AGRICULTURAL.

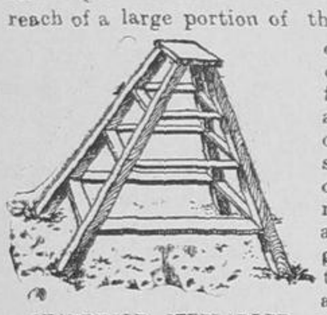
Draining.

Drainage is being studied now by farmers as never before, and in all sections of the country it is becoming a matter of first importance. There are very few farms upon which more or less tiles could not be used with great profit, and as a rule the farmer who begins to drain his farm will be so fully convinced of the benefits derived therefrom that he will continue putting in drains until he has finished the work on the whole farm. A heavy clay soil can never be farmed to the best purpose unless it is drained and, except for special crops, most of mucky and low lying lands are benefited by a thorough system of drainage. A very few sections of the country have a subsoil that is in such condition that drainage is not necessary. These are the sections where the soil rests on a stratum of gravel that allows the surface water to pass away through underground channels. In some places a stratum of clay lies above the gravel, and this must be cut through before the water can reach its outlet. These places are so few and limited in area that in comparison with the whole country or that part of it where drainage is needed, that they are of little importance in considering the subject.

Drainage acts in two ways. It allows the surplus water to run away quickly, leaving the soil in a shape to be tilled in a short time after heavy rains, and paradoxical as it may seem, it keeps the soil in a condition to retain more moisture than it would if undrained. A hard, compact clay soil that in dry times will become baked and lumpy if not drained, will, when a proper system of drainage is in operation, become loose and friable and retain moisture enough to withstand a drought that will wither crops on low black lands. This is because the drains running through the land are not only pipes for carrying off water but they also allow air to penetrate every part of the soil and this air carries the moisture with it and results in benefit to the growing crop. It took a long time to convince farmers that draining was cheaper than open ditches and much more effective, but in these days there are few who will dispute the fact, and these few are among the unprogressive who do not read the papers.

A Convenience in Fruit Gathering.

Designs for ladders are legion, some good some bad, and some indifferent. The quadruple stepladder here illustrated must be classed among the good designs, for obvious reasons. Placed under low, branching trees its use permits one to move about within reach of a large portion of the whole side of a tree, because of its four sides, about which one can freely step. Moreover, when not occupied as "standing ground," the top affords an excellent resting place for the basket. It will be found exceedingly convenient for the home orchard, where one may desire to pick but a basket or two of fruit at a time, and wishes to make a selection of those in the best condition for picking. It should be made strong, but light, so as to be readily moved about.



QUADRUPLE STEPLADDER.

Keeping Up the Milk Supply.

Many dairymen have two general methods for keeping up the milk supply. The more common plan is to keep the same set of cows year after year. The cows remain dry for a month or two, sometimes a good deal longer, but the idea is to bring them around again as soon as possible. Farmers who follow this method usually raise their own stock and take more pride in it, because the cattle are to be kept during the animal's useful period of life. With an eye to future value, the milch cows are not so often injured by over graining, to force a big milk supply. Good cows are bought and the herd is bred up to a better standard, when possible.

Those who practice the other plan usually raise but few animals and do not breed their stock. They buy new milch cows from other farmers whenever they wish to increase their milk supply. They buy a cheap grade of cow, and keep them farrow, milking them as long as profitable, and then either fatten for beef or exchange for fresh milkers. Often a stocky-built cow when fed on a high-grain ration can be milked for a long period and then be all ready for the butcher as soon as the milk flow stops. A great advantage of this plan is that the supply of milk can be much more easily kept at regular amount, a very important consideration in runing a milk route. Also when the cows are fed high and fattened for market a lot of rich manure is an added source of profit. Of late years a number of milk farmers have abandoned the old way to adopt this plan. But to succeed, the dairyman must be something of an expert in judging the value of cows, and in buying cheap milch cows he will do well to keep good watch for animals affected with tuberculosis. Such cattle may milk well as long as they are kept, and will sometimes take on fat, but upon slaughtering they would be condemned for market if found to be affected.

Live Stock Notes.

Sweet milk is the very best food for young pigs. It is worth more when fed to them than when it is made into butter a ten cents a pound.

If there were fewer horses and more hogs in this country just at this time there would be more money in view for the stock raisers. Just now only certain classes of horses are in demand at all, while hogs are cash any day.

About the largest sheep shearing story we ever heard of comes from Wyoming, where it is said that one man sheared 356 sheep in ten hours, and another 322. Everything grows large in those new countries, even the stories they tell.

Most of the diseases of swine arise from filthy quarters, and feeding too excessivly on fat forming food. Give a good grass range and plenty of pure water until it is time to confine them to finish for market, and then have clean quarters for them.

Don't hurry the horses in hot weather. Give them time to do their work at their natural gait. Give them plenty of cold water to drink and let them rest in the shade often. By doing these things you will get more service from them; they will feel better and you will be better off yourself.

We are glad to note that some of the older breeds of cattle are slowly but surely coming into prominence again. The Jersey is all right as a butter machine, but the good old Shorthorn was at one time good for milk and butter both, and as near the ideal general purpose cow as one could expect to find.

Hogs seem to be holding their own remarkably well in the way of prices, and at this time there is no prospect of a great reduction. Hogs have paid better than any other class of farm stock for two or three years and are proving themselves to be the best class of stock for farmers to depend on one year with another.

The loss of stock from impure water is greater than is usually known. In many cases the animals do not die but lose condition and do not make weight in a satisfactory manner. Where the drinking water has a green scum over it it is not fit for drinking purposes for any animal, and unless pure spring or creek water is in plentiful supply it is good economy to put down wells and erect windmills. This may cost something to begin with, but will save money in the end.

NEW DISCOVERIES IN SCIENCE.

Lord Rayleigh and Prof. Ramsay Have Discovered a New Gas in the Atmosphere.

The scientific sensation of the year in Great Britain is the discovery of a new gas in the atmosphere, the announcement of which has just been made by the British Association. The honor of the discovery belongs to Lord Rayleigh and Prof. Ramsay, who kept the result of their investigations secret in order to fulfil the conditions of the prize offered through the Smithsonian Institution for the most important scientific discovery.

The experimenters explained to the association fully and convincingly the results of their operations. They found that nitrogen obtained from air has a different density from that of the same gas obtained from other sources. Treating the pure nitrogen of the atmosphere with magnesium, the nitrogen was absorbed, and the residue was found to be a dense and remarkably inert gas, fifty per cent. heavier than nitrogen and twenty-one times heavier than hydrogen. The spectrum was new, showing a single blue line much more intense than the corresponding line in the nitrogen spectrum. The experimenters were able to secure only a quarter of a pint of the new gas.

While the British Association has accepted the discovery as a most important one, Prof. Dewar, the expert in analysis of the atmosphere, is not prepared to concede a separate identity to the new gas. His experience in liquefying air has been that the product is always clouded by a white deposit, which, in his opinion, may be the solid form of the new gas, but which he supposed was solid carbonic acid and other impurities. As it forms far less than one per cent. he is not prepared to say that the experiments of Rayleigh and Ramsay have brought a new atmospheric quantity to light, but the general belief is that the new gas exists, though not in appreciable quantity in ordinary atmosphere.

Discoveries, like troubles, never come singly, evidently. Simultaneously with the announcement of the discovery of this new gas comes a report from Baltimore of the solution of a problem with which science has coped unsuccessfully for years. This is the production of ammonia from the nitrogen of the air. The name of the discoverer is not made public nor the process by which he arrives at results, but these are of little concern compared with the value of the discovery, if it be real. Among fertilizers the most valuable is ammonia, being composed mainly of nitrogen, and the quest for ammonia in a cheap form has been constant. If the Baltimore discoverer can produce cheap ammonia his future is not only secure, but he will bestow inestimable benefit on agriculture. The soil would no longer be subject to impoverishment and the crop production of the world would be doubled.

WHEAT IN RUSSIA.

The Effect of the Opening of the Siberian Railroad on Grain Markets.

United States Consul-General Jones at St. Petersburg, in a report, points to the fact that the early completion of the Siberian railroad is likely to have depressing effect upon the prices of grain throughout the world. No reliable estimate can be formed of the probable export of Siberian grain to Europe by this road, and one rough estimate, placing it at 6,000,000 bushels for the west Siberian section, is regarded as decidedly too low. Moreover, the completion of the road is expected to greatly stimulate the planting of grain in the black soil belt, famous for its fertility. In 1889 the Siberian Government produced a surplus of 30,000,000 bushels of grain. To lessen the depressing effect upon the local St. Petersburg market of the expected inrush of Siberian wheat a new outlet is being provided by a line of railroad from Perm, already connected with western Siberia, to Kotlas, on the Dvina river, offering an easy waterway to Archangel, on the White sea, whence the wheat can be exported to other European countries.

LOCOMOTION OF THE FUTURE.

Leaders of Science Learning to Fly—Hiram Maxim's Aerial Machine.

For sheer exhilaration there is nothing to compare with a trip on a flying machine. It beats switchbacks, toboggans, and shooting the chutes all put together says the Paul Mall Gazette. It does not matter if the flying machine only flies along the ground it is a novel and exciting sensation; and the step to this from flying through the air is not so great as might be imagined. This was the practically unanimous verdict of a distinguished company who travelled down to Bexley one glorious morning recently, in order to see for themselves, and to try the famous aerial machine which Mr. Hiram Maxim has been engaged on for the last eight years.

There was Lord Kelvin and Lord Rayleigh, Sir Douglas Galton, Earl Russel, Prof. Vernon Boys, Sir Guilford Molesworth, Prof. Bell Pettigrew, of Edinburgh, and the science correspondent of the Paul Mall Gazette. After a short inspection of the beauties of Baldwyn's park and the house, guarded by a formidable-looking Maxim gun, placed in the entrance hall, the party were escorted to where the monster flying machine stood facing the 300 yards of track on which it is allowed to run.

Everyone got on board for a preliminary spin, and began to inspect the construction. The platform seemed to be an oblong framework, covered with a wooden grating, and running like a "bogie" on four heavily-flanged wheels. A web of stays and steels supports stretched upward from this, bearing aloft the main aeroplane, a double-stretched sheet of balloon cloth, like an awning tilted slightly upward in front, and covering, so it was started, 1,400 square feet. With this the machine is just enabled to run lightly, on tip-toe, as it were, without any risk of its leaving the track and projecting itself into space. When all the canvas is on there are ten of these aeroplanes, arranged in tiers or decks, and measuring across the extreme tips of the wings 150 feet. It is impossible to say yet what would happen if the machine were started with all these trappings, for Mr. Maxim is too careful a man to run risks until he has made sure of every individual detail.

At the stern end, starting from the shafts some ten feet from the floor, were two enormous propellors, on which the interest began to be concentrated. A turn of a lever set one of these in motion, and as the revolutions become swifter and swifter, the slender frame-work shivered and shook. When the second started, a hurricane grew up. The machine rocked violently backwards and forwards, straining at the anchor that held it, and threatening to break all to pieces; clouds of shavings and debris arose behind, showing what the force of the push must be; and at last, when everything was ready, and the propellers were at maximum speed, a shrill whistle gave the order to "let go," and the great bird-like structure bounded forward with the speed of an express train upon its brief career across the meadows.

It was rather alarming. The lightness of the frame gave a feeling of instability, and when the lift came on the aeroplane one hardly seemed to touch the ground. Every heart rose to its respective mouth, and every hand grasped convulsively at some solid object, as though life depended on holding on, and the general sensation was one of rushing through space on the crest of a fierce tornado. When the end of the track came in view it seemed absolutely impossible that one could stop. A rope was stretched across the course; we crashed through it, then through a second, then a third, and, lo, we drew up in the gentlest and most graceful manner imaginable within a few feet of the thickest hedge. It was an extremely clever piece of brake work. The ropes were wound around friction capstans, and the pull increased as they were paid out, until the combined action became sufficient to arrest the enormous impetus of the machine rushing at forty miles an hour. Then everybody laughed and declared it was delicious, and decided to try it again.

Telegraph Codes.

The compiler of a really reliable and comprehensive code is met at the outset of his undertaking by a difficulty that so far has defied all attempts at solution beyond a certain point. Despite the fact that the rules of the cable companies permit him to lay under contribution eight languages, the total number of words that can be used with safety for coding purposes is only about 150,000. The reasons for this are two-fold. First, the companies decline to permit the use of any code word of more than ten letters, and it is dangerous to employ those having less than seven, owing to the difficulty of detecting an error in short words. Further, thousands, nay hundreds of thousands, of words are rejected because of the similarity of the telegraphic symbols that make up the letters.

Figures are rarely telegraphed. The possibility of noting an error in a group of arbitrary figures is very remote. Should a letter or two be "jumbled" in a code word, there are various ways of correcting the mistake—the sense, the context, and reference to the code; but these guides do not apply to the case of figures. The only remedy for a suspected error is repetition of the message at an enchanced cost of 50 per cent. Numbers, therefore, are expressed by a code word. Errors in the transmission of amounts of money are very rare. A banker's code contains words for every possible sum of money from a halfpenny up to hundreds of thousands of pounds; and the authors have exhibited great ingenuity in making a limited supply of words do very extensive service.

A Rising Man.

Warden (to newly arrived convict)—In this institution we try to put a man to work at his own trade or profession, so that he can work his way up. What is your occupation?

Convict—I'm an aeronaut.

BRITAIN'S COAL TRADE THREATENED.

Foreign Markets Have Other Sources of Supply, and Much Cheaper Ones.

British coal mine owners are awakening to the fact that there are other coal producing countries in the world than Great Britain and that the development of these deposits will have a marked effect upon the export of coal from British mines. The Glasgow Herald points out that the mining of coal is now a leading industry in quarters of the globe where its existence was not even dreamed of a generation ago. Australia, Chili, Mexico, Japan, Formosa and India now produce coal in quantity, and in the East British coal will soon be unknown. The annual output in India now approaches three million tons, "yet some of the largest and richest coal fields are barely tapped." In 1892 there were no fewer than 88 collieries at work in India, all of which, with one exception, were in British territory. From these mines the factories and shipping of Calcutta are supplied, and from Calcutta the coaling stations on the coast are stocked instead of from Cardiff, the cost at Calcutta being only one-fifth of the cost of imported coal. Bengal coal is also rapidly displacing English and Scotch coal in Burmah, and China, Batavia and the Straits Settlements are profitable customers. As soon as the trans-Siberian railway reaches Vladivo stock the output of the Siberian coal fields will find its way into those seas and a new competitor will be in the market. This means a serious situation for British mine owners and shippers, who for many years monopolized the eastern trade and even supplied the South American and California market. The Glasgow Herald omitted from its list the Vancouver Island deposits and the coal measures in the Gulf of Georgia which, sooner or later, will control the trade on the west coast of North America, where British coal has now small sale. The Nova Scotia article, too, will ultimately play an important part in development on the Atlantic coast. The talk in England is to restrict the output so that foreign demand may not exhaust the supply, but in view of the facts recorded there is little need of such restriction. The foreign markets have other sources of supply and much cheaper ones, and Britain will have to market her output in countries which find her the most convenient.

NO REST FOR ANARCHISTS.

They will be Hunted From Pillar to Post Until Life Becomes a Burden.

The Anarchists are going to have a lively time on both sides of the Atlantic. The new French law punishes advocates of violence with solitary confinement for the first offence, and deportation for the second. The other continental Governments are also up in arms against the Anarchists. The Rosebery Government has declined to introduce special legislation, but the attentions of the metropolitan police have recently been so pressing that the Anarchists have found London too hot for them. The United States has generally been the last refuge of these social outlaws, but even that avenue is to be closed to them. A bill, which has passed the Senate and is likely to become law, forbids the admission of Anarchists to the United States. Special officers will be appointed at the European ports of embarkation to warn the shipowners that such passengers will not be allowed to land. Even if an Anarchist succeeds in getting himself smuggled in, he can be arrested on a warrant and sent back to the country from which he came, if a resident of the United States, not being a citizen, is convicted of any misdemeanor and it is shown that he is an Anarchist, his expulsion from the country can be ordered, and the mere fact of his return will be enough to secure his imprisonment in the penitentiary after which he will be again deported. The enforcement of the law will not only prevent the admission of foreign Anarchists to the States, but will bring about the expulsion of the large number already there, if they attempt any open advocacy of their opinion. It is evident that the Anarchist who is not able or willing to keep quiet will be hunted from pillar to post until his life becomes a burden to him. But as Anarchists show no mercy to society, they cannot expect society to show any consideration for them. The attempt to crush anarchy springs directly from the instinct of self preservation.

CHOSE THE PARK TO DIE.

Real Estate Dealer M'Donald's Sad End—His Lifeless Body Found Leaning Against a Tree by a Policeman.

A Toronto despatch says:—About 6.45 o'clock on Wednesday night P. C. Page, while patrolling Queen's park, discovered sitting upright against a beech tree, just a little south of McMaster University, the lifeless body of an old man apparently about 60 years of age.

The officer examined the pockets of the dead man and, from documents found on his persen, learned that he was Hiram J. McDonald, of 11 Walton street. Lying close beside the body was a soda water bottle entirely empty. P. C. Page immediately summoned the patrol waggon and had the body removed to 11 Walton street.

McDonald, who has lately been a dealer in pictures and picture frames, left home after bidding his wife good-bye as usual about 9 o'clock yesterday morning. He then proceeded to the store of his brother-in-law, Mr. James Brimstin, where he sat and chatted for a considerable time. The ill-health of his wife and his own poor health and business troubles had lately made him very despondent, and he discussed his troubles for some time with Mr. Brimstin. Before leaving he said something to the effect that he "was not very long for this world," but his brother-in-law took no notice of this, thinking that he was only a little more despondent than usual. As Mr. McDonald did not appear at supper, Mrs. McDouald asked Mr. Brimstin to make some effort to find him. Mr. Brimstin sought, but when he returned to Walton street he found the patrol waggon already there with the body.

HELL ON EARTH.

The New Penal Settlement Which Will Succeed Siberia.

A St. Petersburg letter says it has been decreed by the Czar's Government that Siberia is too good for convicts, and as soon as the new Trans-Siberian railway has penetrated its gloomy depths it will be turned into a "paradise" for agricultural settlers and mining sharps, while Nihilists and other refractory members of Russian society will, in the future, be accommodated on the Island of Saghalin, off the coast of Russian Manchuria, the eastern terminus of the Czar's possessions, north of Japan. So revolting and horrible to civilized nations is Saghalin that the Czar consented to its adoption as an open air prison only after the assassination of Carnot and the discovery of the recent plots against his own life.

The people and the convicts of Siberia never speak of the island other than "the hell of Saghalin," and its climate is said to be so much worse than that of Siberia as to rob this appellation of an exaggerated character, even in the mouths of these lost ones. The island is separated from the main land by the Gulf of Tartary, and its eastern coast is washed by the Sea of Okhotsk. The Governor of Manchuria has reported that a human being not being born on the island cannot live more than a year there. There is no means of escape except in the winter, when, if a prisoner can manage to make his way 100 miles north from the prison, it is possible to reach the mainland over the ice. The ice bridge is guarded; still, two or three prisoners have escaped by dodging behind masses of snow and ice, or, what is far more probable, by bribing officials.

At the present moment the most interesting colonist of Saghalin is Sophie Bluhstein, a full-blooded Russian, in spite of her German name. She first achieved criminal renown by pressing her attentions upon the Shah of Persia during the latter's visit to St. Petersburg. Sophie had avowedly no intention of adding his Majesty to her list of admirers, but sought his acquaintance merely for the purpose of relieving him, if possible, of some of his diamonds. She was foiled in her efforts, but succeeded in having her private car attached to the Shah's special train. For this piece of enterprise she was banished to Siberia for a year, and while there, organized a band of cut-throats and robbers, whose services she controlled on the continent after their terms had expired. She is said to be the sharpest criminal living, and in sending her to Saghalin the Russian Government claims to have conferred a lasting benefit upon the wealthy classes.

Fifty Miles an Hour at Sea.

As the inventor of a perpendicular paddle propeller, Mr. G. A. Haig, is through the English papers preparing the world for the advent of fifty-mile-an-hour ocean steamers, which, he observes, would reduce the present Post Office contract time for Melbourne from 35½ to 12 days. "The mistake made by the fast ships," he writes, "is in carrying any cargo—it does not pay, if there are sufficient passengers going to any part, to pay for 'quick transit'. If they built ships wholly for passengers, mails, and parcels, and used the whole of the ship for propelling machinery it would pay them a deal better, and it would be better for the cargo steamers also. At present a great liner will often take cargo for almost nothing just to fill up, injuring her neighbors at first and herself in the end. If we had forty or fifty or sixty mile passenger steamers carrying passengers, mails, and parcels, and nothing else to all our principal colonies, and eight or ten-mile cargo boats, our business would be done much more regularly and quite as cheaply as now. Quick transit passengers would pay more than at present, but cargo would be carried at more steady and therefore cheaper rates, and the few passengers who could not afford express fares could go in the cargo steamers in the captain's cabin, as used to be the rule sixty years ago."

An Infant Phenomenon

A real infant phenomenon keeps all the medical men and pedagogues of the good old town of Brunswick in a state of wonder and delight. The little son of a local butcher, a baby just two years old, can read with perfect ease anything written or printed in German or Latin characters. A few weeks ago three Brunswick doctors had the baby introduced to them at the house of one of the learned gentlemen. The first thing the little one did when brought into the consulting room was to stand on his toes at the table, reading out from the books that were lying about. All that could be ascertained as to the why and wherefore of this uncanny accomplishment is that, when the baby was 18 months old, and his grandmother took him out, he always immediately caught sight of the inscriptions over shops, and asked about them as only a small child can, till he had fathomed the meaning of the letters. It was the same at home; books and newspapers had greater fascinations than lollipops and toys, and whatever the parents playfully told him he remembered, with the result that at the age of two years he reads with perfect ease. Apart from his accomplishment in reading, the boy's development is quite normal.

A Platinum Mine.

In nearly all the nickel ore mined in the Sudbury district there is more or less platinum, but not in paying quantities, except at the Vermillion mine in the township of Denison. Last week, however, an important discovery of this rare mineral was made in the township of Snider, not far from the Tam O'Shanter mine, and in the most casual way. A well-known prospector, who had been out looking for timber for one of the mines in that vicinity, was going down to a small lake for a drink of water, when he noticed the peculiar color of the earth thrown up by a fallen tree in a swamp at the foot of the bluff. On examination the whole flat proved to be a deposit of platinum ore much larger and richer than the one at the Vermillion mine.