

Scientific.

WAVES.

Nearly the whole sea is, four-times a day, subject to a change in its level by the movement of the tides. The motion produced by the winds, and known by the name of waves, is much less regular. The wind, striking the surface of the sea in an oblique direction, pushes some of the water on the surface over that which is contiguous to it, and thus raises it above the common level, until so much water is accumulated that the wind is unable to maintain it in that position, and it falls down. Each wave presents a gently ascending surface to the windward, and a particular descent leeward. The elevation of the waves varies according to the strength of the wind. A rather heavy gale raises them from six to eight feet above the common sea level; but in very strong gales they attain an elevation of thirty feet. This motion of the surface of the sea is not perceptible to a great depth. In the strongest gales it is supposed not to extend beyond seventy-two feet below the surface; and at a depth of ninety feet, the sea is perfectly still. The form and even the size of the waves vary according to the depth and extent of the sea. In shallow water, where the lower part of the waves approaches the bottom, and meets with resistance, the waves are abrupt and irregular, and this is also the case in confined seas; whilst on the open ocean they are wide and long, and rise and fall with great regularity. When the waves run to a slow shore, the slope of the ground breaks their force, and they terminate in a tranquil manner; but when they are impelled against an elevated rocky coast, being repelled by the rock, they produce what is called a surf. This evident rising of the sea on a rocky coast, sometimes attains an elevation of an hundred feet above the sea level. The surf is always dangerous to pass, except in boats of a peculiar construction. The waves do not subside simultaneously with the wind. The sea continues in its agitated state for many hours. The air being little agitated, or not at all, is unable to depress the undulations of the sea, and therefore the waves during a calm after a gale rise higher, and their most elevated part forms a more acute angle than during the gale. Such a state of the sea is called a hollow sea.

Chemical Appliances to Industry.

Dr. Playfair, speaking of chemical appliances to industry, as a characteristic of advancing civilization, remarks:—European nations, as they increase in wants, examine every material to see if it be adapted to their ministrations; they observe and investigate the phenomena and properties of each body, so as to ascertain how far it may be subservient to their desires. In these investigations, Chemistry offers vital aid; she, like a prudent housewife, economises every scrap. The horse-shoe nails, dropped in the streets during the daily traffic, are carefully collected by her, and reappear in the form of swords and guns. The clippings of the travelling tinker, are mixed with the parings of horses' hoofs from the smithy, or the cast-off woollen garments of the poorest inhabitants of a sister isle, and soon afterwards, in the form of dyes of the brightest blue, grace the dress of courtly dames. The main ingredient of the ink with which I now write was possibly once part of the broken hoop of an old beer-barrel. The bones of dead animals yield the chief constituent of lucifer matches. The dregs of port wine, carefully rejected by the port-wine drinker in decanting his favourite beverage, are taken by him in the morning in the form of Seidlitz powders, to remove the effects of his debauch. The offal of the streets and the washings of coal-gas reappear carefully preserved in the lady's smelling-bottle, or are used by her to flavour blancmanges for her friends. This economy of the Chemistry of Art is only in imitation of what we observe in the Chemistry of Nature. Animals live and die: their dead bodies, passing into putridity, escape into the atmosphere, whence plants again mould them into forms of organic life; and these plants, actually consisting of a past generation of ancestors, form our present food.

Electric Phenomena.

At a recent sitting of the French Academy, M. Biot communicated the following interesting account of some very curious electric phenomena in Paris. The circumstances were brought before him by a young gentle-

man who was the subject of the phenomena, and in whose veracity he has the greatest confidence. "I was walking home," says the latter, "on the evening of the 17th of May, when, an extremely loud thunder clap, occurred. I had not advanced fifty paces when a second thunder-clap, accompanied by lightning and rain, caused me to run. Instantaneously I perceived myself to be enveloped by so powerful a light that my eyes ached considerably, and at the same moment my hat was hurled from my head, although there was not a breath of wind. The pain in my eyes became so great that I was apprehensive of being struck blind; but the rain which now fell in torrents on my head recovered me very quickly from a state of bewilderment, which may have lasted seven or eight seconds, and I perceived that my eyesight was unimpaired. On going to bed I took out my watch, and I became then aware that the electric fluid had passed through the left pocket of my waistcoat. The chain to which my watch was attached was not damaged, but the swivel was destroyed. A gold ring, containing several trinkets, was severed in five places, and the watch-key, which was made of steel plated with gold, was carried away, but the gold plating remained perfect. A small silver pocket compass had its poles inverted. In the morning, happening to wind up my watch, I found that the works were in order, and that the effect of the electric fluid upon them seemed to be limited to causing the main spring to run down. In the same pocket with my watch were a small medallion, in Berlin iron, circled with gold, and a small gold key; these had disappeared, through the hole in my waistcoat pocket. As for myself, I felt no other inconvenience than a stiffness in my spine, such as might result from severe physical labours, but neither my skin nor my clothes, with the exception of my waistcoat, showed any sign of the electric fluid. During my residence in Spain, I contracted the habit of wearing over my shirt and under my waistcoat, a sash of red silk wound five or six times round my waist. May not this silk sash have acted as an insulator? My money, which was in a purse in my trousers pocket on the same side as my watch, was untouched."—*Athenaeum*.

The Farm.

From the New England Farmer.

ANALOGIES—WEEDS AND HABITS.

Some years ago, a Scotch emigrant to Van Dieman's Land carried with him to that distant colony a package of thistle-seed. The thistle, our readers are aware, is the national emblem of Scotland, as the rose is of England, and the shamrock of Ireland; and when the honest Caledonian and his friends saw this familiar flower of their native land blooming around their new homes, they almost wept for joy over the recollection it brought to their hearts of their fatherland. "The seed," says a colonist, "was liberally supplied to friends far and near, and soon the down was seen soaring over the hills of Tasmania, bearing the seed in its flight, and the thistle was no longer a stranger in this our adopted country. But, mark the result! The thistle soon manifested himself an usurper, and took possession of the soil to the exclusion of the native grasses and herbs. In a few years the colonists began to take the alarm. Large paddocks were overgrown with the pernicious weed, and not only was the pasture land destroyed, but, in some cases, the land became inaccessible to man or beast, and in autumn the seeds mount in the air, looking like snow, and I have seen the grass perfectly white with the down. The mischief is irreparable, and the thistle will never be extinguished in Van Dieman's Land, while the curse pronounced upon the land for Adam's sake is inflicted."

Among the innumerable analogies that may be traced between the phenomena of the natural and of the moral world, there are few more perfect or more instructive, than that which may be shown to exist between the weeds of the field and garden, and the bad habits, the weeds of the heart.

1. Both commence on a small scale. The Scotchman's little paper of thistle-seeds was sufficient to overrun an island as large as England with the noxious weeds. So the little mischievous seed which a man sows in his heart, will bear a crop of weeds out of all proportion to the original germ.

2. Again, both weeds and bad habits mature and multiply without cultivation. What-

ever is valuable, must be reared with more or less of care and labor; but these natural and moral pests ask only to be let alone. Neglect is the only care they require. Do nothing, and you do all that they ask.

3. They are both lusty and hardy. They are not apt to be nipped by early or late frosts, or scorched by fiery suns. They are the last things to be drowned out in a flood, or to dry up in a drought. Give them a foothold in the soil, and the smallest possible chance of life, and they will take care of themselves.

4. They are both amazingly prolific. It has been said that a single plant of the weed, called "sow thistle" will produce over eleven thousand seeds. We will not venture to calculate how many mischievous seeds may spring from a single weed in the heart, but we know that such things are very prolific.

5. Both are costly and destructive. Though no toil is required to rear a crop of weeds, they eat up the goodness of the soil, and deprive those plants which are valuable of their proportion of nourishment. It has been estimated that a single weed—the red root—has occasioned greater loss in some countries than if every dwelling-house had been consumed by fire. One of our contemporaries, on the supposition that each farm in the United States produces on an average three tons of weeds annually, calculates that the aggregate crop would be enough to load a continued train of farm wagons three thousand miles long—or twenty thousand canal boats—or, more than ten times all the whale ships belonging to the country—with this useless herbage. Who will venture to estimate the cost, even in dollars and cents, of the bad habits of our countrymen? But no money valuation, however large, can approximate to the real loss sustained from this cause.

6. Again, if suffered to remain long in the ground, they both became very difficult to extirpate. If you would eradicate a noxious plant, you must take it in hand at an early stage. If you wait till its seeds are wafted to every corner of the field, and its roots have spread deep and wide, it will mock your efforts to exterminate it. You may cut it down, or pluck it up; you may burn it, or bury it; you may fight it manfully and patiently; but while you are subduing it in one spot, it will spring up afresh in another, to mock your labors, and vex your soul. So it is with a heart long overgrown with the weeds of bad habits. What a long, and stern, and sorrowful struggle will it require, to reclaim that dreary waste, to make it again to blossom as a garden! True, terribly true, is the record which declares that it is as difficult for those to do good that are accustomed to do evil, as for the Ethiopian to make white his dusky hue, or the leopard to change his spotted skin. Southey has pictured this struggle with confirmed bad habits with great vividness in the following lines, with which we close this sober, though not unseasonable, homily:

For from his shoulders grew
Two snakes of monstrous size,
Which ever at his head
Aimed their rapacious teeth,
To satiate raving hunger with his brain.
He, in the eternal conflict, oft would seize
Their swelling necks, and in his giant grasp
Bruise them, and rend their flesh with bloody nails,
And howl for agony;
Feeling the pangs he gave; for of himself
Co-sentient and inseparable parts
The snake tortures grew."

Intellectual Improvement among Farmers.

The advantages of intellectual improvement among farmers, are (some of them at least) as follows:

1st. The sounder the root, the more vigorous is the tree; the firmer the foundation, the more steady the building; the purer the fountain, the clearer the stream. The improvement of the agricultural mind strengthens this root, consolidates this foundation, purifies this fountain. Hence the whole nation is benefitted.

2d. The improvement of taste in the fine arts, developed in landscape gardening, architecture, &c., will beautify the country, draw closer the cords of patriotism around every heart, and exalt and purify the feelings connected with our native land.

3d. It will greatly increase the respect with which the American character is regarded abroad.

4th. It will have a moderating effect on political contentions, when the public mind is less liable to imposition; more determined on having men of integrity and worth to represent it in our national assemblies; and better capable to judge of that worth.

5th. Prejudice, that mighty opponent of all

reason, improvement and truth, will be in a great measure abated.

6th. Sound literature will be circulated and read to a greater degree than has yet been attained, instead of the poisoning trash now so widely disseminated.

7th. We shall have a national literature.

I now proceed to show the perfect possibility of carrying out this improvement of the agricultural mind; and what I have to say will be applicable to every farmer in the land, and involves the highest and most precious interests of our beloved country.

The soul of all success in any business is method. What would become of the merchant if his day-book and ledger were not kept with the most methodical accuracy? What would befall the banker, the tradesman, or the scholar, if all their operations were not conducted by the same regular processes? And what hint is so powerfully suggested to the farmer, as this very method, by her with whom he holds constant communion—dame Nature herself? The seasons, spring and summer, autumn and winter, roll round in an eternally regular succession. The seed germinates, the blade appears, the ear, the blossom, and the grain—each in its turn, succeed the other by the same unvarying method. Animals are brought forth, nourished and matured by the same unchanging law. The rain and sunshine, the frost and the dew, the storm and the calm, are always punctual in their season. Why therefore should the farmer, in the midst of all this regularity, be the only thoughtless, irregular, confused being existent? Why, on the contrary, may not all his operations be conducted by a fixed plan from year to year; his farm be laid out in a regular number of fields, in which a regular rotation of crops may follow one another in a regular order; his time and that of his laborers disposed of according to a regular system; his family and household operations conducted by the same regular method from day to day? All this planning may be done with an immense saving of time and thought, compared with the usual rambling, shambling way of doing business; and when once it is settled there is no more thought about it. All is as regular as clock-work.—*Albany Cultivator*.

Fattening Cattle in Stalls and in Sheds.

An experiment has been made in Scotland to try the comparative value of these two modes of fattening cattle. Ten animals having been chosen, were divided as equally as possible; five were put in a sheltered court with plenty of shed room, and the others into boxes. At the beginning of October it was soon found that those in the court eat 134 lbs. per day, while those in the boxes eat only 112 lbs., or 22 lbs. less, thus proving that a certain degree of warmth is equivalent to food. After seven months, toward the end of April, they were all slaughtered, and the following results were found:—

Cattle fed in boxes . . Beef . . 3,262 lbs. Tallow . . 6,678 lbs.
Cattle fed in courts . . Beef . . 3,416 lbs. Tallow . . 6,054 lbs.

These results show the superiority of feeding in boxes. It is thought that in a less mild winter they would have been more striking. In the course of the experiment the thermometer rose to 50 degrees, and the cattle under cover seemed to suffer from being too warm. It was found a trifling expense to comb them regularly, which speedily produced a very marked improvement.—*N. Y. Tribune*.

VARNISH FOR BOOTS AND SHOES.—Take a pint of linseed oil, with half a pound of mutton suet, six or eight ounces of bees-wax, and a small piece of resin. Boil all these in a pipkin, and let the liquid cool, till it is milk warm. Then with a hair brush lay it on new boots or shoes. If old boots are to be varnished, the mixture is to be laid on when the leather is perfectly dry.

The soles of boots for wet weather should always be kept saturated thoroughly with tallow, mixed with a little resin, or with the above composition. In either case, the leather must be dry before it will absorb the oily matter. You can have your choice, to fill the pores of the leather with water or grease. When one has possession, the other "can't come in."

ARTIFICIAL ICE.—Mix four ounces of nitrate of ammonia and four ounces of subcarbonate of sodium with four ounces of water, in a tin vessel, and in three hours the mixture will produce ten ounces of ice.