ciples that are now our guide: he it was who pointed out the similar appearance of the epidermis of reeds, corn, and grasses, and showed that they contained much silex. He burned them carefully and analised their ashes, and found that they contained the silex in rather a larger proportion than the canes.

All corn and grasses contain sufficient potash or soda to form glass with their ashes; hence, a corn or hay-stack, when burnt, gives the appearance of masses of black glass, in all those positions where the air had been in some measure excluded.

Globules of glass have been made with the straw of corn.

The experiments that have been instituted have fully convinced us of the necessity of there being a proper proportion of silica, and of potash or soda, in all soils. A white glass sand, being merely particles of abraded quartz, would not be so efficacious for vegetation, as a sand with a colour, because that colour is likely to be caused by the oxide of a metal in union with an alkali.

In the French Academy of Science, papers have been read recommending the use of sand as a dressing to arable land, on the ground that the silicious principle is the most predominating earth in all good land. M. Chaptel found more than half silicious matter in a fertile soil on the banks of the Loire. Gisbert found 79 per cent. in the most productive lands near Turin. Sir H. Davy found 89 per cent. of sand in the best barley and turnip soil, at Holk-ham, Norfolk. Liebig found 64 per cent. in a soil that had produced 70 crops of corn without manure.

The fertility of a soil consists of a happy mixture of earths, of which silex should constitute about three-fourths; beyond this proportion its capabilities for the production of certain vegetables, much depend on minute properties—admixture of acids and alkalies; but a light soil will, with little aid of the surface movement, enable the air and water to reach the roots of plants; these necessary and universal foods must reach the extremities of the roots: a continual movement of the surface assists this object—the oxygen of the air and water being as necessary for the success of plants, as it is at the first germination of seed.

On many occasions I have pointed out the fact, that barley and oats, in their straw, take the largest proportion of silex from the soil. Sprengel, in his analysis of straws of the cereals, has given us the following proportions:—oat straw, 4,588 lbs. out of 5,740 lbs. of fixed ingredient. Barley straw, 3,856 out of 5,244 lbs. fixed matters. Wheat straw, 2,870 out of 3,518 lbs. and of rye, 2,297 lbs. from 2,793 lbs. of fixed matters. Next to these cereals come the pea straw, which has 996 lbs. of silex from 4,971 lbs. of fixed matters. Thus it would appear that those crops succeed best is a very silicious soil, which take of the largest proportion of silicious matters: thus oats and peas are the best for such soils.

It is also found to agree with practice that, as all bearded corn require much silex, so will bearded wheat, barley, and rye, prosper best in such soils.

It is a good practice in light soils, after the surface has been prepared fit for the seed, that a press drill be used to form the seams for the grain to fall into; this gives a firm hold for the first rootlets, as they cannot well vegetate in cave like cavities; and after the seeding, a harrowing and a light rolling completes the work. But if rain succeeds immediately after the rolling, this latter process had better be omitted, for a light soil is apt to get too close on the surface, and prevent the admission of air to the germination. The advantages of press-drilling and rolling can only be for the breakage of clods, and for the keeping in the moisture—preventing the sun's rays from absorbing the moisture too rapidly. After the roots have got well set in the ground, hoeing should be attented to, for the purpose of admitting air and moisture to the splongets of the roots; thus would the aqueous flow, after a hot day, pass to the roots: and this always occurs if the nights are cloudless.

A deep hoeing can always proceed with success in all light soils, which are also best calculated for all horse-hoe husbandry processes. A light soil is also best calculated for spade cultivation, and for all wide drill cropping, enabling the cultivator to be continually working between the rows, admitting the oxygen of the air to the roots.

Dibbling and drilling seed, transplanting any of the brassica tribe, is best executed in a light soil. The more distinct the roots of corn, or any vegetation, is placed, the more uniform will be the crop, the more will they generally ripen together;—each root would then have its own share of food from the earth and from the air; thus situated they would not rob each other; crowded roots become barren from their contest for mastery—the most healthy will get the greatest share.

Corn that it set close and in a poor soil, will be ill corned and spindling; the roots has to go deeper for nourishment, and a continued contest will be the result if a sufficiency of air and light are not allowed to each plant and root.

To show the advantages of a light open soil, I need only refer to the fact brought to light by Professor Liebig,—that each shower of rain brings down with it the fertilising material of carbonate of ammonia; hence the necessity of the surface being kept in an open state, to receive these bounteous gifts of Providence. On this head, I cannot quote from a better or more recent authority than that of *Morton's Cyclopedia of Agriculture*, under the head of *Atmosphere*. —"Another important constituent is carbonate of ammonia; the presence of which in the air had long been suspected, but has only recently been proved. Rain water, which washes the