

SCIENTIFIC TOPICS.

CURRENT NOTES OF DISCOVERY AND INVENTION.

A New Invention for Measuring Strength by Means of the Bicycle—A Cantilever Bicycle One of the Latest Novelties.

Ingenious Rat-Trap.



HIS ingenious and curious rat trap is a wicker imitation of a snake, having a real snake's head fastened to the end of it with some adhesive substance. The bait is a piece of skin, containing some vegetable substance to which rats are supposed to be very partial.

The trap is on the collapsible principle, and is set by being pressed together at the ends between the hands, until it is large enough to admit the body of a good sized rat. The spring is then fastened, and as soon as the rat touches the bait at the extreme end of the interior, the whole thing collapses and resumes its original shape, squeezing the rat tightly and effectually securing him, the open work rendering abortive all his attempts to escape. This kind of rat trap is made and used by the natives of Loanga, West Africa.

Wasting Electricity.

Carelessness on the part of the motor-man is, according to recent investigations, the cause of a great waste of electrical force. This occurs at the starting and stopping. Sometimes the power is left on until after the brakes are set, at other times there are merely partial currents, but quite enough to foot up a considerable aggregate. In fact, it is estimated that as much as 20 per cent of power may be lost in this way. So noticeable has this become that it has been found advisable to adopt a very simple device by means of which the lost current is, at least, approximately, measured, and the amount thereof can be charged up against the unskillful or careless motor-man. This device consists of a strip of alloy placed in a box prepared to receive it. The alloy is held against the wire by a weight attached to the lower end of the strip. It is supported by a short piece of German silver wire of such cross section as to be heated by the current which flows through it to operate the car. At a certain temperature the wire melts its way through the strip of alloy, thus allowing the strip and weight to descend. There is an automatic device to prevent injury to the recorder of the stoppage of the car in case the wire should melt under an abnormal current. The recorder is pushed into place, at the same moment closing the car circuit. To insure its use the arrangement is such that unless the recorder is in place, the circuit is open, and the car will not start. A record is kept of the number of miles each man runs, and the number of inches of alloy melted during the run. This is returned at the end of a month and is posted up over against the man's name. It has been estimated that a considerable saving is effected by this means.

Measures Her Strength.

A late invention from Paris is a meter for estimating how much strength a bicyclist may safely expend on a day's ride. One variety of meter is fastened to the wrist of the cyclist, to take the pulse beats. A second meter, shown in the illustration here given, is not only for bicyclists, but to be used in all tests of the lungs and vitality. As



women are more frail than men, and more liable to overdo the thing, the new tests will be of especial value to them.

Uses of Bamboo.

The attention of builders is being drawn to the value of bamboo as a building material. The great strength of bamboo poles is not at all understood by the majority of persons. It is stated on excellent authority that two bamboo poles, each of them 1 7/10 inches in diameter, when placed side by side, will support a grand piano slung between them by ropes, and that they will neither sag nor break under the burden. Bamboo will form poles 65 to 70 feet long and from 8 to 10 inches in diameter. A derrick 26 feet high made of 4-inch bamboo poles raised two iron girders, weighing together 424 pounds. The wonderful lightness of this material in proportion to its strength has excited comment of late, and new uses are constantly being made of it. Scaffoldings of bamboo have the advantage of lightness and strength. It is predicted that this material will come in general use for such

purposes. An additional advantage is that bamboo resists decay in water as well as in the earth, that the older and drier it gets, the more solid it becomes, and that it can be grown for an incredibly small sum.

The Construction of Boiler Plates.

It is a notable fact that steel has almost entirely superseded iron for boiler plates. Steel has a greater tensile strength than iron, and much greater ductility and elasticity. From 55,000 to 60,000 pounds per square inch is the tensile strength now required by standard tests. The test is made on steel bars one inch square, and so carefully are the tests calculated that in the specification for high pressure boilers, it is one of the conditions that the plates shall be of the tensile strength specified per square inch, and that any reduction of area at the point of fracture under test shall not be less than 56 per cent. In other words, an inch bar of steel when strained to the breaking point must not be reduced in size to not quite one-half the original area of the bar. The varying temperature to which the boiler is subjected when in use makes it necessary to exercise this care, as the resistive ability of the plates must show a clear 56 per cent.

The Cantilever Bicycle.

The accompanying illustration is from a photograph of the Cantilever bicycle, one of the latest novelties in cycle construction, and its inventor, Mr. Nickall Pendersen. One of the features wherein this machine differs materially from the ordinary safety bicycle is the weight. Cantilevers range in weight from the nine pound racer to a wheel for rough use, which weighs 14 pounds.

The construction is the outcome of the inventor's desire to secure a perfect seat. Mr. Nickall Pendersen is a Dane, residing in England, and he has been a wheelman for twenty years. His idea



was to enjoy the comfort of a hammock on a bicycle, which he accomplished by the use of silk strings on which the saddle rests.

The front forks are attached to the rest of the frame by a pivot connection at the top and by a strong pivot hinge at the point shown in the cut just where the lower part of the frame joining with the crank hanger goes up to a point near the top of the front wheel. This connection gives the machine a sensitive steering device.

Oranges as Medicine.

There is no doubt that pure fruit juice is one of the best blood purifiers and system regulators that we possess—in fact, there are many who can testify to this fact, particularly as regards oranges. Some people who have hitherto eaten fruit between meals, or just before going to bed, and condemned it as injurious, have learned to eat one of two oranges with nearly every meal, particularly breakfast, and have found, to their pleasant surprise, that it exercised a marvelous effect upon their general health. Many remarkable things have been claimed for oranges taken as a food, such as making the complexion clear and beautiful, curing the drink habit and numerous other things as varied as marvelous, and there are doubtless persons who have made themselves ridiculous eating oranges by wholesale in the endeavor to cure of the disease to which the flesh is heir. Thousands of persons can testify, however, that a judicious use of oranges is a good thing, but a few precautions must be taken. In the first place, buy nothing but good fruit, especially ripe fruit. Green or bad fruit cannot be good for anybody. Then be careful to peel your orange carefully, for the white pith lying beneath the yellow rind is one of the most indigestible substances known in the vegetable world. Do not eat too many oranges at first; but if the habit of eating them with meals is once formed a person will never be satisfied to eat a meal without fresh fruit of some kind. The habit will work wonders in a short time in the direction of regulating the system, keeping the blood in good condition, and creating a good appetite.

Effect of Injuries to Plants.

According to an English authority, when a plant is bruised or injured in any way, a condition arises which exactly corresponds to what we term fever. The rate of respiration is increased, the temperature of the parts affected is considerably raised. The disturbance has its period of increase, reaches a climax and subsides as does ordinary fever. Indeed, the increase in temperature is quite as great, if not greater than in animals. This opens a wide field for investigation and discussion, and one which will be followed up by lovers of nature and its very interesting phenomena.

For the purpose of putting out small fires that are too high in the room to reach easily and where there is no hose handy a new device consists of a gun with a large barrel to hold water, which is thrown onto the fire by a cartridge inserted in the breech and fired by pulling a trigger, the gun being easily recharged for use again.

FOR WOMAN AND HOME

ITEMS OF INTEREST TO MAIDS AND MATRONS.

About Evening Gowns—An Essential Feature of Early Summer Wardrobe—How Overworked Mothers May Save Labor in Gowning the Daughters.



The Little Pink Shoe.
NLY a little pink baby shoe. That is stained and wrinkled and torn. With a tiny hole where the little pink toe peeped out in the days that are gone.
The little pink toe was the "big little pig" that to market so often would go, and over and over the legend was told. As I kissed the little pink toe.

"Piggie some more," the red lips would lip, and the rosy and kiss were given again and again, so happy were we in motherhood's foretaste of heaven.

But there came a night, with a desolate blight, when death bore my idol away, and no little toe ever peeps from the shoe. To be kissed in the sweet old way.

But my tears have deluged the little pink shoe, and stained it a deeper stain, and I long for the touch that would chill me in death. If it gave me my darling again.

So, when I am dead, lay the little pink shoe near my heart which is silent and cold, and perhaps up above, in the sunlight of love, I shall kiss the pink toe as of old.
—Kate Thyson Marr, N. Y. Journal.

Evening gowns.

Even for those having but two weeks' vacation, an evening gown is an absolutely necessary part of the summer wardrobe. It need not be expen-

sive over the shoulders, if it be wide, or edges the flounces, if narrow. Yellow organdie over white silk makes an effective costume.—The Latest.

Crepon Gowns.

To the mother of a large family let me recommend cotton crepe for the gowning of her little daughters. It looks quite as well as organdie, if made up prettily, and, oh, what a boon it is for the overworked mother. You know it doesn't need starching, but can be washed and hung out to dry. After that a very slight pressing is all that is necessary to make it ready for wear. One little mother that I know, with three hardy boys and one tiny daughter that keep presentable, intends to take her children away for the summer. She can't afford to pay immense laundry bills, so she has laid in a stock of cotton crepon gowns for the little maid. A pale corn color has an empire waist



on which the skirt is gathered, the large puff starting at the elbow on black velvet ribbons. Other ribbons are sewed to the edge of the yoke and tie over the shoulders with long loops. A pale green gown has a long Priscilla

FOR BOYS AND GIRLS.

SOME GOOD STORIES FOR OUR JUNIOR READERS.

The Serenade—A Pretty Story for the Little Ones—Reading a Newspaper at the Top of a Flagstaff—Daring Deed of a Chicagoan.



Where to Walk.
HERE the pools are bright and deep, where the grey trout lies asleep, up the river and over the leafy bank, that's the way for Billy and me.
Where the blag-bird sings the latest, where the hawthorn blooms the sweetest, where the nestlings chirp and flee—That's the way for Billy and me.

Where the mowers mow the cleanest, where the hay lies thickest and greenest, there to trace the homeward bee—That's the way for Billy and me.

Where the hazel bank is steepest, where the shadow falls the deepest, where the clustering nuts fall free—That's the way for Billy and me.

There let us walk, there let us play, through the meadow among the hay, up the water and over the leafy bank—That's the way for Billy and me.
—Hogg.

The Serenade.

One day a man, who had pictures to sell, came through the village where Mr. Chester lived. The pictures were mounted on large squares of pastebord edged with gilt paper and were colored very brightly.

"Oh, can't we have one, mamma?" they plead, so their mother told them they could choose the one they liked best and hang it up in their room after they had looked at it.

The boys were a long while choosing among such a number, for there were landscapes and roses and kittens playing with balls of cotton, but at last Fred, the eldest, decided that one called the "Serenade" was much the finest. It represented a garden, a fine house and a balcony. In the garden were flowers of all colors, and a great yellow moon made everything as bright as day, and beneath the balcony stood a gentleman with immense black eyes and curling hair, dressed in crimson velvet coat and knee breeches, with white silk stockings and buckled shoes and lots of lace ruffles at his neck and about his wrists. His big eyes were fixed upon the curtains of a window which opened on the balcony, and through them was thrust a very small white hand holding a rose. Below this picture were these words: "The Serenade" and some verses. When the boys had paid for the picture they sat down on the porch to look at it.

"I think," said Frank, "that it is the most beautiful picture that ever was. Don't you, mamma?"

"I believe it is the brightest I ever saw," said the mother.
"What does a 'serenade' mean?" asked Fred.
"Why, the thing he is playing on, of course," said Louis.
"No," said mamma. "That is a mandolin. When gentlemen admired ladies in those days they often went at night after every one was in bed to sing beneath their windows. They chose or wrote some song that told the lady how they admired her, how pretty and nice she was, and they often sang to a guitar or mandolin. Sometimes they did not sing, but played the flute. This gentleman is serenading the lady who is hiding behind the curtain, and this is probably what he is singing," and she read the verses below the picture.

"Why does the lady hide herself?" asked Frank.

"Well," said Mrs. Chester, "it was considered proper, but, you see, she is going to throw the singer a rose, which will show him that she likes the serenade."

"That's his bike suit, isn't it?" asked Louis. "Where has he left his bike?"

"Bicycles were not invented when men dressed like that," said Mrs. Chester.

Fred read the verses again. "I think everything must have been prettier than it is now," he said. "I often think so myself," said his mother. "Men will probably never dress like that again, but there could be a little more romance in the world if people chose."

"I know what you mean, mamma," said Fred. After awhile he sat down on the lower step of the porch and began to write on his slate, and pretty soon he called Louis and Frank to him, and they all whispered together. Their mother saw they were talking over some little secret.

After awhile papa came home to tea, and then they all sat about the table until about half-past nine o'clock.

As they were very early people they all went upstairs about that time, and at ten the house was dark and everyone in bed or supposed to be.

However, just as the clock struck, Mr. Chester lifted his head to listen.

"Dear me, what can that be?" he asked.

There was a sound of something not unlike Chinese music under the window, a queer whistling and a loud tapping and some laughing. Mrs. Chester jumped up, ran to the window and looked out. The moon shone bright and lit up the small lawn perfectly, and standing upon it she saw three little figures in knickerbockers, wearing sashes around their waists, plumed hats and making the music of which we have spoken. Just as she looked out one of them began to sing.

"What on earth is it?" asked papa.
"Be quiet, I am being serenaded," said mamma.

The three funny figures were Fred and Louis and Frank, with ribbons from the parlor window curtains about



DINNER GOWN OF ELIZABETHAN MODE.

sive, but it must be fresh and cut to show that it is intended solely for evening wear. Fancy silk is offered at such low prices that it seems an easy



matter to secure an evening gown of it. Pretty stripes are offered at about 30 cents a yard, and make up very well for the purpose. Plain taffeta is good also, although rather more expensive. Yet silk is not the only available material. Net is considerably used, and may be draped over a gown that has seen its best days. The skirt should be finished with four or five rows of ribbon, and the waist trimmed to match. If but one evening gown is included in the wardrobe it is best with a square neck. This shape seems more suitable to every occasion than the round neck. Gowns made of organdie and muslin are by far the prettiest of summer evening costumes. They are combined with lace and dainty ribbons. The lace is draped into

bodice with ribbons of the same color tied about the waist. The sleeves are tight and slightly puffed at the top. Yet the prettiest of all is a dainty pink to be worn with a white mull gimpe. The sleeves are also of mull. The skirt is gathered to a white silk band embroidered in pink rosebuds that cross between the shoulders both back and front. Similar bands form epaulets arranged in such a way that they are easily removed when the gown is to be laundered. They are washed in ammonia, and when the gown is washed they, too, are fresh.—The Latest.

Buttons.

Buttons are certainly as ancient as the siege of Troy. In the ninth century before our era, for both in that unfortunate city and at Mycenae, Dr. Schliemann discovered objects of gold, silver and bronze which could have had no other use but that of buttons. In medieval times the clothing of the common people was generally fastened with wooden pegs of the type and form of those resorted to in emergencies by the country boy of the present day. Buttons covered with cloth were prohibited by George I in 1720, to encourage the manufacture of metal buttons.

Polish for the Furniture.

A little turpentine and oil applied to furniture with a flannel cloth, the furniture then thoroughly rubbed, will give it a bright, clean appearance. If your rosewood refuses to polish have your furniture man polish it for you. He will rub it down with sandpaper, and varnish it, so it will last for years.

London's unsuccessful cab strike cost trades unions \$100,000, of which \$95,000 was subscribed by cabmen.

their waists and feathers from the large duster in their caps. Louis was playing on a comb covered with tissue paper. Frank was tapping his little red drum, and it was Fred who was singing. And now his mother guessed that what he had been writing on the slate was this song, which he now sung to a tune something like "Baby Mine":

We have no mandolin, mamma, dear;
No flute and no guitar, mamma, dear;
But we play upon the comb
And we beat upon the drum,
And so we serenade our mamma, dear.

Because we love you so, mamma, dear;
And you are so nice, you know,
mamma, dear;
So pretty and so good
That you really, really should
Have a serenade sung to you, mamma, dear.

Papa laughed as he listened, but mamma did not feel like laughing.

"How cunning they are! Oh, the little darlings!" she cried. Then she ran to the vase on the mantelpiece and took out three lovely roses that had been given her that day, and threw them down to her dear little boys.

And oh! the kisses that she gave them when they came to breakfast next morning with the roses in their button-holes and what raspberry jam with their pancakes.

A True Story.

Everyone knew and loved Father Graham. He was an old-fashioned gentleman with the simple heart of a child. Because of his goodness his influence was very great with both old and young in the little town where he dwelt.

A young man of the village had been badly insulted, and came to Father Graham full of angry indignation, declaring that he was going at once to demand an apology.

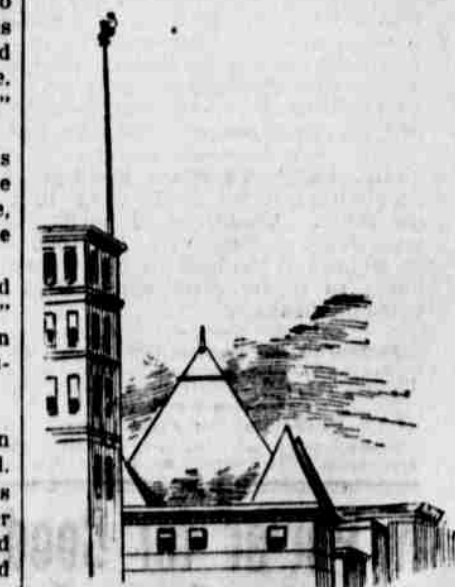
"My dear boy," Father Graham said, "take a word of advice from an old man who loves peace. An insult is like mud; it will brush off much better when it is dry. Wait a little, till he and you are both cool, and the thing is easily mended. If you go now, it will be only to quarrel."

It is pleasant to be able to add that the young man took his advice, and before the next day was done the insulting person came to beg forgiveness.

Reads the News on High.

From the Chicago Dispatch: Just Wang, the assistant janitor of the Tacoma building, hunted up a queer place to read his morning paper today. He was not satisfied with even the roof of a sky-scraper, and so he climbed the fifty-foot flagstaff of the thirteen-story building at the northeast corner of La Salle and Madison streets, where he remained for nearly an hour calmly perusing the story of the preparations for Logan day.

While he sat perched at the top of the flagstaff, 300 feet above the sidewalk, people in La Salle and Madison streets craned their necks and wondered who was erratic enough to choose such a place for a morning airing. But Wang was not up there for his health. He climbed the fifty-foot flagpole to fix the halyard, which refused to work when the janitor attempted to put up the flag for Logan day. When he reached the top of the flagstaff he discovered that the pulley over which the rope passes was broken. A new pulley was needed and while Jacob Pfeifer went over to South



REPAIRING PULLEY ON FLAG-STAFF.

Water street and Fifth avenue Wang enjoyed a smoke and his morning paper.

"It was easier to remain there than come down and climb up again," he explained when he once more reached the roof of the building. Wang is not a professional flagpole climber. He is simply an assistant janitor, but he displayed all the nerve and coolness of a man who is in the habit of performing antics daily in midair. He lives at 184 West Erie street and is an old employe around the Tacoma building.

Camels in the Snow.

Troops of camels, brought from Mongolia are employed in winter to carry supplies and material to and from the gold placers of eastern Siberia, and the spectacle presented by a long line of these "ships of the desert," tramping solemnly across the snows of a Siberian steppe, is described as extremely singular. Camels require only about half as much daily food as horses, but on the other hand, they have to be liberally supplied with salt. Where the country is so wild that neither roads nor tracks exist, reindeer are employed instead of horses or camels, and they find their own living en route by uncovering, beneath the snow, a kind of gray lichen on which they are able to subsist.