

HISTORY OF THE THERMOMETER

The earliest form of temperature measuring instrument was a primitive type of thermoscope which is mentioned by the Greek Physicist – Hero of Alexandria – in the second century BC.

The thermometer is first mentioned by Leurechon, in his book “Recreation Mathematique” written in 1624.

The inventor of this useful instrument appears to be Galileo, an Italian who according to Viviani in his “Life of Galileo” written in 1718 held the Chair of Mathematics at Padua, and in 1592 he produced the first thermometer.

This statement is borne out by some letters which were published by Nelli in his “Biography of Galileo” and which were written to Galileo by Francesco Sagredo of Venice.

The purport of these letters was to explain how the writer had improved Galileo’s instrument, mentioning that the thermometers were made at the Glass Works of Murano and that he used wine as well as water in his instruments.

The instrument as first invented was an Air Thermometer and the water or wine was used to act as an indicator in the tube itself, there being no liquid in the bulb.

The first person to fill the Thermometer with liquid was the Frenchman Rev. who writing to the French theologian Father Mersenne in 1632, describes his invention and how he filled the bulb with wine.

Unfortunately most of Galileo’s manuscript which he kept was burnt by his Grandson Cosimo and a number circulated among various people, by Vaviani who was a pupil of Galileo, succeeded in collecting a number of these and included them in his book, in which he places the date of the invention as between 1692 and 1597.

Sanctorius writing in 1611 in his “Commentaries on the Medical Art of Galen” part III, page 538 refers to the Thermometer as “ a most ancient instrument, and it is interesting to note that this writer who held the Chair of theory of Medicine at Padua 1611 – 1624, applied the thermometer to physiological researches.

Following Sagredo the Duke of Tuscany Ferdinand II, improved the Thermometer and prior to 1654 he produced the first closed instrument, as before that date the upper end of the tube was left open to the air.

Later in 1657 in conjunction with his brother Prince Leopold de Medici. He founded the Academia del Cimento, where experiments in thermometer construction were carried out in conjunction with other research work.

The mercury-filled Thermometer was first mentioned by Athanasius Kircher in 1653 and though further details of their manufacture are lacking they were stated to have been produced by the Academia del Cimento in 1657.

The originator of the first proposal to use mercury is said to have been Halley, but according to Boerhaave- "Chemiae Boerhaavii I", page 720 – it was Aluas Roemoerc, celebrated as the discoverer of the velocity of light, who first constructed the mercurial Thermometer.

In this country Robert Hooke did a good deal of work on Thermometer construction and refers to this in his book "Micrographia" published in 1664.

Prior to this date, Southall in 1650, brought one of the Florentine Thermometers to this country and copies were made by the scientist Boyle.

Another early mention of Thermometers in England is made by the Rev. Stephen Hales in his book "Vegetable Statics" published in 1727, and there he refers to Thermometers made by John Fowler of Swithins Alley, near the Royal Exchange.

These instrument were used in conjunction with hothouses for fruit, etc. and varied in length from 18 inches to 4 feet.

The first known attempt to calibrate the Thermometer was made by Fahrenheit who was an instrument maker in Amsterdam and a native of Danzig.

In 1714 he mixed salt and snow together and as he considered this represented the absolute cold, he called it 0 on the thermometer scale, he called the freezing point of water 32 and the boiling point 212. This is the scale which is in general use today in many countries. Fahrenheit died in 1736 aged 50.

The Reamur scale was introduced by Rene Antoine Ferchault Seigneur de Reaumur des Angles et de la Bermondriere, who in 1731 published his "Rules for the Construction of Thermometers" embodying his method of calibrating the scale, and Abbe Nollet in 1733 made thermometers on these lines. The Reaumur scale is now seldom used.

The Centigrade scale was proposed by Anders Celsius of Upsala in 1742 this scale being subsequently modified by Christin a scientist of Lyons. The Centigrade scale is largely used outside English speaking countries for general purposes, and universally for many scientific and industrial readings.

Registering Thermometers or Thermometrographs were invented some yeas later an according to Phil. Tr. 1757, Lord Charles Cavendish in that year constructed a Maximum Thermometer but it was unsatisfactory as it was hard to adjust

Others either Maximum or Minimum were made by Keith, Traill, Six, and Rutherford the last two being the best known.

James Six lived at Canterbury where in 1782 he invented the self-registering Maximum and Minimum thermometer which today bears his name. This is mentioned in Phil. Trans. 1782, and this type of instrument was modified by Bellani and Bunten and is in universal use at the present time.

Dr Rutherford invented the Minimum Thermometer which is now generally adopted and also introduced a Maximum Thermometer but the latter instrument was never satisfactory.

Of the several types of Maximum Thermometers which have been invented, the best was that introduced by professor Phillips and which was known as the "Phillips" Maximum. This instrument was not very satisfactory, and was superceded by the Maximum Thermometer invented by Negretti & Zambra in 1852, which type is universally adopted for maximum readings at the present time.

This invention was of the greatest importance as it was not only used in scientific and industrial instruments but also was and still is embodied in all medical or what are generally known as clinical thermometers.

It will be seen therefore that though the thermometer was first introduced in Italy many of the subsequent improvements and inventions belong to this country.

As regards Mechanical thermometers Abraham Breguet a Paris watchmaker who died in 1823 made what was probably the first Dial Thermometer which operated by silver, gold and platinum strips which must have been very costly.

The instrument was subsequently reconstructed by his nephew (Breguet), so as to record with a pen on a metal sheet, and this instrument was probably the earliest form of Recording Thermometer.

No attempt has been made in these pages to trace the further history in thermometer development, nor to describe types, such as Electrical Thermometers, Mercury in Steel Thermometers, but in all their development the UK has taken a prominent part.

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