accept the law of Dalton and Gay-Lussac, it follows that this result is independent of any peculiar properties in the air employed; and thus this measure has an additional character of generality and simplicity which make it still more probable that it is the true standard. This opinion is further supported by the attempts to include such facts in a theory; but before we can treat of such theories, we must speak of some other doctrines which have been introduced.

Sect. 2.—Specific Heat.—Change of Consistence.

In the attempts to obtain measures of heat, it was found that bodies had different capacities for heat; for the same quantity of heat, however measured, would raise, in different degrees, the temperature of different substances. The notion of different capacities for heat was thus introduced, and each body was thus assumed to have a specific *capacity for heat*, according to the quantity of heat which it required to raise it through a given scale of heat.[4] The term "capacity for heat" was introduced by Dr. Irvine, a pupil of Dr. Black. For this term, Wilcke, the Swedish physicist, substituted "specific heat;" in analogy with "specific gravity."

It was found, also, that the capacity of the same substance was different in the same substance at different temperatures. It appears from experiments of MM. Dulong and Petit, that, in general, the capacity of liquids and solids increases as we ascend in the scale of temperature.

But one of the most important thermotic facts is, that by the sudden contraction of any mass, its temperature is increased. This is peculiarly observable in gases, as, for example, common air. The amount of the increase of temperature by sudden condensation, or of the cold produced by sudden rarefaction, is an important datum, determining the velocity of sound, as we have already seen, and affecting many points of meteorology. The coefficient which enters the calculation in the former case depends on the ratio of two specific heats of air under different conditions; one belonging to it when, varying in density, the pressure is constant by which the air is contained; the other, when, varying in density, it is contained in a constant space.

A leading fact, also, with regard to the operation of heat on bodies

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[4] See Crawfurd, *On Heat*, for the History of Specific Heat.