# Rural Architecture.

## Notes on Building.

The art of building is usually divided into two parts—the art of construction, and the art of so designing the building that it shall please the eye, or be beautiful Of course, the former division of the art is the most important, especially in those buildings which are erected entirely for trading purposes, but as nations advanced by trade or conquest into wealth, so they always appear to have more and more embellished their buildings until they became simply masses of ornament, and so ran into extremes, which true art always avoids. It is not, however, our object to direct attention to those principles which govern the art of beautifying a building but rather, as being more generally useful, to give hints from time to time by which some of the fundamental principles of the art of construction may become properly understood. Now, the true art of construction may be defined to be the skill to take the best advantage of those materials which Providence has created for our use, and in order to enable us to do this, we must look carefully into the nature of those materials, for such as the atoms are so is the whole. Thus in wood the small fibres which comprise its substance are elongated, whereas in stone they approach the form of a globe, and wood is comparatively light and stone comparatively heavy. Now these properties at once fix the positions of both these materials in a building—the one as the [illegible], the other is the carried and for covering over the space enclosed by the former; and all attempts to use either material for a purpose which nature did not intend it, are contrary to sound principles of construction, and involve extravagance in the long run. Thus a piece of wood placed upright in the ground as a support to a building—a frame house, in fact—can only be accounted a temporary arrangement, as it is not fitted to stand the various changes by which it may be surrounded. The alternate wet and heat to which it is exposed at the point of contact with the earth soon causes it to decay, although the same piece of timber, if placed on a floor or roof, would have remained sound for ages. Now, if we were to calculate how many times we should require to renew a post thus placed, and liable to decay during the time that a stone or brick wall would stand, it would be seen that it is extravagant to use it in such a position; and so with a stone if used as a lintel, in which position an unequal settlement of the building or an accidental blow are able to destroy it. It will thus be seen that the technical knowledge of the builder and carpenter is founded (if correct, which it is not invariably) on a knowledge of the nature of the material to be used. But it often happens that there is a choice of materials within reach of the builder which, from ignorance of the nature of those materials, he is unable to make use of. Sometimes material is dug out of foundations and carted away which would have served to build the walls with For instance, a stiff clay, in a country such as Canada, with abundance of fuel, can easily be burnt into a hard brick substance very suitable for one of the materials for making into concrete. The writer has seen in the Old Country such clay thus burnt into a material for the farm roads, for which it is very suitable, though not so suitable as for mixing with lime and sand to form concrete, because it is scarcely hard enough for roads but quite hard enough to stand all the weight that is usually put on to it in the walls of a building But enough has been advanced to show that even in an art which is usually believed to be thoroughly understood it is proper not to be quite certain that no improvements can be made, while at the same time, even if not profitable in a money point of view, it is as well to understand the reason why such and such a material is proper for such and such a purpose. With this view, we intend to give a few articles from time to time on the nature of the various building materials, and to show how, when and where they should be employed

## Hygiene of Dwellings.

Remarkable testimony as to the permeability of the ground, and of the foundation of our houses, has been given by gas emanations into houses which had no gas laid on I know cases where persons were poisoned and killed by gas which had to travel for twenty feet under the street, and then through the foundation, cellar-vaults, and flooring of the ground-floor rooms As these kinds of accidents happen only in winter, they have been brought forward as a proof that the frozen soil did not allow the gas to escape straight upwards, but drove it into the house I have told you already why I take frozen soil to be not more air-tight than when not frozen. In such cases the penetration of gas into the houses is facilitated by the current in the ground-air caused by the house. The house being warmer inside than the external air, acts like a heated chimney on its surroundings, and chiefly on the ground upon which it stands and the air therein, which we will call the ground air

The movement of gas through the ground into the house may give no warning that the ground air is in continual intercourse with our house, and may become the introducer of many kinds of lodgers. These lodgers may be either found out, or cause injury at once, like gas; or they may, without betraying their presence in any way, become enemies, or associate themselves with other elements, and increase their activity The evil resulting therefrom continues till the store of these creatures of the ground air is consumed Our senses may remain unaware of noxious things which we take in, in one shape or another, through air, water or food. According to Pettenkofer, the air in our houses becomes unwholesome when the carbonic acid in it, provided it be derived from the respiration of animals, rises from the normal proportion of four parts in 10,000 to one part in 10,000. The experiments of Dr. Angus Smith and Dr. Hammond have shown that the organic matter in the air, which increases in proportion to the amount of carbonic acid, is by far a more deadly impurity than the gas —*Sanitarian.*

# Agricultural Implements.

## Transmission of Power by Wire Ropes.

At a meeting of the Institution of Mechanical Engineers, London, Mr. Morrison described the mode of transmission introduced by the Bros. Hirn, and now extensively used on the Upper Rhine. It appeared that they first used flat metallic bands to transmit the power; but these being found objectionable, round wire rope was subsequently adopted instead. The rope is usually made of fine steel wire, as it must be very tough and flexible. The wire rope, which is about one inch in diameter, and contains 72 strands, is run at a high velocity, over pulleys of large diameter. The total loss of power by friction, etc., was stated to be 2½ per cent., and it appeared that of 120 horse-power existing at the motor wheel, 100 horse-power was utilized at 2,200 yards distance; but it could not be elicited in the discussion how these figures had been arrived at. It was also estimated that iron shafting, capable of transmitting the same power, would involve the use of 3,000 tons of material Various materials were tried for facing the grooves of the pulleys, such as copper, leather, etc., as there either was excessive wear in the groove, or the facing destroyed the rope. The best arrangement was found to be a dovetail groove, filled in with gutta-percha, in which the rope soon made a channel for itself, after which the wear was not excessive. The pulleys run at the rate of 50 miles per hour, and the ropes last from one and a-half to two years.

Dr. Siemens remarked that there was no doubt that, by running ropes from 30 to 60 miles per hour over pulleys, a large amount of power could be transmitted with but little waste

Mr. Wm. Smith said that in 1837, soon after his father had invented wire rope, it was used very similarly, and in 1839 and 1840 it was introduced on the Regent's Canal, for towing barges through the tunnel beneath the Harrow Road, and it was also taken three and a-half or four miles along the bank of the canal The bargeman simply threw a catch line over the running wire, and let go when necessary It was tested against the screw, duck-foot propeller and others, but was not found to be economic. He had many times seen a similar application of the principle; the fly rope of an ordinary ropery was an illustration, but that had long since been obsolete. He would like to know whether the paper claimed, as a novelty, the introduction of endless wire ropes for transmitting power to a distance, if so, he doubted whether the claim could be substantiated. If the novelty merely consisted in the running of the ropes at a high velocity, which was all he could see in it, there might be something in the claim.—*Rural Press*

## A Natural Hygrometer.

A plan of measuring the humidity of the atmosphere by means of oats, either the wild or cultivated, is thus given by a French scientist, M. H. De Labouchere:—

The grain of the common oat of agriculture, and also of the wild oat, is surmounted by a helicoidal barb, which is terminated by a right-angled elbow. Let one of these grains at maturity be cut in half, and the upper half be attached by means of glue to the centre of a circle marked upon the plane surface of a piece of wood or metal. To the extremity of the barb may be attached a fine piece of straw, which will serve as a needle, and amplify the indications. To graduate this simple little instrument, place it in very hot air, and mark 0 at the point indicated by the needle; then place it in an atmosphere saturated with humidity by means of wet cloths, and mark the point indicated by the needle 100, and divide the interval between 0 and 100 into one hundred equal parts. The straw needle may be made of considerable length so as to give its indications clearly. Such a hygrometer costs but little, and is always comparable with itself

Farm Machines.—The *World* says: Knowledge of machinery is becoming one of the most important requisites in a farmer or a farmer's help. No machine should go upon any farm without the farmer comprehending it in all its parts, the requirement and relation of each part to the other, how to adjust and care for it, how to remedy difficulties that may arise, and keep the whole machine in proper working condition without the aid of a machinist, unless in exceptional circumstances. It should be the first duty of the hired help to learn the same lesson, if he is to be intrusted with the machine's use. This is urged as a matter of economy. It is frequently the case that a non-observant farmer loses the time of his men and his own, besides making a bill at the blacksmith's or machinist's, when a little gumption and ten minutes' time properly applied would have saved all loss.

Mowing and Reaping Machines.—English inventors appear to be working very vigorously to perfect existing agricultural implements, as well as introduce new forms. The features of a new machine consist, first, in so adjusting the draught pole and driver's seat according to the nature of the crop or the weight of the driver, as not to cause any undue weight to bear on the horses' necks while working, which is accomplished by having slotted holes in that part of the frame to which the draught pole is attached, so that the draught pole, together with the hole of the apparatus for carrying the driver, may be shifted forward or backward and thus be in a proper balance for the easy working of the horses: Secondly, in a method of adjusting the cutters and fingers so as to point up or down, as the nature of the crop to be operated upon may require, by using a lever or link upon the gear frame, to adjust its angle to the draught pole. A new English patent consists in the addition, to any ordinary reaping and mowing machine, of a second or under set of the usual knives or cutters, which may be made stationary by fixing them to the finger bar, or other suitable bar, or be actuated by an extra crank and connecting rod for the purpose.