

disease. Now, in order to compass these primary objects, a systematic series of frequently recorded observations must be made of the quantity and quality of the food actually ingested; of the quantity and quality of the waste excreted, especially by the kidneys; and of the actual body weight. By this means only is it possible to detect those disturbances of metabolism caused by the disease and to refer directly to their cause. We shall be in a position still better to estimate these if we first take a brief survey of the relative and actual values of the various food products at our command. By comparing these with the known physiologic requirements in health, we shall be enabled the most readily to supply those deficiencies caused by the disease, and thus maintain that equilibrium of metabolism upon which all successful management depends.

In physiologic observations it has become the custom to adopt Rubner's suggestion of measuring body energy or force, which results from oxidation changes in the economy, by the unit value of the calorie—or the heat unit. We understand by the word "calorie" the amount of heat necessary to raise one kilogram of water one degree Centigrade. It has been ascertained after careful and repeated investigations that all our food products, through their consumption in the body, produce definite amounts of heat, or the equivalent of this measure in the form of force. By grouping together the various food products in their several chemic groups we shall be able readily to glance at the calorie value of each, and thereby adjust our diet list so as to cover the actual requirements of the economy. For example, it has been found that one gram of albumin, through its conversion into urea, water and carbonic acid, yields approximately four calories of heat or force; that one gram of carbo-hydrate, through its conversion into water and carbonic acids, yields approximately the same, *i.e.*, four calories; that one gram of fat, by its conversion into water and carbonic acid, yields a little over nine calories; and that one gram of alcohol yields about seven calories. With these data before us it is easy enough to establish a diet-ration that will readily maintain the equilibrium of metabolism in a healthy individual, since all we have to do is to furnish him food in quantity and quality such as will represent 2,500 to 3,000 calories. Thus from 100 to 120 grams of albumin, 55 to 70 grams