Kathreen Ahn
Jose Alvarenga
Rose Bustos
Danny Truong

History of Thermometry

I. Galileo's Air Thermometer (1592)
   A. The first instrument to detect hot or cold
   B. Used by physicians to first measure body temperature
   C. Hubin (1725) and Sturm (1676) improve Galileo's original apparatus

II. Air Pressure Thermometer (1700)
   A. Amontons (1700) Air pressure taken degree of heat
   B. Boiling Point of water thought to be a constant
   C. Used by Lambert (1799) who introduced variable barometric pressures
   D. Regnault (1847) develops centigrade scale

III. Early Liquid Thermometers
   A. Rey (1691) water thermometer
   B. Francis II of Tuscana (1631) alcohol thermometer aka Florentine thermometers

IV. Reference Points for Temperature Scale
   A. Boyle (1665) used freezing point of anisol as reference point
   B. Dalence (1688) ice and butter as reference points
   C. Halley (1693) mercury as internal substance
   D. Renaldini (1694) boiling and melting points of water as reference
   E. Newton (1701) linseed oil as internal substance
   F. Fahrenheit (1724) designed his famous scale
   G. Reaumur (1730) scale based again on water boiling freezing points with new increments
   H. Celsius (1742) designed his scale
   I. Stromer (1750) designed Centrigrade scale

V. Coefficient of Thermal Expansion
   A. Charles (1787)first discovered, but didn't publish work
   B. Gay-Lussac (1802) first published account of coefficient

VI. Vapor Studies
   A. Suassure (1783) Vapor present in space above liquid dependent on temperature
   B. Dalton (1801) Dalton's Law of Partial Pressure

VII. Critical Pressure and Temperature: Showed need for standard Temperature Scale
- A. Existence of large positive temperature coefficient
- B. Tour (1822) At high temperatures, density of vapor approaches liquid
- C. Faraday (1823) liquefaction of gases

VIII. Thermometric Properties
- A. Dulong and Petit (1817)
  1. Thermometric Properties of different substances
  2. Arbitrary Nature of Temperature Scales
- B. Thomson (1848)
  1. Establishment of Thermodynamic Scale

IX. The Perfect Gas
- A. Regnault (1847) Extension of gas laws

X. Revival of Amonton's Thermometer
- A. Amontons, Regnault , Dulong and Petit

XI. Newton's Law of Cooling
- A. Newton (1701) Earliest pyrometric method

XII. Confusion of Temperature and Heat

XIII. Biot's Law
- A. Geometric Progression
- B. Amonton (1703) Temperature and Distance relationship confusion

XIV. Black's Method of Mixtures
- A. Black's (1804) calorimeter studies

XV. Improved Thermometry
- A. Pyrometers
- B. Seebeck (1821) Electrical Method for Thermometry
- C. Peltier (1834) Potential Difference at two junctions with different temperatures
- D. Thomson(1856) Thermodynamical Theory
- E. Becquerel (1826) Thermocouple attempt
- F. Pouillet (1836) Low resistance tangent galvanometer
- G. Le Chatelier (1887) Perfected thermocouple

XVI. Modern Thermometry
- A. Infared Thermometers
- B. Liquid Crystal Thermometers

References

Behar , M.F.Temperature and Humidity measurement and control ,Instruments publishing company,113-122, (1932)

Crowther, J.G., (1962), "Scientists of the Industrial Revolution," Printed by Western Printing Services, Bristol, Great Britain.

Day, Arthur L., Sosman, Browning R., (1911), "High Temperature Gas Thermometry", Press of Gibson Brothers, Washington D.C.

Hall, J. A. (1959) Fundamentals of Thermometry. New York, NY: Reinhold Publishing Corporation (First published 1953).

Hutton, Charles LL.D., (1815), "Philosophical and Mathematical Dictionary", Vol. II, Printed by S. Hamilton Weybridge Surrey.

Middleton, W.E. (1966) A History of the Thermometer and Its Use in Metereology. Baltimore, MD: The Johns Hopkins Press.

Molinar, G., Pavese, F. (1992). Modern Gas-Based Temperature and Pressure Measurements. New York, NY: Plenum Press

Proc. Estonian Acad. Sci. Eng., 2007, 13, 4, 276-282.

Wisniak, Jaime, Chem. Educator, 2000, 5, 88-91.