

BOILING POINTS.

These Are Innumerable and Form a Curious Study.

It is interesting to note that the temperature at which a liquid boils is the same as that at which its vapor is condensed, precisely as the temperature at which water freezes is the same as that at which ice melts.

It may seem superfluous to observe that there are more boiling points than the boiling point of water. If it were not so, all bodies would be in the solid, liquid or gaseous state together, and life would be impossible. It is partly by giving every substance its own boiling point, or rather its own set of boiling points—for the fixed temperature, even for the same substance, is a fallacy—that nature has rendered our physical environment suitable to our needs.

What is generally understood by the boiling point of water is a temperature of 212 degrees on the Fahrenheit thermometric scale, but Alpine climbers know well that, on a high mountain, water boils at a very much lower temperature—on the summit of Mont Blanc at 184 degrees. The reason is that, at these altitudes, the pressure of the atmosphere is very much reduced, since the density of the air decreases with the distance above the earth's surface, and the water expands at a correspondingly lower temperature, passing more readily into the vaporous condition, in which the volume of a given mass of any substance is always far greater than that of the same mass when liquid. The boiling point of liquid is, therefore, seen to depend not only on temperature, but also on pressure, and the boiling point of water at 212 degrees corresponds to what is called "a pressure of one atmosphere," approximately 15 pounds to the square inch, or the pressure capable of supporting the column of mercury in a mercurial barometer at a height of 29.9 inches. This is the average pressure of the atmosphere at the sea level, and if it is reduced the boiling point is lowered, while if it is increased the boiling point is raised.

A very curious result is arrived at if we place a vessel of water in the receiver of an airpump and reduce the pressure to .006 of an atmosphere, for then the water boils at 32 degrees—that is, at its freezing point under ordinary pressure. Since it is now possible to produce an almost perfect vacuum, water may be boiled at still lower temperatures.

All liquids do not boil at the same temperature. Thus, while water under a pressure of one atmosphere boils at 212 degrees, alcohol, which passes more readily into the state of vapor, boils at 172.3 degrees and ether at 93.8 degrees, which is below the normal temperature of the body.

Since increase of pressure retards the vaporization of a liquid, it of course facilitates the liquefaction of a gas by assisting the process of contraction. Consequently many gases are capable of being liquefied by pressure alone, though only when they are below what is called their critical temperature (different for every different gas), above which cold as well as pressure becomes necessary. Oxygen, hydrogen and nitrogen are the most remarkable examples of gases having low critical temperatures, and it is only recently that their liquefaction has been accomplished at all. They were long thought to be "permanent gases," but it is now known that all gases are liquefiable.

The boiling points of oxygen and nitrogen are respectively 87.8 degrees and 85.6 degrees F. below the freezing point of water, and therefore these are the highest temperatures at which they can exist as liquids. To produce these extremely low temperatures it is necessary to employ great pressure along with freezing mixtures. The most remarkable liquefaction which has yet been accomplished is that of air. It was supposed that the oxygen and nitrogen having different boiling points, they would liquefy separately. This is not the case; the mixture liquefies as air and presents the appearance of water, but on being again evaporated the nitrogen evaporates first and the oxygen afterward. This is a puzzle in physics which will doubtless be explained ere long.—Good Words.

Love For the Zigzag.

The straight line is an abomination to the Chinese. They endeavor to avoid it in their streets and buildings and have banished it completely where country field paths are concerned. They will always substitute a curve whenever possible, or they will torture it into a zigzag.

In districts not devastated by the Tai Fings nor subject to the influence of the foreigner, the houses and temples are characterized by curved, often peaked, roofs, ornamented with fantastic modifications of the "myriad stroke pattern." The inhabitants of such regions are soon found to have a mental world to correspond. The straight line is scouted. They think in curves and zigzags. To the Chinese mind the straight line is suggestive of death and demons. It belongs not to the heaven above nor to the earth beneath. In a true horizon line are seen the "undulations of the dragon." Therefore, argue the Chinese, the straight line pertains to hades.—Contemporary Review.

Hope Without Faith.

"Oh, doctor, I have sent for you, certainly; still I must confess I have not the slightest faith in modern medical science."

"Oh, that doesn't matter in the least. You see, a mule has no faith in the veterinary surgeon, and yet he cures him all the same."—Tagliche Rundschau.

An Economical Wife.

He—I can't send my clothes to the tailor's every time they need a button. We must economize. Can't you sew on these suspender buttons yourself?

She—Here, my dear; fasten them up with a hairpin. That will save thread, you know.—New York Weekly.

A WONDERFUL HAND.

An Artificial Substitute Nearly as Perfect as the Natural Member.

Willard A. Lucas, the son of a great woolen manufacturer at Paquetannuck, Conn., wears an artificial hand made of aluminum which is really one of the automaton wonders of the century. Young Lucas lost his hand in his father's mills, and Lucas, Sr., who grieved exceedingly over the results of the accident, wrote or went in person to every known manufacturer of artificial limbs in this country and Europe, vainly seeking a false hand for his son. Artificial hands could have been procured from any of them, but what was wanted was not to be found—viz, a hand that would perform all the functions of a real flesh and blood member.

Finally the elder Lucas, who is known as a rare mechanical genius, took it upon himself to make his son a hand—not a mere "dummy," but one that would be useful for the manifold purposes to which such members are put. The result is a surprise to every maker of artificial limbs in the world. The automaton is of aluminum and much resembles the steel gauntlets worn by the knights of the middle ages. The fingers are all perfect and lifelike, the joints in each bending as readily as those in a natural hand, making it possible for the young man to perform every kind of labor. An expert report on this wonderful piece of mechanism reads as follows:

"With it he can grasp and handily use all kinds of tools, pick up things from the ground, drive, handle a gun—in fact, use it quickly and skillfully at any kind of work. Like a natural hand, the artificial one consists of a palm that is provided with a fastening by which it is attached to a cork 'stump,' the joints working by a ratchet, so that the fingers may be bent forward at any angle and held there. The hand may be only partly closed or tightly shut, and only one finger or all, as the wearer desires, may be closed at once and instantly by striking them against the body or other object. To release the grasp it is only necessary to touch a spring at the back of the hand. The invention is as nearly a perfect substitute for a natural hand as could be devised and is the only thing of the kind known in the world."—St. Louis Republic.

The Head Waiter's Cocktail.

In a swell hotel on Broadway the head waiter is not allowed to indulge in bibulous refreshments during the hours he is on duty. The other evening he was filled with an irreplaceable longing for a cocktail. He managed to get it with such ease that it was evidently a well tried and efficacious trick.

His method can be best understood by quoting the waiter: "Sure, we're not charging you for a cocktail," whispered a waiter to a young gentleman to whom he had just brought a check, "but the head waiter wanted a cocktail and thought you would be the man who would mind laste having it put it on to you bill. You see," whispered the waiter, confidentially, "he couldn't put it onto the bill of the gists in the house, they might remark it, so he had to put it onto the bill of somebody who came in from the strate. I'll bring you the twenty cents back and thank you for the accommodation."

"The head waiter has either discerned that you are a man with a liberal and sympathetic disposition or one who knows how good a cocktail tastes and how bad a man wants it when he cannot get it," remarked the young lady who was dining with the gentleman whom the head waiter rightly singled out as a possible friend to a fellow man in need of spirituous consolation.—New York Herald.

When He Stopped Payment.

The bullying manner sometimes assumed by certain barristers in cross examination, in order to confuse a witness and make his replies to important questions hesitating and contradictory, is notorious, and many are the tales told of "cute" witnesses who have turned the tables on their persecutors. The following relates to a case of this kind:

In a civil action on money matters the plaintiff had stated that his financial position was always satisfactory. In cross examination he was asked if he had ever been bankrupt.

"No," was the answer. Next question was, "Now, be careful; did you ever stop payment?" "Yes," was the reply. "Ah," exclaimed the counsel, "I thought we should get at it at last. When did that happen?" "After I paid all I owed," was the answer.—London Tit-Bits.

Where They Eat Tobacco.

Perhaps there is nothing more peculiar about the Eskimoes of Point Barrow than their methods of using tobacco, which, of course, they procure from the whites. They know good from bad tobacco. When they get hold of a few plugs of commissary tobacco from a vessel of the United States navy, they show a marked appreciation of it. The habit of chewing the weed seems to be universal. Men, women and even unweaned children keep a quid, often of enormous size, constantly in the mouth. The juice is not spit out, but swallowed with the saliva, without producing any symptoms of nausea.—Washington Star.

Colonel Burr's Career.

Colonel Burr, the well known newspaper correspondent, has had a remarkable career. When but a child, he was stolen by a tribe of Indians and remained with them for several years. When the war broke out, he was a locomotive engineer. He enlisted as a private and came out of the service wearing shoulder straps. He then studied civil engineering and laid out Deer Park, the famous summer resort on the Alleghenies. Becoming a newspaper correspondent, he soon became one of the most famous of the guild.

Grocery Boomers

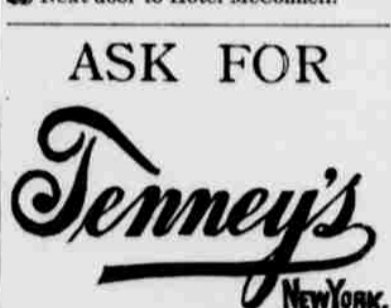
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