Scientific.

Lord Rosse's Discovaries of Starry Firmaments.

As Professor Nichol very truly remarks, "investigation regarding such aggregations is virtually a branch of atomic and molecular inquiry,"—with stars in place of atoms—mighty spheres in place of "dust"—"the firmament above" instead of "the firmament beneath." In fact, the astronomer, in sweeping, with his telescopic eye, the "blue depths of ether," is as it were some Lilliputian inhabitant of an atom itself, or rather of one corner of an atom prying into the atomal structure of some Brobdignagian world of stardust, organized into spiral and other elementry forms—of life, it may be, something like our own. The infinite height appears, in short, like a mirror of the infinite depth, and we know not precisely where we stand between the two immensities of depth and height! The shapes evolved by the wonderful telescope of Lord Rosse are, many of them, absolutely fantastical; wonder and awe are mingled with almost ludicrous feelings in contemplating the strange apparitions—strange monstrosities we had almost called them—that are depicted on the back ground of the illustrations. One aggregation looms forth out of the darkness like the skeleton face of some tremendous mammoth or other monstrous denizen of ancient time, with two small fiery eyes, however, gazing out of its great hollow orbits. Another consists of a central nuclus, with arms of stars radiating in all directions like a star-fish, or rather like the scattering fire sparks of some pyrotechnic wheel revolving. A third resembles a great wisp of straw, or twist or coil of ropes—a fourth a corkscrew or other spiral seen on end—a fifth a crab—a sixth a dumbell—many of them scrolls or rolls of some thin texture seen edgeways, and so on. It is even a suggestion of the author's that some of the spiral and armed wheels may be revolving yet in the vast ocean of space in which they are engulphed. Thus has the telescope traced the "binding" influences of the Pleiades, "loosened the bands of Orion"—erst the chief of *nebulous* hazy wonders, once and for all revealing its separate stars, and thus, in brief, has this wondrous instrument "unrolled the heavens as a scroll." Yet even these astonishing results are as nothing to the fact that those fantastic shapes which it has revealed in the depths of this *limbo* of creation, are not shapes merely of the present time—that thousands of years have passed since the light which showed them left the starry firmaments only now revealed—that the telescope, in short in reflecting these astonishing shapes, lilver to the eye of mind turned inwards on the long stored records of an universal and eternal memory of the past, than to a mere eye of sense looking outward on the things of passing time!—*The Builder.*

Circulation of Plants.

At a meeting of Philadelphia Society for promoting Agriculture, on Wednesday last, Professor Boyce exhibited to the members, by the aid of a powerful microscope, a number of curious and interesting natural phenomena. Among other experiments with the instrument, he presented a very beautiful and satisfactory instance of the circulation of vegetables. The substance selected for the purpose was a blade or strip of the *Valieneria Spiralis*, variety *Americana*, better known as the tape or riband grass, upon which the common canvass back duck is used to feed. The following brief description of this interesting experiment we copy from the Philadelphia *North American*:

"By means of the great magnifying power of the glass, the delicate and elaborate organization of the plant was rendered visible, with the regular, life-like motion of the sap, or blood, so to speak, of the grass, as it flowed backwards & forwards through the wonderfully complicated tissue of veins and arteries with which this kind or vegetable is furnished. What appeared to be singular, as compared with animal circulation was, that the fluid, as it passed through the vessels provided for it, instead of flowing continuously, visibly, crept along in small, separate, oblong particles which bore some resemblance, as they wound their way through the intricate labyrinth of veins, to so many lines of white ants, working their steady progress, close upon each other, in various and opposite, but always systematic directions. The motion of the fluid was rather slow, and apparently difficult, though the latter circumstance served to manifest more conspicuously the positive activity of the circulation.

In reference to this matter of motion, however, Prof. Boyce remarked that the particular bit of the tape grass which he was using was rather younger than specimens he had employed in previous experiments, and that he had observed the circulation to be more rapid in older blades of the plant. Besides this exhibition of a most interesting property of vegetable life, Prof. Boyce showed several prepared specimens of certain organs or parts of plants and insects, displaying the amazing complexity, adaptation and exquisite delicacy of organizations so minute that the eye could not discern them even with an ordinary magnifying glass. In one of these cases was shown the lung or breathing apparatus of an insect, every single, incredibly fine portion of which was perfectly obvious, though the entire animal was but just detected by the naked eye.

The microscope employed in the exceedingly interesting and instructive observations which we have referred to, was imported from the manufactory of Powell & Leland, London, for the Philadelphia High School, and its capacity ranges from 200 to 1600 power—the lowest of these being used in the experiments witnessed on Wednesday. What was then seen gave many a better idea than they ever had before of infinite mysteries of nature—of the miserably small knowledge which human philosophy, with all its boasted attainments, really possesses of the vast worlds and beings around us—of the no less astonishing minuteness than magnificence of creation—and, in short, of the unspeakable insignificance of man in the grand universe of which he is an atom, and incomprehensible greatness of God, its author and supporter."

Sugar from Indian Corn and Oil of Vitriol.

A patent has been granted at Washington for a process of making sugar out of corn, which, though familiar to all chemists, is doubtless novel to most of our readers. A quantity of corn meal is placed in a boiler, to which is added nearly an equal quantity, by measure, of water, together with a small proportion of common oil of vitriol, or sulphuric acid. The mixture is ther boiled at a very high temperature, when common brown sugar is produced, held in solution, of course, with the acid. A quantity of common chalk is now thrown in, which has the effect to remove the vitriol from the sugar, the vitriol uniting to the chalk, and falling with it as sediment, to the bottom of the boiler. The liquid sugar is then drained off into another vessel, boiled down to molasses, and finally crystallized and clarified in the usual manner. We imagine that an operating apparatus, placed in the World's Fair, and turning out lumps of sugar made of corn and vitriol, would have made the "rest of mankind," conclude that the Yankees had a compact with the witches, or some other supernatural power. The Patentee of this process is Mr. George Riley, of this city.

Sugar may be produced in the same manner from common starch, corn stalks and other fibrous substances. The process affords a fine example of what chemists call Catalysis. Though sugar is produced, yet the nature and strength of the vitriol is not a whit altered, neither is the original quantity diminished. The same vitriol would therefore suffice to convert an indefinite amount of mealinto sugar.

We hope the day is not far distant when more attention will be paid to the subject of Chemistry as a branch of education, than it now receives in most of our schools. Though the process above described seems wonderful, it is no more strange than the phenomena presented by the combustions of a tallow candle. How few know that a burning candle is, in effect a gas light, the melted tallow or carbon being raised by capillary attraction to the centre of the flame, which being hollow, forms a retort wherein the tallow it subjected to an immense heat, and thus converted into illuminating gas, in precisely the same manner as the carbon in the huge retorts at the gas manufactory, is turned into gas?

Food, drink, air, fuel, clothing, and thousands of other substances of daily use, are results of chemical combinations, with which every one should be familiar. Chemistry is a science from which more real interesting and practical knowledge can be derived, than from almost any other, yet no branch of education is so badly neglected.

Wear and Tear of Gutta Percha.

The late expeditions in search of Sir John Franklin have proved the value of gutta percha in a remarkable manner. Each of them took out sledge-boats of this substance, for use among the masses of ice. Fitted with a skate, the boat served as a sledge; floated, it would carry five or six persons, with ample provisions; at other times it might be folded up, or converted into a wrapper or bed-tent, safe against the cold, that three or four men might sleep under. Its weight was only eighteen pounds. Moreover, after undergoing all the rough work of the voyage, it returned to England not in the least damaged, and in almost as good a condition as when it left.—*British Banner.*

To Keep a Stove Bright by two Applications a Year.

Make a weak alum water, and mix British lustre with it, perhaps two tea-spoonfuls to a gill of alum water; let the stove be cold; brush it with the mixture; then take a dry brush and rub it till it is perfectly dry. Should any part before polished, become so dry as to look grey, moisten with a wet brush and proceed as before.

The Farm.

Dwarf Trees,

While whole orchards, of these dwarf tress, pear trees in particular, are being planted for the growth of fruit for the market; and when we consider that not one out of a hundred will die in planting—that three hundred to five hundred may be put on an acre of ground, and that in two or three years at most they begin to bear—we do not see why they will not be profitable. Many also very judiciously fill the spaces between standard pear and apple trees with pyramidal pear trees on quince stock considering that at the end of twelve or fifteen years when their standard trees have come into full bearing, and the dwarf trees begin to be in the way, they can very well afford to cast them off. This system of managing orchards is extensively practised in France, where orchards and fruit gardens are models for the world. It cannot but be highly advantageous in this country, at least in all the older districts, where land is valuable, and fruit growing an important pursuit. An orchard of five acres, for example, will, at thirty feet apart each way, contain but two hundred and forty-two standard trees.

Among these we can put in seven hundred and twenty-six dwarf or pyramidal trees, at fifteen feet distance all around. Until the eighth or tenth year, the standard trees will yield nothing worth reckoning upon; but from the third or fourth year, the dwarf will yield considerable income; and by the seventh or eighth year, they will produce not less than from $1 to $4 worth per tree.

A few years ago, nobody sought for dwarf trees. Scarcely anybody knew of such things. The tall standard, with a bare trunk six or eight feet high, was the only sort of tree recognized for all sorts of circumstances. The little village garden of fifty by twenty or the orchard of twenty acres, were placed upon precisely the same footing in this respect. The consequence was, the small gardens were entirely unavailable to fruit culture, beyond a few gooseberry or currant bushes; and thousands and tens of thousands of our citizens, in all parts of the country, who will in a few years have charming little gardens of dwarf trees, were quietly excluded from all the pleasures and profit which this interesting culture cannot fail to yield.

People everywhere in our cities and villages, who have but a small lot of ground to cultivate, are very naturally delighted with trees so admirably adapted to circumstances. Old people, too, who could not reasonably hope to reap the fruit of standard trees that never yield in less than six or ten years, are planting dwarfs, because in two years at most they may gather their fruits. Thus, two large classes of persons heretofore quite excluded from fruit culture, are now brought in and are in fact the most active.—*Exchange.*

Pasturing Mowing Lands.

Some farmers object to the practice of turning cattle into mowing grounds in the fall of the year. They contend that cattle should never be admitted into mowing grounds at any time, insisting that if cattle are kept out there will be no need of re-ploughing, or re-seeding the grounds; but that good harvests of hay will be realized for twenty years in succession.

This is all theory, and much better suited to the lips of such as have no experience in the matter than to men who have kept cattle through the year. It is better to let the cattle have the fall feed while it is good for milk and butter, and top-dress such fields as are not to be ploughed. Cattle often obtain a good living without feeding from the barn, till the latter part of November. We are then obliged to feed from the barn for nearly half the year—quite long enough for those who mean to obtain a living by farming.

It may be said that this is an uncommon year, and that in general cattle will get along well enough without going into the mowing grounds. But we think differently. Cattle of all kinds thrive better on good fall feed than on anything short of grain. And even such as are to be turned for beef and are fed with grain thrive better in fields then elsewhere, and beef is made faster and cheaper in October than in any other month. Calves ought to have as good a chance at grass in October as possible. They should be used to a little hay also while the fall grass is good, otherwise they will pine on the sudden change from grass to hay. When they are taken entirely from grass they should have something besides hay in the fore-part of the winter. Roots of all kinds are good, and apples also if they can be stored properly. They should be crushed at the time of feeding.—*The Presbyterian.*

HINTS TO FARMERS' BOYS.

There is one thing I would like to impress upon the minds of the farmer in thiss country To all you that have boys that can write, get each one a memorandum book, a few sheets of paper will do, if nothing better can be had and in that have each one keep an account of every day's work done in the year, the kind of work employed in, and the day of the month and date of the year. If in sowing, mention the kiud of grain, and the amount of seed per acre, the time of planting and of reaping. In fact I should have them note all the passing events of the farm; and as they grow older they will find more of importance to note Six cents will buy a book that will last one year, to commense with. My word for it, if the farmer will adopt this course, their sons will be much better farmers than their fathers. It may seem like dry business to commence with the first of January, but as the spring opens, the green grass appears, and bright prospects are in our paths, and the tasks will be more pleasing every day until the close of the year. Who would not give twice what the paper and ink cost, could they but obtain a memorandum book written by a grandfather a hundred years ago? Try it, farmers, young and old; keep a journal of every day, and you will become a race of scientific book farmers, not to be imposed upon. George Washington, one of the best farmers of America, kept a journal of the farm. Much might be written to prove the benefit of such a course, if adopted; but I leave it for the present, hoping some one more capable will write upon the sucject hereafter.

WEEDS, VORACIOUS FEEDERS.

Constant and unceasing warfare against every species of noxious weeds, is one of the prime duties of the thorough farmer. No one, who has not given careful thought to the subject, can imagine how much the productiveness of even the best tilled farms is abridged by their presence. A writer in the Germantown Telegraph speaking of this subject remarks:

"All plants which come legitimately under this name are gross feeders; they require a very much larger amout of pabulum to perfect their several systems, and carry them successfully forward to complete perfection than the cultivated plants of equal weight and size, and are consequently vastly more emasculating to the soil. A single "pig weed" will abstract from the soil in the course of its vegetative career, as much as in required to give perfection to four spires of productive wheat. Many other weeds are equally voracious in their habits, and where numerous and unrestricted, abstract from the soil to an extent almost too great to be believed. All weeds, therefore should be destroyed. Not a worthles plant should be allowed to tenant the farm; nothing that will not make some valuable return for the food and nourishment it consumes. This is the true policy for the farmer.

BREAKING STEERS.

An effectual and speedy mode of breaking steers is to use a yoke long enough to hold four bows at suitable distances. Put a strong, steady yoke of oxen on the outside, and the steers inside, treat them gently and do not use the whip nor goad, and you will soon have the young ones as well broken as the old.