

WORK-ENERGY-POWER

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Overlooked No More: Alison Hargreaves, Who Conquered Everest Solo and Without Bottled Oxygen

Hargreaves sent her children a message from the apex: "I am on the highest point of the world, and I love you dearly." She perished months later while descending Earth's second-highest peak, K2.



AmerAlpineClub STATES:

The work capacity on the summit of Mount Everest is very small, being about 0.07 horsepower or 50 watts. This means that a climber of average body weight (including clothing and minimal equipment) would take about **2 minutes to climb up a slope of 10 meters vertical height**. This low maximum flow and therefore the pressure of oxygen in the air is greatly reduced below the sea level value. The body just cannot transfer oxygen rapidly enough into the

INTRODUCTION:

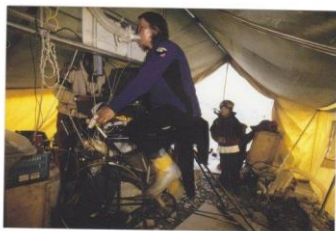
power = work/time
 $P = W/t$, thus $t = W/P$, base camp at Mt Everest (where climbers start climbing is at 17,600 ft.). The purpose of this application is mainly to determine the time it took Alison to free climb (no oxygen) to the summit at 29,029 ft..

QUESTIONS: (a) Convert 0.07 HP to Ft. lb./s.?. (b) Determine the vertical height (h) Alison climbed from base camp?

When asked if a female climber needed to be tougher than a man, Alison Hargreaves, in her last known interview, said: "I think that women in general have to work harder in a man's world to achieve recognition."

By Maya Salam

March 14, 2018 When Alison Hargreaves reached the peak of Mount Everest on May 13, 1995, she sent a radio message to her son and daughter: "To Tom and Kate, my dear children, I am on the highest point of the world, and I love you dearly." With that triumph, she became the first woman in history to conquer the Earth's apex — **29,029 feet high — alone and without bottled oxygen. Hargreaves, one of the world's greatest alpinists then and of all time, also did without the fixed ropes set by others on that Himalayan climb.** Only the Italian mountaineer Reinhold Messner had ascended Everest in a similar manner before. Her homeland, Britain — stoked by a front-page headline in The Times of London that read "One of the greatest climbs in history" — rejoiced. "The rest of Fleet Street followed, keeping the story in the air" until her return, her daughter, Kate Ballard, said in January. Exactly three months after Everest, in the late afternoon of Aug. 13, Hargreaves reached the summit of K2 in Pakistan, the world's second-highest peak. Just hours later, she and five others died when they were engulfed by a storm with fierce winds that rose up the mountain. She was 33. After her death, a backlash — fueled by a media frenzy around her death — began to mount. "The next stage was everyone saying she shouldn't have left the children." Those who criticized Hargreaves were "wrong and incredibly shortsighted," her daughter said. "Twenty years later with more equality and thinner glass ceilings, would they have written the same? No." In the 2002 interview, James Ballard expressed disappointment in how women and mothers are judged for succeeding in their careers, particularly dangerous ones. "How could I have stopped her?" he said of his wife. "I loved Alison because she wanted to climb the highest peak her skills would allow her to. That's who she was."



Alison Hargreaves reached the peaks of Everest and K2 without supplemental oxygen.

QUESTIONS(continued): (c) The work Alison did was the same as her increase in gravitational potential energy: $W = m g h$. Alison weight = $m g = 150 \text{ lb}$. Find the work she did in climbing Mt Everest from the base camp?, (d) Find time in seconds and hrs. it took Alison to climb from the base camp to summit of Mt Everest?, (e) Verify that she was climbing at about 10 meters/2 min. as stated by American Alpine Club above.

HINTS: 1 HP = 550 ft. lb./s. , 3600 s./hr. , 3.37 ft./meter, $x = v t$

ANSWERS: (a) $P = 38.5 \text{ ft. lb./s.}$, (b) $h = 11,429 \text{ ft.}$, (c) $W = m g h = 1.714 \times 10^6 \text{ ft. lb.}$ (d) $t = 4.45 \times 10^4 \text{ seconds} = \sim 12.4 \text{ hrs.}$, (e) _____.

COMMENT: Alison was first woman to climb Mt Everest without Oxygen. In 1978 Reinhold Messner was first man to climb Everest without oxygen.