We have here, as Mr. Parkes observes, satisfactory evidence that the accession of heat was solely derived from meteorological agency—that is from action on the surface, and not from the substratum, as the latter possesses invariably a lower temperature, which must have tended to diminish, rather than to increase, the heat finally acquired by the worked bed.

It is evident, indeed, from these and other observations, that in the month of June rain-water carries down heat, and raises the temperature of of the subsoil; whilst the loss of heat by the strata nearer the surface is quickly restored by the sun's rays. And another important effect is also observable in all soils properly prepared to receive heat and water, and permit their descent—viz., that the transmission of accessions of heat downwards continues during the afternoon of the day, and throughout the night, whilst the superstrata (but chiefly from 7 inches upwards) are losing some amount of their heat by conduction upwards and radiation. Such is the influence of good and deep drainage and ploughing upon the temperature of the soils thus improved. But the benefit does not end the re; others follow from those operations—advantages which were thus well described by the late Professor Johnston ("Chem.," p. 110): "Vegetable matter becomes of double value in a soil thus dried and filled with atmospheric air. When soaked in water, their vegetable matter decomposes very slowly, or produces acid compounds more or less unwholesome to the plant, and even exerts injurious chemical reactions upon the earthy and saline constituents of the soil. In the presence of the air, on the contrary, this vegetable compound decomposes rapidly; produces carbonic acid gas in large quantity, as well as other compounds on which the plant can live; and even renders the inorganic constituents of the soil more fitted to enter the roots, and thus to supply more rapidly what the several parts of the plants require."

Let us next refer to the *limestone soils of* Yorkshire. Here we have on record the observations of Mr. Charnock, of Holmfield, near Ferrybridge, (*Ibid* vol. x., p. 516) This Journal was kept during the six years from 1842 to 1848. The following table gives a digest of the results obtained in inches:—

	1842.	1843.	1844.	1845.	1846.
The total amount of rain-fall was.....	26.11	24.49	19.0	22.18	25.24
The evaporation from the soil, when saturated with water was.....	30.02	31.19	37.85	31.09	32.28
Ditto when drained....	21.56	20.11	15.40	23.26	18.30
The filtration from the soil, through a drain three feet from the surface, was.....	4.55	4.28	3.60	4.92	6.70

If we examine the clay soil drainage waters, and the effect of their removal from the soil, similar results are obtained.

Mr. J. B. Denton found the temperature of the drained soils, at Hinxworth, at a depth of 18 inches from the surface, was commonly two or three degrees higher than the surrounding atmosphere, and about two degrees higher than that of the undrained soils. One observation of Mr. Denton I have not elsewhere met with. He says, "A remarkable proof of the influence and penetration of atmospheric changes through the soil to the depth of the drains, is seen in the fact that all the outlets discharged an increased quantity of water on the 6th March and 22nd April without any fall of rain on the surface, it being observed on each occasion that a very considerable fall of the barometer had taken place within the previous twenty-four hours."

From the following table constructed by Mr. J. B. Denton, from the results obtained by him in the drainage of the Hinxworth estate of Mr. Clutterbuck, several other useful facts may be gleaned. It shows the rainfall in inches, and in gallons per imperial acre, from Oct., 1, 1856, to May 31, 1857, and how many of these gallons of rain water found their way into the drains from the several outlets. In my abridgment of the tables of Mr. Denton I shall give only the quantities of water delivered from two drain outlets, viz., Nos. 6 and 15—the first delivering the water draining from fields composed of the lower chalk, mixed with clay, gravel, sand, mixed with gault; the last, gault clay, with lime infiltrated.

	Rainfall.		Discharge from Outlets.	
	Inches.	Gallons.	Gallons. No. 7.	Gallons. No. 15.
October.....	1.645	37,215	12,910	—
November.....	1.630	36,872	27,000	303
December.....	1.235	27,935	30,135	5,815
January.....	2.333	52,775	43,885	21,505
February.....	.192	4,345	27,360	9,060
March.....	.620	18,547	8,415	3,310
April.....	1.440	32,566	6,693	6,163
May.....	.750	16.967	4,177	3,413
Total.....	10.015	227,220	160,550	69,931
Difference between the rainfall and the discharge from drains.....			66,670	157,289
			227,220	227,220

The mode of draining both the mixed and clay soils of Hinxworth is thus described by Mr. Denton—

"The mixed open soils were drained by occasional and wide parallel drains (from 4 to 8 feet deep), sufficient to discharge the rainfall and relieve the pressure of subterranean water passing through the soil from the higher grounds to their natural outfalls, at a cost varying from £1 10s. to £3 10s. per acre The drains in this description of soil were reduced to a minimum in number, on the principle that any excess of work beyond that sufficient to remove excess of wetness would be a waste of outlay; whereas in the gault clay soils—which were drained uniformly by a parallel arrangement of drains 25 and 27 feet apart, 4 feet deep, at a cost varying from £5 10s. to £6 10s. per acre—the reverse principle governed the operations, the number of drains being increased to a maximum consistent