

6-1893

## **The Student: A Journal of Education (Vol. 3, No. 6)**

Northern Indiana Normal School

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June 1893.

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Vol. 3, No. 6.

VALPARAISO UNIVERSITY

THE

# STUDENT

A

Journal of Education.

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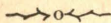
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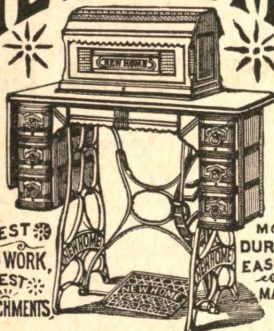
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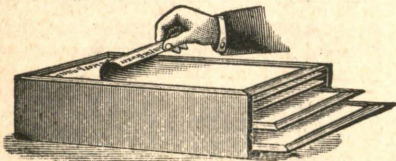
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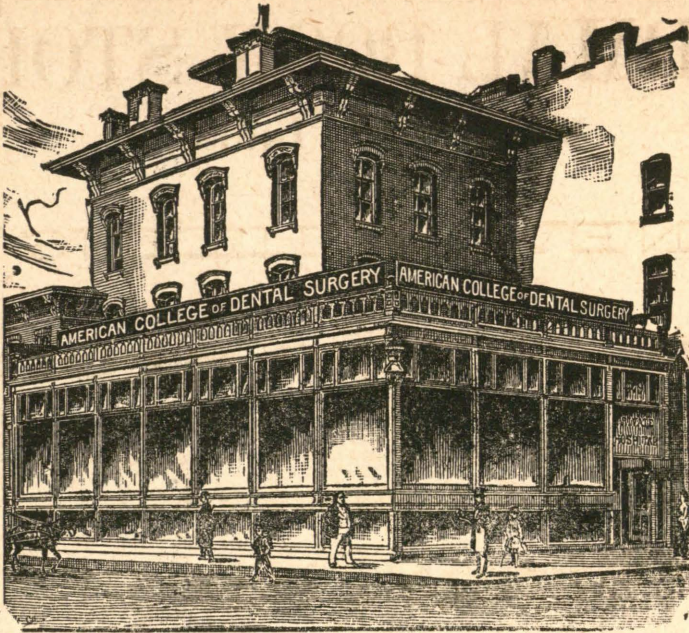
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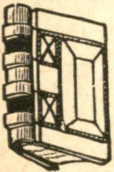
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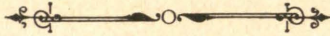
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VOL. III.

JUNE, 1893.

No. 6.

---

## DISEASE GERMS.

BY WILLIAM DURHAM, F. R. S. E.

THE fact that we are surrounded by myriads of small organisms whose vital action produces fermentation and putrefaction naturally suggests the inquiry as to their action on mankind and the lower animals. As these organisms destroy the bodies of animals as soon as life is extinct, may they not also injure even the living animals, and produce many of those diseases whose origin has hitherto been obscure? The importance of this inquiry is at once realised when we consider that we must take into our systems, whether we like it or not, thousands of these tiny forms every day. It has been calculated that every one of us must inhale about one hundred millions every year, and as a matter of fact we find them in great numbers in our mouths, stomachs, and intestines. It is worthy of note, however, that they are never found in the blood of a healthy person. By some means or other they are prevented from entering into the general circulation. To the great Frenchman, Louis Pasteur, belongs the credit of having settled this question, and of having proved beyond a doubt that these organisms are certainly the cause of many diseases, and that among the many species of bacteria &c., there are some forms which produce each its own special disease on man and the lower animals. The history of this great discovery is very interesting and instructive. About five-and-thirty years ago, certain minute rod-like organisms were noticed in the blood of an animal which had died from anthrax or splenic fever, a disease which attacks both man and the lower ani-

mals; but no one seems to have suspected that these organisms were the cause of the disease until Pasteur published his remarkable researches on fermentation and putrefaction. It then occurred to Devaine, who had first noticed those little bodies, that they might possibly be the source of the malady. He accordingly took some of the tainted blood and inoculated healthy animals, and found that a very small quantity indeed of the blood produced a fatal attack of the disease. This, however, did not prove that the disease was really due to these germs, because the blood itself might be altered in some way so as to act as a poison. To settle this question, Pasteur took the matter up, and very speedily showed that it was from the germs, and from them alone, that the disease proceeded. The method he employed to prove this was as follows:—He took a drop of the infected blood and added it to a solution prepared for the purpose, in which the germs were cultivated. He then took a drop from this solution and added it to a second solution similar to the first, and again cultivated, and so on for a great many times, so that any poison contained in the blood was diluted to such an extent that it could not possibly have any effect, and he got, in fact, in the last solution nothing but the germs themselves. With these he inoculated healthy animals, and the disease was produced at once, just as with the original blood. The demonstration was complete; splenic fever at any rate was certainly due to the living action of these small organisms, and the existence of disease germs proved. Proceeding in the same manner. Pasteur and many other investigators discovered the specific germs which give rise to a great number of well-known epidemic and contagious diseases. Among these may be mentioned rabies, glanders, fowl cholera in the lower animals, and fevers of various kinds, such as scarlet and typhoid, smallpox, measles, whooping-cough, phthisis, cholera, &c., in man; even the decay of teeth has been found to be due to a particular form which attacks the tooth when the enamel is broken by the action of acids in the mouth. These discoveries have revolutionised our ideas of disease, as these germs seem to be found at every turn doing their hurtful work. Of course, in such investigations where the objects to be observed are so exceedingly minute, it is sometimes not easy to identify the particular germ of any disease, and there may be doubt in some

cases, such as cholera, if this has really been done. Although the existence of certain specific noxious organisms which we have called disease germs has been thus satisfactorily made out, the manner in which they accomplish their deadly work is not yet known. It may be that these germs wage war against the cells of which our blood and tissues are formed and destroy them, or they may appropriate to themselves the food and the oxygen intended for the nourishment of our bodies, and thus cause death by gradual exhaustion. Perhaps the best explanation, however, is that which ascribes death to the action of some poison secreted by the organism. We know that those organisms which give rise to putrefaction produce soluble alkaline poisons called ptomaines, and that other forms produce ferments, and it may be that those disease germs also produce a ferment or a poison which acts fatally on the animal system. If this be so, then the action of the germs is indirect, and the really fatal thing is not the germ itself, but the poison which it produces in the system.

However this may be, the fact remains that we are in the midst of hosts of noxious things against which we must wage continued war, and it is of the greatest importance that we should study the forms, habits of life, &c., of these small, almost invisible foes which work such deadly havoc in our midst, in order to discover, if possible, some defence against their insidious attacks. We may consider those eminent men who, patiently and in silence, microscope in hand, study the varied forms of these germs as in reality an army doing battle with the foe, and in the quiet researches of the laboratory there is often as much heroism exhibited as in mounting the deadly breach. The experiments are not without danger. It is said of Pasteur that he sucked into a tube some of the saliva from the foaming jaws of a raging mad bull-dog held down by ropes; the slightest mistake or slip of the ropes and he might have been inoculated with the deadly virus of this most awful disease. Valuable knowledge has already been acquired by the labours of these investigators, although much still remains obscure. We know where these hurtful forms are most likely to be found in greatest numbers, we know certain precautions which must be taken to avoid them, we know how to kill them, and in some cases at any rate how to mitigate or entirely prevent many of the virulent diseases

they bring in their train. These disease germs only live in a thriving condition within certain limits of temperature. At high temperatures they are destroyed completely, and at the boiling-point of water the organisms themselves are killed if the exposure is sufficiently long—sometimes a very short time suffices; but the spores or germs properly so called offer a greater resistance, and the temperature requires to be raised somewhat above this point in order to make their destruction certain, so that they may not spring into active life again when transferred to a suitable medium. At low temperatures, such as the freezing-point of water, these organisms are only paralysed, not killed, so that they renew their activity on the temperature being raised; but so long as the cold is maintained they remain dormant and harmless. It is owing to this action that butcher-meat can be preserved by being frozen, the putrefactive bacteria being rendered harmless so long as the temperature is kept low. It is curious to note that Lord Bacon, among his other little accomplishments of writing tragedies and cryptograms, seems to have had some sort of foreknowledge of this fact; in truth, he met his death in trying an experiment on the subject. Macaulay writes of him that he had an idea that snow might prevent animal substances from putrefying, and one very cold day in the year 1626 he alighted from his coach to try the experiment. He went into a cottage, bought a fowl, and with his own hands stuffed it with snow. In doing this he incurred a chill, which resulted in his death. In the last letter he wrote he mentioned that the experiment had succeeded “excellently well.”

Many chemical substances act energetically on the disease germs, and either destroy them altogether or render them comparatively harmless. Among these may be mentioned mercuric chloride, sulphurous acid, carbolic acid, boracic acid, &c. Lister has applied some of these with great success in the dressing of wounds and sores, and in surgical operations. The full action, however, of these substances cannot be utilised when the germs are actually in the body, because the quantity required is often in excess of that which it would be safe to administer. The most promising field for preventing the evil effects of disease germs seems to be that of inoculation. It is well known that some diseases, such as measles or scarlet fever, rarely attack the same individual more

than once; the first attack seems to bestow an immunity from that particular disease. Smallpox also is prevented by vaccination, the vaccine matter creating a similar disease of a milder form, which renders the individual proof against the more deadly malady. It occurred to Pasteur that he might find the means of producing the germ-formed diseases in a mild form which would act as a protection in the same manner. This he accomplished in the following way. He made repeated cultivations of the disease germ according to the method already referred to, but instead of making the cultivations rapidly one after the other, he allowed several months to elapse between each, and found that when he did this the germs from the last cultivation were so weakened they could produce the specific disease in only a very mild form on any animal which he inoculated with them. But, as he had expected, this weakened form of the disease bestowed on the animal a protection against the attacks of the germ in its most active state. Pasteur ascribed the weakening of the disease germ by his method of cultivation to be due to an excess of oxygen acting for a long time; for he found, if he took means to exclude an excess of air during the cultivation, the germs retained their virulence. Other investigators ascribed the result to the action of heat; but it is quite possible that it may be brought about in different ways, for the organism may be weakened by more than one agency. At any rate, inoculation with these weakened germs was completely successful in the case of splenic fever, as was demonstrated by trial on a large number of animals. The same course of treatment has been adopted in the case of rabies or canine madness, and although some remarkable results have been attained, it cannot be said to have been so undeniably successful; but a great field for investigation has been opened which will undoubtedly yield much good fruit in the future.

The reason why some diseases in a mild form give protection from the attack of the same disease in a more virulent form is not understood. Pasteur's idea is, that the mild form abstracts from the blood and tissues certain elements which are necessary for the sustenance of the germ, and thus, to use an agricultural expression, exhausts the soil, so that the same germ, even in a powerful condition, cannot thrive on it. This does not seem very satisfactory, as it is difficult to understand how the immunity should continue



for years, as we should imagine that the blood and tissue cells would sooner or later recover the elements of which they had been deprived. It seems much more likely that the result is due to the resistance which the living cells of animal bodies offer to the disease germs being strengthened by use. The white blood cells of frogs inoculated with the anthrax germs are observed to incorporate and destroy these germs, and the animal is not affected; but if the animal is kept at a high temperature the germs increase so rapidly that they gain the mastery over the blood cells and destroy them. Now, it is probable that the living cells of the animal body offer more or less resistance to the attacks of these invading disease germs, and if the latter are weak the former may overcome and destroy them, and in so doing may be permanently strengthened to resist all such attacks from the same kind of germ in future, just as all powers are strengthened by use. This acquired strength might descend to cells formed from those who bore the attack. This view might explain why certain individuals seem to enjoy perfect freedom from diseases which strike down many in their immediate neighborhood, and why, indeed, so many of us continue to exist in the midst of such unknown dangers. The vitality of some may be able completely to resist the attacks of those disease germs, while others, weakened from various causes, may readily succumb. We may, indeed, look upon the whole matter as a struggle for existence between those disease germs and the cells of our blood and tissues. If the former are the stronger they will prevail, and we shall suffer disease, and, it may be, death itself; if the latter are the stronger we shall remain in health. If, however, the germs are excessively numerous, the strongest may succumb to the force of mere numbers. In this view of the case our duty is plain. We should, by every means in our power, keep our bodies in strong vigorous health and avoid everything that tends to lower vital activity, such as exhaustive work, bad or insufficient food or air, excess of all kinds, and by so doing we shall offer a strong resistance to the first inroads of these secret enemies. Again, we should be careful of any disorders in the throat, stomach, or intestines; because, as we mentioned, numbers of germs are always present in these parts even of healthy persons. They may not, indeed, be germs associated with any particular malady, but still

they are only prevented by the living action of the mucous membrane from entering into the circulating system, as it has been proved that the action of the gastric juice and other secretions of the body have very little effect upon them. If, therefore, the mucous membrane is injured, they may pass through it and produce many serious disorders. Thus keeping our bodies in thorough and vigorous health, we must avoid all those places where germs are most likely to be found in greatest numbers, such as crowded dwellings, hospitals, &c. We must have plenty of fresh air, and above all, plenty of sunshine, which is found to be very destructive to those ubiquitous pests. Crowded houses and narrow closes are nurseries for the rearing of these disease germs. Cleanliness is absolutely necessary to check their spread. Linen and blankets soiled by contact with persons suffering from any of these diseases are very dangerous. It is comparatively easy to avoid infection from water, food, or even from drains, if well flushed, but clothes of all kinds dry, and the germs are carried into the air, which we cannot avoid, as we must all continuously breathe it. Of course, when the disease is fairly upon us, there is no resort but to the skilled physician, but by proper attention to health and sanitation his valuable services may be rarely required.

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### SHOES AND WALKING.

EXTRACT FROM A LECTURE BY DR. J. H. KELLOGG,  
OF THE BATTLE CREEK SANITARIUM.

Reported by Helen L. Manning.

**I**N order to be able to walk well, one must stand in an erect position with the weight of the body poised over the arch or instep of the foot. It is then balanced over a spring of fibers, bands, and ligaments which makes standing easy. The direct line of the center of gravity, when one stands properly, is one drawn just in front of the ear, falling right in front of the shoulder and so on down to strike the balls of the toes. Heel standing is always tiresome, yet one who is tired out and relaxed is very apt to assume it. A position in which the muscles of the body are relaxed, is the foundation of all incorrect habits of standing. Relaxed walking

indicates either that the person is weak and feeble in health or else of weak, pusillanimous character.

An improper standing poise and partially relaxed muscular system result in a number of errors in walking. Among them is the teetering gait which is caused by too great flexion of the limbs. A very much more common error is the swaying gait, which is especially due to the relaxed condition of the muscles of the waist. Even in a person who takes a correct attitude in walking there is always a slight movement of the body toward the forward limb. When the right leg is thrown forward, the body is balanced slightly over it and then when the left limb is thrown forward in turn, there is a little movement of the trunk toward that side. But there is a constant effort on the part of the muscles of the waist to keep the movement of the body from being excessive. The swaying gait indicates weak, relaxed muscles of the trunk. It is not uncommon in laboring men who have been careless in their habits of walking and standing. It is also noticeable in the lady who has been wearing tight clothing and has laid them off. The proper remedy is, not a return to supports of steel and whalebone, but such exercise as shall develop the muscles which support the chest and which balance it on the pelvis, until they are able to do their work properly.

Another very common error in walking is the stooping gait, the head thrown forward and the eyes cast down. This shows a relaxed condition of the muscles of the back of the neck and the upper portion of the spine. This is specially illustrated by the man who has a "brick in his hat," alcohol having paralyzed his muscular activity and the nerves of control.

But the gait which gives a person the most ridiculous appearance is the straddling gait, which is due to weakness of the muscles of the legs and hips. This can be corrected by special exercise of the weakened muscles in persons who have not advanced too far in years. The short, quick steps of the stiff walk is particularly noticeable in smart clerks. It is not an energized walk but a sort of heel-stepping which jars the spine and brain and is exceedingly tiresome. One could not walk very far in the country in this artificial manner.

In splay walking, the toes turn out too much. This is some-

times due to a weakened condition of the muscles of the under side of the foot and the muscles which connect the foot with the leg. When the foot becomes flattened so that the outside of the foot is arched more than the inside, the weight falls upon the inside and the toes turn out too much. The opposite of this is the pigeon-toed gait, in which the toes are turned in, and which is extremely awkward and ungainly.

There has been considerable discussion as to what is the proper style of walking. It is generally supposed that the proper position for the feet is with toes turned slightly out, although some maintain that the feet should be perfectly parallel. This latter position is seen in many savage tribes, but I think the custom is derived from following a narrow trail, often crossing a stream on small logs etc., and thus walking much on a narrow base from force of habit, rather than in obedience to natural law. When the foot is turned out a little, the base is broadened and the body is better supported and braced than when the feet are parallel. It is also more graceful and easy.

It is not possible to walk correctly on high heeled shoes or with shoes of a considerable height of sole and heel. High heeled shoes have the effect of raising the heels unnaturally, and throwing the weight of the body upon the toes, and so in order to maintain his balance a person must bend his knees a little. To walk with the knees bent and the weight on the toes, throws the body out of its natural poise and the result is a very awkward, ungraceful gait. The spring heeled shoe is a very wholesome one and children especially should have the advantages to be derived from wearing them. At most, only a low broad heel is permissible for natural, untrammelled walking.

I have been interested in studying shoes in various countries abroad. The French cartman, for instance, wears a shoe in which nails are hammered in so thickly that the sole resembles an iron clad ship. The shoe is thus rendered heavy and uncomfortable, and is not to be recommended for health or grace. The Dutch and German peasants wear shoes which are hollowed out of blocks of wood. It puzzled me at first to know how such shoes could be kept on since the opening must be large enough for the foot to slip in easily, but I learned that the wearers acquire the habit of

curling the toes under to hold the shoes on. This prevents freedom of movement of the limb and is very ungraceful. In Italy, the peasants wear a "clog" of which the rear part of the shoe is lacking and this is held on by the toes also. It gives a shuffling, awkward gait. The Malays wear clogs held in position by a grasp of the toes. Some of the large footed Chinese wear a kind of slipper with the heel in the middle which puts the person practically on stilts. This is better than having the heel behind, for then the ankle is all the time on the stretch and the whole weight of the body is thrown on the ball of the foot.

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### THE MARRIAGE RELATIONS.

H. L. POSTLEWAITE.

**T**HE rights and wrongs of women are now debated with a vigor and virulence which increase every day. Those who demand for women, not only all the privileges which men possess, but also continued exemption from their responsibilities, would carry the principle of female emancipation to a point which has aroused opposition on the part of many who in every great question of the day are admittedly leaders of the party of progress. While the contest rages as to whether women are to know, say, and do everything that the coarsest of men can; or, on the other hand, be kept completely in the background, people are apt to forget what is really the crucial point of the whole question. They forget that the position of women, and of men too for that matter, is inseparably bound up with the relationships between the sexes known as marriage; are apt to forget the importance of that relationship, not only to individuals, but to the state—are apt to forget that too rigorous a subjection of women may bring us near to barbarism; too great an emancipation may lead to that corruption which has so often in the world's history been the outcome of a civilization which has not placed due restraint on the passions and impulses.

The prosperity of a country depends on the proper maintenance of the relations between husband and wife quite as much as on its outer strength, and however great and powerful a country may seem to be, if these domestic relations are unhealthy—if the wife

has not her place in the social polity—that country is rotten to the core, and its complete decay and demoralization are inevitable. Speaking generally, there are four aspects or ideals of the status of the wife—four ways in which her position is regarded by men. There is the method of the Barbarian, that of the Oriental, that of Western civilization, that of corrupt civilization, which last is practically the degraded form of the third. The Barbarian regards his wife as a mere slave; a squaw to cook his food, carry his burdens, submit to his ill-usage. The Oriental sees in his wife a plaything to gratify his passions, to be kept in the strictest seclusion, and to be treated altogether as a brainless being; regarded by him, in fact, so far as any respect is concerned, much as the squaw is regarded by the savage. From the third point of view the wife's position is very different. True, she is the mother of her husband's children; true she has duties to perform which her husband would disdain; true her husband is the head of the family, and she bears his name. But with all this she is looked upon as her husband's equal, is the sharer of his counsels, his intelligent partner, and has a right to expect from him the fidelity which in the case of the savage or the Oriental is so one-sided.

The credit of placing this view of married life before mankind has been claimed by Christian writers for their religion. But although we must admit that Christianity has done much to improve the position of women, yet the high ideal which we have termed that of Western civilization existed in a very strong degree in ancient Greece, still more strongly among the Romans and the nations of Western Europe, whom they conquered and civilized long before Christianity was preached; and the noble qualities which we admire in those races may often be directly traced to the influence of wives and mothers. Again, it must be remembered that it is under the auspices of the Christian religion that the degraded or fourth ideal, which we shall next consider, has often prevailed and that many attribute its existence to a teaching of a section of the Church.

But high as is this ideal, history shows that there are dangers which threaten those societies where it prevails; danger the outcome of that very civilization which it has done so much to perfect. Luxury, prosperity, too great liberty, want of mutual respect and

continual striving after new sensations are too apt to destroy that wholesome state of things, which has been the palladium of every great nation, and we too often have examples of the fourth ideal which though springing from the third is so distinct from it that it deserves to be classed by itself. Where a wife is no longer content with taking her share in the battle of life, no longer content to recognize the fact that there are things which it better becomes the woman to do than the man, and vice versa; when she insists on aping and sharing the follies and vices of the man; on casting from her that modesty and reserve which are woman's greatest charms; when she spurns maternity and domestic duties as trivial or monotonous, then, indeed, the marriage state must fall into disrepute; then the fatherland must surely suffer. It was this which led to the unspeakable horrors of Imperial Rome; it was the unsexed women, their profligacy only equaled by their audacity, who were responsible as much as Nero and Domitian themselves for the downfall of Roman civilization. Otho and Silius would have been impossible but for Poppœa and Messalina. In later times, too, and even in Christian countries where the marriage tie was in theory held so sacred that if duly celebrated it could only be dissolved by death, we have seen a state of things as bad. Wife and husband have each gone their own way—the husband with his mistress, the wife with her lovers, and yet have been looked upon as good sons and daughters of a Catholic Church; and even the priests of that Church, aye, and the highest of those priests, have been art and part in immorality—as contrary to the teachings of Christ as was the wickedness of ancient Rome.—*Westminster Review*.

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### THE SCHOOL ROOM.

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#### SUPPLEMENTARY READING.

RHODA LEE.

THE surprised and shocked expression that stole over the face of a visitor when entering my class-room a few days ago amused me somewhat. The children were holding their books in a comfortable position and reading silently. There was nothing

strange or painful about that. It was not the occupation but the *literature* that caused my old friend to elevate his brows. The books were not the First Reader, part 2nd, that he expected to see, but back numbers of *Wide-Awake* and *Babyland* that I had just received from the publishers. They were particularly bright and attractive numbers, and, of course, it was a little unusual, but after explaining my method of using them, and reasons for so doing, he seemed rather pleased, even expressed a regret that we had not more such magazines. I would go further and express the hope that some day in the primary classes we shall have no two books alike, and instead of a fixed reader, a large collection of stories and story-books suited to children of that age.

One might think there would be a tendency to careless reading in putting books of this description into the hands of young children. There is certainly a danger. Careful reading, accurate thought-getting, is something we must cultivate. Questioning is the only test we can apply at first, but as soon as possible I require my children to write the story in their own words. This is generally done in a rough note-book which is handed in for inspection. Illustrations occasionally accompany the stories, and sometimes these are, to say the least, striking.

Encourage reading at home. How often the Christmas and birthday books are valued only for the pictures and bright covers, even when the children could read and enjoy them with a little application. Let your pupils bring these books to school occasionally, and endeavour to create an interest in the reading matter.

One or two suggestions for drill in word recognition. I have a set of cards each of which contains four or five long words, syllabized and accented. These are distributed among the children who read them to me when recognized.

The cards of another set form a complete story. I supply the outline, and the blanks are filled up by sentences found on the cards.

Word-building is also of considerable value. Let me give an example: The first word placed on the board is *bit*; next, *habit*; then *inhabit*, and lastly, *inhabitants*. *Misunderstanding*, *representation*, *uninteresting*, are samples of words that can be built up in this way.

Reading lessons should occasionally relate to current events.



The season and everything pertaining to it should form a topic. There is never any scarcity of subjects if we would only look for them.

In closing I would again urge those who have not already a collection of stories for supplementary reading, to delay no longer. The advantages are plain to all, and there is really no difficulty in obtaining suitable matter. Sunday-school papers may be cut up, "Children's Corner" in periodicals preserved, and back numbers of magazines, such as those mentioned, obtained at very small cost.

Short stories copied on a caligraph or type-writer are very good. Some of the best of this kind I have seen were original stories written by children seven and eight years old, and then copied on a machine.

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#### NUMBER LESSONS IN SECOND GRADES.

Number lessons should be language exercises in all grades not using a book. It may be necessary to use objects at first; but gradually accustom pupils to think out processes, or learn mathematical facts independent of association with objects. The power of association, as has been said of literature as a profession, "is a good staff, but a bad crutch." Begin in Grade II. to throw away the crutch in object-lessons in number. Teach numbers from ten to twenty or thirty, so that all their possible combinations will present themselves without hesitation as facts when called for, with a certainty that three sevens are twenty-one, and cannot by any possibility be twenty or twenty-two. If this is not thoroughly learned in Grade II., it will be necessary for some other teacher to do your work for you. Be careful to do your own work thoroughly, and do not attempt the next teacher's. Sufficient unto the Grade is the work thereof. You will never be in danger of teaching what belongs to you too well.

Do not on the other hand, make number-work too abstract. Children like to "keep store." Enliven number-work by concrete examples given by pupils. See that the sentences used are correct and the mathematical combinations possible. Do not in this or any other grade "multiply cats by dogs." The combination of abstract numbers are always abstract. In multiplication the mul-

tiplier must be abstract, and in division the divisor. The product will be of the same kind as the multiplicand, and the quotient like the dividend. Dollars divided by dollars will not give sheep, so that it is better in all grades to apply concrete expressions, by way of explanation, to the results of abstract operations. That the class may be supplied with concrete examples when their own stock is exhausted, teachers should have upon their desks several primary arithmetics composed of practical every-day examples. When the teacher puts an example to the class, the answer should be a number simply, without repetition of the problem, but the examples given by pupils should be fully and correctly expressed by them. In one case you are calling for a mathematical fact, in the other for a language exercise in mathematical form. The more you develop this power of expression, the greater scope and play you give to the imagination and the thinking powers. In no other subject is it possible to lead children to do, to talk, and to think, as in number.—*S. Arthur Bent.*

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#### VARIETY WORK.

BY LAURA F. ARMITAGE.

1. Write three words that end in *y*.
2. Write names of two yellow flowers.
3. Write names of two red flowers.
4. Write names of two animals having fur.
5. Write names of two animals having hair.
6. Put letters before *old*, and make other words of it,—*g-old*,  
*t-old*, *s-old*, etc.
7. Name three kinds of trees that grow near your home.
8. Write what stands for Doctor, Mister, Street.
9. Write the names of four birds you have seen.
10. What color is your house?
11. What animals dig holes in the ground to live in?
12. Write five girls' names.
13. Write five boys' names.
14. Write three names for dogs.
15. Of what color are lemons?

16. Of what color are ripe grapes?
17. Write three words of four letters each.
18. Name five things that can jump.
19. Name something that likes to live in water.
20. Name three things you like to do.
21. Tell what cows are good for.
22. Name some animals that have hoofs.
23. Write the first name of a light-haired girl in your schoolroom.
24. Of a dark-haired boy.—*American Teacher.*

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#### THE RECITATION.

No suggestion that I can make is more important than that teachers study how to get more done in the few minutes given to recitation, the purposes of which are to find out whether the work assigned has been done, and, if not, why not; to train the entire class to a more thorough understanding and expression of what they have learned, to apply what they have learned in new directions, and then prepare the way for work of another day. All this must be done for ten or twenty different pupils with but thirty precious minutes in which to do it. I have often seen a teacher spend most of the time in getting at his work, standing idly by while the pupils were at work at the board, or at work with one pupil while a dozen were unemployed and listless, or teaching as if he were helping the pupils learn their lessons, and using other devices apparently to kill time.

The problem of the recitation is, how to lay out work for pupils so that they will bring the necessary material to the recitation, and then for thirty minutes keep every boy and girl intensely busy and interested listening, thinking and doing, in handling the matter of the lesson. At the close of such a lesson the pupils leave the room like young gymnasts, energized and strengthened intellectually by the vigor of the training. On the other hand, a sluggish recitation not only furnishes no good results, but trains to sluggish habits that make it impossible for a boy to gather himself up on occasion as at an examination, and work vigorously and with effect.—*Superintendent Kiehle.*

## THE TEACHER IN THE RECITATION.

1. The teacher, while hearing a recitation, should assume a position that will enable him to keep all of his pupils in sight.
2. In large classes it is best, if possible, for the teacher to assume a standing position, but whether sitting or standing the position should be graceful.
3. The teacher's manners in the presence of his class should be dignified and gentlemanly.
4. The teacher should be pleasant and affable in his manner of teaching, and thus control his class by his own example.
5. The teacher should so conduct his work as to keep all in the class interested and busy.
6. The teacher should show by his manner that he himself is fully interested in what he attempts to teach, and thus awaken interest on the part of his pupils.
7. The teacher's language should be well chosen and correct, that his pupils may not lose respect for him because of his many errors of speech.
8. The teacher should be enthusiastic and energetic, thus leading his pupils to feel the importance of the work in which they are engaged.
9. The teacher should use pleasant tones of voice, and thus avoid creating nervousness in either himself or his pupils.
10. The teacher should be even tempered, not permitting trifles to ruffle or provoke him to scold, and thus make his pupils disorderly.
11. The teacher should be prompt in calling and dismissing classes, and prompt in his questions and general class work.
12. Everything in the class recitation should be methodical and systematic, but not to such an extent as to destroy interest.
13. The teacher's manners should be such as to encourage the timid and repress the impertinent.
14. The teacher should be quick to change his methods of recitation the moment the interest begins to flag.
15. The teacher should take as little of the recitation time as possible in reprimanding pupils. A simple shake of the head is more effective than a half hour's scolding.

16. The teacher should move about occasionally among his pupils, even during recitation. This will tend to keep all orderly and busy.

17. The teacher should not be too prompt to help a pupil out of difficulty by offering assistance. The recitation is to be made by the pupil, not the teacher.—*Raub's School Methods*.

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#### IN THE SCHOOLROOM.

“Toiling, rejoicing, sorrowing,  
Onward through life he goes;  
Each morning sees some task begun,  
Each evening sees its close.  
Something attempted, something done,  
Hath earned a night's repose.”

What are the teacher's emotions as she enters her schoolroom every morning? Are the following lines expressive of her sentiments?—

“Uneasy lies the head of all who rule;  
Her's, worst of all, whose kingdom is a school.”

Does she long for the mechanical performance of duties, which she terms teaching, to terminate, in order that she and her unfortunate mechanisms may be liberated? Or, on the other hand, does she realize the nobility, happiness and sweetness of rearing “the tender thought,” and thus enter upon her daily duties with a kind, loyal, yet thoughtful, heart, knowing that she is teaching for eternity, not merely for the current term?

The teacher who would be a true educator and seek to develop character as well as intellect, adheres to the principles of the “golden rule.” She is appreciative and sympathetic. She bears in mind that her pupils—to quite an extent—are her reflectors, and as she wishes for kindness, she's kind. She wishes for truth, hence she's true.

Instead of continually “harping” at the dull, thoughtless boy she shows her appreciation of the bright, thoughtful one, knowing that if she brands a boy with “bad,” or “stupid,” he will in all probability live up to the reputation.

She encourages her pupils to confide in her, putting a high premium on sincere, penitent "confessionals."

She does not forget the little courtesies which sweeten social intercourse, viz., "Thank you," "If you please," "Good morning," etc.

In full the true educator endeavors to make her pupils "make the most of themselves, by instilling principles of virtue and honor, and teaching them that goodness and usefulness are the greatest nobility.

The teacher who has the privilege of moving in a social and moral school atmosphere—and all may, who admit the truth of "the world is just what you make it," will not find the work irksome. True, it is sometimes tiresome and discouraging, but consciousness of duty faithfully and lovingly performed will be an ample reward.—*L. M., in Educational Review.*

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#### CANNOT AFFORD TO READ.

Said a teacher in our hearing a few days ago:

"I am so lonesome for want of reading matter. The family with whom I board have no books and take but one paper. That is a monthly flashy advertising sheet."

"But do you take no papers yourself?"

"No, I can't afford it. My wages are small and the school term is so short I cannot afford to spend a cent for such things."

Out upon such teachers! America has no use for them. The teacher, above all persons, must be abreast with the times. He should come before his school enthused with the world-life that is throbbing on, outside his little domain. And in these days of cheap newspapers, cheap magazines, correspondence, and agencies, he has no excuse for saying he cannot afford it.

Does the teacher not know that the surest way for him to stagnate in some backwoods country neighborhood is for him to attempt living and teaching outside the world? Does he not know that the most certain way to preferment and honor is through broad-minded culture? There lies the way, and he is indeed shortsighted who will be penny-wise in view of the possibilities before him.—*Charles M. Hayer in North Carolina Teacher.*

## WHAT IS EVER SEEN IS NEVER SEEN.

BY CELIA DOERNER.

"You may all put your hands behind you," I said to a class in the first year of High School. "Now tell me, John, which of your fingers is longer, the first or the third?" "The first—no, the third—indeed, I don't know." And John looked puzzled. "Mary, which of yours is longer?" "I'm not sure, but I think it's the first." "What do the others think?" "The third!"—"No, the first!" "They're equal!" All these answers were given with evident hesitation.

"You may now look at your hands and convince yourselves." All but one of the pupils now decided that the ring-finger was longer than the index-finger. One found the two fingers of equal length. I told them that in some few hands the index-finger is longer.

The pupils were amused to think that they had never closely observed their own hands, and I placed on the board the sentence, "What is ever seen is never seen." After what had preceded, it was not difficult for the class to grasp the thought.

"Now, boys and girls, I shall ask each of you to observe some familiar object more closely than ever before and to write out the result of your observations, together with your reflections on this experiment. The sentence on the board would make a good heading for the composition."

The result was a number of very interesting compositions containing much that was a surprise and a revelation, even to one who had had some previous experience with the blindness of seeing.

One girl said that she had just found out that the stars shine even in winter; she had always imagined that they were visible only in summer. As, among other things, I had suggested their observing the heavens, several expressed their surprise and astonishment at the beauty of the starry sky, which they had never before suspected. It was the first time, too, that some of them had noticed that the stars have an apparent motion in the heavens, just as the sun and the moon have.

Others made discoveries as to the beauties and wonders of some common weeds or insects. One made a study of human ears and

was surprised to find that they differed so much in shape. Another examined a coin and came to the conclusion that he had never before really seen it.

One of the girls told how almost every day she passed along Garfield Place, yet had never even noticed the statue there, until one day a stranger who happened to be with her asked her the name of the monument. Then for the first time in her life she beheld the statue of Garfield. One boy made a study of the Probasco Fountain, of which he was sure that he could not have given even the meagerest description beforehand. Several declared that during that week they had learned more by the use of their eyes than in months and years preceding, and many good resolutions were recorded.

Does not this experiment point clearly to some serious deficiencies in our teaching, and to the simple remedies which are within the reach of every teacher in every school?

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NOTES:—SCIENTIFIC AND OTHERWISE.

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BITS OF NEWS.

An English teacher, Miss A. C. Graham, has taken a prize offered by the *University Correspondent* for the best collection of pupils blunders. She vouches for them all as literal copies of the originals, and explains that she was led to set about their collection by reading one day the surprising statement that "Iaied and Odessae translated Euripides." We give a few of the choicest gems of her collection, in some of which the outcropping of the English idea that all history converges on the British Isles is almost startling.

Esau was a man who wrote fables and who sold the copyright to a publisher for a bottle of potash.

The Jews believed in the synagogue and had their Sunday on a Saturday, but the Samaritans believed in the Church of England and worshiped in groves of oak, therefore the Jews had no dealings with the Samaritans.



Titus was a Roman Emperor—supposed to have written the Epistle to the Hebrews—his other name was Oates.

Oliver Cromwell was a man who was put into prison for his interference in Ireland. When he was in prison he wrote "The Pilgrim's progress" and married a lady called Mrs. O'Shea.

Wolsey was a famous general who fought in the Crimean War, and who, after being decapitated several times said to Cromwell: "Ah, if I had only served you as you have served me, I would not have been deserted in my old age."

Perkin Warbeck raised a rebellion in the reign of Henry VIII. He said he was the son of a prince, but he was really the son of respectable people.

The heart is a comical shaped bag. The heart is divided into several parts by a fleshy partition. These parts are called right artillery, left artillery, and so forth. The function of the heart is between the lungs. The work of the heart is to repair the different organs in about half a minute.

Explain the words fort and fortress: A fort is a place to put man in, and a fortress is a place to put women in.

Hydrostatics is when a mad dog bites you. It is called hydrophobia when a dog is mad, and hydrostatics when a man catches it.  
*Youths' Companion.*

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#### SYNTAX BY EXPERIMENT.

Little Jane had been repeatedly reprov'd for doing violence to the moods and tenses of the verb "to be." She would say "I be," instead of "I am," and for a time it seem'd as if no one could prevent it.

Finally Aunt Kate made a rule not to answer an incorrect question, but wait until it was corrected. One day the two were together, Aunt Kate busy with embroidery, and little Jane over her dolls. Presently doll society became somewhat tedious, and the child's attention was attracted to the embroidery frame.

"Aunt Kate," said she, "please tell me what that is going to be?" But Aunt Kate was counting and did not answer. Fatal word, be! It was her old enemy, and to it alone could the child ascribe the silence that followed. "Aunt Kate," she persisted, with an honest

attempt to correct the mistake, "Please tell me what this is going to am?" Aunt Kate sat silently counting, though her lip twitched with amusement.

Jane sighed, but made another effort. "Will you please tell me what that is going to are?" Aunt Kate counted on, perhaps by this time actuated by a wicked desire to know what would come next. The little girl gathered her energies for one last and great effort, and said: "Aunt Kate, what am that going to are?—*Ex.*

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### COMMON SCHOOL ETHICS.

The following principles among others are laid down by Mr. Joseph Wharton, of Philadelphia, who founded and endowed the Wharton School of Finance and Economy in the University of Pennsylvania, as fundamentals of the course of instruction for youth intending to enter upon a business career anywhere or at any time:

"The immorality and practical inexpediency of seeking to acquire wealth by winning it from another, rather than by earning it through some sort of service to one's fellowmen.

"The necessity of system and accuracy in accounts, of thoroughness in whatever is undertaken, and of strict fidelity in trusts.

"The necessity of rigorously punishing by legal penalties and by social exclusion those persons who commit frauds, betray trusts, or steal public funds, directly or indirectly. The fatal consequences to a community of any weak toleration of such offences must be most distinctly pointed out and enforced."

Whilst waiting for the outcome of uneasy discussions in some quarters of the question of religion in the common schools, we have in the above paragraphs a code of the purest Christian Ethics, to which no man, whatever his religious connections may be, can justly make any objection. They go to the root and core of right conduct in all the avocations of life, professional as well as industrial and commercial. The *integrity* which they enjoin should be taught at the fireside and at every mother's knee, and if thus impressed upon the infant mind, it would make itself felt with stern inflexibility in all the vicissitudes of after years. The first and third propositions are absolute in their soundness of principle, and

the second is an invaluable adjunct to both, for many defalcations and failures are as much due to incapacity and neglect in keeping accurate accounts as to any wicked intention in wrong doing.

The above propositions come like the sudden striking of a crystal spring in the midst of turbid waters, and their application is much wider than the particular school upon which they have been enjoined.—*Penn. School Journal.*

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#### THE MODERN HERCULES.

According to a writer in the Theatre, the poor men have their hands full in trying to manage a woman of to-day. She is very different from the woman of yesterday. To-day she is aggressive, self-reliant, self-assertive, snapping her fingers at conventionalities. In spite of St. Paul's prohibition she speaks in public her ideas on everything. Her gowns are gored at the hips to show her figure, she cuts her dresses with a deep V; comes alone; goes alone; and carries a ticket for Sioux Falls in her pocket! The woman of to-day does not care for the man of brains, but she does insist upon a man of figure, style, carriage, and above all, good legs, for polo and athletics. The girl of to-day does not say limbs, but plain legs. A careful mother assured me that soon after the Yale-Princeton football match her parlors were over-run by young men of extraordinary type, looking like prize-fighters in dress coats, short thick necks, and great broad shoulders. One, a young Hercules, attracted her attention. He was rude and almost boisterous. "Good gracious, girls," exclaimed the mother in horror, "who is that vulgarian?" "Why, mamma, what a speech! That is Jack Higgary, the foot-ball slugger, a perfect classic; look at his legs, mamma!"

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#### THE SISSY MAN.

As a contrast to the masculine girl and her swagger, it might be pertinent to present the sissy man and his affectations. You see this rare exotic in full bloom at those essentially feminine ceremonies known as five-o'clock teas, where nothing, sweetened and

tied up with a bow, furnishes the repast, where soft light filters through rose-hued shades over fair faces, and æstheticism revels in daintiness galore. The sissy man has his prototype in Paris and London, and one of his chief characteristics is his devotion to the married woman, particularly if she has a monster of a husband that can't understand Browning and had rather shovel coal than read Rossetti. The sissy makes it a point to calmly ignore the husband, who would kick him out for his impertinence only that he knows what a harmless little lamb he is and thinks it would be needlessly cruel. He knows more about the code of candy-giving and the etiquette of flowers than he does about the Constitution of the United States.—*New York Sun*.

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#### WHAT IS FASHION?

Fashion may be described as the element of uncertainty run wild, and it is in this light we must view it when considering its effect upon production. Fashion's progress is marked by sudden transfers of prosperity from one class or locality, and the question is. Are such transfers advantageous to the country at large? There are plenty of people who will answer with an unhesitating "yes." They will say that if such transfers come with sufficient frequency, they tend to diffuse periods of exceptional prosperity over widely separated portions of the industrial field, so that in the course of every few years each group of workers engaged in the production of things which fashion affects will in turn have enjoyed some of this prosperity. In this way industries will be given an opportunity of expanding to the point where they can avail themselves to the utmost of improved machinery, increased division of labor, and all that economy of manufacture consequent upon some utilization of waste not till then profitable. Then, when the wave of fashion recedes, the industry can devote itself to staple production; or will have secured a hold upon foreign markets; while, of those who have been benefited by the times of exceptionally active trade, many will manage to permanently retain the benefit by the judicious use they have made of higher wages and profits. In this manner most men will get that opportunity which is supposed to come to every one once in his life. But there is a reverse side to

the scene in the fact that every increase of prosperity secured to a class or locality by change of fashion involves a corresponding loss to some other class or locality. The hard times induced by waning fashion may deprive people not only of all the advantages they have gleaned from the exceptionally good times, but of all those also which steady trade had previously bestowed upon them. Now, as far as the working classes are concerned, it may be taken as an axiom that to descend in the scale of comfort does infinitely more harm than to ascend does good, and that the intensity of the struggle to secure work when work is scarce carries wages far lower down than the keenness of competition to obtain hands when hands are few carries wages up.—*Nineteenth Century.*

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#### THE DINNER HOUR.

It is interesting to note that the dinner hour has gradually progressed from the forenoon until evening, just as the matinee has been transferred from the morning performance that its name signifies to the afternoon. The word dinner is believed by many persons to be a corruption of *dix heures*, or ten o'clock, the hour at which the Norman conquerors of England ate their principal meal. During the reigns of Francis and Louis XII. of France, fashionable people dined at 10.30, and supped at the latest at six o'clock in the evening. Four hundred years ago a household of importance in England arose at six o'clock, breakfasted at seven, dined at ten, ate supper at four, and shut the gates at nine P. M. Louis XIV. did not dine till twelve, while his contemporaries, Cromwell and Charles II., took the meal at one. In 1700 the hour was advanced to two, and in 1751 the Duchess of Somerset's dinner-time was three. In 1860 Cowper speaks of four o'clock as the then fashionable time. But these customs are comparatively modern. The Romans, at the time of Cicero, took breakfast from three to four in the morning, a luncheon at twelve or one, and about three o'clock the principal meal of the day. This meal, however, was often prolonged far into the night, as the diners reclined upon couches, and were entertained and amused by the novelty of the dishes. Never before or since has so much money

been spent on eating as by the Romans. Dinner began with eggs, and ended with fruit, and large quantities of wine were drunk. The courses between "the egg and the apple," as Horace phrases it, were varied according to the wealth of the host and the skill of the cook.—*Harper's Young People.*

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FRIDAY AFTERNOON EXERCISES.

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Susanna Snook's Sorrows.

Susanna Snooks sings sad, sweet songs,  
 she sees soft summer skies:  
 Strange sunset shades sift silently—she  
 somewhat sadly sighs;  
 Soliloquizingly she strays, sweet song-  
 sters shyly sing,  
 She sees slim spruce's slanting shades  
 surround some sparkling spring.  
 Still southward silently she strays.  
 She spies shy Simon Slade.  
 "Stop, Simon!" says Susanna Snooks.  
 Still sifts sweet sunset's shade.  
 Sly Simon six snug satisfying squeezes  
 slyly stole;  
 Susanna snickered. Simon stayed. Sick,  
 silly, spoony soul.  
 Susanna's sire saw some shy suspicious  
 stranger stray,  
 Saw Susan say, "Stop, Simon Slade!"  
 Saw simple Simon stay,  
 Stern sire sought some solid stick—  
 serenely, slyly slipped.  
 Susannah saw. She shrilly shrieked,  
 "Skip, Simon!" Simon skipped.  
 —*Selected.*

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The Cake That Kate Baked.

This is the cake that Kate baked.  
 These are the plums  
 That lay in the cake that Kate baked.

This is the boy  
 That ate the plums  
 That lay in the cake that Kate baked.  
 These are the ills  
 That worried the boy  
 That ate the plums  
 That lay in the cake that Kate baked.  
 These are the pills  
 That cured the ills  
 That worried the boy  
 That ate the plums  
 That lay in the cake that Kate baked.  
 This is Katie, pretty and sweet,  
 Who gave the pills  
 That cured the ills  
 That worried the boy  
 That ate the plums  
 That lay in the cake that Kate baked.  
 This is the doctor, so grave and neat,  
 That proposed to Katie, pretty and sweet,  
 Who gave the pills  
 That cured the ills  
 That worried the boy  
 That ate the plums  
 That lay in the cake that Kate baked.  
 This is the parson who thought it a treat  
 To marry the doctor, so grave and neat,  
 Who proposed to Katie, pretty and sweet,  
 Who gave the pills  
 That cured the ills  
 That worried the boy

That ate the plums  
That lay in the cake that Kate baked.  
—*London Tit-Bits.*

### She Could And She Couldn't.

She could sing and she could play,  
She could dance from night till day,  
She could while the hours away,

So 'tis said;

She could skate and she could paint,  
She could play the patron saint,  
But she couldn't and she wouldn't  
Make a bed.

She could walk eight miles a day  
And play tennis charmingly,  
Flirting in a saucy way,  
Little scamp!

She could drive and play base-ball,  
She could make a s.ylish call,  
But she couldn't and she wouldn't  
Clean a lamp.

She could swim and she could row,  
She could always have a beau,  
And I am sure that we all know  
She was shy.

She could laugh and she could prance  
She could play a game of chance,  
But she couldn't and she wouldn't  
Make a pie.

She could etch and write a book,  
She could vanquish with a look,  
She could win by hook or crook,  
I confess;

She could scold and she could flout,  
She could cry and she could pout,  
But she couldn't and she wouldn't  
Make a dress.

She could talk of church affairs,  
But knew naught of household cares;  
But I'm sure that none compares  
With sweet Nan;

Even if she couldn't bake  
Bread and pies and angel cake,

She entrapped and she captured  
A rich man!  
—*Bar Harbor Bazaar.*

### The Indians' Appeal.

You have taken our rivers and fountains  
And the plains where we love to  
roam—

Banish us not to the mountains  
And the lonely wastes for home!

No! let us dwell among you;

Cheer us with hope again;  
For the life of our fathers has vanished  
And we long by your side to be men.

Our clans that were strongest and bravest  
Are broken and powerless through  
you;

Let us join the great tribe of the white  
men,

As brothers to dare and to do!  
We will fight to the death in your  
armies;

As scouts we will distance the deer;  
Trust us, and witness how loyal  
Are the ranks that are strangers to  
fear!

And the still ways of peace we would  
follow—

Sow the seeds and the sheaves gather  
in;

Share your labor, your learning, your  
worship,

A life larger, better, to win.  
Then, foemen no longer, nor aliens,  
But brothers indeed we will be,  
And the sun find no citizens truer  
As he rolls to the uttermost sea.

You have taken our rivers and fountains  
And the plains where we loved to  
roam—

Banish us not to the mountains

And the lonely wastes for home!

No! let us dwell among you;

Cheer us with hope again;  
For the life of our fathers has vanished,  
And we long by your side to be men.

—Edna Dean Proctor in *Indian Advocate*.

### Temple of Fame.

Three riders set out for the Temple of  
Fame,  
Each bootied and spurred and equipped  
the same.

The first rode forth at a rattling pace,  
Like a jockey who wins an exciting race.  
The second starts out with caution, slow,  
That, when need was, he might faster  
go.

The third rode steadily, quietly on,  
And which do you think will the win-  
ner be;

The hare, the tortoise—or number three?  
The first one soon broke down, of  
course,

He saved his saddle, but lost his horse!  
The second met the regular fate—  
Dallied too long, and was just too late!  
The third I grieve, and regret to say,  
Did not get there—for he lost his way.  
He thought too much of his regular trot,  
To look at sign boards he quite forgot.

See how strangely things befall!  
Another—not thinking of Fame at all—  
Who was on his way to the bread-fruit  
tree,

To provide for a wife and children  
three,

Went straightway into the Temple of  
Fame,

And innocently asked its name!

They answered him. With a quizzical  
face,

He remarked, "It's a most uncomfort-  
able place!"

Then he went to the bread-fruit tree,  
And home to his wife and children three.

The moral? Well, if you can find it!  
Write it out—for I shan't mind it!

*Christian Union.*

### In Distress.

What a dreadful thing it is  
Just to be a boy,  
With two hands and feet that rob  
Life of all its joy.  
When the room is full of folks  
Sitting in a row,  
Seems to me of hands and feet  
I've a score or so.

Then there always is a stool,  
Or a rocking-chair,  
Bumping up against my feet,  
Till I'm in despair.  
And on every side are ranged  
Knick-knacks fair to see,  
That go crashing on the floor  
At a touch from me.

So, I think my hands I'll keep  
In my pockets tight,  
But on every side I hear,  
"That is not polite."  
O, I often wish I had  
Pockets for my feet;  
I would hide them, too, though all  
Should that cry repeat.

Only he who's been a boy  
Can my trials know,  
All the blushes and the chills,  
All the silent woe.  
All the inward wrath my tongue  
Never can repeat,  
Just because I am a boy  
With two hands and feet.

—Clara J.

### The Boys We Need.

Here's to the boy who's not afraid  
To do his share of work;



Who never is by toil dismayed,  
And never tries to shirk.

The boy whose heart is brave to meet  
All lions in the way;  
Who's not discouraged by defeat  
But tries another day.

The boy who always means to do  
The very best he can;  
Who always keeps the right in view,  
And aims to be a man.

Such boys as these will grow to be  
The men whose hands will guide  
The future of our land; and we  
Shall speak their names with pride.

All honor to the boy who is  
A man at heart, I say;  
Whose legend on his shield is this,  
"Right always wins the day."

### Three Fishers.

Three little fishermen, down by the bay,  
Went on a voyage one sunshiny day;  
Dick had the bait in a pink china dish,  
Ted had a basket, to bring home the  
fish,  
And Tommy, the captain, went march-  
ing along  
With a gold-headed rod on his shoulder  
so strong.

Three little fishermen, out on the bay,  
Laughing and shouting went sailing  
away,  
Sailing away with the wind and the tide,  
And the little waves danced as they ran  
by the side;  
But the worms wriggled out of the pink  
china dish,  
And the gold-headed rod only frighten-  
ed the fish.

Three little fishermen, out on the bay,  
Weeping and wailing, went drifting  
away,

Till a grimy old oysterman brought  
them to land,  
And set them down safe in a row on the  
sand;  
But the gold-headed rod, and the pink  
china dish,  
And the big willow basket were left for  
the fish.—*Emily Huntington Mil-  
ler, in Our Little Ones.*

### "Long Ago."

Grandma told me all about it;  
Told me so I couldn't doubt it,  
How she danced—my grandma danc-  
ed—

Long ago.  
How she held her pretty head,  
How her dainty skirts she spread,  
How she turned her little toes  
Smiling little human rose!

Long ago.  
Grandma's hair was bright and sunny,  
Dimpled cheeks, too—ah, how funny!  
Really, quite a pretty girl,

Long ago.  
Bless her! Why, she wears a cap,  
Grandma does, and takes a nap  
Every single day; and yet  
Grandma danced a minuet,

Long ago.  
Now she sits there rocking, rocking,  
Always knitting grandpa's stocking  
(Every girl was taught to knit

Long ago);  
Yet her figure is so neat,  
I can almost see her now  
Bending to her partner's bow  
Long ago.

Grandma says our modern jumping,  
Hopping, rushing, whirling, bumping,  
Would have shocked the gentfolk  
Long ago.

No—they moved with stately grace,

Every thing in proper place;  
 Gliding slowly forward, then  
 Slowly curtesying back again,  
     Long ago.

Modern ways are quite alarming,  
 Grandma says; but boys were charm-  
 ing—

Girls and boys, I mean, of course—  
     Long ago.

Bravely modest, grandly shy—  
 What if all of us should try  
 Just to feel like those who met  
 In their graceful minuet,  
     Long ago?

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### Conquer Yourself.

It's no use to grumble and sigh,  
 It's no use to worry and fret,  
 It is useless to groan or to cry,  
 Or fling yourself down in a pet.  
 You'll never be wise or be great,  
 If you bluster like bees when they  
     swarm;  
 'Tis folly your woes to berate,  
 And pitch like a ship in a storm.  
 Don't get in a tantrum and shout  
 When obstacles rise in your path,  
 And don't—let me beg of you—pout,  
 By way of displaying your wrath.  
 Don't butt out your brains just to spite  
 Some fancied injustice of Fate,  
 For time will set everything right,  
 If you only have patience to wait.

The blustering wind cannot chill  
 The lake, though he ruffles its face,  
 But the frost, with its presence so still,  
 Locks it fast in a silent embrace.  
 So you may win fame beyond price,  
 And conquer the world with its pelf,  
 If you will only heed this advice,  
 And first learn to conquer yourself.  
     —*Golden Days.*

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### If I Were You.

What would I do if I were you?  
 First thing I'd make a rule  
 To put my hat and books in place  
 When I come home from school.  
 What would I do if I were you?  
 I wouldn't pout and cry  
 Because I couldn't have my way  
 About a piece of pie.  
 What would I do if I were you?  
 I'd speak a pleasant word  
 To this and that one in the house,  
 And not be sour as curd.  
 And when a body asked my help  
 I'd try to do a favor,  
 So that it should not always have  
 A disobliging flavor.  
 If I were you my little friend,  
 I'd try to be so good  
 That my example all around  
 Might follow, if they would.

—*Selected.*

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## DEBATING DEPARTMENT.

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SHOULD IMMIGRATION TO THE UNITED STATES BE RESTRICTED?

The recent cholera epidemic and the danger threatening this country on account of immigrants coming from infected ports has

had the effect of bringing the subject of immigration prominently before the people.

Three policies may be adopted in reference to immigration, viz: a policy of non-restriction, a policy of restriction, and a policy of entire prohibition.

Ever since the discovery of this continent it has been regarded as a place where the over-crowded population of Europe could find an asylum; and the United States especially, on account of the extraordinary fertility of its soil, its vast extent of unoccupied territory, the freedom of its institutions, and its unexampled prosperity, has always been regarded as the fit refuge for the persecuted and oppressed of all nations. We point with pride to that sturdy band of immigrants who crossed the sea in the Mayflower, and struggling with the elements and the foes of the forest, laid the foundation of that rugged New England manhood which has been the pride of the nation. The English in Virginia, the Huguenots of the South, the Quakers of Pennsylvania, the French of Acadia might be pointed to with equal pride. Controlled by this sentiment the founders of the government adopted a policy of non-restriction. Immigration was not only free to all nationalities, but it was even encouraged. This liberal policy of our forefathers was fully justified by its results. Side by side with the natives these foreigners pushed farther and farther to the west the limits of civilization. Before their vigorous advance the wild inhabitants of the forest receded, and the wilderness itself was turned into a blooming garden. They dug canals, constructed railroads, worked in the factory, and went down into the earth and brought up its hidden treasure. Shall a policy that has done so much for the development of this country be discontinued? Shall the spirit of universal brotherhood which prompted this policy give way to one of universal selfishness? Nearly all the conditions which existed at the foundation of the government exist to-day though in a less degree. On the whole, our industries are in a state of infancy. The average population of the United States is only 17 per square mile, while a square mile of land is capable of supporting several hundred persons. The records of the Land Office show that there are still about 600,000,000 acres of vacant public land subject to entry. Thousands of our fellow men in the Old World oppressed by un-

just political and social condition look to America as the land of their deliverance.

What, then, are the reasons for the Government's change of policy on these subjects? These reasons may be summarized as follows: Within the last few years the character of immigrants to this country has greatly changed. There has been a decrease in the number of desirable immigrants and a great increase in the number of the undesirable. Instead of the German, the Englishman, the Frenchman, the Swede, and the Norwegian we are getting the Chinaman, the Italian, the Russian Jew, and the Pole. These immigrants have just money enough to take them to Castle Garden, and are dumped out, an ignorant and helpless mass, expected to take care of themselves and develop into American citizens. They must find work or starve. Accordingly, they offer their services for any sum that the greedy capitalist may be willing to pay. The result is the forcing down of the wages to a point where respectable American workmen cannot live. But even then they can not all find employment and the result is a vast army of beggars and tramps that must be supported at public expense. Again, the easy conditions on which foreigners are granted the right to vote adds another danger to unrestricted immigration. Too ignorant to understand the use of the voting power, they sell their suffrage to any one who can give them a temporary relief from their miserable condition. So numerous have they become in the large cities as to practically control legislation. Less than twenty per cent of the inhabitants of New York City are of native parentage, while ninety-one per cent of the people of Chicago are either foreigners or the sons of foreigners.

The laws on the subject of immigration which have thus far been enacted, exclusive of the Chinese Act, may be summarized as follows:

The law of 1882 placed a tax of fifty cents upon each immigrant, and excluded all convicts, lunatics, idiots, and persons incapable of self support.

This law having been found insufficient to protect American laborers from competition with the pauper labor of Europe, in 1885 Congress enacted the Alien Contract Law which prohibited the making of contracts with foreigners before they landed in the

United States.. These laws, however, were practically dead letters on the statute books.

In 1891 Congress passed another law the main features of which are as follows:

The exclusion of "All idiots, insane persons, paupers, or persons likely to become a public charge, persons suffering from a loathsome or a dangerous contagious disease, persons who have been convicted of felony or other infamous crime or misdemeanor involving moral turpitude, polygamists, and also any person whose ticket or passage is paid for with money of another, or who was assisted by others to come, unless it is affirmatively and satisfactorily shown on special inquiry that such person does not belong to one of the foregoing excluded classes, or to the class of contract laborers excluded by the Act of February 26, 1885; but this shall not be held to exclude persons living in the United States from sending for a relative or friend who is not of the excluded classes." Immigrants induced to come by advertisements in foreign countries are declared excluded under the Alien Contract Law. An alien becoming a public charge may be returned in one year. Steamships and transportation companies, or owners of vessels, are prohibited from directly, or through agents, either by printing or oral representations, soliciting immigrants or aliens into the United States. The expense of the return of immigrants of the excluded class is to be borne by the owners of the vessels in which they came.

These laws are not considered sufficiently stringent and there is at present a very wide demand for more effective laws.

See

- Appleton's Am. Cyclopedia, Vol. 6 p. 571.
- Lalor's Cyclopedia of Political Science, Vol 2 p. 85.
- Problems of American Civilization, p. 1.
- Thompson's Workman, Chap. 10.
- Forum, Vol. 3 p. 532; Feb. 1893.
- North American Review, Feb. 1893.
- Public Opinion, March 1893.
- R. M. Smith's Emigration and Immigration.
- North Am. Review, Vol. 82 p. 134; Vol. 134 p. 347; Vol. 152 p. 27.

IS THE CO-EDUCATION OF THE SEXES IN HIGHER  
INSTITUTIONS DESIRABLE?

In discussing this question we have to take into account the comparative physical and mental capacity of the two sexes, and also the influence they are likely to have on each in such close relationship. In other words, we have to consider the physical, mental, and moral aspects of the question.

The physical side of the question is one of physiology and must be decided entirely from that standpoint.

Secondly. Is woman's mental constitution so different from that of man as to require a separate school and a separate course of study? That there is a difference cannot be denied; but there is also a difference between the minds of different men. Yet we do not establish separate schools for the different grades of intellects among men. Is this intellectual difference a fundamental one or has it been brought about by the differing circumstances in which men and women have been placed.

If originally they were alike, why did they not maintain their equality? Again, how can woman become the companion of man without sharing his studies?

As to the moral influence, it is admitted by all that proper intercourse between the sexes is beneficial. But the conditions of the home are not the same as the conditions of the school. It is not possible to place the same safeguards about the young lady at school as at home.

The co-education of the sexes is an important question, and is receiving much attention in educational circles. Women will not be kept in the back ground. They demand higher education and must have the doors of all colleges thrown open to them or institutions of their own of a higher character.

See

Female Brains and Girls' Schools, *STUDENT*, May 1893.

Bryce's *American Commonwealth*, Vol. 2 p. 587—590.

*Sex in Education*, by Dr. Clarke.

*Proceedings of Nat. Ed. Association*, 1874, p. 118.

*Rep. of Commissioner of Education*, 1874, 1877, 1878, 1879, 1881, 1883.

*Education of Am. Girls*, by Miss Brackett.

No Sex in Education, by Mrs. Duffey.

An article on this subject will also appear in the July STUDENT.

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QUESTIONS FOR DISCUSSION.

Is Bismark a greater statesman than Gladstone?

Was the execution of John Brown justifiable?

Should the President of the United States be elected by a popular vote?

Should there be any laws against committing suicide?

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QUESTIONS AND ANSWERS.

Please answer the following through the columns of THE STUDENT: Name five leading Democratic Journals in the U. S., also five leading Republican Journals, and the editors and publishers of each.

Answer.—Democratic—New York Sun, Chas. A. Dana; New York World, Joseph Pulitzer; Louisville Courier Journal, Henry Waterson; Times-Democratic, New Orleans, published by a stock company; Chicago Times, published by a stock company.

Republican—New York Tribune, Whitelaw Reid; Chicago Inter Ocean, H. H. Kohlsaas, publisher; Chicago Tribune, published by the Tribune Co.; Springfield Republican, Samuel Bowles, editor and publisher;

Denver Republican, published by stock company.

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What is amber and where is it found?

Answer.—Amber is the name of a fossil gum. The gum is found in the ground; and as it seems to be a crystallized substance it is called a mineral. It oozes out of pine and fir trees and runs down to the roots and becomes deposited in the ground. It is found in large quantities around the shores of the Black Sea.

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Is there a fee charged for admission to the different buildings of the World's Fair.

Answer.—No. Admission to the grounds costs 50 cents.

That is the only charge except by the side-shows in a sort of annex known as the Midway Plaisance. This is a wide parkway extending westward from Jackson Park, and it contains a trained animal show, Chinese, Dahoman, Indian, Austrian, and other villages, and many similar exhibitions, run by outsiders for profit, under concessions from the World's Fair management. There is no fee to pay on entering any building of the World's Fair proper.

What is the size of the liberty bell, and of what metal is it made?

Answer.—It is about two and a half feet high and its rim diameter is a little more than that. It is made of bell metal which is a compound of copper and tin.

Who have been chief justices of the United States, and how long did each hold the office?

Answer.—The following are their names with their terms of office: John Jay, six years; John Rutledge, less than a year; Oliver Ellsworth, five years; John Marshall, thirty-four years; Roger B. Taney, twenty-eight years; Salmon P. Chase, nine years; Morrison R. Waite, fourteen years; and Melville W. Fuller, nearly five years since his

appointment in 1888. Considerable intervals followed vacancies, in some instances.

Who were the Pilgrims, when and where did they land in America, and in the reign of what king or queen?

Answer.—They were members of an independent congregation driven from England, mostly from Norwich, to Holland by religious persecution. They remained in Leyden for several years, and their first party sent to America landed at Plymouth, Mass., December 21, 1620, in the reign of King James I.

Who were the Puritans, when and where did they land first, and in the reign of what king or queen?

Answer.—They were the element, speaking of American history exclusively, among the colonists who came to this country from England as members of the Church of England dissatisfied with its practices and insisting upon simpler, purer forms of worship and modes of living. The Pilgrims who landed at Plymouth were Independents who had left the Church of England, while the Puritans had sought to change the church in accordance with their own idea instead of withdrawing from it entirely. The Puritans first es-



established a permanent settlement at Salem, in 1628, in the reign of King Charles I.

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Who persecuted the Quakers, the Puritans or the Pilgrims?

Answer.—The Puritans. The Pilgrims, properly speaking, persecuted nobody.

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Is it true that in the English Parliament the members sit with their hats on?

Answer.—Yes; during the reign of King John (1199), the king agreed to settle the difficulty with France by single combat. John, the Earl of Ulster, was the English champion; and as soon as he appeared on the field of combat, his adversary fled, leaving him master of the field. King John asked the earl what his reward should be. He replied, "titles and lands I want not; of these I have enough, but in remembrance of this day, I beg the boon for myself and my successors, to remain covered in the presence of your Majesty and all other sovereigns of this realm." The request was granted; and this accounts for the odd custom in Parliament of members wearing their hats.

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Why does the Lord High Chancellor of England sit on a wool-sack?

Answer.—During the reign of

Elizabeth an act of Parliament was passed forbidding the exportation of wool. As a memorial of that event, and to impress the people with the importance of it, sacks of wool were placed in the house of Lords, on which the judges sat. The Lord High Chancellor, who presides over the House of Lords, still sits on a wool-sack over which is thrown a red cloth, and is still said to be "appointed to the wool-sack."

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How are aerolites, or meteoric stones, accounted for?

Answer.—Meteoric stones, in single masses and in showers, have fallen from the atmosphere at various periods, in many parts of the world. The largest of these stones at present known is in the province of Tucuman, South America, and weighs thirty thousand pounds.

Aerolites have been proven to be atmospheric, both by eye-witnesses, by the similarity of their composition in all cases, and also by the fact, that, though the materials mingled are well known, they are never united in the same manner as in the productions of our globe, and nothing like them has been ejected from terrestrial volcanoes; and, further, by the fact that their situation is generally isolated,

and on the surface of the earth. There have been many theories advanced as to their origin. La-Place traces them to volcanic origin. The respect due to his opinions no one will dispute; but Prof. Olmsted, the American astronomer, has offered the most satisfactory explanation. He has shown that countless bodies of small dimensions cluster together in vast rings, and revolve, as do the planets, around the sun. These bodies become visible when the orbit of the earth approaches their orbits; and, when they come within the atmosphere of the earth, they are ignited, and fall upon the earth as meteoric stones.

Is there such a thing as a river of ink in the world, and if so where is it?

Answer.—Yes; there is a river of ink in Algeria. It is formed by the junction of two streams. One of the streams comes from soil that contains a great deal of iron and the other comes from a peat swamp. The water of the first stream, of course, is strongly impregnated with iron; while that in the second is impregnated with gallic acid. When the two streams meet, the acid of the one combines with the iron of the other and forms a genuine ink.

Please tell me what is meant by the expression, "Letters four do form his name," as found on page 2 of the Autocrat of the Breakfast Table.

Answer.—The "letters four" are F-O-O-L.

[Your other question has been referred and will be answered in a future number.—Ed.]

Who is Prince Kropotkin?

Answer.—Prince Alexeievitch Kropotkin, a Russian revolutionist, was born Dec. 9, 1842. He entered the Russian army and spent five years in Siberian service. Accounts of his geographical and geological observations have been published by the Russian Geographical Society. In 1872 he became acquainted with the International Working Men's Association in Switzerland and joined the most advanced anarchist section of it. He was arrested in Russia in 1874, but escaped from prison in 1876 and went to England. He has been engaged in agitation against the Russian government in France and England, and has also written on prisons and on scientific subjects. The anarchist paper, *La Revolte*, published in Paris, was founded by him.

## HISTORY OF THE MONTH.

[April 15, to May 15.]

*Apr. 16.*—The Mayor of Brussels was severely beaten by socialists.

*Apr. 17.*—The debate on the second reading of the Irish Home Rule Bill was resumed in the House of Commons.

*Apr. 18.*—The annual meeting of the National Academy of Science began in Washington, D. C.—The town of Boles, Ark., was almost destroyed by a cyclone

*Apr. 19.*—A cyclone struck Osage City, Kan., destroyed a large number of buildings, and caused the death of several persons.—The island of Zante is being shaken by earthquake shocks.

*Apr. 20.*—A terrific storm raged over the country east of the Rocky mountains.—Many of the exhibits at the World's Fair were damaged.—Earth quakes continue in the Island of Zante,

*Apr. 21.*—The extradition treaty between this country and Russia was approved. Ratifications have been formally exchanged between the two governments.—Great damage by gales was reported in many states.—The Irish Home Rule Bill passed the second reading by a vote of 347 to 304; the debate was closed by Mr. Gladstone and Mr. Balfour.

*Apr. 22.*—The silver wedding of King Humbert and Queen Margaret was celebrated at Rome.

*Apr. 23.*—President Cleveland declared that he and his cabinet are all in favor of gold payments for all paper.

*Apr. 24.*—The naval squadron, in Hampden Roads, sailed for New York.—The Duke of Veragua and his party were received by the President, at the White House.—The Columbian guards, at the World's Fair, went on a strike.

*Apr. 25.*—The Bering Sea Court adjourned for a week on account of the illness of Lord Hannen.

*Apr. 26.*—The President has appointed the following Union Pacific R. R. directors: Henry F. Dimmick, of New York, Don M. Dickinson, of Michigan, J. W. Doane, of Illinois, Fitzhugh Lee, of Virginia, Joseph W. Paddock, of Nebraska.—President Cleveland and his Cabinet went to New York to attend the Naval Review.—Oklahoma Territory was visited by a tornado, doing great damage. 62 persons were killed, and many injured.

*Apr. 27.*—The International Naval Review was held at New York. The war-ships were in two columns, on the Hudson river, and stretched away for three miles. President Cleveland reviewed the fleets from the deck of the Dolphin.—The birthday of Gen. Grant was celebrated in many places.

*Apr. 28.*—President Cleveland started for Chicago, to take part in the World's Fair exercises.

*Apr. 29.*—A great tornado destroyed the town of Cisco, Texas, killing and injuring many people.

*Apr. 30.*—Six men were burned to death at Burlington, Iowa.—The Na-

tional Bank of Australasia failed, with liabilities of 7,500,000 pounds.

*May 1.*—The World's Fair was formally opened. After a parade in which many distinguished guests took part, prayer was offered by Rev. Dr. Milburn, a Columbian Ode was read, Director Davis made a speech, the President delivered a short address, and then pressed the button—The Mississippi river is overflowing its banks, and causing great damage.—Twenty-two thousand coal miners, in Ohio, went on a strike.

*May 2.*—The Mississippi river is still rising, and much damage has been done by the floods, in several states.—President Cleveland arrived in Washington, from Chicago.

*May 3.*—The floods in the western rivers continue to cause damage and interruption to traffic.

*May 4.*—Secretary Carlisle issued an order suspending the arrest of Chinese, under the exclusion act.

*May 5.*—Exciting scenes occurred in the New York Stock Exchange. Several Wall Street men failed.—The President has decided to postpone the re-assembling of the International Monetary Conference, until November.

*May 6.*—The World's Fair officials announced that the Fair would be closed on Sunday.—There were nearly 25,000 paid admission to the Fair to-day.—Much damage done by storms, in the west.—The German Army Bill was rejected by a vote of 210 to 162. The Emperor immediately dissolved the Reichstag. New elections will be held on June 15th.

*May 7.*—President Cleveland issued a manifesto declaring that hereafter, the White House will be closed to office

seekers.—A great demonstration in favor of the eight hour law, was held in Hyde Park, London.

*May 8.*—A destructive cyclone swept Arkansas, in the neighborhood of Saratoga.—Carlyle W. Harris was executed at Sing Sing prison, New York.—John Ruskin has been tendered the honor of Poet Laureate, of England.

*May 9.*—The President has appointed James H. Blount, of Georgia, Envoy Extraordinary and Minister Plenipotentiary, to the Hawaiian Islands, to succeed John L. Stevens, resigned.—The Chemical National Bank of Chicago, and its branch at Jackson Park, suspended.—The bank of Victoria, of Melbourne, Australia, suspended with liabilities of 2,400,000 pounds.

*May 10.*—The National League of Republican Clubs, and the National Republican Committee, both held meetings in Louisville.—Queen Victoria opened the British Imperial Institute in London. This, it is said, is her last public appearance.

*May 11.*—W. W. Tracy, of Illinois, was chosen president of the Republican National League of Clubs, by the Louisville convention. The convention adjourned after selecting Denver as the next place of meeting.—The Columbia National Bank, of Chicago, and the Capital National Bank, of Indianapolis, suspended.—The New York Central's new engine, No. 999, ran a mile in 32 seconds.—Mr. Carter, of Montana, was chosen chairman of the National Republican Committee.—The Earl of Aberdeen has been appointed Governor General, of Canada.

*May 12.*—A large number of western banks closed their doors as a result of the failure of the Columbia National

Bank, of Chicago.—The directors of the World's Fair met to-day, and decided, that the grounds should be opened every Sunday.—The steamer *Campania*, of the Cunard line, reached Queenstown, having made the passage from New York, in 5 days 17 hours and 27 minutes. This is the fastest time on record for the eastward passage.

May 13.—Much criticism is being indulged in concerning the action of the local directory, to open the World's Fair on Sunday.

May 14.—Ten miners were killed by

falling down a shaft, in the Calumet and Hecla mine, in Michigan.

May 15.—The Supreme Court of the United States, declared the Geary Chinese Exclusion Act constitutional.—George Kennan submitted to President Cleveland complaints of Russians and Poles, in various parts of Europe, against the ratification of the Russian treaty.—The Women's Congress was opened at the World's Fair.—The White Star Steamship Co. has ordered the construction of a steamship to be 800 feet in length.

## DEPARTMENT OF ARITHMETIC.

Edited by J. B. F. SHOWALTER.

### PROBLEMS.

9. A man has two silver cups and only one cover. First cup weighs 12 oz.; if covered, it will weigh twice as much as second cup; but if second cup be covered, it will weigh  $3\frac{1}{2}$  times as much as the first cup: required the weight of the second cup, and also that of the cover.

L. H.

10. A board is 2 ft. wide at one end and 1 ft. at the other, and is 20 ft. long: how far from either end must it be cut across in order that each part may contain half the area?

J. P. M.

11. If 3 acres of grass keep 13 oxen 9 wks. and 4 acres keep 20 oxen 6 wks.; for how many weeks can 36 oxen graze on 6 acres, grass growing uniformly?

Id.

12. A New York merchant, having £350 to pay in London, bought a draft for that amount with gold @ 114, exchange standing at \$4.85. He might

instead have remitted 5-20's, then selling @ 119½ in N. Y., and worth 107¾ in London; what would he have gained or lost by the latter? W. N.

13. A. B. & C. start from the same point at the same time, and travel in the same direction, around an island 20 mi. in circumference. A. goes 3 mi. an hr., B. 7, and C. 11: in what time will they first be together? Id.

### SOLUTIONS.

No. 1.

1. No. of acres in field =  $\frac{1}{180}$  of the square of No. of rds. in one side.

2. 11 ft. = 1 board length.

3. 1 " =  $\frac{1}{11}$  " "

4.  $16\frac{1}{2}$  ft. =  $\frac{3}{2} \times \frac{1}{11}$  board length or  $\frac{3}{22}$  board lengths.

5. ∴ No. board lengths in one side =

$\frac{3}{22}$  No. of rds. in 1 side.

6. and No. of boards in one side =

$1\frac{1}{2}$  or 6 times No. of rds. in 1 side.

7. ∴ No. of boards around field = 4

×6 or 24 times No. of rds. in 1 side.

8. ∴  $\frac{1}{160}$  of the square of the No. of rds. in one side=24 times the No. of rods in 1 side, or

9. No. of rds. in 1 side=160×24 or 3840.

10. No. of rds. around field=4×3840 or 15360.

11. No. of board lengths around field= $\frac{3}{2}$ ×15360 or 23040.

12. No. of boards around field=4×23040 or 92160.

13. ∴ the field contains 92160 acres.  
Ed.

No. 2.

1. He saves his first money the 21st year, and his last the 41st year; he will, therefore, save 20 annual sums.

2. Regard his saving as the interest on some sum of money @ 6%, and consider, first, this interest to be just \$1 per year.

3. Initial value of \$1 per yr. @ 6% = $$.0\frac{1}{6}$  or \$16 $\frac{2}{3}$ .

4. Compound interest of \$16 $\frac{2}{3}$  for 20 yrs. @ 6% =2.2071355×\$16 $\frac{2}{3}$ , or \$36.78559, final value of an annuity of \$1 a yr. for 20 yrs.

5. \$25000=final value of the required annuity for 20 yrs.

6. \$25000÷36.78559=\$679 62, amt. to be saved annually.  
Ed.

No. 3.

1. First debt runs from Aug. 11 to Sep. 1=21 da.

2. Second debt runs 60 da. after Sept. 1=60 da.

3. Since the second debt runs  $\frac{60}{21}$  as long, it must be  $\frac{2}{3}$  as large as the 1st.

4. Hence both= $\frac{6}{80}$ + $\frac{2}{3}$  $\frac{6}{80}$  or  $\frac{3}{40}$  of first debt.

5. ∴  $\frac{3}{40}$  of 1st=\$100.

6. and  $\frac{1}{80}$  of 1st=\$100 $\frac{0}{1}$

7. “  $\frac{6}{80}$  “ “ =60×\$100 $\frac{0}{1}$  or 74.0740.

8. “  $\frac{21}{80}$  “ “ = $\frac{21}{80}$ ×\$100 “ 25.9259,

what he must pay Aug. 11  
Ed.

No. 4.

1. \$6=cost of grindstone.

2. A pays \$3, hence he is entitled to use  $\frac{3}{6}$  or  $\frac{1}{2}$  of s.

3. B pays \$2, hence he is entitled to use  $\frac{2}{6}$  or  $\frac{1}{3}$  of s.

4. C pays \$1, hence he is entitled to use  $\frac{1}{6}$  of s.

5. 3ft.=diameter of stone.

6. ∴  $3^2$ ×.7854=7.0686, area of s.

7. B takes the center, and gets  $\frac{1}{3}$  of 7.0686=2.3562, area of B's portion.

8. Diameter of B's= $\sqrt{2.3562\div.7854}$   
=1.732+ft.

9. C takes the portion next B's and get  $\frac{1}{6}$  of 7.0686 sq. ft.=1.1781 sq. ft.

10. Area of B's and C's=2.3562+1.1781 or 3.5343 sq. ft.

11. Diameter of B's and C's= $\sqrt{3.5343\div.7854}$ =2.1213.

12. ∴ Diameter of C's=2.1213—1.732 ft. or .3893 ft.

13. A's portion is what is left on the outside, which is  $\frac{1}{2}$  the whole area, the diameter of which is 3 ft.—2.1213 or .8787 ft.

∴ the portion of the diameter ground off by each is as follows: A's, .8787 ft., B's, 1.732 ft., and C's, .3893 ft.

LLOYD HOSHAU

[CORRECTION:—The editor of this department takes pleasure in acknowledging the receipt of the correct solution of the third question in arithmetic in the May number of THE STUDENT.

The solution was corrected and sent in by Mr. Frank A. Burgess, and is as follows:

1. To get a board 1 in. thick will require  $\frac{2}{3}$  in. for as many boards as sawed, less 1, the last cut of the saw making 2 boards.—This was overlooked in the May number.

2. 10 in.—1 in. (for the extra board)  
=9 in.

3. ∴ there will be left  $9 \div \frac{9}{8}$  or 8 cuts  
of the saw, *i.e.* 8 boards, and adding the  
extra board we obtained in the 2d step  
we have 9 boards.

4. 1 board= $16 \times \frac{1}{2}$  ft. of board  
measure.

5. 9 boards= $9 \times 16 \times \frac{1}{2}$  ft. board  
measure, or 216 ft. board measure].

### The Analytical Solution in Per- centage Continued.

In last month's issue of THE STUDENT we spoke of the equation being indispensable in arithmetical reasoning. This is true not only of arithmetical reasoning but of any other reasoning as well.

Some authors in defining the equation limit it to algebraic reasoning, since, they say, "it is the expression of equality between two algebraic quantities." But the sign of equality (=) when placed between two quantities indicates that those two quantities are equal to one another, and whether the quantities be algebraical or arithmetical, this will not alter the relation existing between them; and, since two quantities thus connected form the equation, therefore, the equation legally, and properly, belongs to arithmetic.

But, while the equation is indispensable, it is not the only instrument necessary for the analytical solution of problems in arithmetic. Substitution and transposition belong to the same kind of reasoning, and accompany the equation as its necessary auxiliaries. Without these two accompanying processes the equation would be incomplete, and would many times fail to accomplish the very purpose for which it was created.

I am aware that both of these processes are usually thought to belong properly to algebraical and geometrical reasoning only; but this is not the case. By a careful examination of the different authors on this subject, you will find that all, without exception, have problems, the solutions of which require the

process of substitution; and many have given those whose solutions require transposition. We, therefore, have a *tacit* acknowledgment, at least—and that a unanimous one—of the necessity of the first process, that of *substitution*.

Let us illustrate this process by a very simple problem: If John has two times as many marbles as James, and both together have thirty, how many has each?

From the conditions of the problem it is readily seen that we may say John's marbles or two times James', as suits our purpose best, since each is equal to the other. Hence, in the solution we would say, since John and James together have thirty marbles, and since John has two times as many as James, therefore John and James together have two times James' and one time James', or three times James'. Therefore, three times James' equal thirty, one time James' equal  $\frac{1}{3}$  of thirty, or 10, James' marbles; two times James' equal 20, John's marbles.

Hundreds of problems might be cited, but let this one suffice, as it illustrates the point.

Let us defer the second process for the present, in order to examine the most powerful and useful of all the equation's auxiliaries. The ship without sail or rudder would not more surely defeat the pilot in his course than would the equation perplex and disgust the reasoner, if shorn of its axioms.

There are truths the mere statement of which makes them apparent; they need no proof, nor do they require argument: these are called axioms. Some are special, some are general. Some belong to algebra only, others are confined to geometrical reasoning, while others, still, are arithmetical. But there are some that are general in their application, and hence belong, and properly so, to all of these branches; and no one branch has a claim superior to that of the other upon these *general* axioms.

If equals be added to equals, the sums will be equal, or the quotients of equals by equals are equal, or halves of equals are equal, or two times equals are equal, or if equals be taken from equals, their remainders are equal, etc., are general axioms, and must accompany the equa-

tional form of thought, lest the equation fail in its own purpose.

Lastly, Transposition. The word itself means to place across.

In mathematical reasoning it means the changing of any quantity from either member of the equation to the other.

It is not my purpose to produce an argument to show that this process, too, belongs to arithmetical reasoning. If I have shown that the general axioms of right, and necessity, belong there, then this process needs no argument in its favor, for I shall show that it is merely a convenient way of stating one or the other of two of the general axioms. Also, it being admitted that these general axioms belong to arithmetical reasoning, I shall show that "Clearing an equation of fractions" is but a convenient way of stating one of the general axioms, and hence must also be

admitted as belonging to arithmetic.

It is a mistaken idea that the difference—or any part of the difference—between arithmetic and algebra is that in the one you use transposition, and substitution, and axioms, and the equation, while in the other you just get along the best way you can without any of these processes.

If a process be found in algebra, there is no reason for accepting it as conclusive evidence that it belongs there more than elsewhere. If pains be taken to investigate the matter, it may be found that the process as properly belongs to, and may have originated in, some other branch.

Algebra is generalized arithmetic, and the line of separation can not be drawn with too much nicety or precision. You can not say here arithmetic ends and here algebra begins.

(Continued in next issue)

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## THE EDITOR.

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To one who attended the World's Fair on the opening day, three things forcibly presented themselves: the incompleteness of the exhibition, the lack of sufficient food to feed the people, and the determination on the part of those who did have food to extort all they could for it. The people who attended the Fair on the opening day had a right to expect that at least they could procure sufficient food. But food fit to eat could not be had at any price, and food unfit to eat was dished out in a "stand and deliver" manner that would have been a credit to an Italian bandit. Director General Davis contributed an article to the

North American Review on the subject of "Charges at the World's Fair" in which he states that the management of the Fair had organized a "bureau of protection and comfort" for the benefit of the people. Where was that bureau on May 1? Certainly no one of the thousand of people in attendance would conclude from his experience on that day that such a bureau was in existence. He would be more apt to conclude that several bureaus of discomfort and highway robbery had been organized.

\* \* \* \* \*

But those who had been victimized were informed a few days later that the management



had "heard" that there was extortion practiced on the grounds, and were about to "investigate" the matter. Why it should take this "bureau of comfort and protection" several days to learn that extortion was practiced on the grounds is not easy to understand. One would expect that such a bureau would be organized to prevent extortion and not to investigate it after it had been committed. It will be small consolation to visitors to know that the extortions to which they must submit may be investigated several days after they have left the grounds. Better lock the stable a little sooner.

\* \* \* \* \*

But the Fair is a magnificent thing and every body will want to visit it during the summer. This can be done at reasonable expense by the exercise of a little care. Teachers will find it much more economical to remain in smaller towns outside of Chicago and ride into the city in the morning on excursion trains that will take them back again at night. By taking lunch with them they can avoid the extortion of the Chicago restaurants, and a month can be spent visiting the Fair in this manner at no greater expense than a week in Chicago would be.

The gathering of the prominent women of the world at the Woman's Congress in Chicago on May 16, brings forcibly to the mind the extraordinary ad-

vancement that women have made in recent years.

In this notable gathering of women were teachers, preachers, doctors, lawyers, lecturers, real-estate dealers, authors, poets, actresses, painters.—Indeed, women seemed to have pushed themselves into nearly every industry and profession. Man may well tremble. It is now to be a question of the survival of the fittest. In the future household woman will not necessarily elect the kitchen as the place ordained for her by divine law. It will depend on who is most fit to go into the kitchen; and the man who marries a genius must wear the apron.

The young teacher who is doing faithful work in the country school is anxious to get into the city. He looks upon the city position as a much higher place. The fact is that there is no school where the work is more important and more honorable than the district school. They are the schools that send out the vigorous boys and girls that make their mark in the world. Herbert Spencer says that the first element of success for a man is to be a good animal. The country student does not have the vitality ground out of him by a complex school machinery. His excess of animalism makes him sometimes difficult to manage; and occasionally he lets off some of the steam by throwing the teacher through the window. But re-

member that in the long race of life this vitality will be his most useful resource.

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Prof. F. D. Kelsey, Sc. D., the newly elected professor of botany of Oberlin College, is one of the men whose experience should be an inspiration to others. Graduating from Marietta College in 1870, and Andover in 1874, he entered the ministry, and a few years later went to Montana as a home missionary. He at once identified himself with the development of the educational system of that new country. He soon saw that the flora of that region contained many characteristic features, and though he had never handled a microscope, and was a thousand miles from an instructor, he ordered an outfit and procured all the book assistance he needed and began a thorough study of the vegetable life of that new world. He became after a time the one authority in those parts, and his articles upon the subject attracted wide attention. He did not realize how much this work of his signified until his door bell rang one day announcing the arrival of a gentleman who had come all the way from Oberlin to offer him, upon the strength of his reputation, the professorship in botany in that institution. He is the most widely known botanist in the entire Northwest, and is recognized in the universities of America and Europe as the authority upon botany of

that region.

This illustrates the possibilities open to a studious man who is willing to devote himself to a specialty in any section of the country. Even a thousand miles from the centers east or west he can make himself felt from sea to sea, and even across the seas.

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While studying methods, theories, and devices the teacher must not forget that the most valuable of all aids is "common sense." It is the want of this common sense that is making all the trouble in the Chicago schools. Methods, theories, and systems must be used according to circumstances. A teacher visits the Boston schools and witnesses the fire-drill in the schools. She is charmed with the perfection of the drill, goes back to her country school-room and determines to have a fire-drill in her school. How utterly absurd! We don't know of any one who has done this particular thing, but it is not difficult to recall things done in the public schools fully as absurd as this. Does the teacher hear a lecture on clay-modelling? Forthwith she must have some mud in her school—out in the country, perhaps, where the children roam over acres of mud and have been playing with it all their lives. Does she read an article on "Physical Exercise in the Public Schools?" She must take an hour of the already too short session to try to develop the muscle of boys who

plow, rake, pitch hay, milk cows, dig potatoes, from five o'clock in the morning until school time, and again from the close of school until bed-time. Does some "noted educator" who has never taught school go wild on "object lessons?" Then she must not be behind the times. She must have cats and dogs in school to tell the pupils that "This is a dog" and "This is a cat."

Has she been "finished off" at a "State Normal?" Then she knows all about it. She has it all planned out how she will give her pupils the "percept" and the "concept" and the "appercept." When her pupils have undergone the various processes in her hands they will be the finished article. Pshaw! friends! let us throw away some of our theories about apperception, and conception and intuition and the like, and use "common sense." It is this blind application of theories without reference to conditions that frequently arrays public sentiment against genuine progress. Psychological knowledge must not be applied like patent medicine. Every case must be diagnosed before treatment is undertaken.

#### Personals.

As will be seen from the following interesting letter, the public schools of the city of Dawson, Minn., and the town itself, has been captured by some of Valparaiso's wide-awake graduates:

April 10, 1893.

DEAR SIR:

Enclosed please find \$1.25 for THE STUDENT, that bright and ever welcome journal that brings me so much news from dear old College Hill and the many friends now located in nearly every state in the Union.

College Hill, as you will see by this letter, is well represented in Dawson; Marie Larson and Mrs. Reppy, our kindergartner, besides myself, being from College Hill.

The best evidence of our success, perhaps, would be the fact that inside of one year the growth of our schools forced us to put in two additional teachers; besides we have all been re-elected, Mrs. Reppy and I for the third year, Miss Larson for the second.

I will be in Valparaiso this summer for the reunion. Hope all the class of '90 will be there.

Fraternally, E. A. MANLY

Prof. Billmeyer's many friends will be glad to read the following letter from him. We doubt not that he will meet all his old friends in Valparaiso this summer. Valparaiso will be the great summer resort for teachers this year:

MR. EDITOR,

*Valparaiso, Ind.*

Dear Sir:—You will please find enclosed one dollar and twenty-five cents which renews my subscription to THE STUDENT until March '94.

I assure you that no magazine or paper is a more welcome friend than THE STUDENT. I am teaching in the Chillicothe Normal School, as are also Prof. Ames and Prof. Robbins. We each like our positions very much.

We all send greetings of the warmest kind to our many friends who read THE STUDENT, but especially to those of our schoolmates of '89 and '90. We all expect to be at "Valpo" during commencement exercises next August, and hope to see many of our old friends and classmates there.

Yours Truly,

G. M. BILLMEYER.

Prof. J. F. Smith who has been principal of the Roanoke, Ind., schools during the past year, has charge of the laboratory work in the Northern Indiana Normal School.

Prof. H. H. Stroeter closed a successful year's work at Missouri City, Mo., and is now attending school at Valparaiso.

We take the following from the *Neoga News* where Prof. S. S. Frederick, a former student of the N. I. N. S. is principal:

Prof. S. S. Frederick has been principal of Neoga schools for five years, and during his administration the schools have advanced beyond what we ever expected. The course now agrees very well with the ordinary preparatory course and the fact that we have four years for the work makes the work more thorough.

The following letter from Hon. B. Byron Lower, Superintendent of Public Instruction for the state of Idaho, explains itself. Since leaving the Normal in 1886, his rise as an educator has been rapid until now he is at the head of the educational system in his state.

EDITOR STUDENT.

Dear Sir:—Sample copy of THE STUDENT came in due time and I have enjoyed its perusal very much. Herewith I send you \$1.25 as payment for the ensuing year's subscription. Will you kindly send me the February No. I am particularly interested in THE STUDENT, having been a member of the Normal, of which it is the "organ," for two years ending August '86.

Yours very truly,

B. BYRON LOWER.

### The Star.

At the regular meeting for the election of the anniversary program, the following members were chosen: Orators, J. J. McManaman and J. H. Cloud; Recitationists, Anna McDonough and Beth Wood.

Owing to a proposed festival or social and an exchange of nights with The Crescents, the last program of the term was given May 19, in Star Hall.

The election was unanimous. The Recording Secretary cast the ballot for officers as follows: R. L. Moore, Pres.; J. E. Karns, Vice Pres.; Ella McMullen, Rec. Sec.; Sena Swift, Cor. Sec.; G. R. Williams, Treas.; Frank McNulty, 1st Critic; Carrie Ruple, 2nd Critic; J. J. Riggs, 1st Editor; Nellie Jones, 2nd Editor; E. S. Waterbury, Vocal Chorister; Nora Ulery, Instrumental Chorister; H. A. Snyder 1st Marshall; C. L. Greengo, 2nd Marshall; J. D. French, Reporter; R. L. Moore, manager of Printing; J. H. Cloud, E. O. Busenburg, and J. C. McClure, Commissionars.

The many friends of J. P. McKinley, a prominent Star of '85-'86, will be pained to learn of his death, which occurred at his home in Elgin, Fayette Co., Iowa, April 21, 1893. While here he made a host of friends who will ever hold him in pleasant remembrance. For the past five years he was principal of the Elgin public schools. He was one of the leading educational men in his part of the state.

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 100 10  
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 920  
 9916.88  $\frac{2}{3}$

## APRIL EXAMINATION QUESTIONS FOR INDIANA.

### READING.

'Tis not enough the voice be sound and clear,  
 'Tis modulation that must charm the ear.  
 The voice all modes of passion can express,  
 That marks the proper words with proper stress.  
 But none emphatic can that actor call  
 Who lays an equal emphasis on all.  
 Some o'er the tongue the labored measures roll,  
 Slow and deliberate as the parting toll:  
 Point every stop, mark every pause so strong,  
 Their words, like stage procession, stalk along.  
 All affectation but creates disgust,  
 And e'en in speaking we may seem too just.—*Lloyd.*

1. In assigning the quotation above for a reading lesson, what would you tell your class to do? 10
2. State the difference between grammatical and rhetorical pauses. 10
3. What would you do to insure good articulation on the part of your pupils? 15
4. What attention would you give to breathing exercises preparatory to the recitation in reading? Why? 15
5. Tell how you would conduct an exercise in supplementary reading. 15
6. Is the plan of marking emphatic words in the reading lesson beneficial to the pupils? Why? 10
7. Read a selection indicated by the Superintendent. 25

### ANSWERS.

1. They should be required to express in their own language the thoughts contained in the selection.
2. A grammatical pause is one required by the sense of the piece; a rhetorical pause is one not required by the sense but made for better effect, as the pause at the end of each line of poetry, the caesural pause &c.

3. The way to secure good articulation is to drill on the elementary sounds.
4. Breathing exercises are valuable in imparting energy to the class, and securing proper position in the recitation.
5. As an exercise it should be conducted the same as any other reading lesson.
6. It is, in some instances where the thought of the writer would not be clear without it.

### ARITHMETIC.

1. Annexing the figure 7 to the written number 354 is equivalent to what processes or operations performed with the number 354 as a base?
2. Assume the dimensions of the room in which you are to be 22 feet 6 inches long, 18 feet 9 inches wide and 13 feet high; what would be the cost of plastering the ceiling and four sides of the room at 30 cents per square yard?
3. If Smith should sell his farm for \$3,500, 20 per cent. of this money would be gain; would he gain or lose, and what per cent., if he should sell it for \$2,975?
4. A retail bookseller buys books at 20, 10 and 5 off, and sells at list prices. What per cent. profit does he make?
5. Jan. 1, 1885, a person borrowed \$4,835 at 3 per cent., promising to return it as soon as it amounted to \$5,000. On what day did the loan expire?
6. If a locomotive moves  $\frac{5}{8}$  of a mile in  $\frac{1}{4}$  of a minute, how far will it move in  $43\frac{3}{4}$  minutes? Write out full analysis.
7. A square field contains 2,560 acres. Find the cost of fencing it at \$1.12  $\frac{1}{2}$  per rod.
8. Wheat is worth 90 cents per bushel, and a field yields 21 bushels per acre at a cost of \$16.75 per acre for cultivation. If the cost of cultivation be increased 20 per cent., and the yield be thereby

$\frac{175}{45} \times \frac{15}{22} = \frac{175}{12} = 14\frac{7}{12}$

$\frac{15}{22} = \frac{15}{22}$

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$\frac{15}{22} = \frac{15}{22}$

$\frac{175}{12} = 14\frac{7}{12}$

$\frac{15}{22} = \frac{15}{22}$

865  
792  
25

increased 30 per cent., what is the net gain per acre?

ANSWERS.

I.

Annexing 7 to the number 354, we have 3547.

$$3547 = 3540 + 7 = 354 \times 10 + 7.$$

∴ In annexing 7 to the number 354 is equivalent to first multiplying by 10 and then adding 7 to the product.

II.

The room will contain 2 sides, 2 ends and 1 ceiling.

$$1 \text{ side, } 22\frac{1}{2} \text{ ft.} \times 13 \text{ ft.} = 292\frac{1}{2} \text{ sq. ft.}$$

$$2 \text{ " } 22\frac{1}{2} \text{ " } \times 13 \text{ " } = 585 \text{ " "}$$

$$1 \text{ end, } 18\frac{3}{4} \text{ " } \times 13 \text{ " } = 243\frac{3}{4} \text{ " "}$$

$$2 \text{ " } 18\frac{3}{4} \text{ " } \times 13 \text{ " } = 487\frac{1}{2} \text{ " "}$$

$$1 \text{ ceiling, } 22\frac{1}{2} \text{ ft.} \times 18\frac{3}{4} \text{ ft.} = 421\frac{1}{8} \text{ sq. ft.}$$

$$\therefore 2 \text{ sides, } 2 \text{ ends, and } 1 \text{ ceiling} = 1494\frac{3}{8} \text{ sq. ft.}$$

$$1494\frac{3}{8} \text{ sq. ft.} = 1494\frac{3}{8} \times \frac{9}{16} \text{ sq. yds. or}$$

$$166\frac{1}{4} \text{ sq. yds.}$$

$$166\frac{1}{4} \text{ sq. yds. @ } 30 \text{ c.} = \$49.81\frac{1}{4}$$

III.

$$20\% \text{ of } \$3,500 = \$700, \text{ gain on farm.}$$

$$\$3,500 - \$700 = \$2,800, \text{ cost of farm.}$$

$$\$2,975 - \$2,800 = \$175, \text{ what he would}$$

gain by selling @ \$2.975.

\$175 is what % of \$2,800? is the question.

$$\$2,800 = 100\%$$

$$\$1 = \frac{1}{28} \%$$

$$\$175 = \frac{175}{28} \% \text{ or } 6\frac{1}{4} \%$$

IV.

Let 100% = L. P.

Then 20% = 1st discount.

And 100% - 20% = 80% 1st rem.

10% of 80% = 8% 2d disc.

80% - 8% = 72% 2d rem.

5% of 72% = 3.6% 3rd disc.

72% - 3.6% = 68.4% cost.

100% - 68.4% = 32.6% gain.

∴ 32.6% is what % of 68.4%? is the question.

$$68.4\% = 100\%$$

$$1\% = \frac{100}{68.4} \%$$

$$32.6\% = \frac{32.6}{68.4} \times 100\% \text{ or } 47\frac{11}{13} \% \text{ rate of gain.}$$

V.

$$\$5,000 \text{ amt.} - \$4,835 \text{ principal} = \$165 \text{ int.}$$

$$I \quad \$165$$

$$\text{Time in years} = \frac{I}{P \times R} = \frac{\$165}{\$4835 \times .03}$$

$$= 1.137 \text{ yrs.}$$

$$1.137 \text{ yrs} = 1 \text{ yr., } 1 \text{ mo., } 19 \text{ da.}$$

$$1 \text{ yr., } 1 \text{ mo., } 19 \text{ da. after Jan. 1, } 1885 = \text{Feb. 20, } 1886.$$

VI.

$$1. \frac{1}{2} \text{ min.} = 55 \text{ seconds.}$$

$$2. 43\frac{3}{4} \text{ " } = 2625 \text{ "}$$

$$3. 55 \text{ sec.} = \frac{1}{8} \text{ mi.}$$

$$4. 1 \text{ " } = \frac{1}{55} \text{ of } \frac{1}{8} \text{ mi. or } \frac{1}{88} \text{ mi.}$$

$$5. 2625 \text{ sec.} = 2625 \times \frac{1}{88} \text{ mi. or } 29\frac{7}{8} \frac{1}{8} \text{ mi.}$$

VII.

$$1. 1 \text{ acre} = 160 \text{ sq. rds.}$$

$$2. 2560 \text{ acres} = 2560 \times 160 \text{ sq. rds. or } 409600 \text{ sq. rds.}$$

The square of the number of rods in one side will give the number of sq. rds. in the field, and hence the sq. root of the number of sq. rds. in the field will give the number of rds. in one side.

$$3. \sqrt{409600} = 640, \text{ no. of rds. in 1 side.}$$

$$4. 4 \times 640 = 2560, \text{ no. of rds. around the field.}$$

$$5. 2560 \text{ rds. @ } \$1.12\frac{1}{2} = \$2880. \text{ ans.}$$

VIII.

$$1. 21 \text{ bu. @ } 90 \text{ c.} = \$18.90, \text{ yield per acre.}$$

$$2. \text{ The cost of cultivation per acre} = \$16.75.$$

$$3. 20\% \text{ of } \$16.75 = \$3.35, \text{ increase in cost of cultivation.}$$

$$4. \$16.75 + \$3.35 = \$20.10, \text{ whole cost per acre.}$$

$$5. 30\% \text{ of } \$18.90 = \$6.30, \text{ increase in yield.}$$

$$6. \$18.90 + \$6.30 = \$25.20, \text{ whole yield per acre.}$$

$$7. \$25.20 - \$20.10 = \$5.10, \text{ net gain per acre.}$$

$$8. \$6.30 - \$3.35 = \$2.95, \text{ net gain per acre on account of increase in cost of cultivation.}$$

ENGLISH GRAMMAR.

1. The view has been advanced that, to call the attention of pupils to incorrect language forms for correction, is a hindrance to the mastery of correct forms. What is your opinion?

Handwritten calculations:

$$\begin{array}{r} 2500 \\ 25 \\ \hline 1003 \end{array} \quad \begin{array}{r} 6000 \\ 3025 \\ \hline 99508 \end{array} \quad \begin{array}{r} 2020 \\ 252 \\ \hline 2272 \end{array}$$

2. Name the properties of the noun, and tell what each denotes and state how this is shown.

3. Give an example of each use of the compound personal pronoun.

4. In what sense may verbs be said to have person and number?

5. Make clear the difference in meaning between these two sentences:

(a) If he were here, we should return at once.

(b) If he was here, nobody saw him.

6. Write a discourse of from one to two hundred words on any of the following subjects: Voluntary attention; how to teach language in the primary grades; the value of historical study; the excellences and the defects of Indiana's school system; recent tendencies in education.

7. What do you regard as the principal defects in teaching grammar?

8. Why are certain forms called the principal parts of a verb? Give the principal parts of the following: Begin, know, sting, shine.

#### ANSWERS.

1. We do not think this view is correct. There are so many incorrect expressions used in common parlance that imitation can not be relied upon to learn the correct form. If to express a certain idea the child hears the incorrect form used twice by his associates outside the school where he hears the correct form used once by his teacher he will certainly acquire the incorrect form.

2. Nouns have gender, person, number and case. Gender is that property of nouns which shows the distinction in regard to sex. The gender of nouns is shown in three ways: by different words, as boy, girl; by different terminations, as actor, actress; by prefixes and suffixes, as landlord, landlady. Person is that modification that distinguishes the person speaking, the person spoken to, and the person spoken of. Number is that property that distinguishes one from more than one. It is shown by the ending and by the form of the word. Case is that property of a noun that

shows its relation to other words. It is shown by the form and use of the word, mostly by the use.

3. Apposition. — He himself was there: I saw the man himself.

Object of verb. — He pierced himself in the breast.

Subject of verb. — Myself am Naples.

Object of preposition. — He cares for none but himself.

4. They have person and number simply in the sense that they are inflected to agree with their subjects in person and number.

5. In the first the condition assumed is contrary to the fact; while in the second it is assumed as a fact.

#### 6. RECENT TENDENCIES IN EDUCATION.

The most striking feature of modern education is its tendency toward the practical. There is a wide-spread feeling at the present time that education shall not merely polish a person so that he may shine in society, but shall fit him to be of some use in the great industrial machinery of the country. What the country needs is wealth producers, not wealth consumers. This idea has, in a few years, completely revolutionized the theory of teaching in the public schools as well as the courses of study in higher institutions.

7. The principal mistakes made in teaching grammar are: teaching technical grammar too early in the course, and teaching too much by definition without giving practice upon the principles learned.

8. (a) Because they are the parts by the aid of which the whole verb can be conjugated.

(b) Begin, began, begun.  
Know, knew, known.  
Sting, stung, stung.  
Shine, shone, shone.

#### PHYSIOLOGY.

(Seven out of ten.)

1. Define protoplasm.

2. Describe in detail any unicellular animal you have seen.

3. Of what use is the skeleton, and where is it located?
4. Describe cartilage; where is it found?
5. What is fatigue? How is it caused?
6. How does the capacity of the capillary blood-vessels compare with that of the remainder of the circulatory system?
7. Make a sketch of the plan of a gland.
8. Describe the stomach, and explain the functions of the different parts.
9. Describe the vocal apparatus.
10. How are sensations of smell produced?

## ANSWERS.

1. A semi fluid or jelly-like organic matter composed of proteids.
2. A bell-anamalcule has a small stalk attaching it to its place, a bell shaped body with a mouth opening on the margin surrounded by motile cilia. It has a nucleus and a pulsating vacuole. Its protoplasm is granular.
3. Locomotive levers, frame work and protection. It is located internal to the soft parts.
4. It is a tissue in which the intercellular substance is homogeneous and elastic or fibrous. It is found at the extremities of bones and in the articulations.
5. That condition of the muscles in which the contractility has become wholly or partly exhausted or in nerves the irritability. It is caused by too prolonged or excessive stimulus.
6. The aggregate diameter of the capillaries is about 800 times greater than that of the aorta.
7. ———
8. The stomach is a pear shaped enlargement of the alimentary tract. It has three coats, an internal mucous, middle muscular, and external serous. In the inner coat are mucous glands for the secretion of the gastric juice, the muscular coat produces a peristaltic motion and the external coat is smooth

and moist allowing movement without friction.

9. It consists of two "vocal ligaments" stretched from before backwards in the Larynx, a cartilaginous box composed of membrane and two cartilages. It is located at the upper part of the trachea.

10. By a vapor or gas or finely divided particles of a substance coming into contact with the nerve endings of the olfactory nerve in the nasal passages and thereby acting as a stimulus.

## GEOGRAPHY.

1. If you wanted to teach your pupils in geography by means of characteristic pictures, what would you show for Pittsburg? New Orleans? Illinois? Italy? Transvaal?
2. Name the States which border on the Great Lakes, and locate their Capitals.
3. How would you proceed to teach the size of New York City?
4. Name a list of physical conditions in a country which would insure it to be owned by an intelligent, hardy, and progressive people.
5. What could be done for a class of pupils with a piece of anthracite coal in the hands of the teacher?
6. Bound Austria, and give its form of government and some account of the character of the people.
7. Draw an outline map of California.
8. What use would you make of geography while teaching the subject of history?

## ANSWERS.

1. (a) Iron manufactures. (b) Cotton and sugar industries. (c) Corn and stock raising. (d) Cities, commerce, silk and grape industries. (e) Farming and stock raising.
2. N. Y., Albany, on the Hudson; Penn., Harrisburg, on the Susquehanna; Ohio, Columbus, on the Scioto; Ind., Indianapolis, on the White river; Wis.,



Madison, Southern; Minn., St. Paul, Southeastern.

3. By teaching its area as compared with a known area and its population as compared with some city known to the pupils.

4. A country with a temperate climate and a fertile soil.

5. Not very much. The object is too isolated.

6. N., Germany and Russia; E., Romania; S., Servia, Turkey, Adriatic Sea, Italy; W., Switzerland and Germany. It is a limited monarchy. There are many nationalities represented and the Catholic religion prevails.

7. ———

8. Carefully locate on the map all places mentioned in the History.

### U. S. HISTORY.

1. Write a sketch of the administration of Benjamin Harrison.

2. Give an account of the growth of the modes of communication since the Revolution.

3. In whose administration were the Alien and Sedition laws passed? State their purpose, and how they were received by the people.

4. Give an account of the battle of Gettysburg, stating the special reasons why it was fought, and the special advantage which followed from this battle.

5. Give an account of the impeachment of Andrew Johnson, stating the reason for the impeachment and the result of the trial. What body tries impeachments?

#### ANSWERS.

1. Benjamin Harrison's administration extended from March 4, 1889 to March 4, 1893. This administration was characterized by peace and great prosperity among the people. Many important events happened during this period, chief among which may be mentioned the Centennial Celebration in New York in commemoration of the

one-hundredth anniversary of the inauguration of Washington as first President of the United States; the trouble with the Samoan Islands; the Johnstown Flood; Opening of the Sioux Reservation; the meeting of the Pan American Congress; the admission of several new states; the organization of Oklahoma Territory; the passage of the McKinley Bill; etc.

2. In the Revolutionary time communication was by letter carried on horse back. After the invention of the locomotive this afforded more rapid means of conveyance. In 1844, the invention of the magnetic telegraph secured still more rapid means of communication. Telegraph lines are now built to all parts of the country. In 1866 the laying of the Atlantic Cable brought the Old World and the New World into communication. Since that time ocean cables have been laid which bring all parts of the civilized world into direct communication. Following the telegraph came the telephone, which enables people, though far apart, to converse as if in the same house.

3. They were passed during John Adams' administration. Their purpose was to prevent aliens from plotting against the U. S. government, and to protect the government from libel by newspapers. These laws were very distasteful to the people and were soon repealed.

4. The battle of Gettysburg was fought July 1, 2, and 3. Gen. Lee commanded the Confederate forces and Gen. Meade the Union forces. It was fought to prevent the invasion of the North. The effect of it was the abandonment of the idea of Northern invasion.

5. On March 3rd 1868 the House of Representatives adopted articles of impeachment against President Johnson. The case was tried by the Senate over which Chief Justice Chase presided. The immediate charge against the President was the violation of the Tenure of Office Act in the removal of Edwin M. Stanton from the office of Secretary of War. The trial began on the 23d of March and lasted until the

26th of May. The President was acquitted.

Impeachments are tried by the U. S. Senate.

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### SCIENCE OF EDUCATION.

(Applicant to discuss three out of four.)

1. Upon which of these three conditions of permanent remembrance would you rely most in teaching, and why: intense interest on the moment of learning, association of the thing learned with knowledge already understood, or frequent repetitions?

2. Which do you consider of most benefit to a child, the changes wrought in his capacities through study, or the information gained through study? Show how your belief in this particular will affect your methods and practices in teaching.

3. In the proper use of globes, maps and pictures in the teaching of Geography, what powers of the child are chiefly exercised? Specify the particular use of each power or faculty in such teaching.

4. Sustain or overthrow the following proposition by a course of argument: In Arithmetic teach processes before reasons.

### ANSWERS.

1. The first should be relied upon most because it calls for self activity on the part of the child and on that account produces a healthier development.

2. The change wrought in his capacities through study are the most valuable. The teacher's method, therefore, should not be one of pouring knowledge into him but it should be a method that will lead him out—one that shall cause him to exercise his faculties voluntarily. It is only by exercise that his mind can be strengthened.

3. Two faculties of the mind are chiefly exercised in the use of maps and globes, memory and imagination. The memory is exercised in reproducing the impression obtained from the map, while the imagination is exercised by constructing in the mind the real thing which the mark on the map represents.

4. This must depend entirely on the age of the pupil. With mature students the reasoning should generally precede because the reflective powers are stronger and are depended on more than the memory. But with young pupils beginning arithmetic, very little but processes can be taught, since the child depends entirely on memory.

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PUBLISHER'S PAGE.

**THE STUDENT.**

HOWARD TEMPLETON, EDITOR.

M. E. BOGARTE,  
J. B. F. SHOWALTER, } ASSOCIATE EDITORS.  
H. N. CARVER, }

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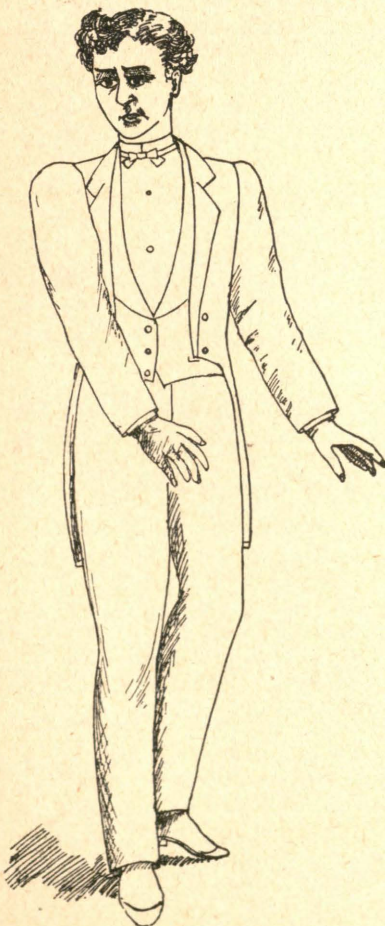
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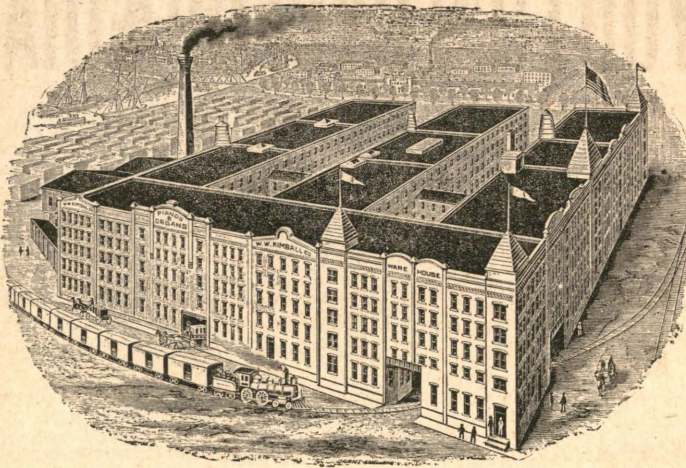


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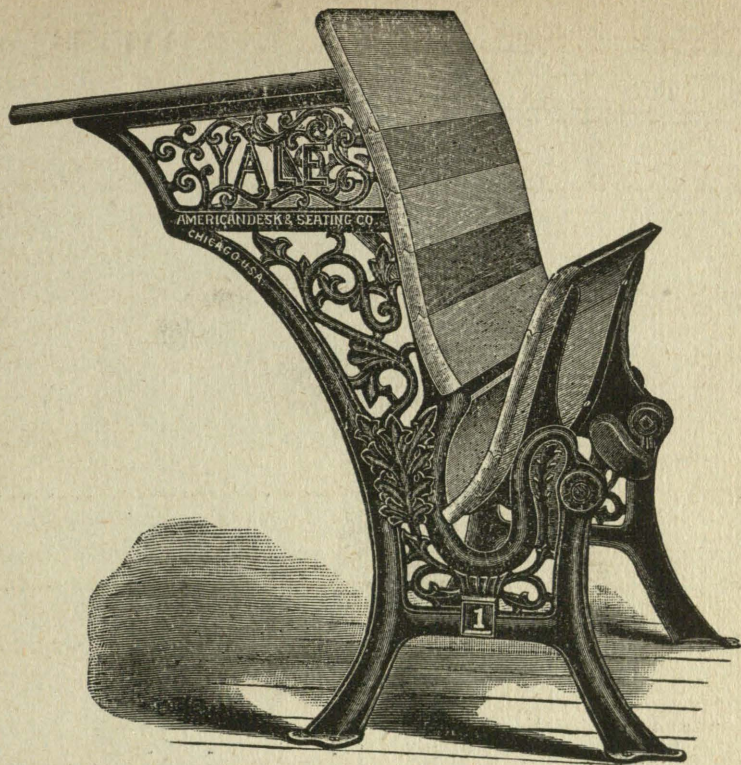
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