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FOR THE YOUNG FOLKS.

FACTS AND FANCIES LIKELY TO PLEASE THEM

Practical Instructions for Teaching a Dog How to Behave Himself Properly—What Happened When Cy and Amos Went a Fishing to Long Pond.

Of dogs it is true, as of men—education counts. Given an equal amount of intelligence at the start, a dog that has been well trained is worth twice as much as one untaught. Do not undertake to teach a puppy unless you have a large stock of patience. Unless you can control your temper, and be persistent in teaching, your best course is to buy a dog already trained.

But if you want real dog love and confidence, take the animal in his puppyhood, as soon as he is able to feed himself, and your efforts will be crowned with a greater success than ever comes otherwise. No dog ever loves anyone so well as his teacher, who represents to him the wisdom and power of the world. A dog's world, you know, is a very narrow one.

Suppose yourself the owner of a puppy. He is entirely ignorant. "Come here!" "Go there!" mean the same to him, since they mean nothing at all. He must first learn what you want, and there you must give yourself the first lesson in patience.

Begin with "Come here!" You can make him understand what this means, by allowing him to see his food in your hand. Teach him nothing else until he knows perfectly what that means, and obeys it.

When he comes to you, pat him and pet him. Dogs are much like children, fond of praise, and equally fond of their own ways. If you tell your dog to come to you, make him do it. If he never disobeys, he will never know he can disobey.

Do you want to teach your dog tricks? Let him be alone with you when you are at work with him. His attention will wander to everyone and everything else, if you attempt to teach him in a room where there are others. Trainers who prepare dogs for the others. Trainers who prepare dogs for performing in public do their training at night, when everything is still.

To teach a dog to "speak" hold some dainty before him when he is hungry. At first he will not know what is wanted, but say "Speak!" to him, and when he barks, which he is pretty sure to do when he finds the morsel still beyond his reach, feed it to him at once. He will soon associate the word "speak" with the bark and the dainty.

To "play dead," to "say his prayers," to "smoke," to "read," are all equally learned. First show the dog what you want by putting him in the position you wish him to take, with the command that you use for that trick. Be sure always to use the same words for any trick. Do not say "Lie down!" one day, and "Charge!" the next. If you begin with "charge," keep on with it.

You will do well to teach your dog to follow you behind you, or, as it is called, to "heel." It will at times be a convenience to him. It is easy to make the dog associate the command "Heel!" with the act of walking close behind his master, but it requires a good deal of persistence on the trainer's part. It is a dog's nature to run and roam all about, and if he is allowed to do so once or twice he seldom remembers himself.

Should your care to have your pet imitate a dog's voice, provide him a clean pipe. Make him sit up in a chair. He will take the pipe in his mouth after a little training, but you will not be able to persuade him to be more a smoker than he is, and he will take kindly to tobacco.

He is an amusing fellow as he sits in his chair, pipe in mouth, and if you teach him to read a small paper over his forelegs so that it may appear to read and smoke, you will have taught him a popular trick.

Really, the art of teaching your pet Bess is no wonder.

You make him understand what you want.

Always use the same words in giving a command.

Your work is a large accomplishment until Bess is learned perfectly.

Whatever you begin to teach your dog to do, make him do it. Force you leave him.

Always praise and reward him when he does well.

Keep your own temper.—D. M. Merrell in The Cosmopolitan.

Cy and the Bear.

"The way of it was this: Cy and Amos went a-fishin' together one day down to Long Pond, an' on the way, as they was walkin' along down there, what should they see of a sudden but a great brown bear, an' stand right up on his hind legs in the middle of the road in front of 'em, lookin' just as if he expected to eat 'em up.

"Amos he grabbed a stick of cord-wood out of a pile of wood by the road, an' was goin' to shy it at the varmint. But Cy, he wouldn't do no such thing. He jest as a squirrel. He didn't stop to think that a brown bear can climb a tree and as easy as a cat.

"Cy, he didn't seem to take no notice of Amos, but up he an' went after Cy. Cy, he jest kept on a-lookin' at the bear, an' says he, 'O, Amos!' hollers he to Amos, why don't you work a miracle? Do kill me, I know he will. Can't you kill him, Amos?'

"Well, Amos he couldn't do anything, even if he had an miracle, for the bear was pretty well up to Cy by this time, and was begin'in to make up on the limb that Cy was a-sittin' on a-lookin' an' a-screechin' like mad, an' almost scart to death.

"The limb wasn't strong 'enough to hold him long, an' it began to bend down. Still the bear he kept a-lookin', an' Cy a-lookin' back, and he scrat, crack it went an' down fell the limb, and the bear an' Cy, both of 'em to the ground.

"Twas lucky 'twa'n't a very high limb, but 'twas high enough to jar 'em a good deal when they struck. But Cy bein' so near the end, an' the limb bendin' down so, he didn't have far to fall. He hadn't more'n touched the ground 'fore he gave a yell an' jumped on the keen jump, an' made a beeline for home.

"He never stopped till he was safe in the house an' never down suller. He lost his hat an' shoes, an' tore his clothes most all off, an' he came a-crashin' through the brush.

"Well, I tell you, he was kinder stunned; but pretty quick he came to, picked himself up, gave a kind of a grunt, an' went a-lumberin' off into the bushes jest opposite from the way Cy had gone.

"Twas all done so quick, an' they was so near scared, that Amos, he was kinder dazed like, an' didn't hardly know whether he was to one of these 'ere dissolvin' views, or what in creation was goin' on anyway.

"Just then a couple of men come a-runnin' through the woods, an' when they see 'em stopped an' begin to jabber a lot of foreign lingo at him, an' shrug their shoulders, and elevate their eyebrows, an' wave their hands, an' so on. Amos, he was more bewildered than ever, till all at once it came to him that most likely 'twas their bear got loose somehow. So he asked 'em.

"'Yes,' one of the men said; 'he of course; what you call 'em? he one train bayer; he perform bayer, an' he have run away.'

"An' says Amos, 'he's a pet bear, is he?' Well, I don't know as I should 'a' thought that. He seemed to me more like a man-eatin' bear. But it's all right, I guess, and they most likely find him over yender in the woods.'

"Then they thanked him dreadful polite, an' was gone about as quick as they come.

"'You see there'd been a sheep in the woods, an' the bear had got his collar off an' left, an' he terrible yells that Cy let out had waked them up an' started 'em on the right track.

"Amos concluded it wa'n't goin' to be much of a day for fishin', an' so he sot out for home. On the way he stopped to inquire for Cy, but Cy wouldn't have a word to say to him. Seemed 's if he was mad as a wet hen.

"I don't know why, but he always seemed to have Amos a grudge ever afterward. Curious, wa'n't it?"—John F. Barnes in Youth's Companion.

Governments.

A Royal English boy writes the following essay on "Governments":

"It may surprise your fathers and mothers to learn that we read in our books there are many kinds of Governments. Five or six I can count. In Persia the people call the Shah a Dessipot. And your fathers and mothers will say he deserves it. Why, if a man does anything wrong as not to please him, the Dessipot has only to say, 'Cut his head off.' And the police does it. But when this man who thinks he is king comes to England he can't do it. My mother remembers him once coming, and she says he had to behave himself whether he liked it or not.

"In France they have not now a king. Only a man as they choose for a Government, called a President.

"In our reading-books it tells you a lot about the country, only I can never think of it. The men are too fond of governments, and they have had more of them than any other country nearly. Napoleon was one, but there were lots of others. The Government this year is a President. These Presidents have got queer names, but they are not kings nor despots.

"Our country has a Queen who can't do anything but what she ought to. She has been at Government for fifty years. No gentleman can get into the House of Commons unless they know as he can make laws. But the Queen has to look over them and see if they are made right.

"These commons are called Conservatives and Liberals, and they try and hinder one another as much as they can."—Louisville Courier-Journal.

Marine Animal Life.

In crossing the Indian ocean about the line of the 10th degree of north latitude, one has an opportunity to realize how this widespread element teems with life. A hideous, man-eating shark was seen for days steadily holding his course in the ship's wake, and watching for possible human prey. Large sea turtles now and then came to the surface of the water, where they floated, stretching their awkward necks to get a sight of the hull; schools of dolphins played their gambols on our side, darting hither and out of the water and pitching back again in graceful curves. Occasionally a large water snake appeared at the surface, raising its slimy head a couple of feet above the waves and causing a most disagreeable sensation to thrill one's body. This reptile has been known to board sailing ships by coiling about a rope carelessly left hanging over the side, but such an attempt would not be made upon a fast-moving steamer.

Scores of flying fish, about eight and ten inches each in length, were constantly skimming over the sea. The sailors, knowing that a light attracts these creatures, extended a piece of canvas, shaped like a scoop, from a forward port hole, hanging a lantern just above the same, and thus secured a good mess for cooking. Now and then the ship moved for a quarter of an hour and more through a great shoal of that indolent representative of animal life, the jelly fish. It is incorrect to speak of the sea as being a dreary waste, since it is always teeming with such a variety of animated forms.—Louisville Courier-Journal.

Burnt-Out Stars.

Astronomers tell us that our sun and all the stars must eventually burn out and become dead celestial bodies. Then we should like to know what is to become of the remains. It is a pretty well established fact that in nature nothing is lost, and we may fairly assume that there is no universal cemetery where defunct stellar bodies are laid at rest. When our sun, for example, reaches the end of its life span it will of course emit no light, yet its change from life to death will not stop its onward journey in the realms of space at its present rate of nearly half a million miles a day. Just so it must be with all the other suns, the whole fifty million that are visible through the telescope and the countless millions beyond telescopic range.

But in considering this matter of a burnt out and dead sun we must remember that we can look at stars, any clear night, that may have been well-defined suns before our own great luminary was born. It this process of sun-making, or star-making, as you choose to call it, has been going on so long, does it not logically follow that there are at this very moment, stellar spectres, dead and dark remains of stars, wandering through the universe? Many astronomers believe this, and none of them have so far successfully argued against the theory.

If this be true, we may be looking directly in the line of a dead and dark star, up there between two bright and living ones, when we gaze at the heavens clear nights.

But here is an interesting thought. If these immense dead bodies are thus wandering through space, is there not a possibility that one of them may wander into the confines of the solar system, and play havoc with our sun and his little brood of planets and moons? This possibility has been discussed by some astronomers; but the matter is one that neither this generation nor the next one, at least, need trouble itself about. For this reason, the approach of such a body would be detected by astronomers before it could get within a hundred years of travel from us, even if it moved at the sun's rate of half a million miles a day.

The presence of the planet Neptune nearly three billion miles away, was detected by certain perturbations that astronomers noted in the movements of Uranus. Now it is safe to assume that a body so large as a burnt out sun, coming toward our solar system, would, by its attraction, affect our outlying planets and also the sun, when at least twenty times farther away than Neptune is. At the rate Neptune travels in his orbit, it would take him about twenty-five years to reach the sun, traveling in a straight line if he should take a sudden impulse to visit his parent.

Even allowing for a spectral tramp star to take a fancy for calling on us, it would take it certainly not less than a hundred years to get here after the astronomers would have detected its intentions, even if it should come at the sun's speed of a hundred and sixty million miles in a year.

But this question as to what becomes of the dead stars is one that the astronomer seem very chary about discussing. They can see what they believe to be the process of star-making constantly going on, but they cannot see any dead and dark stars, and there is nothing but analogy, conclusion and conjecture upon which to base an opinion.

One thing we certainly know; there is no stellar spectre now near enough to the solar system to get here during the lifetime of any body now living on the earth.—Youth's Companion.

Curious Facts.

A burning paper uncovered for a single instant, during which it does not lose power amounting to the one-thousandth of a grain, would fill with light a sphere four miles in diameter, so as to be visible from every part of the compass.

Platinum can now be drawn into wire strands so fine that twenty-seven twisted together can be inserted into the hollow of a hair.

All watches are said to be compasses; point the hour-hand to the sun, and the south is exactly half way between the hour and the figure XII on the watch; for instance, suppose it is 4 o'clock, then point the hand indicating IV to the sun, and II on the watch is exactly south.

The fastest mile a single man has traveled by various methods of locomotion is, to date, as follows: Swimming, 26.52; walking, 6.23; snow-shoes, 5.49¾; rowing, 5.01; running, 4.12½; tricycle, 2.49 1-5, bicycle, skating, 2.12 3-5; trotting horse, 2.08¾; running horse, 1.35; railroad train, 46 seconds; balloon, pneumatic tube and electricity records are yet to be made.—Philadelphia Times.

The Guardian Angel.

Baby, sleep and dread no harm; clasped in that protecting arm.
Not a shadow of ill shall come to thy angel-guarded home.
Older eyes may be strong waken, older hearts more grave forsaken,
Thou art safe in cradled rest, birdling in a happy nest.
"Tis a weary world, no doubt, but thou hast not found it out;
Only love has sheltered thee, from a thousand perils free.
Coming to the world a stranger, thou hast known nor fear nor danger;
Little king from morn to night, ruling in thy
Golden head on pillowland; violet eyes 'neath silken shade;
Dimpled hands and dainty feet; cheeks like roses, flushed and sweet.
Life shall bring thee many a grace, baby, in this holy place,
Health and wealth and youth and fire, love and joy and heart's desire.
Never is the time to be shall the angel turn from thee,
Never, till the heavens are dim, cease to chant thy cradle hymn.
As I watch the angel light in that guardian form to-night,
Something dual baffles thought, strangely are my fancies wrought.
Could the look be less Elysian if the radiant heavenly vision
Were no phantom floating wide, were no beauty glorified,
Only looked as mothers do when the mother-heart breaks through
Eyes that were the baby's sky, though no seraph waited nigh?
Gift of gifts to mothers given, making home an earthly heaven,
'Neath the spreading angel wings, where the child's own angel sings.
Far and wide the angels fly, sweeping down the starlit sky.
Some to watch o'er beds of pain, some to hover o'er the main.
This to bid a bright dream perish, that a sunny hope to cherish.
But the dearest angel still guards the household pet from ill.
Here and there are brawl and strife, there and here are buoyant life—
Dancing feet that trip to measure, hearts that throb with gayest pleasure.
In the baby's day is calm, isles of peace in seas of balm,
And the baby has no care, yet too young for guile or snare.

—Harper's Bazar.

Take! Take! Take Simmons Liver Regulator for dyspepsia, constipation, and heartburn.

SCIENCE AND INDUSTRY.

USEFUL AND CURIOUS FACTS FROM MANY SOURCES.

The Big Tonnage of the Maine Ship-Yards During the Past Year—The Bath, Waldoboro and Belfast Districts in Maine Make the Best General Exhibit.

A review of the work done in Down East ship-yards during the past year shows that the building of wooden vessels is far from being a lost art, and the builders of Maine have reason to regard the new fleet of 1890 with pride and satisfaction.

Bath, as usual, leads all other ports in the amount of tonnage launched, while the Waldoboro district makes a fine showing, with Belfast a close third. Big schooners have been the feature of the season's operations, as they have for years past, and will be for years to come, but there have been several notable vessels of other rigs and classes launched which deserve special mention. First and foremost comes the pride of Bath and marvel of the maritime world, the ship Shenandoah, biggest of all wooden ships and second or third largest sailing vessel in the world. She is now in your harbor, where New Yorkers will have a chance to see what Maine ship-yards can turn out when they get an opportunity. She was built by Arthur Sewall & Co. at a cost of $170,000, and is commanded by Captain James F. Murphy, of Bath, who formerly sailed the ship W. F. Babcock and others of our deep-water fleet. She was built to carry, but is also expected to get around pretty lively.

The story of the ship St. Mary, 1,911 tons, built at Phipsburg by Charles V. Minot, is soon told. She sailed from New York on May 30 for San Francisco with a general cargo, and after a disastrous collision with an unknown British vessel 300 miles west of Cape Horn on the night of August 6, was wrecked on the 19th while trying to make the Falkland Islands. All hands got away in the boats and landed at Fitzroy, a settlement on the islands, but after getting ashore Captain Carver dropped dead from heart disease. His remains were buried at Port Stanley. The ship Rappahannock, next in size to the Shenandoah, although launched in 1880, was completed in 1889, and was included in The Sun's review of that year.

Bath contributed one large bark, the St. Katherine, to the list, and a couple of the now popular barkentines, while from a Belfast yard came a craft of novel rig, the four-masted barkentine Steadfast, 856 tons. This vessel is the first of her rig in the American register, and there is but one other in the world. She was built for the Bonner line, sailing in the coffee trade between Baltimore and Rio, and is a fine vessel, as were her predecessors, the Priscilla and the Giant Tidings. While seven barkentines have been launched this year, not a single brig has been sent out to join the lonesome few of that rig now in our register, and there is no prospect of any being built.

In the matter of big schooners Bath leads this year in point of large tonnage, as well as in the number launched. The biggest one of the lot is the Glenwood, a four-master of 1,569 tons, built by Kelley and Spear, she is the largest four-master afloat, and, with the single exception of the five-masted Governor Ames, the biggest schooner afloat. Next in order come the Charles A. Campbell, 1,561 tons, built by Morse & Co., of Bath; the George S. Wasiott, 1,476 tons, by G. S. Crosby, of Bath, and the Marjorie, 1,387 tons, built at Camden by H. M. Beam. Seven other four-masters of more than 1,000 tons each were also launched this year, with many closely approaching the 1,000-ton mark.

All the big schooners appear to be doing well in the coasting trade, and some few have gone on West India voyages, while one, the great 1,601-ton five-master, Governor Ames, has set out on a 16,000 mile voyage around Cape Horn, carrying 2,250 tons of coal from Baltimore to San Francisco at $7.75 per ton. That will be a good fat freight if she ever reaches the Golden Gate, but it is rather risky business for a fore-and-after, however big she may be.

A vast amount of capital has been put into vessel property in Maine during the year, Bath alone launching over $2,250,000 worth of new tonnage, and the season has been busy and profitable for all hands, from carpenters to owners.

Besides all this new tonnage in the water, there is yet a big fleet on the stocks in various stages of construction, and a great many vessels are under contract, so that the prospect for 1891 is bright indeed. At Bath the yards are full of new vessels of all sizes and descriptions, and business was never better.—New York Sun.

The Costliest of Common Metals.

"What do you suppose is the most expensive part of these incandescent electric lamps which we see burning in that shop window?" asked an electrician recently of a Washington Post reporter.

"You would naturally suppose it would be the glass bulb, or perhaps the brass fitting for screwing it into the socket, but you would be wrong. Those two little pieces of platinum wire, so fine that you can hardly perceive them, which pass through the glass stem up in the base of the lamp, to which the fine carbon filament is attached, enter more greatly into the cost than any other part of these now almost indispensable electric lamps.

"Why don't they use some other metal than platinum for this wire?"

"Because platinum is the only metal in which the expansion and contraction are the same as in glass, and a great fortune awaits the man who can produce a cheap metal or alloy in which the valuable property of platinum can be preserved. You probably know that a vacuum must be maintained in these incandescent lamp bulbs, or the carbon filament would burn out and become destroyed the instant the electric current is turned on. Therefore the reason for using the platinum wire for running through the glass is because unequal expansion between the glass and wire would either crack the glass or create a space about the wire, and even though infinite minute, the air would find its way in and destroy the carbon.

What Koch's Discovery Leads To.

It can safely be assumed that every statement made by Koch himself is true and accurate. He has gone no farther than is justified by the actual scientific facts. With this assumption, no one can doubt that Koch has made one of the most important discoveries in the history of medicine. If it be true that "phthisis in the beginning can be cured with certainty," it is possible, if not probable, that consumption may be cured in the later stages by supplementing the injections by general hygienic measures of treatment, antiseptic inhalations, and so on, which have already been found useful. The direct value of the discovery of a means of curing a disease which is responsible for one-tenth of the deaths from all causes, including violence, is indeed great; but the imagination almost fails to grasp the importance of the method extended to other diseases produced by micro-organisms. If we know the exact mechanism of the cure for consumption, it is certain that we shall soon be able to successfully apply this knowledge to the study of other diseases.

It is possible, in the light of what has recently been accomplished by Koch, that in the near future many curative lymphs will be discovered, each produced by the special micro-organism of each disease. It would then be not too much to expect that these agents would probably arrest the different diseases to which they are applicable. For example: The typhoid lymph, the diphtheric lymph, the lymph for measles, scarlet fever, etc., would promptly arrest these diseases and save patients from the degenerations and the accidents which are liable to occur when these diseases are allowed to run their course, and that convalescence will be prompt because the diseases have not produced damage which can only be repaired by time. Truly this would be a revolution in medicine, and it now seems to be impending.—Dr. Austin Flint, in January Forum.

American Coal Production.

It is estimated that the quantity of coal produced in the United States during the current year will not be less than 155 millions of tons. This would employ some 445,000 hands directly, assuming an average of 350 tons per man employed per annum, and it would probably, in coking, transportation and collateral occupations, furnish employment for as many more, so that the total number dependent on coal mining and its allied branches would not be much short of a million hands, on whom a further four millions would be likely to depend for subsistence. No other single industry in America finds work for such a multitude, agriculture excepted. As a means, therefore, of determining both the present and the future course of labor in the United States, the coal trade may be regarded as a specially trust-worthy and important barometer. And yet when we come to examine the figures available on this point, we are surprised at the conflict of testimony and the differences of rates. The coal bearing area of the United States is so vast that it would be all but ridiculous to expect the same conditions or the same rates of wages applying over the whole. The geological and geographical circumstances of the different fields, to begin with, vary perhaps as much as they do in Europe as a whole. In one coal field we have anthracite and bituminous coal coexistent; in another bituminous and cannel; in one case seams of extraordinary thickness, in another thin and difficult seams. In one case there is the coal worked at the outcrop; in another there are deep and expensive mines to operate. Negro labor is employed here, convict labor there, and skilled white labor at another place. The comparative efficiency of the workmen employed differs greatly, as between one coal field and another, due as much, perhaps, to the physical conditions under which the coal is found and worked as to the skill and capacity of the workers.

The Compass in the Watch.

A correspondent of the London Truth sends the following: A few "day ago I was standing by an American gentleman, when I expressed a wish to know which point was north. He at once pulled out his watch, looked at it, and pointed to the north. I asked him whether he had a compass attached to his watch. 'All watches,' he replied, 'are compasses.' Then he explained to me how this was. Point the hour hand to the sun, and the south is exactly half way between the hour and figure XII on the watch. For instance, suppose that it is 4 o'clock. Point the hand indicating 4 to the sun and II on the watch is exactly south. Suppose that it is 8 o'clock, point the hand indicating eight to the sun, and the figure X on the watch is due south. My American friend was quite surprised that I did not know this. Thinking that very possibly I was ignorant of a thing that every one else knew, and happening to meet Mr. Stanley, I asked that eminent traveler whether he was aware of this simple mode of discovering the points of the compass. He said he had never heard of it. I presume, therefore, that the world is in the same state of ignorance. Amalfi is proud of having been the home of the inventor of the compass. I don't know what town boasts of my American friend as a citizen."

International Coin.

The International American Conference which met in Washington last winter, among other things recommended the establishment of an International American Monetary Union, and the issue of international coin or coins, uniform in weight and fineness, to be used by all the countries represented in the conference. The recommendations have been adopted by all of the American republics, and, as resolved by the conference, a commission composed of delegates from these countries will meet, as indicated by the President's invitation at Washington, on Wednesday, January 7th, to consider the quantity and kind of currency to be issued, the uses it should have, and the value and proportion of the international silver coin or coins, and their relations to gold.

The London Statist says that a decimal system of coinage, weights, and measures will one day perhaps be adopted by the greatest trading country in the world." Including the United States of America, there are now thirty countries using the decimal system as applied to coinage.—Journal of Commerce.

Tattoo Marks Immovable.

It has often been claimed that tattoo marks may be removed by pricking over them goat's milk. This is a mistaken idea. Chemists and others have for years experimented with various preparations in the hope of discovering some agent to wholly remove India ink marks from the human skin. Nothing, however, has as yet been found that will remove a portion even of the objectionable marks, unless, possibly, the attempt be made immediately following the tattooing process. At Mound Washington University, Baltimore, an experiment was some years ago made in presence of the writer upon the forearm of a noted character of that city, who died there. Before his death the man granted permission to the students of the university to experiment as they saw fit with his dead body. One of these students, curious to learn everything possible connected with the process of tattooing, cut from the dead man's arm a strip of skin upon which a coat of arms appeared. Beneath the skin the design remained visible. By degrees the flesh was removed, the design in India ink still remaining in sight, until finally the bone was reached. After a thorough sponging for the purpose of removing the blood and pieces of flesh remaining, it was found that the representation still appeared. After cutting away a small section of the bone, the india ink mark was found to have not penetrated beyond.—Boston Commercial Bulletin.

The Utilization of Niagara.

From information furnished by the Cataract Construction Company, at a consultation of the engineers of the company in London, says Bradstreet's, it was decided in starting the tunnel from the lower river that the portal should be so located as to have its floor twenty feet below the average water level, the only part of the tunnel mouth showing above water being the arched roof of nine feet radius. From this opening the tunnel will be carried on a grade of 0.4 per cent. (four feet per 1,000), making the floor slope less than the hydraulic gradient required to enable a tunnel of 400 square feet section to deliver the water required to give 120,000 horse-power with a head of 120 feet. The expected theoretical advantage to be gained by treating the tunnel as a full running pipe was carefully discussed and anticipated by the partial submergence of the floor of the tunnel by the water of the lower river for about 5,000 feet of its length, and the possible total submergence or filling from above by an adjustable regulator at or near the discharge mouth of the tunnel. The required hydraulic slope that may eventually be wanted is perhaps 0.7 per cent. (7 feet per 1,000) or what will give a mean velocity of current of about 28 feet per second, a speed not greater than already exists in some parts of the Niagara river below the falls. It will doubtless be some years before the capacity of the tunnel will be taxed to its utmost, and until that time comes the tunnel will be a stone-walled water-way, with an arched roof above the water.

New Railroad Signal.

From an exchange we take the following description of a recent invention by J. M. Brohard, of Clarksburg, W. Va., of a pneumatic railway signal:

It consists of a disc about a foot in diameter, made of two pieces of plate glass placed an eighth of an inch apart in a copper band. There is an opening in the bottom of the band, to which is soldered a pipe which connects with a copper reservoir placed above the signal. At the top of the band a small half-inch pipe protrudes from between the glass plates, to which is affixed the air tube, which runs to the office from which the signal is to be operated. A liquid is to be poured in the reservoir, and flows down through the pipe, up between the glass plates of the disc, completely filling the space, and making the normal condition of the signal red.

The signal man changes it to white by blowing through the small air tube, his breath forcing the red liquid back into the reservoir. There is a stop-cock connected with the mouthpiece of the tube, which, when turned on, prevents the air from escaping, and keeps the signal white at the will of the signal man. After a train has passed, all he has to do is to turn the stop-cock off, allowing the air to exhaust, when the red liquid flows back to its place between the plates. Tests have been made with a full-sized signal, and it has been found that it operates instantly at a distance of one hundred feet from the office with but slight exertion on the part of the operator.

Mr. and Mrs. Partington in Maine.

[Lewiston Journal.]

The Maine Mr. and Mrs. Partington are still on deck. One lady just returned from Boston informs the neighbors that she rode "upstairs in a refrigerator, and had her washed at a foundry." A Maine man clothes recently rose in a municipal meeting and solemnly announced that "for reasons unknown to himself he desired to resign." An old lady in Bath recently mortified her relatives intensely. At a grand dinner she overheard a lady guest politely answer to the welder of the carving-knife that "it was immaterial which portion he had." A luscious slice was passed up to her, and our old lady, after an appropriate glance, "guessed that she would have a small hunk off n. the immaterial."

Every Mother

should see that her little ones are protected, and that a bottle of Dr. David's Cough Syrup is at hand to give in case of croup, coughs, or colds.

PLANTER AND FARMER.

FACTS TO PROMOTE THE PROSPERITY OF AGRICULTURISTS.

How Cows Should be Milked—Observations by an Experienced Dairyman—Effects of Selecting Year After Year the Improved Seeds of Cotton.

Cows do not like to be kept too long waiting to be milked, and they are even capable of jealousy if one cow is milked out of her turn to the neglect of another. Regularity in feeding, in milking, and in perfect gentleness and kindness in dealing with cows are essential to success. Any breach of these rules is inevitably marked by a falling off in the yield and a consequent diminution of profits. In a large dairy, where perhaps fifty or one hundred and fifty cows are milked, it would pay well to give a salary to a foreman of the milkers, whose sole duty it should be to see that the cows are properly treated and carefully milked. He would test each cow and also keep a perfect yield of each at every milking. The scales alone should tell him whether the milkmen were doing their duty faithfully.

The greatest drawback in dairy work is the difficulty in obtaining honest, faithful servants. So far as pecuniary matters are concerned, there is generally no complaint to make; but there is another kind of honesty, which is very scarce. The majority of milkmen are neither strict nor particular in the performance of their work when the master's eye is not upon them. The master cannot leave the milking shed in their sole charge, and he cannot trust the servants to treat the cows with gentleness and to milk them quickly but without flurry, and at the same time to do the work thoroughly.

Very few, if any, people can find pleasure in milking a number of cows morning and evening for month after month, but yet it must be done with the most perfect regularity and thoroughness. The udder must be emptied to the last drop, and if this is not done every time, the supply will fall short every time—that is, that nature finding that more milk has been produced than is required, will abstain from producing so much milk and devote the food to the production of fat or of muscle.

Almost anybody can milk a cow, but there are few who can do it properly. It is an art, and the man who can practice it is worth more to the dairyman than any other help. The art of milking is to draw it off steadily, quickly (by no means hurriedly) and completely. Scarcely any two cows are exactly alike in disposition and in the character or nature of their teats and udder. Some are hard to milk and have very small apertures; some have tender teats; some are quite easy to milk, some cows are phlegmatic, others are lively and nervous.

Now it is extremely difficult to find a servant who will trouble himself to study the individualities of the various cows and try to humor their caprices or adopt his plans to their peculiarities. He wants to get through his "job" as quickly and easily as possible. The easy milk cow is his favorite, and comes off by far the best, but he sits down beside the hard milker with a kind of grudge against her supposed failing. He expects some trouble with the timid one, and this very fact is likely to make the trouble appear. The animals know him and his temper and moods far better than he knows theirs. They must be humored and put into a good humor. They may be forced into submission, but they ought instead to be coaxed or pursuaded into willing compliance. If they are roughly handled, approached hastily and without any care for their "mood," it irritates and worries them, the fretting, the agitation and the worry make them fall in quantity, and within a very short time the decrease in yield is quite marked.

The worst of it is that a return to proper treatment will not restore the former condition of things when the supply has fallen off through wrong treatment, through the employment of a careless servant; it can not be restored by entrusting the cows to the care of even the most careful person. Under proper feeding and kindly treatment the udder of the cow becomes distended with milk at regular intervals, and when the time comes she looks forward to be relieved of her burden. If the milkman understands the cow she looks to him as her friend, and yields up her milk with pleasure, because the distension of the udder is painful to a certain extent. But when a cow becomes troublesome, tries to kick over the pail, won't give down her milk, and so on, there is a cause for it, and the cause will generally be found outside the cow—she has not been properly treated and she resents it.—Dallas News.

Cotton Seed for Planting.

A bulletin of the Alabama experiment station contains the following:

The intelligent farmer has often noticed in his fields of cotton some plants much larger than others, containing a larger number of well-informed bolls, and with fiber whiter, more silky, and better in quality than on any other plant in the field. It he would select from this plant the bolls that are the largest, the finest and most perfectly matured, and, after ginning the cotton, carefully select the seed, rejecting all that are blasted or imperfectly shaped, and then carefully protect them to prevent fermentation or becoming in any manner damaged until the next planting season, the first important step would be taken. There is no chance in this matter if we follow closely the laws by which nature performs her perfect work.

The cotton seeds that have thus been carefully collected from the first soil, under the best conditions, and well cultivated. No cotton of an inferior grade must be planted in the neighborhood. In fact it does not pay to cultivate inferior cotton, and it is best to send all such seed to the oil mills.

When blooms of low grade cotton open, insects and winds will soon transport the pollen from them to the pistils of the selected variety, and the germs will become depreciated by such inferior fertilization. There are a number of insects that visit the flowers of the cotton plant for the nectar they contain, and in the effort to reach the base of the flower, where the nectar is found, their bodies become covered with pollen that is transferred to the stigma, where they come in contact with pistils of other flowers.

It is really seen, therefore, that if plants of an inferior grade are growing and blooming in the immediate neighborhood of the selected varieties, the insects will soon convey the pollen from the inferior to the superior plant, and the seed that will be produced will contain a germ with qualities of the inferior plant. This work of the insects might explain, to some extent, why it is that improved seeds in a few years degenerate so badly. If the selection of the seed is repeated from year to year, and no inferior cotton planted near enough to vitiate with its pollen by means of insects or wind, and if seasons are favorable there seems to be no reason why practically perfect plants may not be produced.

Kaffir Corn.

A Kansas correspondent of Colman's Rural World, in speaking of Kaffir corn, says:

"This year the farmer who has the most Kaffir corn is the one that is happiest as to feed, especially in this section of country. During the extreme dry weather while field corn was burning up and some shooting and trying to shoot and missed the stalk, the Kaffir corn seemed to stand still and was nice and green, and when the rains began to come, why the Kaffir just jumped and made a fine crop and lots of fine feed as to fodder and seed, while the field corn was past all hopes of redemption. Some of my neighbors have been getting their Kaffir corn threshed, and, as usual, the yield of seed per acre is five times more than field corn, and in quite a number of instances still greater, and the fodder is nice and green and full of nutriment, and greatly relished by stock of all kinds. The hogs eat the stalks as well, and are especially fond of the seed. I have grown it now for three years, and am well pleased with it.

The Saw as a Sire.

Prof. A. J. Cook, in the Rural New-Yorker, writes: I was much interested in the editorial remark in a recent issue of the Rural New-Yorker to the effect that the dishorning of male cattle was already affecting the offspring of such males. It is a very interesting question, and is so important in its scientific aspect that I wish to know more in relation to it. Just at present there is a very earnest discussion going on among scientists on this very question. Weismann contends that accidental peculiarities like the loss of horns or pathological disturbances are not inherited. Many others, like Cope of our own country, believe that these lost characteristics may be transmitted. Governor Luce, of our State, tells a very good story, in substance as follows: Once Professor Church, a teacher of distinction in our State, told his class that if any organ of an animal was repressed in growth, cut short or destroyed by man or accident, there would be a tendency toward such modification in the progeny of the unfortunate parent. If such mutilation was continued its transmission to offspring would be almost sure. A bright boy raised his hand and then queried: "How is it that our lambs all have long tails, when farmers have practised the pruning of these organs for years?" The professor was vanquished.

I believe that accidental peculiarities are often transmitted, else how does man establish better breeds by better care coupled with selection? I believe the better care develops finer organs, which are inherited by succeeding offspring. Whether such mutilated organs will be inherited or not may depend somewhat upon their importance in the life economy of the animal; possibly upon the fact of the continuance of the impression or friction which induces the first modification, and possibly upon the closeness of the relation of the mutilated organ to the reproductive system. A sheep's tail is not a very important organ functionally, nor would clipping it or its loss make much of an impression upon the general organism of the animal. The horns, on the other hand, are functionally important; their loss changes the spirit of their former possessor; and, again, they are closely coordinated with sex, as we know that in many ruminants only the males have horns. Hence, if what the Rural says be true, we need not so much wonder, yet I am surprised that the effect is so speedy. Can there be any mistake about the matter? It is so important a fact scientifically that I wish any who have evidence that dishorning does tend to reduce or destroy the horns through inheritance would write to me fully of the facts, or write to the Rural, as they prefer. I am sure in a matter of so much importance every fact should be published.

Japan Clover.

The following extract is from an address of Professor F. A. Gully, of the Agricultural and Mechanical College of Mississippi.

We have in this State a variety of plants that will take the place of the Northern grasses as readily as the cotton seed can be substituted for corn in feeding cattle or fattening beef. I will place Japan clover (lespedeza striata) first on the list, not that it is best of all, but it will take unculti vated lands without sowing or preparation, after a little of it is introduced into a community; and it will interfere with cultivation no more than red clover and timothy when the land is plowed for planting crops. It not only has the peculiar power of the red clover in its roots to extract a larger amount of nutritive matter from the soil than most other plants, but it will spread over the poorest of our land, a scanty growth at first, but if not too closely pastured it will improve the soil and increase its pasturing capacity at the rate of at least twenty-five per cent. a year. In this respect it surpasses any other plant known to me. On fertile land it will furnish as much grazing as any other plant known in this country, if we except the Bermuda grass, and on righ lands it will cut two or three tons of hay of good quality per acre. For grazing, as a milk and butter making food, it is nearly equal, if not quite equal, to the blue grass, and for fattening or making growth from July to November it surpasses all other grazing plants on ordinary upland or sandy soil. It chokes out weeds and inferior grasses, even Bermuda on certain lands. When started on our old hills that are too poor to pay for cultivation, and pastured with cattle that are fed on cotton seed a part of the year, the fertility of the soil and the capacity of the land for carrying cattle increases more rapidly than under any other treatment I have ever seen in any part of the country.

In making these assertions I stand prepared to give proofs in the way of facts demonstrated, on which I base my conclusions.

The Disappearance of Fences.

On a subject which has been much agitated in the South, an exchange says:

Belgium and Bavaria get along without fences. The people in those countries need every inch of land for cultivation. In Georgia and South Carolina the no-fence counties are conspicuously prosperous and well satisfied with their experiment. The Sun says:

"A very great number of the fences on farming lands are unnecessary. The separate fields are liable to invasion and constitute a barrier between the property of neighbors for which there is no occasion. To build them and keep them in repair imposes an expense which, in the aggregate, is enormous, and where they are of wood they cause an unnecessary draught on the forest supply at a time when our timber needs to be carefully preserved. Many of the fences, especially the more modern fences, deface the landscape, as foreign travelers have so often complained. They are placed where no excuse for building them exists; not merely to shut off the property of different owners, but to divide the fields of a single farm, and where protection against cattle is not at all required. They also keep from cultivation a vast amount of the land in the aggregate. It therefore becomes a question of practical economy for every farmer to consider whether he has fences, and how many of them, which are absolutely necessary."

The time, labor, and money consumed in keeping up fences is an important item. Even in the little towns and villages around New York fences