cropping, purchased manures ought not to be necessary, except, perhaps, for the raising of root crops, a department of Canadian agriculture that profitably admits of both improvement and extension. When guano, crushed bones, superphosphate of lime, can be got of *good quality* at a moderate price, every improving farmer should more or less avail himself of them for this purpose. And here *quality* of culture, rather than *extent*, should be the primary consideration. By a liberal and judicious system of management, as many turnips, for instance, may be grown upon a single acre, as under a contrary course will be ordinarily produced from two or three. The cost per bushel, therefore, will be found much in favor of high culture. The chief value of root crops consists in their enabling the farmer to sustain a large number of animals in better condition than he otherwise could, and thus adding to his manure heap, on which he must mainly depend for increased returns of hay and grain.

The *dung heap*, therefore, must be considered the Canadian Farmer's sheet anchor, and nothing should be left undone to increase its quantity and improve its quality. The former can only be accomplished by keeping the arable portion of the farm in good heart, thereby producing not only more grain, but a greater amount of hay and straw,—which with a liberal supply of roots, will enable the farmer to keep a larger number of animals, which are to be regarded as manufacturers of manure.

But it is of the latter condition, the *quality* of the manure, that we designed more particularly to speak. In this respect also, there is indeed much room for improvement. During our cold, dry weather in winter, farm-yard manure is not exposed to much waste or deterioation, and it may be put out into the field in separate cart loads, without much risk of loss. Even animal substances we find under these conditions of temperature and moisture run but very slowly into decomposition, and consequently the escape of ammonia into the atmosphere is prevented. The amount of rain too, in our winter months, is not generally so large as to cause much waste of the manure exposed in our yards and heaps, by washing away its saline and soluble portions. The great danger from this cause is in the spring, or the first breaking up of winter, when the rapid thawing of the frozen ground and the sudden conversion of snow into water, accompanied often by heavy rains, may be seen to convert the more valuable portions of farm-yard dung into stagnant pools or running streams, the water of which is so strongly impregnated with saline and organic matter, as to assume a dark brown, and sometimes even an absolutely black color. Now what a lamentable waste is here going on, under our daily observation, and at our very doors! By this repeated drenching of the farm yard and dung heaps, the manure, before it is applied to the crops, is often denuded of one half of its fertilizing power. Now we ask our farmers to prevent this. How is it to be done, some may ask? Much of this waste is owing no doubt to defective arrangements in the farm buildings, which are generally erected, with little regard to any high degree, of not only preserving the manure, but even of the comfort and health of the animals, and the proper economy of their food.

Without asking our farmers to do, what perhaps the majority have neither the means nor inclination of doing—to erase their old buildings, and put up new ones on a better system, (a most desirable and practicable object, however, in some cases,) much can be done towards mitigating the evil complained of, by the exercise of a little ingenuity and forethought. By collecting all refuse matter about the homestead and on the farm, in connection with the bedding of animals, and the litter in the yards, all of which is more or less impregnated and intermixed with the solid and fluid excrements of the cattle; and putting these materials into a heap, so as to ensure a moderate degree of fermentation, covered by absorbing substances, such as half rotted straw or leaves, liberally sprinkled with plaster or charcoal powder; *a much larger quantity of superior manure of home production*, can be obtained on the spot where it is required for application, than is now the case on ninety nine farms out of every hundred. The principal thing is to prevent the heavy rains washing away into the swales and streams the liquid or best portion of the manure. By furnishing buildings with eve-troughs, and making a cheap tank or two, and especially by absorbing with porous substances the liquid matter as it exudes from the heap or yards, thereby preventing its absolute waste; these and other expedients that will naturally suggest themselves to every thoughtful mind, as adapted to special circumstances, would in a few years do wonders in effecting the increase of our crops and herds, and consequently the profits and improvement of Canadian farming.—*Canadian Agriculturist.*

PRODUCTS OF GOOD COWS.

At the last exhibition of the Hampshire Franklin and Hampden (Mass) Agricultural Society, nine milch cows were entered for prizes. We condense from the Transactions of the Society a portion of the statement furnished by the owners of the cows, relative to their products.

1. A. J. Lincoln, Northampton. Cow supposed to be grade Durham. Calved about the middle of March—during month of May, 1859, was fed on cut hay and six quarts corn meal and rye bran, equal parts per day. She gave of milk during this month, 1178¼ lbs, equal to 38 lbs per day. June 1st, she was turned out to pasture, and no extra feed, given—and for the month of June gave 1220½ lbs, equal to 40 2 3 lbs per day. For seven successive days in June, viz., from 10th to 17th, she gave 287 lbs, or 41 lbs per day. For the month of July, she gave 1130 lbs, equal to 36½ lbs, per day. For three months ending July 31st, she gave 3528¾ lbs, equal to 38 1-3 lbs. per day. Milk was sold and no butter made.

2. W. B Hale, Northampton. Grade Durham cow, eight years old. Mr Hale bought her November 25, 1857, two weeks after calving. From this time till June 21, 1859, (when she again calved,) a period of 572 days, she gave 13,056 pounds 3 ounces of uncommonly rich milk, an average daily for the whole time (including 24 days in which she was dry) of 22 lbs. 13 oz., over nine beer quarts or eleven wine quarts. No butter was made—milk sold.

3. E. Fitts, Northampton. Cow seven-eights Durham, 7 years old. Calved January 20, 1859. From 1st to the 10th June, she averaged 21½ quarts milk per day, weighing 53 lbs. Feed—the best of hay and 1 peck of roots per day. From the 10th to the 20th of September she averaged 35 lbs per day—feed, poor pasture and 4 quarts of shorts per day. From the 10th to the 20th of September, was made from her milk 17½ lbs of nice butter.—*Country Gentleman.*

SCIENTIFIC.

ARCHAIA.*

"It is a philosophy which never rests—its law is progress: a point which yesterday was invisible is its goal to day and will be its starting point to morrow."—*Edinburgh Review, No.* 132.

Geology, unlike the fabled Minerva, has not sprang forth in her full proportions at her birth. Half a century has elapsed since Werner, in Germany, and Hutton, in Britain, bent their energies to the reduction of the immense stores of geological facts in their possession to a system. Ridicule, opposition, and persecution attended all their efforts to establish as a true science that which is now regarded as the beautiful twin-sister of Astronomy, and the most fascinating of all scientific studies. But the proportions and harmonies of truth are so certainly discoverable, that where from want of time, and lack of apparatus, one student of nature fails in revealing her beauties, others are invariably found, to conduct the process to its successful termination. Where Copernicus relaxes his studies, Galileo begins his; and where Galileo tires, Newton and La Place with unbridled ardor, begin the scientific race. The dim outlines of the first serve to furnish *material* for the elaborate systems of the last—"and the goal of yesterday becomes the starting point of to day." The science of Geology has met with a similar fate as that of Astronomy. A succession of highly intellectual and learned men, have followed each other consecutively—the outermost edge of the circle swept by the hand of a Hutton, was the point at which a Lyall places his compass,—he forms a new circumference,—a semi-diameter in advance of his predecessor. Miller stands upon that further circumference, and compels his soul to enter the *ne plus ultra* beyond. At that *beyond* Dawson takes his stand; with the errors and successes of his predecessors he perceives his path radiant so far as he has advanced, but all is dark in front. Whether Mr Dawson has continued to increase the light which shines in his rear, or whether he has made the circumference of Miller's discoveries the point of a *new* circle, it will be our business in this paper to discuss.

That the work now before us is one required by the times, no one acquainted with the position now occupied by the science

*Archaia; or studies of the Cosmogony and Natural History of the Hebrew Scriptures. Professor Dawson, L.L. D., F. G. S. Montreal; Dawson & Son. 1860.