissance).
- 1937 — Sixth British Expedition.
- 1938 — Seventh British Expedition.
- 1952 — Swiss Expeditions sponsored by the Swiss Foundation for Alpine Research and rumors of a Russian attempt.
- 1953 MAY 29 — British Expedition and first summit by Tenzing Norgay and Sir Edmund Percival Hillary (New Zealand) via the South-East Ridge Route.

TOTAL
SUMMITS: 2,249
DEATHS: 186

TIMELINE OF MAN-MADE BUILDING STRUCTURES TALLEST BUILDINGS (FREESTANDING STRUCTURES) IN HUMAN WORLD HISTORY

- STRASBOURG CATHEDRAL 1439-1847
- ST. NIKOLAIKIRCHE 1847
- ROUEN CATHEDRAL 1876
- COLOGNE CATHEDRAL 1880
- WASHINGTON MONUMENT 1884
- EIFFEL TOWER 1889
- CHRYSLER BUILDING 1930
- EMPIRE STATE BUILDING 1931
- OSTANKINO TOWER 1967
- CN TOWER 1975