New and Interesting Facts from Science and Life

JOLTING TO CURE "BAD EYE" HABIT

HAVE you a "bad eye"?—not the kind called an "evil eye," that, according to superstition ages old, has the power of bewitching, but an optic whose physical limitations make you a "slow reader"? If you have such a pair of eyes then you should have them "jolted."

Recently announcement was made that the educational department of Springfield, Mass., had decided to increase the reading capacity of the school children; and that Prof. Colin A. Scott, head of the department of education at Mount Holyoke College, would direct the work. How Prof. Scott is accomplishing his purpose with the aid of a machine—a device of cogged wheels and sliding shutters and speed controls that might be called an "eye-jolter," is described in Popular Science Monthly by Raymonde G. Doyle.

Early tests showed that the reading capacity of both children and adults varies greatly. It was proved that if 22 per cent. of all the people in the United States cannot read at all, there are probably not more than 25 per cent. who find any comfort in reading even the newspaper. Graduates of high schools were able to read material as difficult as the ordinary news items at the average rate of 310 words a minute. Some read as slowly as 150 words a minute, while others progressed as rapidly as 450 words a minute. Those who read more rapidly, it was found, were usually able to give as good an account of what they read, and of course a longer account, than those who read more slowly.

Ultimately Prof. Scott found that the rate of comprehension was a large factor in determining speed reading.

Another point made clear by the tests was that certain mechanical habits are formed by children, and that some of them interfere with both speed and comprehension. Among them was the habit of fully pronouncing words mentally while reading silently. The rapid reader never does this, although he cannot get along without some pronunciation. He telescopes or slurs his words, a great advantage in silent reading, but a drawback in that it tends to make the individual a slipshod speaker.

The next step was the determination that the rapid reader had a great positive advantage, chiefly because impressions passed before his mind quickly and crowded together into one focus, thus unifying within the span of a few seconds the different elements that went to make up a thought.

Then Prof. Scott gave his attention to the movements of the eyes as they pass over the material read.

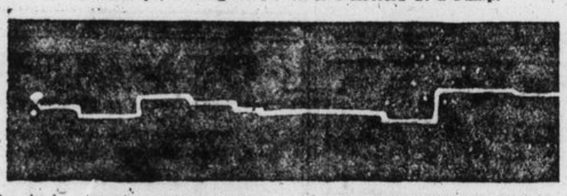
"The reader," he says, "usually assumes that his eyes glide evenly over the line unless he should be stopped by something not properly seen or understood. Accurate observation, however, shows that this is not the case.

"A good reader takes in 12 or 13 letters in one glance. In order to do this, the eyes rest for a fraction of a second, usually about one-third of a second. They then move rapidly to the next section, and so on.

"These sections doubtless overlap somewhat on the edges and are of slightly irregular lengths. The eyes move a certain distance and then stop, whether the distance moved is exactly the same as on the previous section or not. The line of travel is along the upper portion of the line, but the centre of the resting-point may be, not a letter or a word, but a blank space. This makes no difference to the vision, since it is a certain section that is seen, not successively, but at once. In an ordinary newspaper line, a rapid reader will make only three stops, and will thus be reading about 350 words a minute. A slow reader, on the other hand, makes as many as seven and more stops and reads perhaps only 160 words a minute."

The Oculist First Exposes a Section of Printed Line, Covers It Up, and Then Exposes the Next Section. If the Pupil Reads Slowly, the Machine Is Geared Up to a Higher Rate of Speed, Literally "Jolting" His Eyes Along.

The Top Photograph Records the Movements of an Eye Reading a Magazine Line. The Dots and Hesitant Lines at the Left Indicate Difficulty in Starting. The Well-Defined Shifts Show That the Line Was Read in Four Sections. The Lower Photograph Shows the Reading of a Newspaper Line (Half the Length of the Magazine Line). After One False Move, the Eye Traveled Over the Line in Six Jumps, Taking About Twelve Letters at a Jump.



As a result of his highly important observations, Prof. Scott has drawn the conclusion that about half of the slow readers continue to be slow even when the material read could be comprehended by them much more rapidly. Not lack of comprehension, but the persistence of a "bad-eye habit," prevents their reading rapidly.

At this stage of his work Prof. Scott began to see a glimmer of hope. He invented a machine to correct the "bad-eye habit" of slow readers.

Prof. Scott's machine exposes a section of printed line as it would be seen by a good reader, covers it up, and exposes the next section at whatever rate may be found comfortable for the pupil. If, however, the pupil reads slowly, the machine can be geared up gradually, almost imperceptibly, to a higher rate.

The machine has proved that the shutting off of an exposed section of a line, the exposure of the next section, and so on, does not interfere with the creation in the reader's mind of an impression of what he has seen.

The impressions "overlap," and the full import of the text is grasped easily.

Now, if the reader had been left to struggle along in his own way under the handicaps of a mechanical defect in eye movement, what would have happened? Undoubtedly he would have hesitated and lingered on this one line, and divided it into four or five or possibly six sections. But the abrupt shutting off of the first section of the line compelled him to shift his eyes to the next. Literally, his eyes were "jolted" along when his own inclination was to go slowly.

Gradually the eyes become accustomed to being forced to jump ahead, and they jump of themselves. The reader becomes oblivious to the motion of the shutter, and at the end of six weeks is able to read without it at about the same rate as with it.

Pink Kitchen to Banish the Housewife's Blues

DOCTORS and psychologists are witnesses to the fact that many housewives have become dangerously depressed and melancholy while living in a dark apartment, this melancholy and depression bordering on and producing definite physical ailments. Take this same woman and transplant her to a sunshiny kitchen, a light bedroom and living room and her physical as well as mental health quickly changes. Many authenticated cases can be cited to prove this statement.

One might at first say that the woman becomes depressed because of housework—that she doesn't like it, and wants to live in a hotel and play away her time. This is not true. She may need a rest for a time, but it is not her dislike of housework that, as a rule, makes her ill, yet she doesn't realize this.

There are two factors which a writer in The Illustrated World points out as being prominent mainly in causing the blues and physical as well as mental depression. First, the physician gives the pathological cause of dark rooms and dark colors on the walls as an explanation. The sun cannot get in its bactericidal work on dark rooms. The woman becomes a victim of an excess of definite germs in the air. If she does not succumb to pneumonia, she suffers with vague sore throats, a general lassitude, and weariness. With this lassitude comes a heavy dose of the blues. With the blues comes a general distaste for life, a distaste which makes her think for the time being that it is housework which is the basis of her trouble. She falls a prey to self-pity and despair.

"Give the woman a rest," says the physician, "and then a bright apartment or house flooded with sunshine." This sounds like excellent advice—much better, one would think, than mere tonics. The psychologist, however, adds something else. While he realizes that the sunshine is essential he claims that a still quicker and better cure can be obtained by the study of the colors of the rooms in the apartment after the sunshine has been admitted. The mere suggestion to select her own colors will cheer up any woman.

For her rest and relaxation in her living room give her the neutral shades of blue, gray and tan with an occasional brightening spot such as a yellow vase, a soft rose shaded lamp. Take away the brilliant or dull reds and browns unless they can be neutralized by softer colors of tan or gray.

Her bedroom is distinctly a matter of her personal choice, for unless she spends much time in this room it will not affect her habitual mental thought, as will the rooms in which she spends the greater part of her waking hours. This is one of the perversities of modern home decoration.

But the kitchen is a different matter. Real estate agents and paper hangers have too long had the say of what color shall be put on the walls of this room where the housekeeper spends so much of her time and uses so much of her output of energy. Grays, greens and queer shades of blue seem to be the favorite colors for decorating the kitchen. And grays and greens are not the happiest of colors in their effect on the housewife, declares the psychologist. The quieting effect of gray and blue is all right in the living room, but in the kitchen the ideal is to secure a stimulating color. Pink is the one chosen for its happiest effect on the worker when she enters this room on a dark winter morning to prepare breakfast and to do the necessary cooking for the day. It will dispel the feeling of dreariness.

The kitchen, therefore, trimmed in pink, is the latest recommendation for cheerfulness.

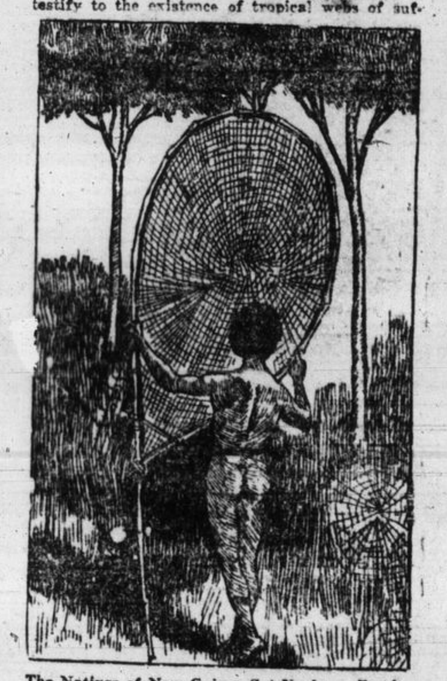
Catching FISH with SPIDER'S WEB

SPIDERS spin their webs with the object of catching flies and other delectable insects. If a spider could speak, he would doubtless tell you that it is a long, tedious job, but worth while in the end. Imagine the feelings of the spider of New Guinea when he returns to his web and finds it gone—stolen by cannibals!

Mr. Spider hears a splashing in the brook near by. He goes down, and there he sees a woolly-headed man-eater catching fish with the web he had so carefully spun but a few hours before.

In New Guinea, explorers report, spiders are as large as hazel-nuts, and they have great hairy dark-brown legs about two inches long. The webs they spin are often six feet in diameter and are very strong. The natives soon found this out, and they set up long bamboo sticks, looped at the end, in places where the webs were thickest. When the natives returned next day, their fishing-nets were ready for them—several unsuspecting spiders having spun their webs on the bamboo loops.

You can hardly blame anyone who demands somewhat more than the unsupported word of a traveler before he believes that a fish-net can be made from a spider-web; yet when a considerable number of independent observers assert that they have seen such nets in common use, and others testify to the existence of tropical webs of sufficient strength to make nets, skepticism must give way. So at least think Prof. E. W. Gudger of the State Normal College, Greensboro, N. C., who describes in The Zo-ological Society Bulletin what he calls "the most remarkable fishing-net known."



The Natives of New Guinea Set Up Long Bamboo Sticks, Looped at the End, and Unsuspecting Spiders Make Fish-Nets by Spinning Their Webs on the Bamboo Loops.

"Louis Becke, author of many interesting books on the life and customs of the South Sea Islanders, says that many years ago he was discussing the customs, habits and manner of life of the inhabitants of western Polynesia with Dr. J. S. Kubary, a German naturalist and traveler of high standing. They were at the time traversing a path through the mountains of Ponape, one of the islands of the Caroline Archipelago, lying northwest of New Guinea.

"It was early in the morning, and spiders' webs with the dew on them were found everywhere. They were very large, so much so that occasionally one of them would obstruct the path of the travelers, and would have to be broken through with a stick."

Difference in SERUM and VACCINE

THE difference between a vaccine and a serum—terms that are frequently confused—is simply explained in Holland's Pharmacy Handbook, quoted as an authority by the Medical Record, as follows:

"A serum is a product obtained by injecting into an animal, usually the horse, a culture (e.g. diphtheria) or the toxin from a culture (e.g. streptococcus) of the organism. Serums may be subdivided into—(a) Anti-toxic serums, such as diphtheria and tetanus, which are obtained by injecting filtered cultures into the animal used to provide the serum; (b) Anti-bacterial serums, such as anti-streptococcus and anti-gonococcus, in the preparation of which unfiltered cultures are used. Serums are usually injected in the flank or between the shoulder blades, the skin having previously been cleaned and the syringe carefully sterilized. Cases are on record where they have been given intravenously with normal saline solution.

"A vaccine is a finely divided suspension of killed cultures of a micro-organism which is injected directly into the human subject. The object is to stimulate the individual to elaborate his own antibodies, which results in increased resistance to the ravages of bacterial infection. Vaccines are of two kinds: (a) Autogenous—prepared from the organism isolated from pathological material taken from the patient; (b) Stock prepared from virulent cultures of the organism, isolated from other cases of similar bacterial origin. Vaccines are administered by subcutaneous injection by means of an all-glass hypodermic syringe. The site of injection may be the flank, thigh, shoulder or back. The skin is first sterilized by a pledget of cotton wool, saturated with a suitable antiseptic.

Briefly, the difference is that with a serum the opposing influence to the toxins is produced outside the human body, while with the vaccine it is produced inside, and the degree of immunity conferred is greater with the latter than the former. It should also be noted that the dose of a serum is much higher, from the standpoint of the amount of fluid injected, than in the case of a vaccine. With the former the dose usually ranges from 10 c.c. to 50 c.c., while with the latter it is as a rule, not more than 1 c.c."

ATHLETICS and MOTHERHOOD

DOES the athletic girl make a healthy mother? For some time this question has been debated by doctors of the leading nations, but it came up in an acute form when the pioneers of the agitation against athletics for girls held a conference in London the other day and condemned games as tending to be injurious to the next generation.

To such dimensions is the campaign against feminine athletics growing, that it is considered likely many colleges will shortly revise their games curriculum and that the present craze for violent exercise among all classes of British girls will be struck a fatal blow.

The chief blow to the "muscle girls," as they are known in London, was dealt by Miss Cowdry, a college principal who has had experience of girls for three generations. She says:

"The girl trained to hockey, cricket, football and tennis suffers in after life. Sometimes the child suffers and sometimes the mother, and sometimes one of them dies. The Victorian girl was better physically than the modern girl. A great many girls brought up on present methods of physical training are bad tempered and soured in later life."

Equally sweeping in her criticisms was Miss Radmar, head of a London institution for the physical development of girls.

"The typical athletic girl of today," she said, "with her wide hips and over-developed chest, is not elegant or fine. She is a degenerate. Big muscles are out of place in a girl. She should be educated to do the soft and gentle things of life."

Medical support was given by Dr. Arabella Kenealy, a celebrated English doctor, who says: "Athletic women produce female offspring mainly. Seldom do they have sons and these are apt to be puny and delicate."

On the other hand, there is an influential body of medical opinion in favor of athletics for girls. Dr. Mary Scharlieb, the famous woman surgeon, says: "Much of this criticism is nonsense. Athletics are excellent for girls, provided care is taken over them."

"These criticisms are merely part of a plan to get women back to their old-fashioned atmosphere," comments Dr. Jane Walker. "Athletics are exceedingly good for girls. The lie about puny children was nailed to the counter years ago. Investigations were made concerning the families of athletic women who had been to Oxford or Cambridge. It was proved that they had had beautiful, healthy children—and plenty of them. The trouble is that some timid mothers are beginning to be fussy about their girls, and there is danger of healthy exercise being interfered with."

Dr. Sloan Chesser, another well-known woman, said there was a tendency to overemphasize the value of athletics for both sexes.

"Boys and girls can play pretty much the same games until the age of 14 or 15," she said. "Girls seem to be as good as boys until then, but after that age the boys become relatively stronger, and other types of exercise appear to be better for girls. Dancing is a much better form of exercise for girls than Swedish drill, and I am also in favor of eurythmics."

The view of big business concerns employing huge numbers of girls (most of whom in England provide their personnel with grounds for games) is expressed as follows by a member of one company:

"The most efficient members of our staff are those who indulge in games. We have never found that the health of the business girl suffers from tennis, hockey or football."

It is pointed out that there exists a class of woman school teacher who wants girls' schools run on the lines of boys' schools, especially in the playing field. Sex jealousy is held to be at the root of the mischief. The muscular development produced in girls by violent exercise may be undesirable, but more than any question of aesthetics is the risk of nervous strain and physical exhaustion, and the probability that the child-bearing capacity of the woman of the future will be dangerously curtailed.

Finger-Nail Music

PUT a record on the talking machine and start it revolving, then, instead of using the needle, rest your finger-nail with gentle pressure on the disk, as shown in the illustration, and you will hear the piece reproduced, but not very loud, says the Illustrated World. A corner of a card will produce equal success.

HOW a CHILD LEARNS to TALK

ONE of the most interesting discoveries, resulting from the laboratory study of human beings by psychologists, is the almost incredible rapidity with which a child acquires a vocabulary. Scientific investigators have found that the average child from 4 to 5 years of age employs about 1700 words, and, if proper names are included, the number is more than 2000. The foundation of the intricate language habits of the adult is to be found in the cries of the infant.

One investigator has recorded the following sounds during the first 30 days of a child's life: "'M' in conjunction with 'a' as 'ma' (at), 'n' as 'nga' (nat, 'g' as 'gah,' 'h' as in ha' (at), 'r' as in burr, very slight sound, and 'y' as in 'yah' (at). Vowel sounds are 'o' as in 'owl,' 'e' as in 'fell,' 'oo' as in 'pool,' 'a' as in 'and' and 'a' as in 'father' (relatively rare)."

The first words learned have no more significance to an infant than those that a parrot utters have to it. Hearing a child make some instinctive sound remotely resembling a word, its parents, ever anxious to have it speak as soon as possible, reiterate that word many times. In this way words like "ma" and "pa" are acquired.

Words having a definite association with objects or actions are learned much later. The process is believed to be as follows: A child desires some object beyond its reach, as, for instance, a rattle, becomes restless and cries; its mother, endeavoring to find out the cause of her child's discomfort, hands it the rattle, saying, "Baby want a rattle? Here is tootsie-wootsie's rattle." Receiving it the child stops crying. The same process is repeated many times and gradually the child begins to understand that by saying "rattle" it can get that particular object much quicker than otherwise. This, to be sure, is only a rough description of language acquisition.

At the end of the first year the average child has a vocabulary of about eight or nine words. During the second year there is an increase to from 250 to 300 words, and some of the children tested had a command of up to 400 words. At the end of the third year children have a vocabulary of about 800 words. By the time they are 4 or 4½ years old they actually employ about 2000 words. After this age the extent of a child's vocabulary becomes more and more dependent on its environment.

An interesting factor in the language habits of children is their universal tendency to talk almost continuously. The talking child is, in reality, thinking. It is only after social training has exerted itself that the child abandons "auditory thinking" for "silent thinking." This conception of thought, while not thoroughly established, has at present the weight of scientific observation in its favor. Some adults have never got over the habit of talking or moving their lips while reading or thinking.

Differences in the voice of every individual may be observed from birth. A mother can distinguish her infant's cry even in a large nursery.

How POTATOES Are Made Into FLOUR

THE question is often raised by the manufacturers, and by consumers as well, as to whether or not potatoes which had been peeled had lost their valuable mineral constituents, especially in the treatment necessary to prepare them for milling. It has been found, however, by Mr. C. E. Mangels, of the Bureau of Chemistry of the United States Department of Agriculture, who reports his investigations in the Journal of Industrial and Engineering Chemistry, that there is no appreciable loss through peeling. He finds that the decrease of potash is almost negligible and since the proportion of the ingredients of the flour are unchanged, he does not regard the paring as a factor worth consideration.

"The 'hot drum' process," Mr. Mangels adds, "is now commonly used by the different companies engaged in the manufacture of potato flour. The potatoes are washed and unsound potatoes sorted out and discarded. The peel is partially removed by friction paring machines, and the potatoes placed in a steam retort cooker where they are subjected to cooking by steam at 15 pounds pressure for 15 to 20 minutes. The soft cooked potatoes then pass to hot steam-heated revolving drums over the surface of which they are spread in a very thin layer, and are thus quickly dried. The dried potato film is removed from the drum as it revolves by stripper knives, and the dry flakes are reduced to flour, after which the flour is bolted and the tailings discarded."