THE GLEANER.

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THE GLEANER.

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Composition and Cultivation of Clay Lands.—The earthly substance known as alumina or argil, forms a most important part of the materials of the earth. It exists no where in a pure or uncombined state, and when procured from alum, of which it forms the base, it is a light white powder, very soft and spungy. It is distinguished in a peculiar manner, by forming a tenacious and ductile paste, when mixed and kneaded with water, and whenever it is found in soils to any considerable extent, it imparts to them this quality in an eminent degree.

The substances nearest approaching to pure alumina, are the argillaceous minerals, some of which are among the most beautiful of Creation's gems. A large class of these known as *perfect corundum*, possesses a hardness and density, only inferior to the diamond, and are classed by the lapidary according to their various colors. The red, constitutes the oriental ruby; the blue, the sapphire; the yellow, the topaz; the purple, the amethyst; the green, the emerald; and the yellowish green, the chrysolite. Of these, the sapphire analysed by Klaproth, was found to contain 98 5 of argil, 1 of oxide of iron, and 5 of lime. The ruby afforded 90 of argil, 7 of silex, and 1.2 of iron. Emery, a more extensively diffused mineral, and of general use in the arts, is composed of 86 5 of argil, 3 of silex, and 4 of iron. Mica, an invariable constituent of granite, has 30 to 35 per cent of alumina; and hornblende, which combined with feldspar and quartz, constitutes sienite, has 12 to 14 per cent. Basalt, forming an extensive mass of rocks, has 16 per cent of alumina; clinkstone and wacke have a large proportion; argillaceous slate, extensively disseminated, has 26 per cent; and whet slate, or honestone, of a splintery character; and drawing slate used as tiles; alum slate, from which alum is extracted; and bituminous shale, each contain large quantities.

In the disintegrated form in which alumina exists in combination with other earths, *porcelain clay* contains a greater amount than any other substance; Wedgewood having found it in Cornwall, England, to contain 60, combined with 20 of silex. Generally however, it has not over 42 to 48 with silex 52 to 58. The strongest agricultural or pipe clay, consists, according to Johnstone, of 36 to 40 of alumina, with 53 to 56 of silex, 3 or 4 of oxide of iron, and a trace of lime. This is generally called pure lime. The constituents of which it is composed are *chemically* united in most cases; that is, so combined that they cannot be separated by washing or other mechanical means.

The strongest clay soils, which brings us to the practical part of our subject, consists of the last mentioned clay, with 5 to 15 per cent of silecious sand, *mechanically* mixed, which admits of separation by boiling, when the sand settles, and the clay, which remains suspended in the water, may be poured off. A *clay loam* has a still larger proportion of sand, 15 to 30 per cent., which can be separated as above, and which renders the soil more loose and friable. A *loamy soil* has 30 to 60 per cent of sand; a *sandy loam* 60 to 90 per cent; while a *sandy soil* has not over 10 per cent of pure clay, contains only 36 to 40 per cent of alumina.

The distinguished characteristics of clay soil in an agricultural point of view, are their great tenacity, which renders their separation by the plow and other implements, more difficult than such as have a larger proportion of sand; and when so divided, they do not crumble and separate into minute particles, except under peculiar circumstances. They have a strong affinity for water, holding it in great excess after rains; and their texture is such, as to prevent the easy escape of the surplus, so desirable, and even necessary, to the most successful cultivation and growth of vegetable life. These are objections that attach to all clay soils, in their unimproved condition. They are inherent in their nature, and inseparable from their constitution, wherever found, and however existing. These deficiencies are still further augmented when they occupy a level position, as many of them do. To rid them of their surplus water is the great object to be accomplished, and if this be effectually done, all other difficulties vanish. In Scotland and England, where they have a large proportion of this kind of land, which is more highly esteemed than any other, for wheat and other of the most valuable crops, they have, as is well known, adopted to a considerable extent, adopted a system of thorough under draining. We have received in the last No. of the London Farmer's Magazine, the details of this system, from Mr Smith, of Deanston, which we shall give at length hereafter, if we can find room, as containing the latest and fullest intelligence on this most important practice; and, for the present, content ourselves with extracting from the Journal of the Royal Agricultural Society the details of an effectual system of draining, so cheap as to be within the reach of all where the materials are to be had conveniently. They are from the pen of Rev. G. V. Holcomb. He says:

The land is drained with dried turf, procured for the purpose from the fens, similar in appearance to what used to be consumed instead of coal in the cottages; the length varies from 12 to 16 inches, according to the goodness of its quality, some being more brittle and more easily broken in carriage than others; the width and depth of the best turves is about three inches; the retail price is now 7s per thousand; 4 horses in a waggon easily bring 3000. Supposing the drain to be a rod, *i. e.* 5 1-2 yards, asunder, the usual distance, 2000 turves amply suffice for one acre of land; the durability of the drainage depends upon the soundness of the clay, the depth in the earth at which the soil is buried, and the goodness of turf, which varies in different parts of the fen. I have myself been a tile maker for my own consumption, and used many thousands, but after twenty years of practical experience of tile and turf, prefer the latter; it is two thirds cheaper than tiles, and, where sheep folds are set, not so liable to have the drains broken in, the turf giving way to the drift, whereas the tile breaks and the earth follows. I now cut across the old tile drains to make turf ones in opposite directions, and deeper in the ground. The tile drains are frequently found to be destroyed—rats, rabbits, moles, or narrow wheeled carriages passing over them, are all injurious. Turf is found to be sound which has been laid sixteen years, but it pays well to renovate the drains every 8 seasons. The *shape* of the drains corresponds with the turf. I send a slight sketch. The first operation is with a double breasted plow, which makes a deep impression in the land; the laborer then takes a shovel to clear out the loose earth; afterwards he uses the spade; lastly he uses the land ditch tool, with which the lower part of the drain is excavated to the depth of 12 inches more; the width of this aperture is about 3 inches at the top, and is gradually reduced by the shape of the implement to one at the bottom. The drain is perfectly cleared by a drawing tool or hoe. The turf is then pressed into the drain by the foot to its depth, which is about three inches, leaving an open course for the water of about 9 inches deep underneath; when expanded by moisture, with the earth filled in open, it will bear any weight of horse or cart. The party of men who undertake the job, generally carry to the field a small iron drift, with which they break or remove any stone that may interrupt the spade; if a large one they dig it out, filling the space with clay out of which the drain is formed for the turf. —A little boy or girl, from six to eight years old, commonly attends each drainer, with a tin mug, often an old powder tin, attached by a bit of string to the end of a stick, and filled frequently with water out of a pail, with which the child follows the spade, and by pouring it out when necessary, loosens any stiff piece of clay or earth; when not wanted, the boy shovels out the moulds, previous to the operation of the spade, or collects the stones cast out, for which he is paid per load. The price of draining varies from 3s 6d to 5s per score rod, including boy's wages; a good hand will execute 14 rods, some more in the day. Sometimes 2, or even 3, spades' depth is taken out to get a proper level, or to penetrate the clay, when the price of course rises in proportion. If the shoulders of the drain give way in a gravelly or gaulty place, bushes or stubble are placed under the turf, which is doubled to fill a larger aperture.'

According to the above plan, having the drains within one rod of each other, there will be required 160 rods of ditch or drain on an acre, and this at the above highest estimate costs 5s for every 20 rods, or 40s per acre, or a little exceeding $9. If we double this amount, to cover the extra price of labour in this country, for the cost of this species of draining, we have less than $20, as the expense of putting an impracticable, clay soil, in a condition of yielding for 20 years or more, the greatest quantity of produce, with much less preparation than is now required. This surely is a system which will justify adopting, whenever lands are so valuable as to render a moderate augmentation of their products an object.—We are not advised of the increased value of thorough drained clay lands in this country; but though our hotter summer and drier atmosphere would probably render the difference effected by draining much less here than in England, yet there is no doubt, that the increase in crops and saving of labor must be very great. —Till we have details of the effect of such draining in this country, it would be presumptuous to state, at what price per acre this improvement would be justified. The value of an 18 years' of land, before draining, was estimated by Mr Smith at less than £6, while the same lease, after thorough draining, is estimated by him to be worth more than £64; or even ten to one in favor of the land which has been drained. Such results, which have been experienced in Great Britain, will warrant ample trials among the intelligent Agriculturists of America. We shall be most happy to receive, and give publicity to any well conducted, and accurately noted experiments made in this country, if any such exist.

(To be concluded.]

From the New England Farmer.

Winter Reading.—It is happy for all—farmers as well as others—if they have a taste for reading. The instruction and enjoyment which books may afford, are great and beneficial. He who reads the opinions and experiments of others, engaged in the same calling to which he devotes his time, may get many valuable lessons and hints. None can do this to greater exent than tillers of the soil. It would contribute to the intelligence, happiness and success of most farmers, were they to spend more of their leisure moments than they do, in reading what has been written in regard to their own pursuit. We know that with many of them reading is no very easy or fascinating operation. We do not mean that they have not leaned to read readily—that when they sit down by the warm fire with the book or paper in their hands, they are very apt to fall asleep. It is often said that the long winter evenings afford farmers fine oportunities for reading; and so they do—but their active habits during the day: and their exposure to the cold, make the most of them excessively drowsy as soon as they get comfortably seated and well warmed by the kitchen fire.

But few book's or papers then have interest enough to keep them awake. The full effects of their habits of life upon them in this respect can be known only by those who have passed some winters in the out door work of the farm, and others in sedentary pursuits. Probably there are great differences in the susceptibilities of different constitutions to action of this kind. One case will not make a rule: but we have had some observation as as well as experience; and both tell us that the farmers habits during winter days, make it dificult for to read long with any comfort in the evening.