

Science & Mechanics.

THE POTATO ROT.

There can be no doubt that there are certain atmospheric conditions which favour the development and increase of certain minute fungoid growths, which in their turn materially influence both animal and vegetable life. Dr. Lionel Beale, one of our best microscopists, insists most strongly on this point. The very great quantity of rain and the great humidity of the atmosphere during the months of September and October, conditions peculiarly favourable to fungoid growth, may in all probability have had its effect on the potato crop in the Province of Quebec, for all throughout it—more particularly in the Gaspé district and the low lands lying between Montreal and Three Rivers—the potatoes are more or less diseased.

Some eminent botanists and microscopists are firmly persuaded that the disease is traceable to minute fungi or parasitic growth, which first attacks the under side of the leaves of the potato plant, stopping up their breathing pores and preventing the emission of perspiration; consequently the potato plant gets surcharged with moisture, which rots the stem and leaves, and gives the spawn the opportunity of preying upon the tissues most disastrously, for in almost incredibly short space of time the whole plant becomes one putrid mass.

In England the damage done to the potato crop has been immense, and is estimated by a writer in the *Times* at about \$100,000,000; and probably the amount is not exaggerated when the rapid growth of this "potato fungus" is taken into consideration, for it is stated with authority that in a few days a whole tract of country will be overspread by it, and the evil will then be apparently incurable. All fungoid growths are remarkable for their amazing rapidity of development and it is important to bear this in mind.

One of the remedies proposed is to mow the stems down as soon as the disease makes its appearance. This plan often fails, because the tubers may be diseased before the plants are cut down, and when that is not the case the potatoes are often so weakened by the process as to be of little value.

Admitting the cause of the disease to be known there is great contrariety of opinion as to its cure. A writer in the *Gardener's Chronicle* advises growers always to plant early varieties, and to get the potatoes out of the ground as soon as possible. The difficulty is that we cannot tell beforehand when the crop is likely to be affected, and then, when symptoms of disease appear, it is often too late to apply the effectual remedy.

English scientific writers have called attention to the singular circumstance that the periods of maximum sun spots coincide with periods of great national epidemics. The years 1848, 1860, and 1872 are specially cited by astronomers as dates for the periods of maximum sun spots, and in each of these years the potato disease was prevalent, as were also other epidemics. A writer in *Nature* suggests the idea that such diseases may be expected in periodically recurring cycles. Again, may not the same electrical conditions which have been favourable to the spread of the potato disease in Europe have had some share in the production of the "epizootic" malady in America?

It would be well if the Professors of Meteorology would present to the agriculturist some of the physical laws on which meteorology depends, and the relation between the weather and disorders of particular character which affect both animal and vegetable life, or, in other words, the influence of peculiarities of weather on the functions of organized bodies, so as to awaken a more lively interest in the subject of meteorology, when so much depends upon an acquaintance with its laws.

TANK LOCOMOTIVE FOR THE PRINCE EDWARD ISLAND RAILWAY.

This is one of a class of locomotive tank engines lately constructed for the Prince Edward Island Railway by the Hunslet Engine Company of Leeds, under the superintendence of Mr. James Livesey, of Westminster. *Engineering* gives the following particulars respecting its make and capacities:

The line for which these engines have been built has a gauge of 3 ft. 6 in., and the engines have outside cylinders, four coupled wheels, and a four-wheeled bogie in front. The cylinders are passed through the frames (which are on one solid plate from end to end), and are secured by flanges all round the steam chests, which latter are enclosed in a chamber under the smoke bars, and are easily accessible by removing the front plate, which is arranged for that purpose.

The water is carried in a saddle tank, and two side tanks, all connected, and containing a sufficient supply for a run of 40 miles. The coke box is placed behind within the cab, and has capacity for a proportionate quantity of fuel.

The firebox is made of Howell's homogeneous metal, and the tubes are of wrought-

iron. The coupled wheels are of wrought-iron with crank bosses and balance weights forged in, and the bogie wheels are of the disc pattern, and are of crucible steel. All the wheels are fitted with Bessemer steel tyres. A powerful brake acts upon the four coupled wheels. The leading end of the engine rests on a circular seat on the cradle of bogie, which is suspended by links (as shown in the transverse section on page 364), from cross stay or girder plates between the bogie frames, thus allowing for both lateral and radial motion. The buffer beams are of oak, with wrought iron plates on both sides; the front beam fitted with cow-catcher and pushing bar; the back beam is fitted with central combined buffer and drag spring.

The boiler is fed by one pump, worked by an eccentric, and one injector—Seller's patent—while the engine is fitted with sand boxes on each side, and with the usual accessories of American engines, such as large and small whistle, bell, &c., all of which are brought under the control of the driver by handles carried through the front of the cab. The latter is wholly of iron, and is fitted with glass lights, hinged to open.

The following are a few of the leading particulars:

Gauge of railway	ft. m.
Diameter of cylinders	3 6
Length of stroke	0 10
Diameter of wheels (four coupled)	1 4
" bogie wheels	3 6
Centres of coupled wheels	1 10
" bogie wheels	5 6
Wheel base from centre of trailing axle to centre of bogie	4 0

Length of boiler barrel	12 10
Diameter	8 3
63 tubes 2 in. diameter outside	2 8

Total heating surface in tubes and firebox, 320 square feet.

One saddle tank and two side tanks, collective capacity, 500 gallons.

Capacity of coke box, 36 cubic feet.

Weight of engine in working trim, 15 tons.

Weight on coupled wheels, 11½ tons.

The engine we illustrate are altogether of very neat and compact design, and will, we have no doubt, give satisfaction. We may mention, in conclusion, that the Hunslet Engine Company have for some time made the construction of small tank engines a speciality. Amongst others they have just completed some for a railway in Brazil of a metre gauge, and they are at present building others for a 3 ft. 6 in. gauge line in Portugal, these latter, which have 14 in. cylinders and 2 ft. stroke, being probably nearly the maximum sized engine for the gauge, so long as ordinary types of locomotives are adhered to.

NEW PATENT GAS.

A patent has been recently taken out by Messrs. Hengst and Muschout, for the manufacture of gas on an entirely new principle. After the gas has been generated in an ordinary retort, much in the usual manner of generating coal-gas by means of superheated steam, and immediately on its leaving the retort, it passes through a series of pipes or small auxiliary retorts which are heated and charged with a porous substance, which, when in an incandescent state, either absorbs or converts into permanent gas almost the whole of the impurities contained therein, and thus the gas leaves them in a fit condition for use.

The inventors claim the following advantages over any other mode of gas making:

1. The entire freedom from sulphur, ammonia, smoke, or offensive smell in the gas produced.
2. Greatly increased production of gas from a given quantity of coal, and gas of much greater brilliancy and illuminating power.
3. A great saving in cost, not only of making gas but in the erection of apparatus employed therein, as by this mode gas may be manufactured from common coal, or even small coal, at a cost not exceeding 8d. per 1,000 ft., and of an illuminating power of 33 candles from a burner consuming 5 ft. per hour.

One great feature of the apparatus is its simplicity of construction. It can be appended to existing works at a small cost. Small works can also be erected on this principle at little cost.

PHOTOGRAPHING THE EYE AND EAR.—Dr. Vogel writes to the *Philadelphia Photographer* as follows: "That the interior of the human eye has been photographed is well known. The experiment is a somewhat cruel one for a living subject; still there are victims who stand it. I know, for instance, a very handsome young lady, whose brother is a physician, who patiently takes extract of belladonna until the pupil has become sufficiently enlarged; the interior of the eye is then illuminated with magnesium-light, and photographed. In a similar manner has the ear been photographed, that is to say, the tympanum only. A tube is inserted, in which is a mirror, inclined at a certain angle. The mirror throws light into the interior of the ear. The mirror is also provided with a central hole, through which the illuminated tympanum can be inspected. A system of lenses projects an image on the sensitive plate, and the picture is made in the ordinary manner."

Courier des Dames.

THE FASHION PLATES.

These illustrations are intended principally to give a general idea of the form and trimmings of some of the costumes and toilettes in vogue in Europe for the winter. No particular directions are given for the material of the different dresses, this being left to the taste or fancy of the reader. In the first plate are given three specimens of in-door costumes, of which one—the fourth in order of grouping—is a *costume de cérémonie*, and is worn with a demi-train. There are also two visiting or promenade costumes, and a costume for a little girl. The second plate gives some very elegant evening and bridal costumes.

WINTER CLOTHING.

According to a writer in *Scribner's Monthly*, a crusade has been commenced by some of the most skillful medical men in New York against the use of furs. The following is a paragraph from the article in question:

"In his experiments to determine the heat-conducting power of linen, cotton, wool, and silk, Sir Humphry Davy found not only that these materials conducted heat in the order given above, linen being the best, but also that the tightness or looseness of weaving possessed an important influence. It is therefore evident that in the selection of winter clothing, and especially of that to be worn next the skin, the material of least conducting power, as wool and silk, should be chosen, and the fabrics should be loosely woven. As regards the external garments the same rules apply with equal force, but in this case care should be taken to remove overcoats and shawls when in a warm room; especially should this precaution be observed in the instance of the furs worn by ladies. The habit of wearing these articles for hours in succession while shopping and visiting, often so weakens the powers of resistance in the wearers that they become the ready victims of inflammations of the throat and lungs. To such an extent does this occur in New York that many of the most skillful physicians advise their patients to discontinue the use of furs, and the advice is often followed with the most satisfactory results.

The University of Melbourne has resolved, by an unanimous vote, that women shall enjoy in future all the facilities for gaining knowledge and taking degrees which are already possessed by men and upon equal terms.

The next move of the ladies' rights enthusiasts is it seems to be to abolish men altogether, for there is a proposal for a United Service Club in London, where no gentleman or male servants are to be admitted. It is hardly the correct title, as "United Service" surely means male and female. Why not call it the Sunnery Club?—*Court Journal*.

The following on *dit* has run the round of the papers, and, if not correct, is not unsuggestive. A lady residing in Clifton, Bristol, of good family, and enjoying a fortune in her own right, has just conferred her hand upon a young man of the humblest class, who hitherto has had no higher occupation than attending the "leader" of an omnibus, and attaching drags to the wheels of carriages. The lady in question, it appears, was a district visitor, and in that capacity visited the houses of the poor in a populous district of Clifton. In the course of these visits she happened to call upon the young man's mother, who has been until recently an invalid, and was so much struck with the filial attention and affectionate disposition of the youth, that she took notice of him from time to time. The wedding was celebrated a few days since at one of the churches of the cathedral city of Wells. The juvenile bridegroom has not seen more than seventeen or eighteen summers, while his "better half," whose infatuation has led her to sacrifice position, relatives and friends, is about thirty years of age.

The following anecdote is told of Margaret Kerr, the grandmother of William and Robert Chambers. She was a small, plain woman, strict, critical, and a severe censor of what she considered degenerating manners. As the wife of a ruling elder she exercised a certain authority in ecclesiastical matters; and once, in the presence of several neighbours, lectured the parish minister on a delicate subject—his wife's dress.

"It was a sin and a shame," she said, "to see sae muckle finery."

The minister did not deny the charge, but distinctly encountered her with the Socratic method of argument. "So, Margaret, you think that ornament is useless and sinful in a lady's dress?"

"Certainly I do."

"Then may I ask you why you wear that ribbon around your cap? A piece of cord would surely do quite as well."

Disconcerted with this unforeseen turn of affairs, Margaret determinedly rejoined, in an under-tone, "Ye'll not have long to ask sic a question."

Next day her cap was bound with a piece of white tape, and never afterward, until the day of her death, did she wear a ribbon or any morsel of ornament.

A new *coiffure* establishment in Paris offers its patrons some novel attractions which are thus described by the *Echo*:—"To have one's hair frizzed to the sound of soft music is a pleasure

reserved for the ladies who frequent the splendid salons of a new *établissement de coiffure* in Paris. Far away be the days when the "harber of Seville," or of any other city, was a personage to be treated with gentle irony. Hair-cutting in Paris has mounted beyond the regions of an art, it has almost become a science. Its votaries assemble in vast and magnificent rooms, to which they are introduced by lackeys in rich liveries, and where they are attended by the most distinguished artists with "irreproachable tenue"—able to speak all the languages of Europe. While the gentle operation of the tonsure, the brushing and the perfuming are in process, a mysterious music is heard pervading the apartments. Gentlemen's heads are softly shaved by razors of "velvet electricity"—the next thing, of course, to "battered lightning"—with the aid of soap, which is, in truth, the honey of Arabia, dissolved in the dewdrops of dawn. Ladies, meanwhile, have their locks frizzed as by an "Eolian breeze"—which may be either "stormy" or "calm," as suits their temperament and style of head-dress. Surely we are in a world of exquisite novelties! Only one thing in the programme recalls the barbarous days of old. The ladies are promised not only "delicate attentions" from their attendants, but also "the most *spirituelle* conversation!"

The *Echo* says:—"Among the many interesting phenomena depicted in the 'hieroglyphics' of the astrological almanacs for next year, we observe a young lady, dressed very fashionably, turning her back towards the beholder, and engaged apparently in examining a large black cat, which, in its turn, is taking no notice of anything. The unassisted imagination might interpret this in various ways without hitting upon the true meaning of it; but, happily, the prophet himself explains. He says: 'The female figure, placed prominently in the foreground, indicates the position which woman is destined to occupy in the immediate future, while the fact of her face being turned away from us, and the attention she is bestowing upon the cat, would seem to imply that she will still retain that mobility and domesticity which are the greatest charms of her character.' So then both sides are to be satisfied, if compromise can satisfy either. But we greatly fear that this vision will be found unsatisfactory all round. The advocates of 'prominence' will hardly agree to have that prominence merely consist in prominent domesticity, a sort of turning the family life inside out; while their opponents will assuredly object to the coining of a black cat being taken as the type of that life in the home which they always speak of as the 'sphere' of woman. While, then, the compromise is a failure, the uncompromising part of the picture is even worse. The young lady has a chin at least twice the size of her head. The presence of such a monstrosity in a vision of the future is enough to appal the stoutest heart."

The following observations on "the rights of woman" appeared in the October number of *Colburn's New Monthly Magazine*:—"When people talk of the 'rights of women' to perform all the functions of civil life which men perform, they forget that these 'rights' would involve duties which women cannot discharge, and labours which they cannot undergo. They might as well talk of the 'rights' of women to break stones on the road, or to serve in the police, or in the army or navy, or to go out on the whale-fisheries! They forget that women have duties of their own, which would be neglected if they attempted to discharge the duties of men also. Women simply have not the requisite physical strength and capabilities for doing the work of men. A lady-advocate, for instance, would be more likely to be broken down by the fatigue of professional business than an advocate of the stronger sex. She would hardly be able to endure seven or eight hours of legal work day after day in a crowded and noisy court. The nerves and frame of most women would be unequal to such exertions as men are able to undergo in public life. And in litigation (for we will, for argument's sake, and to bring the question to a practical test, adhere to the supposed case of female law-practitioners), there would obviously arise a multitude of matters unfit for the ears, much more for the intervention, of the female sex. They could not, then, be lawyers. How could they be physicians, except in the case of their own sex, and of children? They could not be divines, if the rule of an apostle is to be considered as decisive in the matter. The publicity of preaching is contrary to the reserve and retirement which befit the sex, and which nature itself prompts them to maintain. Law, therefore, medicine (with the exception above stated), and divinity are closed against them. As to their intervention in political affairs, these require reasoning, and women are not famous as reasoners, though their intuition be quick and acute. The 'rights of women' are, as all rights must be, limited by the duties and capabilities of the claimants."

WE SAY THEY ARE GOOD.—The Shoshonee Pills are manufactured with the utmost care, scrutiny, and exactness, from the very active principles, doubly refined and purified, of such of the choicest remedial agents of the vegetable kingdom as to possess them of properties that only meet in harmony the exigencies of every ingredient entering into the composition of the Shoshonee Remedy, and also that give the Pills themselves more desirable qualities for general use than any family pill before the public. On account of the extreme mildness and yet great certainty in action of the Pills, as well as their strengthening and healing effects on the stomach and bowels, and in fact the whole system; along with their permeating and restorative action on the liver, kidneys, skin, &c., &c., we say on account of their superior qualities the Pills are placed on sale as a Family Medicine.