support of animal heat are not all similarly composed to flesh, and consist of starch, gum, sugar, &c. Knowing these facts, it becomes a money question as to the value of particular kinds of food for the support of the frame. We know how much of flesh-giving principle each variety of food contains, and therefore we can at once estimate how much of each it will be necessary to consume to obtain one pound of real nutriment, and what the cost of that pound will be to the consumer. The following table is constructed on this principle, but as prices vary in different localities, these may be altered to suit the peculiar case: in the table they are given at the rate at which the respective substances might be purchased in London, under favourable circumstances—

Quantity of food necessary to produce one pound of flesh, and the money-cost of its production.			s.	d.
25 lb. of	milk furnish one pound flesh, and cost	...	3	1
100 "	turnips "	...	2	9
50 "	potatoes "	...	2	1
50 "	carrots "	...	2	1
4 "	butcher's meat, free from fat and bone, furnished one pound of flesh, and cost	...	2	0
9 "	oatmeal "	...	1	10
7 1 10 "	barleymeal "	...	1	2
7 4-10 "	bread "	...	1	2
7 4 10 "	flour "	...	1	2
3½ "	peas "	...	0	7
11 9-10 "	beans "	...	0	6½

In the same way Professor Playfair valued the carbonaceous, or heat-producing portion of food of animals. He adds in a subsequent page—"Let us look at the various kinds of food with reference to their value as fuel, and we shall perceive that the potatoe takes its proper rank. Such a table as the following is, however, a mere rough approximation, for the carbonaceous matter or fuel is of very various kinds, and some of them give more heat than others by their combustion. The table, therefore, must only be taken for as much as it is worth—a rough approximation to truth.

"This table attempts to show the approximative value of various kinds of food fuel to sustain animal heat.

			s.	d.
4 lb. of	potatoes contain 1 lb. of carbonaceous fuel, and cost	...	0	2
10 "	carrots "	...	0	2
1½ "	flour "	...	0	2 8-10
1¼ "	barley meal "	...	0	3
11 1-10 "	turnips "	...	0	3¾
1½ "	oatmeal "	...	0	3¾
1 9-10 "	beans "	...	0	3¾
1 9-10 "	peas "	...	0	3 8-10
2 "	bread "	...	0	3
11 9-10 "	milk "	...	1	5"

The owner of live stock may, we feel assured, often refer with advantage to the results of these laborious examinations into the nature of food, and the varying demands of animals which that food is called upon to satisfy. It is needless to repeat, that practice will often find these things out by a different mode, but the practice of that farmer will assuredly be the most safe and the most profitable who best understands the true objects for which he is striving. That knowledge, by the aid of the chemist is not only rendered more certain, but by his help we are still further advanced; since we not only perceive the nature of the nutriment required, but we further find out the kind of food from which it is for our purpose the most economically obtained.—*Bell's Weekly Messenger.*

PHILOSOPHICAL ESSAYS

(Written for the Irish Farmer's Gazette.)

BY JACOB THOMPSON DUNNE, CULLENAGH, MARYBOROUGH.

ESSAY I.—THE ATMOSPHERE.

"If I were to tell you what I mean by the word *air*, I may say it is that fine matter which we breathe in and breathe out continually, or it is that thin fluid body in which birds fly, a little above the earth; or it is that invisible matter which fills all places near the earth, or which immediately encompasses the globe of earth and water.—Watts' Logic.

Air is a French word, derived from the Greek *aer*, or *aemi*, to breathe. The term *air*, in its common signification, means that compound of aëriform fluids by which our atmosphere is constituted.

The ancient philosophers were very ignorant respecting the nature of air, and so were the modern till chemical experiments unfolded its component parts. Aristotle, *Lib.* 2, *cap* 2, *de Generatione et Corruptione*, defines air as *Elementum calidum et humidum*—that is, *a hot and moist element*; a later writer calls it, *liquidum et siccum, liquid and dry.* Quintus Lucillius Balbus, a noted Stoic philosopher, maintains, *aeram ex respiratione acquarum oriri*—that is, *that air arises from the steam of water.* Cicero, *Lib.* 2, *De Nat. Deor. quasi vapor quiedum, aer nabendus est*—that is, air is to be considered as a kind of vapour. Cartesius asserts, that it consists of very thin filaments, which appear to float in æthereal substance, *ex paribus, longe tenuoribus, quasi filamentis, quæ in ætherea substantia fluitare videntur. Princip. 4 Par N.* 45, *and Institut. Philos. vol.* ii., *c.* 11, *p.* 172. Plutarch and Stobæus quote Aristotle, as maintaining air to have weight. Aristotle himself says, Empedocles was of the same opinion, and that he remarked that its heaviness forced it into our lungs, and caused our respiration; the same were the sentiments of Asclepiades, as we learn from Plutarch.

Among the moderns Galileo, and his disciple, Thoricelli, in 1643, proved the ponderosity of air. Messrs. Pascal and Petit, in France, continued the investigation on the Torricellian principle of the pressure of the air; several experiments confirmed it; and the barometer was invented, which shows by the rising and falling of its contained mercurial fluid, a corresponding change in the density of the atmosphere: at the surface of the earth; the mean density or pressure of the air is equal to the support of a column of quicksilver thirty inches high; the air becomes lighter the higher we ascend in it, so the higher the barometer is taken up the more quick-