

through October, November, and December, until January, when a point was attained from which there was little variation in January, and March. In April and May the amount of carbonic acid evolved was yet further increased until the point was reached whence he started. The extreme amount of change observed was a loss of three grains of carbonic acid gas per hour from the commencement of June to Sept.; and the extreme quantities recorded were in May 10.26 grains, and at the lowest period between six and seven grains. The rate of respiration, the quantity of air inspired, and the quantity of carbonic acid exhaled, followed the rule he had explained. It had been proved by several series of experiments that the rate of pulsation was increased by heat—the rapidity of pulsation was the converse of the rate of respiration. With reference to the evolution of nitrogen the conditions were the opposite of those of the elimination of carbonic acid. The general results he had arrived at were, that there was a greater amount of fluid evolved in the summer months than in the winter. The carbonic acid evolved decreased with the increase of temperature. On a sudden increase of temperature there was a large decrease of vital action, and on a fall of temperature there was an increase of vital action. The greatest growth of animals would occur at the period of the year when there was the largest amount of vital action; and in this respect they had connected the animal with the vegetable kingdom. He believed that this was the fact with regard to the growth of children—that they grew at a greater rate in spring than in winter. From facilities which the Registrar-General had afforded him, he had ascertained that a much larger number of those children born at the latter part of summer died within a year of birth than took place amongst those born at other periods of the year. The children born in the winter and spring period were less subject to disease, and in a probability, had stronger constitutions than those born in the summer season. These variations in the increase and decrease of the vital power of the system seemed to him to be the origin of diseases, especially those that were chronic. All epidemics, to a large extent, in whatever part of the world they occurred, took place at the period when the human system was decreasing in vital action. This rule applied to cholera especially, which generally attained its greatest height in June, in October diminished, and in November disappeared."

ADULTERATION OF ARTICLES LIABLE TO DUTY.

—The report of Mr. Phillips, the head of the laboratory department of the Inland Revenue, has just been published for the year ending the 31st of March. He states that the analyses made during the 12 months amounted to nearly 11,000, and that the officers have become so efficient that although some of these analyses had

to be sustained in courts of justice, not a single instance has occurred of any one of them having been shown to be wrong. The articles of which Mr. Phillips specially reports are tobacco, snuff, pepper, coffee, beer and hops, and malt. With regard to tobacco, it is stated, that although it would be absurd to suppose that the smuggling and adulteration of an article subject to a duty of about 700 per cent. upon its cost can be entirely prevented, there is reason to believe that frauds are rare, and that the revenue from this article is comparatively well secured. An inspection of most of the tobacco manufactories in Ireland, and of many of those in England, during the year, has taken place with the discovery of a single practice that could be deemed illicit. Of five adulterated samples purchased, it is to be presumed, of retail dealers, the illicit materials consisting of burdock, clover foot, and cabbage leaves, sugar, common salt, and oil. Of snuff it is stated that owing to great diminution which has taken place during the last four or five years in the adulteration of this article, it has been found necessary to examine only ten samples. Of these, three, which all came from Ireland, proved to have been sophisticated with peat-moss and ground Pineapple Pepper, it is believed, is still extensively sold that the prevalence of the fraud is mainly due to the adulterated state, and Mr. Phillips considers the practices of some wholesale dealers in grinders of the commodity. "The skillful, almost scientific manner in which the pepper was so adulterated," he says, "and the care which is taken to render detection difficult, conviction doubtful, are alone sufficient to point out the source, as it is always easy on analysis to distinguish between the highly-finished article of the wholesale delinquent, and the coarse production of the unscrupulous retailer." Of illicit materials detected in the samples examined during the past year were rice, husks of, and white mustard, sago starch, and the husks of cereals. Coffee also continues to be extensively adulterated, and it is to this that the fall of the consumption not having increased during the last 14 years, in face of a reduction of duty is supposed to be attributable. Chicory is a material almost universally employed, and in the past 12 months numerous samples which had been purchased as pure coffee have been analysed in the laboratory, and found to contain from 30 to 86 per cent. of chicory. From Glasgow and some other towns in Scotland samples which were bought at the rate of 1s. per lb. having been found to contain from 70 per cent., and in one instance 84 per cent. chicory. In samples sold at 1s. 4d. above cost as mixtures of coffee and chicory, there is, it is said, no limit to the proportion of the latter, and instances occur in localities chiefly inhabited by the very poor, where the coffee prove to be composed of it entirely. 6.