

between. It is in this closed inner chamber, lighted by plate glass windows and supplied with a constant current of pure air, that the animal is placed during the experiment, being admitted by large doors at one end. The temperature of the chamber can be regulated to the hundredth of a degree, food is regularly given through special doors, and the animal stands or lies down at will.

The object of the apparatus is to study the food as a source of energy, or, in other words, as the fuel of the body. Food is burned in the body somewhat as coal is burned in a locomotive and gives much the same final results, viz., heat and motion. A bushel of corn or a bale of hay if burned in a furnace gives off a certain definite amount of heat and energy. The aim of the experiments to be undertaken with the respiration calorimeter is to find out what proportion of this energy can be utilized by the animal to produce meat or milk or work, and how much is simply used up in heating the surrounding air. A comparison of corn and hay, for example in this respect, will show which one contains the greater store of energy in available form. Similarly a comparison may be made of the ability of different animals to utilize the same food, or of the influence of various external conditions, such as temperature, water supply, light, excitement, etc.

The comparisons are made much as we might make them with a locomotive. Knowing the energy contained in the coal, an analysis of the waste products, including the gases from the stack, and a determination of the heat given off, would furnish the elements necessary for the comparison. In the case of the animal, the visible excreta can be readily collected and analyzed by proper appliances. The flue gases are represented by the breath of the animal, the gases of which are carried out of the chamber in the current of air. The air current is maintained by an ingenious piece of apparatus specially designed and built for the purpose by Mr.