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THE STUDENT.

VOL. I. JANUARY, 1891. No. 1.

MIND AND MUSCLE.

J. H. KELLOGG, M. D.

"A SOUND mind in a sound body," was the trite maxim of the ancient Greeks, which they wrote over the doors of their temples and exemplified in their habits of daily life. Aristotle, the tutor of Alexander the Great, knew well that the luxuries of the court were not conducive to the development of a sound body, and hence withdrew his pupil to a place of retirement where he could be trained in simple habits, that both body and mind might attain a symmetrical and vigorous development. Physical culture was considered by the ancient Greeks, and by the earlier Romans as well, one of the most important of all the elements of an education, and a duty which a man owed to the state as well as to himself. Not infrequently, men were chosen to fill the highest positions of authority and influence, when the chief qualification which they possessed was unusual physical proportions and bodily strength. A Roman emperor, while on one of his expeditions, discovered a gigantic barbarian, whom he made one of his generals, and who afterward became himself ruler of the empire.

It was natural that the ancients should esteem physical strength so highly, as in warfare the failure or success of an army depended upon the ability and endurance of its soldiers in personal combat. The invention of the fire-arms and artillery of modern times has entirely changed the mode of warfare, so that at the present time the size of a commander's guns and the length of his purse is of even greater consequence than the number of his soldiers.

So, also, the application of machinery to agriculture, and to almost all arts, has greatly diminished the necessity for physical exercise in nearly every branch of human industry, and to such a degree that there is comparatively little demand for mere brute force, and physical development has come to be considered a matter of little consequence. The decline of physical culture has undoubtedly had much to do with the loss of that symmetry of form which obtained its perfection among the ancient Greeks, as shown in the Apollo, the Venus of Milo, and other specimens of ancient Greek art.

The modern sculptor who wishes to produce even an approximation to the standard of excellence presented in the ancient models, finds himself quite unable to secure a living model suitable for his purpose, but must make a composite figure by combining the parts of a large number of different subjects, copying a leg of one, an arm of another, a neck of another, etc.

This degenerative process is rapidly

developing a race of deformed and decrepit human beings, who are so different from their ancestors of two or three thousand years ago that they might almost pass for a different species. Each generation seems a little weaker, physically, than the one that preceded it; and the puny, pale-faced boys of to-day, with lank, feeble bodies, active but unbalanced brains, irritable nerves, and precocious propensities, make a poor outlook for the generation to come.

Frazer, the champion long jumper of the world, is able to jump twenty-three feet. Washington jumped twenty-four feet. The champion base ball thrower sends a ball a distance of four hundred feet. Washington threw a silver dollar six hundred feet. When Chief Justice Coleridge asked an American senator how he did it, the senator replied, "A dollar went further in those days than now." It may be considered that strong muscles are less essential to success in these modern days than in the times of ancient Greece and Rome, or even than a century ago; nevertheless, it is still as true as ever that the man of physical strength and soundness is the one who, other conditions being equal, wins the prize in almost every department of human life. Notwithstanding the many apparent exceptions to this rule, such well-known examples as those of the English premier, Gladstone, M. Thiers, Victor Hugo, William Cullen Bryant, and others equally notable whom we might name, are sufficient to establish the principle.

Physical development is only to be obtained as the result of exercise. Throughout the whole animal world, exercise seems to be essential to growth and development. It is a universal rule in nature that an organ which is not used, gradually wastes away until it becomes useless, and sometimes disappears altogether: while an organ that is used, develops in proportion to the amount of work required of it. Even the storm-beaten oak gains firmness and strength and increased vigor by the shakings it receives from the tempests and tornadoes which howl through its branches. Each time its massive trunk is swayed, its rootlets strike deeper down into the earth, thus not only securing a firmer hold, but providing an increased number of mouthlets through which nutrition may be received from the soil.

The blacksmith with his right arm swings a heavy hammer, while with his left he holds with a pair of tongs the heated iron, which he beats upon the anvil. In the course of a day, many thousands of vigorous blows are struck. This enormous amount of work performed by the right arm causes its muscles to grow much larger than those of the left, which are little if at all larger than those of men engaged in ordinary occupations.

Notice, on the other hand, the effect of inaction upon the arm of the Hindoo devotee, which he supports in a horizontal position, and consecrates to his deity, keeping it absolutely motionless for years. In consequence of this inaction, it gradually shrivels up until it becomes a mere stick, simply bone covered with skin, the muscles having entirely wasted.

A brief consideration of some of the benefits to be derived from such exercises as will secure a good and symmetrical muscular development will be of interest to those who are anxious to pre-

pare themselves for the greatest usefulness.

1. A good set of muscles is one of the most excellent qualifications a young man can possess. There is no position in life for which they unfit him, and there is none which they will not enable him to fill to better advantage than he otherwise could do. There are a thousand and one emergencies in life in which strong, vigorous and well-trained muscles are of enormous service and in which they may be of incalculable value.

The famous Doctor Winship, by persistent, systematic exercise, succeeded in developing his muscles to such a degree that he became able to lift by the aid of shoulder straps, fully three thousand pounds—a load which the strongest cart horse could hardly stand up under. In his youth, Dr. Winship was so inferior in physical development that, when a student at school, he was obliged to bear patiently most provoking insults from his school-mates because unable to make a good physical defence. He himself said that it was this fact which gave him the impulse to undertake the course of physical culture which resulted in his extraordinary development.

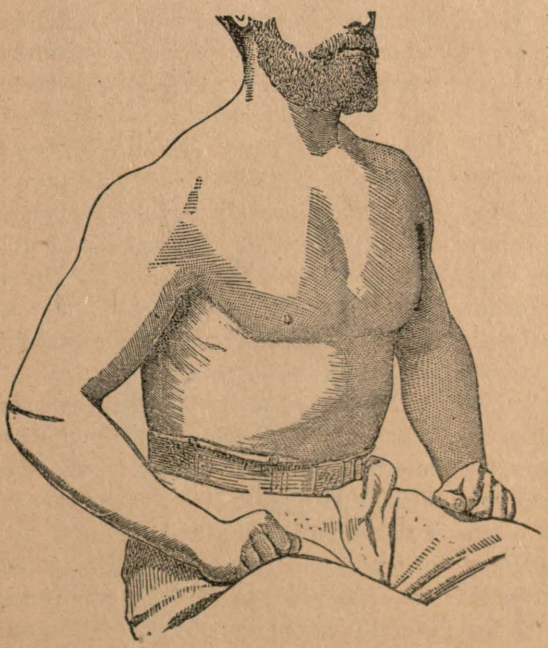

Fig. 1.

Exercise not only develops physical strength, but gives dexterity of hand, suppleness of limb, and grace of movement. The man who walks with a shuffling, swaying, awkward gait, does so, not on account of any original defect in his physical make-up, but through the weakness of certain muscles, which by disuse, have become unable to do their part in the act of walking, and so render him unable to perform it in an easy and graceful manner. The trained gymnast exhibits a lightness and elasticity of movement impossible to an individual who has not had the benefit of physical training.

A comparison of Figs. 1 and 2 will give a correct idea of the difference between a well developed and a poorly developed man. In one case, the muscles are large, firm and capable of efficient work, the chest is well developed and prominent. In the other case, the chest is flat, the muscles soft and flabby, and there is evident want of vigor and vitality.

2. Lack of attention to physical training results in various bodily weaknesses and deformities, such as round shoulders, flat and narrow chests, straight backs, projecting chins, and a weak or

awkward expression of the figure. Contrast the outlines shown in Figs. 3 and 4. I have for many years given much attention to the subject of physical culture and the study of the human figure in health and disease. I have made extensive studies among the people of various nationalities, particularly among the

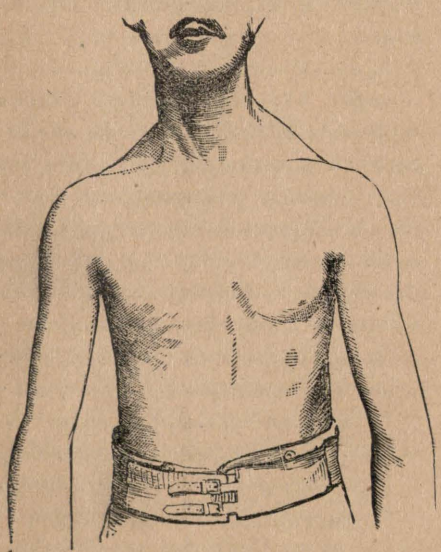

Fig. 2.

Chinese, Italian, German, French and English peasantry, and the various tribes of North American Indians. I have found that among people with whom physical development has been encouraged by active exercise practiced from earliest childhood, and whose muscles have been free to act untrammeled by any unnatural restrictions of the clothing, good figures are very prevalent, while weak, awkward figures are very seldom found. Fig. 3 is an exact representation of the side outline of a German peasant woman between twenty-five and thirty years of age, who had been accustomed for many years to carry heavy weights upon her head, often walking a distance of two or three miles, and carrying upon her head, the entire distance, without resting, a weight of ninety pounds. The result of such vigorous exercise was the development of a fine physique, and a natural poise. Fig. 4 correctly represents the outline of a civilized woman who by corset wearing and tight lacing and the neglect of physical training had distorted the natural curves of the body, producing a weak and awkward expression of the figure. Such a bodily outline is inconsistent with good health, and there is always connected with it serious displacement of the stomach, bowels, and other important internal organs.

For a teacher, a good physical bearing, a dignified and healthful poise of body, is a matter of no small consequence. The expression of the figure is fully as emphatic and impressive as the expression of the face. A teacher whose figure expresses weakness and uncertainty cannot exercise that control over his pupils which can be exercised by a teacher whose bearing is strong, noble and dignified. The difference in the expression of Figs. 3 and 4 is almost wholly due to the difference in bodily poise. Young women in particular, who are preparing themselves for the profession of teaching, should give this matter serious attention.

Correct poise is a matter of habit rather than inheritance. Not many months ago, a lady called at my office with her daughter. The young woman, a tall, slender girl of twenty, had a rather pretty face, but a most awkward figure. The poise of the body was almost exactly that shown in Fig. 4. The mother wished to consult me respecting the treatment which must be administered.

I remarked upon the importance of maintaining a correct poise of the body. The mother said, "Doctor, I am sorry for my poor daughter, but she cannot help it. If you will notice, her form is exactly like mine, she has inherited it." Begging pardon, I replied, "Madam, you mistake. Your daughter has a poor figure simply because she has never learned to stand or sit correctly. I will convince you of this in one moment." Asking the young woman to stand upon her feet, I directed her how to use her muscles in such a way as to hold the body in a correct poise. In less than two minutes, she was standing with the poise shown in Fig. 3, erect, dignified, and with such a magnificent expression of face and figure that her mother exclaimed with delight, "I never knew my daughter was so fine a looking woman."

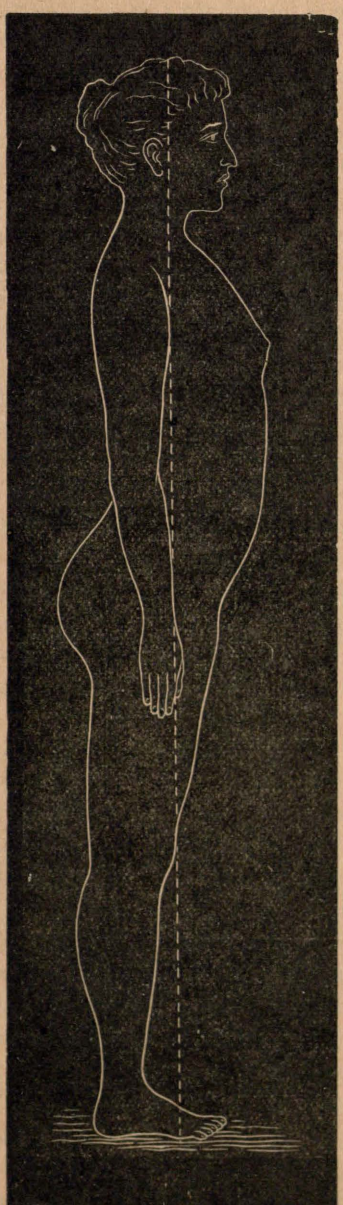

Fig. 3.

For the benefit of those who are especially interested in the development of a good figure, I have prepared for my journal, Good Health, for 1891, a series of articles giving definite instruction respecting the exercises which must be taken for the development of those muscles necessary to be used in holding the body in a correct poise. Any one interested in this matter should address Good Health Pub. Co., Battle Creek, Mich., for a copy of the journal which is furnished at $1,00 per year.

3. Exercise influences favorably every organ of the body. The lungs by their increased activity introduce into the blood and veins of the whole system a larger quantity of oxygen, the great purifier which vivifies the blood, vitalizes the tissues, and cleanses every nook and corner of the vital domain. Every activity is quickened. The whole system is infused with a higher grade of vitality. The bodily machinery runs at a higher speed and with greater effectiveness for work. The brain freer from the products of waste, and supplied with

more highly vitalized blood is able to do better thinking. The liver having a

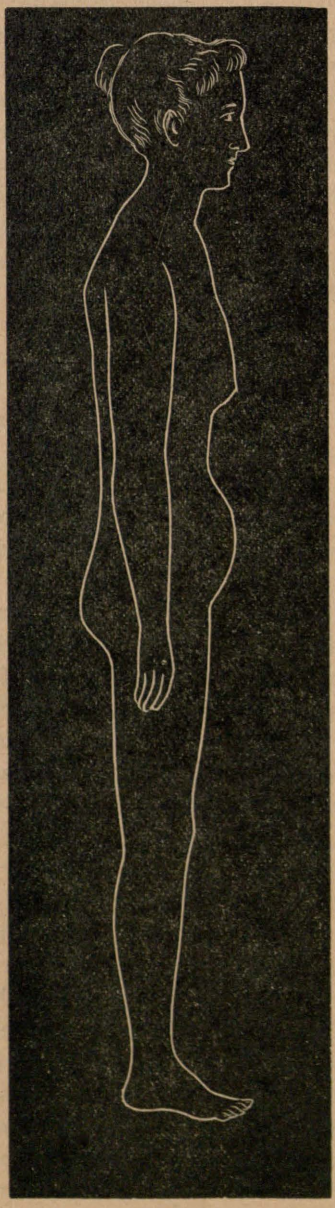

Fig. 4.

larger amount of oxygen and a better blood supply, can do more bile-making. The stomach, having its activities quickened by a larger and richer blood supply, secretes a better quality of gastric juice, and more of it, and hence is able to digest a larger quantity of food and to more perfectly elaborate it, and prepare it for entrance into the blood. The demand for a larger quantity of food creates a better appetite and a keener relish for food.

Thus every part of the body seems to take on new life and activity, and to a person who has previously been in a state of inaction, with his system torpid and clogged by the products of wastes which have not been properly eliminated, the change is almost equivalent to a new birth. After having once tasted of the delights of living on a higher plane, with all his sensibilities quickened, and his ability for enjoyment and appreciation of the pleasures and blessings of life so greatly increased, one can hardly be induced at any price to return to the old sluggish and innate existence.

4. Lastly, the reader's attention is invited to the influence of exercise upon the brain and nerves, which receive perhaps the largest share of benefit from symmetrical physical training. When a muscle contracts, it is in obedience to the impulses originated in the brain, sent to the muscles along a nerve trunk. Hence muscular exercise also implies exercise of the brain and nerves. Hence, muscular exercise, instead of detracting from mental development, as might be supposed, actually encourages the development of the brain and increases its capacity for action. This is undoubtedly the reason why muscular exercise has so marked an effect in steadying the nerves, giving to one self-command, mental equipoise and readiness. Noth-

ing so well prepares one for readiness of action as thorough training of the muscles.

The derivative of muscular exercise renders it one of the most efficient means of counteracting the effect of laborious mental occupations, and such employments as are likely to cause an excessive flow of blood to the brain. When the muscles are active, they are capable of containing a much larger proportion of blood than when idle, and thus drain it away from the brain and nerve centers, which, through excessive and prolonged activity, may have become congested and surcharged with blood. On this account, regular, systematic exercise is of the greatest value to students and professional men. Thousands of men break down before completing their education, or just after graduation ; and thousands of clergymen, lawyers, professors and other brain-workers make disastrous failures in consequence of the onset of some nervous disorder, which might have been entirely prevented if the brain had been cooled and rested by regular systematic exercise.

Another of the valuable benefits to be derived from muscular exercise is to be found in its effects upon those portions of the nervous system which control the purely animal functions. An individual whose brain is irritated and excited by too much blood, the result of excessive brain work or worry is vastly more likely to become a prey to the torments of propensities or passion clamoring for gratification, than he who by active muscular exercise, relieves the brain of blood, thereby producing that gentle fatigue which is so conducive to rest and calmness of mind and body and soundness of sleep.

I shall perhaps have opportunity in another paper to give some definite suggestions respecting the best forms of exercises for students and teachers, and some suggestions respecting the best methods for obtaining the greatest degree of benefit in the shortest time.

PSYCHOLOGY AND TEACHING.

PROF. H. N. CARVER.

PSYCHOLOGY is the fashionable word in educational circles. An institute without a course of lectures upon the subject, would be only a feast without wine. Now, there is no nobler science than Psychology, nothing more worthy of study than its subject-matter; but it is doubtful whether very much real good comes from what is done, or can be done, with the science in institutes or so-called training-schools.

Probably a majority of those who obtain their knowledge of the science from institute-lecturers, or reading-circle text books, or manuals on pedagogy, get little more than an impression, that somehow or other, if they could only find out how, the science should furnish them with a set of recipes for their work, in much the same way that a cook-book tells the cook how to make soups and gravies. Many a young teacher, and old one, too, for that matter, goes into the school-room with his scratch-book outlines and definitions, and imagines that his teaching must be good, because it is psychological; and never learns that his work is bad, because the fruitage is so long ripening, and because he would not know good fruit from bad, did he see it. Sadder still is it, that many a young teacher, of good judgment and thorough goodness of purpose, after hearing a course of such lectures, carries away nothing but a vague feeling that there is something which she ought to have, but does not have; and she does bad work at the examination and in the class-room, simply because she is honest and stands in awe of a pedagogic examiner or superintendent, who has neither her ability nor honesty.

Education is an art, not a science, and the teacher is an artisan. His materials are the bodies and souls of his children, and the products of his workmanship must be the best men and women which the materials and circumstances will permit. Undoubtedly the teacher must know his materials and know them thoroughly. But there are two kinds of knowledges, the one made up of outlines and definitions, precise, pedantic, and of avail chiefly for purposes of examination; and the other, an artistic knowledge, in no wise inconsistent with the first, but rather supplementing it, above it, the knowledge which every great artist and inventor has used in making those discoveries that keep society and civilization living and progressive. The first is expressed in rules and formulas, and is of value, mainly, in preserving what has once been learned. It enables the workman to duplicate his work rapidly; it teaches no new truth. A machine can be made by rule; a work of art cannot, much less can a living, rational being, the very law of whose being is that it shall vary from any other, or not reach the end of its own being.

Any one acquainted with the history of the sciences, knows how difficult is their classification, and how the masters in the oldest and most perfect are not

agreed as to the import of the terms used in them. It must be evident, how much more difficult is the attainment of a clear and distinct conspectus of one of the most complex of the sciences, especially when psychological truths must be blended with sociological truths, as they must be, if they are to be of any service to the teacher. And it is just this thing, this clear and distinct comprehension of his subject, that distinguishes the artist's knowledge from the mere pedant's. As Prof. Joyce says, he knows his subject so thoroughly that he can afford to forget his outlines and analyses.

There are three elements that go to make up the good teacher : good natural ability, a good knowledge of the subject to be taught, and a real love for the children. The first and the last are of vastly the most importance. The first need be only an average, so much of good judgment and good feeling as will make the teacher a good member of the average social community. The last is indispensable,—it must be real, the love that Jesus had, not the love of Barnum or Crassus. Of course, experience will widen and deepen all these, and nothing but experience will do it. The limitless fields of knowledge will open to any one who has the ability to enter them, and wishes to enter them, and loves his children deeply enough to wish to have them enter with him. No training-school can do anything to help the teacher in these matters. The world's great teachers have never been through a training-school other than this one; and any young teacher thus equipped will do good work and have a good method. He may not have an examination-knowledge of Psychology; but he will have the only knowledge that he can use, because obtained in the real experiences of life and the class-room in which he received his own academic training, the only real class-room for learning methods of any kind.

It is not denied that some theoretical knowledge of Psychology will be helpful to the teacher. Indeed, so far as it can be helpful at all, the wider, and deeper the knowledge, the better will be its results.

A lawyer or physician would undoubtedly be a better professional man, if he had a good knowledge of geometry and philology. What is objected to, is the tendency of this craze for psychological teaching to make us a body of pedagogues rather than teachers, and to substitute a formalism moribund from its birth, for a system plastic as life is plastic. It is hard to see what help the young teacher can get from the ill-digested stuff he finds in the manuals, and still harder to believe there is much more than learned trifling in this talk that we hear of observation, and experiment, and inductive methods, carried on with the purpose of finding some formula by which a child may be taught arithmetic or geography.

"Quid dignum tanto feret hic promissor hiatu?" One finds it difficult to believe that the country suffered any loss, because the mother and step-mother of Abraham Lincoln were ignorant of psychological methods. What, then, shall the young teacher do in the matter? Give no attention to the subject? By no means, if he has the opportunity, and does not need to spend his leisure upon something of more consequence. But let him keep the science in its own proper place, and not try to get from it what it cannot possibly give him. Es-

pecially, let him use care in applying any conclusions drawn from the discussions of the manuals, unless their soundness is established by his own previous experience. Let him not be disheartened by any dicta of the walking-delegate; the future will probably show that the delegate was only "Chimaera bombinans in vacuo."

The advantages to be obtained from the study are chiefly indirect, at least, indirect for the young teacher. As means for mental development, no other science can furnish topics that excel its own. But a difficulty arises at this point. Psychology has, fortunately, been largely separated from metaphysics, yet the separation is not complete, and probably will never be so. Almost every writer whose books are available for the plain teacher, Hamilton, Spencer, McCosh, Porter, even Dr. Harris, our Commissioner of Education, has some metaphysical conceptions, or some attitudes toward metaphysical conceptions, which color all his views of psychology, and make a good knowledge of the history of philosophy indispensable to a clear understanding of the writer. With some of the second-class writers, this coloring of their views becomes positively vicious; with others, the effort to avoid it gives merely colorless thought, form without life. But in spite of these difficulties, no one can follow the thoughts of such a mind as Hamilton's, or Herbert Spencer's, without having all his mental habitudes strengthened and uplifted by simple contact with a mind so vast, and fair, and manly as the writer's. In this uplifting of himself, the teacher's work with his pupils will share, and the advantages will be infinitely higher than they would be, were he to go on cudgeling his poor brains for some catechismal justification of his practice. The teacher need have no fear, that any vital acquaintance with such a master as Hamilton or Spencer will make any vital acquaintance with his children impossible. Let him remember that Michael Faraday, one of the greatest of teachers and noblest of men, taught science to the urchins of London, and used to say, that he never found a child too young to understand *him*.

And let the young teacher, who honestly tries to do what is indicated before and nothing beyond it, "take no thought for the morrow," harrassing himself lest something has been left undone or done wrongly. Such a possibility attaches to all human work, the highest and the best. The truth and the consolation have been beautifully expressed by the wise and genial old Autocrat:

> "My duty lies before me! Lo,
> The lever there! Take hold and blow!
> And He whose hand is on the keys
> Will play the tune as He shall please."

Should these articles be continued in future numbers of THE STUDENT, an attempt will be made to help the young teacher not only in the manner pointed out, but also, possibly, in his work in the examination-room.

READING. I.

MANTIE E. BALDWIN.

IN TEACHING READING to beginners, such a method should be chosen as will be *speedy, simple* and *accurate.*

No one method thus far presented seems satisfactory in all respects. A combination of several methods has been found to be productive of the best results.

The plan here given is the result of years of experience in teaching and has been successfully used by hundreds of teachers in various parts of the United States. It must not be understood as entire, or complete; but merely suggestive, the wide-awake teacher being expected to take it and develop it in the way best suited to the wants of his, or her particular class or school.

I. OBJECT.
II. WORD.
III. PHONIC SPELLING.
IV. SENTENCE.
V. ORTHOGRAPHIC SPELLING.

This is the order in which the subject is presented to the young learner. Much depends upon a wise selection of the word to be taught. There are five things to guide in its selection.

1. *It should, if possible, be the name of something that has life;* because children are more easily induced to notice animate than inanimate things.

2. *It should be the name of some animal in which they are interested.*

3. *It should be the name of some animal with which they are familiar.*

4. *It should be a name that is easily written.*

5. *It should be a word in which no two of the letters are similar, either in appearance or sound.*

For these reasons the word *cat* is probably the best suited for the purpose. If it is at all possible, have a cat in the school room. This should be a full-grown cat, and one that is accustomed to being handled, so that it may not become unmanageable and throw the school into confusion.

The teacher should have in view the accomplishment of some definite thing in each lesson. In this first one, the intention is to call the children's attention to the name of the animal, and to have them observe the word with sufficient care to enable them to write it. Everything depends upon the teacher's success in presenting this first lesson.

It will be better for the teacher to sit down and have the children group themselves about her, as in this way, she can more easily draw their attention and interest them in what she has to teach.

Holding the cat in her lap and stroking it gently, she might begin the work in this manner: "What is this I have in my lap?" Some of the little girls will answer, "It is a kitty," while the more sturdy boys will answer, "It is a cat." The teacher will respond, "Yes it is a cat." Then might follow a five minutes' talk upon cats, their habits, nature, &c, the teacher saying little and the children much, this being done to set them at ease and stimulate them to desire to know what the teacher has to tell them.

When they have become sufficiently interested, they may be shown, in the reader, or on the chart, or elsewhere, a picture of a cat. They should be asked if they think it is the picture of this cat, and such other questions as will arouse greater interest in the subject.

Then the teacher should go to the blackboard and write, not print, the word cat, with the letters large, round and distinct, but not joined ; thus, *cat.*

The children should be asked if any of them know what that word is. If none do, they may be told it is cat also. "Now we have three cats. Are they all alike?" They will answer "No." They should be asked to tell the difference. Some of them will say, "This is the real cat, that is the picture of a cat, and that on the board is the cat's name."

This being what the teacher desires them to say, the cat having fulfilled its mission educationally, is put out of doors. The children are called upon to observe how the name is written, the teacher again writing it slowly upon the board. It is now necessary to have them try to write the word upon their slates. If there is time, this may be done while they are still there with the teacher; if not, they may be sent to their seats and told to try to write the word as many times as they can on one side of their slates, and to draw a picture of a cat upon the other. This will probably keep them employed twenty or twenty-five minutes. At the expiration of that time, it would be well for the teacher to go to them and examine the work done.

This is a critical point in the work. The children, unused to study or anything of this nature, have become nervous and perhaps a little discouraged, and are anxious to have the teacher's approval. The teacher should, therefore, have herself under perfect control, and not show any signs of disapproval or of disappointment, if the work is not as well done as she had hoped it would be.

Some of the little ones may have been previously taught how to write and may be able to imitate, with considerable accuracy, the word upon the board; others may think they have made a good representation of it, though they have not; while others know that theirs is not right and feel that they cannot make it, and so are ready to give up everything.

The teacher should be honest and truthful in all things and at all times. But at this juncture, a word of praise, if it can be truly given, will work wonders.

The teacher ought to enter heartily into sympathy with them, and say whatever good of their work she can. To those who have done the best she may simply say, "This is well done." To the ones who have done the poorest, "You tried hard, didn't you? You will succeed by and by." This last should be said, not pityingly, but hopefully. The picture each has tried to make should also be examined and the effort praised, even though the picture itself may bear little resemblance to a cat.

The pupils should be again required to write the word as often as possible on one side of the slate, and to make another picture on the other side. This will keep them busy for perhaps twenty-five minutes longer.

At the expiration of this time, they should be called upon in class form, and stand in line, but not toe a mark. Their work should be carefully inspected, but it will not be necessary for the teacher to make any comments this time.

The inexperienced teacher may be a little disappointed in this second trial. It may not show any improvement over that done the first time, and it may be even worse than the first. Unaccustomed to protracted effort, the children, being especially desirous of pleasing the teacher, have tried too hard, and being excited and nervous as well as tired, have not done so well.

When the children are called up to recite, there should be upon the board a number of words written in the same manner as the word *cat* was written. These should be words that are to be learned in the course of the next few days. There should be in this list no two words similar in appearance or sound, and no words containing silent letters, like *g* or *l* in *egg* or *ball*. The words ought to be repeated several times, and the word *cat* be used most frequently, thus:—

cat is my it
runs cat it is
my is runs cat
it cat my runs

etc. etc.

Each child should be asked to find the word *cat* on the board. When he has done so, it may be crossed off.

Unless the class is too large, it is well to have the word written as many times as there are pupils, so that each may have a *cat* that he calls his.

Then, in order to vary the work, (for it is of course necessary for them to write the word again,) they should write it in columns on their slates; thus,—

cat cat
cat cat
cat cat

They will think they are doing something new while in reality it is but a repetition of the old.

By the time this is done, it is probable that the majority of the children will have learned how to write the word reasonably well. They must now learn to read it in print and to distinguish it from other words. Upon the board may be printed the word cat.

The children should be asked if they know what it is. No doubt some of them will know. If not, the teacher should write the word immediately below the printed word. The pupil will recognize this and may be told that the other is also the word *cat*. The first is the *printed* word, such as they find in books; the other is the *written* word.

The chart may now be brought forward and the pupils required to find the word there, as well as in their readers. Little ones are always ambitious to do what they see their older brothers and sisters do. It will add to their interest to be permitted to try to find it on that page of the unabridged dictionary containing it. They become greatly excited and, with a little help from the teacher, succeed in finding it there.

The Phonic Spelling of the word may now be taught. This is done by having the pupils speak the word slowly and distinctly several times. The teacher should then ask them what they say first when they speak the word. They will answer by giving the hard sound of *c*. Then, what they say last. They will

answer by giving the sound of *t*. Then what they say first; then what next; they will give the sound of *a*. Then the teacher may say rapidly, "What first? What next? What last?" They will of course give the sounds in quick succession. She will then ask them to pronounce the word, and then say, "What have you done?" They will probably answer, "We have spelled *cat*." After this, each child should be required to spell it by sound. Nothing should be said about the names of the letters. The teacher must be very careful about this, as it is necessary for them to learn the distinct articulation of the sounds before trying to learn the names of letters.

In order further to test their ability to discriminate between this word and other words similar, it may be well to have prepared some papers containing about a dozen of the words they will find in the first part of their readers. These should be written with ink and spaced as in the former lesson; thus:—

cat it my runs
the rat is my
can cat has it
did is rat my
is cat get the

etc. etc. etc.

The words should not be arranged in the same order on any two of the papers. This difference in arrangement will prevent one child from imitating another's work. One of these papers should be lent to each pupil and a pin given him with which he is to prick the word *cat* wherever it occurs on his paper. These papers are to be kept clean and neat and returned to the teacher at a certain time. After this amount of drilling, even the slowest learner in the class will surely be able to write the word and recognize it wherever found in print.

A new word may now be given. The word *my* would be a good one to use next. It is easily written and spelled. In one lesson the children could learn to write it, spell it, and find it in print. It should then be combined with the first word learned.

After pointing to the words miscellaneously arranged on the board, the teacher might then point to the two written thus:—

my cat

and ask, "What does that say?" The pupils will answer, "my cat;" The teacher should then say emphatically, "Whose?" The class will then answer by placing the emphasis upon *my*. Then the teacher may say, "What is it?" They will this time emphasize *cat*. If this drill is given in a spirited manner, the children will become enthusiastic, their eyes will glow with the ideas brought out by the varying emphasis.

A sentence has not yet been formed, though two distinct ideas have been presented by emphasizing first the word *my* and second the word *cat*. The next word to be given should be a verb. The verb *runs* will best answer the purpose. It is somewhat difficult to write and spell, but a little care on the part of the teacher will enable the children to learn it in about two lessons. The three words may then be combined to form a sentence, and several thoughts be developed by placing the emphasis upon

each word in succession; thus:—

my cat runs

my cat runs

my cat runs

The teacher would do well not to point to each word separately as this will cause the pupil to respond spasmodically and without thought. Neither should the teacher read the sentence for the children; nor with them, as this will cause them to imitate tones without thinking, or else make them dependent upon the teacher. By skillful questioning, they can be made to read the sentence properly. "Whose?" "What?" "What does it do?" and other like questions will bring forth accurate answers.

In the same manner, other words may be taught. Each time a new word is learned, as many combinations as possible should be made with words already learned. The teacher must use her judgment as to the frequency with which a new word may be given. It is not wise to crowd the work too rapidly, though it is desirable that they should learn to read as soon as possible.

But immature minds do not retain things as well as mature minds do; therefore, they should not be forced to do more than is natural to them.

The length of time for each recitation should not exceed ten minutes. The class ought to recite at least four times a day. The length of time required for the preparation of each lesson need not exceed twenty minutes. Forty minutes spent in recitation and eighty minutes in study, will make two hours of concentration, which is all that ought to be required of little learners.

It is expected that the work thus far presented will be written on the slates and on the blackboard, and read from the chart but not from the reader. In another article the manner of using the lessons in the book, and of teaching Orthographic Spelling will be given.

ARITHMETIC. I.

PROF. H. B. BROWN.

IT is not the purpose of these articles to give anything like an exhaustive treatise on Arithmetic or to solve so many problems, but rather to present some of the underlying principles, and the reasons for the same. The true teacher recognizes the fact that principles, not problems are remembered, principles not particular problems used. If these articles shall enable any of the readers of THE STUDENT, to have a clearer understanding of the subject, and thus make them better teachers, the writer will feel amply repaid.

In order to make any subject the most valuable to learners, the teacher must comprehend it in its entirety, that is he must know more than comes within the limit of a definition of it.

To teach grammar well, a knowledge not only of the rules of the laws of language must be had, but a knowledge of Rhetoric, Literature, History and kindred subjects in which his knowledge of grammar will be applied. This will enable him to have an objective point to which he may hope to bring the mind of the pupil. In teaching any subject, the teacher should have in mind some definite purpose for which the knowledge acquired may be useful; better a poor purpose than no purpose at all. This of course will depend entirely on the conception had of the subject under discussion.

The purpose or end in arithmetic is to aid the pupil in the prosecution of his study in the higher mathematics, but beyond and pre-eminently above this, it should be to enable him to make rapidly and with great accuracy all of the computations necessary in the actual business world, (Of course the mind training is not considered, that is always a result of correct training.) hence, a most thorough knowledge of principles is absolutely necessary. In order to obtain this desired knowledge, the learner should be led by his own investigations to see that in arithmetic as in any other subject, there are a few principles only. All of the rest of the work is deduced from these. In percentage, for example, when the pupil is thoroughly drilled in the subject proper which contains the four cases or principles, let him know that this is all. That the subjects following are not new, nor do they contain any new principles, but are simply the principles already learned, and that every problem in all of the applications of percentage may be solved without a knowledge of a single additional principle. In fact from the beginning to the end there is one connected line of thought. Let the teacher teach this, and it will not be long before the pupil will not pass from one subject to another without seeing this connection so that when the subject is completed it will not be known as separate subjects but as a whole.

Definitions are the results of the application of principles, so in the main these will be omitted in these articles.

One word with reference to defini-

tions, however. When they are given, they should be logical. To make this a little clearer, take for example the definitions of the fundamental subjects as they are given in many books and note how illogical, not to speak of the impossibility of their being true. Here they are: Addition is the process of finding the sum of two or more numbers: Subtraction, the process of finding the difference: Multiplication (note the change) is a short method of addition, or the process of taking one number as many times as there are units in another: Division the process of finding how often one number is contained in another. If addition is the process of finding the sum, and subtraction of finding the difference, surely from the use of multiplication, it cannot be the process of taking one number as many times as there are units in another, nor necessarily a short method of addition.

A little problem will illustrate: suppose it is desired to multiply 8 by ½: evidently in this case the multiplicand is not taken as many *times*, nor even time, neither is this process a short method of addition, because addition makes greater.

The natural and logical definitions deduced from the actual work would be: Addition is the process of finding the sum: Subtraction of finding the difference: Multiplication of finding the product: Division of finding the quotent. These will answer in all cases.

Again it is said that a *prime number* is one that cannot be divided by 2 without a remainder. Now since any number can be divided by any other number without a remainder, any number can be divided by 2 without a remainder, and therefore according to this definition there would be no prime numbers. These articles will call attention to definitions and rules in only such cases as the definitions given seem wholly incorrect. While these discussions as they shall appear from time to time may not be complete, yet they will contain such an outline of the subject, which if followed will, we believe, start the investigator in a correct and practical manner.

EARTHQUAKES.

ATLANTIC MONTHLY.

OUR EARTH is subject to earthquakes: some of these are local; others start with a shock, and spread as a vibration far and wide. What are these shocks? In general, it seems to me, we must reply that the attractions of the sun and moon produce a system of strains within the earth. On the one hand, these strains cause a part or even the whole of the external crust sometimes to slide a little about its viscous interior; on the other hand, these strains occasionally and systematically combine, so that the crust cracks and separates, or crumples and faults a little, and this operation is repeated accumulatively age after age, until mountain chains and continents are formed. The specific day when such cracks are most likely to occur is that when the sun and moon are in conjunc-

tion and in perigee. At that time we have the greatest tidal strains. This condition endures for a day or two as the moon moves past the sun. During each day, at this period of conjunction, the earth, by its rotation, presents each meridian successively to the sun and moon, and causes all its substance to pass through the region of greatest strain. Now, our globe is not strictly homogeneous as to density nor as to strength, and when its weakest great circle comes into the plane of greatest strain there is a slight give, an earthquake, a fault, a dislocation of strata, a squeezing up of lava. Thus it goes on, age after age. The steady process of crumpling is therefore caused by lateral pressures, that are due not so much to cooling as to the tidal strains in the solid but plastic globe itself.

The dependence of the earthquakes of the Pacific Ocean on the sun and moon is suggested by statistics. The great circle of the Andes, Rocky Mountains, and eastern Asia marks the principal plane of weakness of the earth's crust: this divides the great depressions of the bed of the Pacific Ocean from the elevations of Europe, Asia, Africa, and America; or, it divides the land from the water hemispheres.

Doubtless in early ages our crust may have yielded more frequently than now to special strains produced at every conjunction or opposition of the sun and moon, but for a long time past the principal yieldings must have been those which occurred when sun and moon were in perigee; and in this way has been brought about that remarkable configuration throughout the world of mountain ranges and coast lines whose great circles are tangent to the Arctic and Antarctic circles. A very similar slower tidal strain in the body of the moon has given her surface a bulge and a series of ridges that are admirably prominent to the eye of the astronomer.

The pressure due to luni-solar tidal strain is a more potent factor and a more systematic agent in producing sliding and crumpling than that due to contraction by cooling. But the motions of the strata are liable to be spasmodic, and the earthquake shocks become earthquake vibrations that run over a large portion of the earth's surface: the study of these vibrations may properly be expected to enable us to trace each to its origin, and thus show to us the depth to which the tidal strain is effective. Below this depth it is evident that a species of rock welding goes on; the rocks, under great pressure and moderate heat, weld into one continuous plastic mass. This strata of welded rock is the extreme limit of the earth's crust.

Cleveland Abbe.

SIGMA PI MATHEMATICAL ASSOCIATION.

THE SIGMA PI MATHEMATICAL ASSOCIATION was organized, Oct. 5, 1890. The following extract from the preamble to its constitution, gives a good idea of its aims:

"For the purpose of mutual improvement and assistance in the study of Mathematics and Mathematical History, and for the further purpose of encouraging a more thorough and general study of this Science, and aiding in the dissemination of Mathematical knowledge, we do hereby organize ourselves into an Association."

Mathematics affords one of the best mental drills in the school curriculum, and a student, by mastering its principles, acquires a habit of inquiry, which, if properly guided, will enable him to obtain a practical education, which, in turn, will aid him in discharging his duties as a citizen.

Sir John Herschel, speaking of Astronomy, said, "Admission to its sanctuary, and to the privileges and feelings of a votary, is only to be gained by one means,—*sound and sufficient knowledge of Mathematics, the great instrument of all exact inquiry, without which no man can ever make such advancement in this or any other of the higher departments of science as can entitle him to form an independent opinion on any subject of discussion within their range.*"

Now there are a great many students who, realizing the value of mathematics, are desirous of continuing privately their studies after leaving school; others, anxious to become proficient and who must depend wholly on their private reading. It is to unite these with those pursuing the subject under the direction of teachers here, for the purpose of mutual assistance and sympathy that the Association has been formed.

We have already enrolled among our number all the students now here who expect to study mathematics to any considerable extent, and quite a number, not here, have signified their desire to join us. This department of THE STUDENT will enable us to communicate readily with each other and furnish the means whereby those not here can be active workers and receive all the benefits of the Association.

We cordially invite all, who are interested in the project, to investigate the matter, and will be glad to furnish any information desired.

All letters of inquiry, as well as all communications intended for this department, should be addressed to C. M. Jansky, Care of THE STUDENT, Valparaiso, Indiana.

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PROGRAMMES.

The following are the programmes of the Sigma Pi Mathematical Association for the next eight meetings. The first of these programmes will be given at the ninth regular meeting, which will be Jan. 31. The programmes of the Association, in the future, will be published as soon as arranged.

EIGHTH MEETING.

Talk on Algebra, M. E. Bogarte
Victoria and Britannia Bridges, G. M. Voris
Smyth's Theory of the Great Pyramid, T. I. Packard
General Problem. Query Box.

NINTH MEETING.

Talk on Algebra, M. E. Bogarte
Tay Bridge, - - Frank Krull
Proctor's Theory of the Great Pyramid, E. O'Riordan
General Problem. Query Box.

TENTH MEETING.

Talk on Algebra, M. E. Bogarte
Niagara Bridges, J. L. Towsey
Other Theories of the Great Pyramid, E. P. Harmon
General Problem. Query Box.

ELEVENTH MEETING

Talk on Algebra, M. E. Bogarte
East River Bridge, C. W. Branstrator
Squaring the circle, Anna Molloy
General Problem. Query Box.

TWELFTH MEETING.

Talk on Algebra, M. E. Bogarte
Suez Canal, Minnie Chambers
Influence of Mathematics in mental culture, - Mrs. C. W. Boucher
General Problem. Query Box.

THIRTEENTH MEETING.

Talk on Algebra, M. E. Bogarte
Construction of the Steam Engine, F. O. Stokoe and L. D. Summers
Egyptian Sphynx, Carolleane Tyrrell
General Problem. Query Box.

FOURTEENTH MEETING.

Talk on Algebra, M. E. Bogarte
History of the Calendar, H. S. Ward
Construction of Coloseum, A. C. Koenig
General Problem, Query Box.

FIFTEENTH MEETING.

Talk on Algebra, M. E. Bogarte
The Telescope, J. C. McGhee
Sir William Herschel, W. W. Worthington
The best method of extracting cube root, - - J. D. French
General Problem. Query Box.

SIXTEENTH MEETING.

Talk on Algebra, M. E. Bogarte
Ancient Architecture, John Wright, Miss E. W. Brown
Caroline Herschel, Joseph Conroy
General Problem. Query Box.

HELPFUL NOTES.

Under the above caption we shall give each month some practical notes on mathematical subjects prepared expressly for THE STUDENT by successful teachers of long experience.

SOLUTION OF QUADRATIC EQUATIONS.

The earliest algebraists of whom we have any account appear to have known how to solve the quadratic equation.

The elder Heron, an Egyptian of Alexandria, who probably lived about 125 B. C. seems to have solved quadratics but lacked a proper symbolism. Euclid solved them but confined himself wholly to geometric methods and conditions. Diophantus, a Greek of the first half of the 14th century, made some use of algebraic symbols and undoubtedly knew how to solve such equations, and promised to explain the method of doing so,

but if the promised explanation was ever given it has been lost as it does not appear among his works. He uses several determinate equations of the second degree but contents himself with simply stating the values of the unknown quantities without hinting at the method by which he obtained them. He never gives more than one of the roots even when both are positive and never uses a negative root.

The Hindoo writer, Arya-Bhatta, about 530 A. D., gave a general solution as did also Brahmagupta who wrote a little later but who also gave only the positive sign to the radical. The early Arabian writers next follow, probably drawing their materials from both Indian and Greek sources. From them Algebra was finally introduced into western Europe.

The solution of the pure quadratic is perfectly evident, being suggested by the form of the equation. We shall therefore inquire into the solution of the affected quadratic only.

When we square any binomial, $a+b$, we observe that in the power, $a^2+2ab+b^2$, the second term, $2ab$, is twice the product of the square roots of the first and third terms. Then this law will always enable us to find the third term of such a *complete square* when the first and second terms only are given. By applying this simple principle we shall have no trouble in reasoning through the various steps of the solution and thus avoiding the usual empirical method of completing the square.

Let us take the equation

$$\frac{x+1}{x}=\frac{11}{2x}-\frac{x}{6}.$$

Treating this as we have been accustomed to treat simple equations, that is clearing of fractions, transposing and reducing, we have $x^2+6x=27$, which is the simplest or typical form of the equation. Now we wish to find the values of x, (We say *values* because it will appear that there are *two*.) and in order to do this we shall have to extract the square root of the first member, as it involves x^2. But the first member being a binomial is not a perfect square, hence we must make it a trinomial and a perfect square. $6x$ is the second term of our *proposed* trinomial, hence is twice the product of the square roots of the first and third terms. If $6x$ is twice the product, $\frac{1}{2}$ of $6x$, or $3x$, is the product, and hence $3x$ divided by x, the square root of the first term, will give 3 for the square root of the 3rd term. If 3 is the square root of the 3rd term, 3 squared, or 9, will be the 3rd term. Hence we must add 9 to the first member and if we add to the first, we must add the same to the second to preserve the equality. This gives us $x^2+6x+9=27+9=36$. Extracting the square root of each member we get $x+3=\pm 6$, whence $x=\pm 6-3$. Using the $+6$, $x=3$ and -6 gives $x=-9$. Hence the values of x in the given equation are 3 and -9.

It is often asked why place the sign $\pm$ before the second member only.

We may place it before the first member also, but the resulting values of x will be the same as though it were placed before the 6 only. Thus $\pm(x+3)=\pm 6$ gives us the four forms $+(x+3)=+6$, $+(x+3)=-6$, $-(x+3)=+6$, $-(x+3)=-6$. Changing the signs in the last two forms they become $+(x+3)=-6$ and $+(x+3)=+6$ which are identical with the first two. Hence the four may be written $x+3=\pm 6$ and it is sufficient to put the double sign before *one*

of the members only.

It is evident that by transposition and reduction every quadratic equation may be reduced to the form $x^2+px=q$, where p and q may have any value and be either positive or negative. This equation may therefore be called the type of all quadratic equations and whatever, without assigning value or sign to p and q, we show to be true of it will be true of all quadratics.

If we apply the same analysis to $x^2+px=q$ that we applied to the example just given we shall have

$$x^2+px+\frac{p^2}{4}=q+\frac{p^2}{4}, \text{ whence,}$$

$$x+\frac{p}{2}=\pm\sqrt{q+\frac{p^2}{4}}, \text{ or}$$

$$x=-\frac{p}{2}\pm\sqrt{q+\frac{p^2}{4}}.$$

Now as we have assigned no particular value to p or q this result is perfectly general, and expresses the values of x in what has been called *algebraical language*. It is a formula, and may be *translated* as follows:

The values of the unknown quantity in any quadratic equation of the typical form are half the coefficient of its first power plus and minus the square root of the binomial composed of the second member and the square of this half coefficient.

Hence to solve any quadratic it is only necessary to reduce it to the form of the type, and then apply the rule. However we should remember that the rule is a short cut and depends for its demonstration upon the analysis.

We shall, in another number, discuss some points on the theory of quadratic equations and quadratic expressions.

M. E. B.

INDETERMINATE EQUATIONS.

A problem is usually indeterminate when the number of unknown quantities exceeds the number of independent equations.

Take the problem: John and James have 7 apples; how many has each? There is but one condition expressed, and since it only requires the aggregate to be 7, the number of apples that each may have can be represented as follows:

John, 1, 2, 3, 4, 5, 6.
James, 6, 5, 4, 3, 2, 1.

The algebraic solution would be:
Let x = number of apples John has.
Let y = number of apples James has.

$$x+y=7$$
$$x=7-y$$

Let y = 1, 2, 3, 4, 5, 6,
then x = 6, 5, 4, 3, 2, 1.

Now take the equation

$$2x+3y=20.$$

whence, $x=10-\frac{3y}{2}$.

Since the value of x depends upon that of y, and vice versa, we may assume

that y = 1, 2, 3, 4, 5, 6, 7, 8, &c.
then x = 8½, 7, 5½, 4, 2½, 1, −½, −2, &c.

The above shows that an indefinite number of values for x and y can be obtained if negative and fractional values be allowed; therefore only the positive and integral values are taken, and the results should read:

x = 2, 4, 6.
y = 7, 4, 1.

When there are three unknown quantities and two independent equations it is not possible to eliminate more than one unknown quantity by the ordinary

methods, and the following will illustrate the manner of solution:

How many pigs at $\$\frac{1}{2}$, sheep at $\$2$, and calves at $\$4\frac{1}{2}$ per head can be bought for $\$100$, the total number bought being 100?

Let x, y and z equal no. of pigs, sheep, and calves respectively.

then (1) $x+y+z=100$

(2) $\frac{1}{2}x+2y+4\frac{1}{2}z=100.$

$(2)\times 2=(3)\quad x+4y+9z=200$

$(3)-(1)=(4)\quad 3y+8z=100$

whence, (5) $y=\frac{100-8z}{3}$

Let $z=2,\ 5,\ 8,\ 11.$

then $y=28,\ 20,\ 12,\ 4.$

and $x=70,\ 75,\ 80,\ 85.$

It often occurs that a problem, which has all the appearances of being indeterminate, will give determinate results.

The following problem is one of this kind; A man buys 20 stoves for $\$180$, paying $\$19$ each for one kind, $\$7$ each for a second, and $\$6$ each for a third. How many of each kind did he buy? The answers to this are 4, 8, and 8.

J. E. R.

Our subscribers are cordially invited to send queries and problems over which they may be puzzled to the editor of this department, and they will be answered in these columns so far as they fall within the scope of the work of the Association.

Address, Sigma Pi Mathematical Association. Care of THE STUDENT, Valparaiso, Ind.

The latest method of "squaring the circle" is that proposed by Dr. Goodwin who has just made us a rather lengthy visit. The Dr. enunciates the following astonishing theorem: "A circular area is equal to the square on a line equal to the quadrant of the circumference; and the area of the square is equal to the area of the circle whose circumference is equal to the perimeter of the square.

Geo. M. Ballard, a former student, has secured a position as instructor in mathematics in the schools of Mulberry Tennessee. We wish him much success.

It does not take some persons long to know a good thing when they see it. L. C. Libby, of Carthage Texas, is one of these. He knew what good could be obtained by joining a Mathematical Association, so he has joined the Sigma Pi.

MUSICAL MATTERS.

NOTATION. I.

R. A. HERITAGE.

THE FOLLOWING statements are exactly as they were called up in the class teaching, and caught by a reporter who attended the class. No attempt has been made to systematize, by placing each subject by itself, but I leave the matter in the order in which the needs of the class demanded it:

1. *Sound* is anything that is audible.

2. Sound is *divided* into two classes, musical and unmusical.

3. A musical sound is called a tone, an unmusical sound, a noise.

4. A *tone* is a sound in which pitch is perceptible.

5. A tone has *four properties;* length, pitch, power, and quality.

6. *Length* is the duration of tone.

7. *Pitch* is the highness and lowness of tone.

8. *Power* is the force of tone.

9. *Quality* is the character of tone.

10. A *property* of a tone is one of its essential elements.

11. The study of Music is divided into three *departments,* Rhythmics, Melodics, and Dynamics.

12. *Rhythmics* treats of length.

13. *Melodics* treats of pitch.

14. *Dynamics* treats of power and quality.

15. *Quarters* are *tone lengths,* about as long as a pulse beat.

16. *Notes* are characters which represent the length of tone.

17. There are five different kinds of notes: whole, half, quarter, eighth, and sixteenth.

18. A *whole note* is an open head, without stem.

19. A *half note* is an open head and stem.

20. A *quarter note* is a closed head and stem.

21. An *eighth note* is a closed head, stem and one hook.

22. A *sixteenth note* is a closed head, stem and two hooks.

* * *

"The Sea King" is the best light comic opera now before the public.

The Musical Department gave Gutterson's beautiful cantata in costume and with orchestral accompaniment in Chapel Hall, Jan. 2. It was well given.

The musical world suffers a great loss in the death of the brilliant Prima Donna, Emma Abbott. She was only 36 years old, but had worked her way from obscurity to the highest type of vocal art.

The "Carrington Grand Opera Co." are billed for the 19th at Valparaiso. The musical and society people are expecting a rare treat. They give "Martha."

Blatchford Kavanaugh, the wonderful boy soprano, is spending his winter in Bombay, in his tour around the world with rich friends.

The Metropolitan Musical Conservatory of New York opens up with an unusually strong faculty. A. R. Parsons, Dudley Buck, and H. R. Shelly are among them.

THE EDITOR.

WELL, THE STUDENT, a little flushed and embarrassed as the newest arrival is apt to be, stands, cap in hand, making his best bow to you. He has no apology to offer for his intrusion, no intention even of presenting the well worn "long felt want" excuse. The fact that he is here is *prima-facie* evidence that his sponsors feel that there is a place for him. Whether this opinion is justified by the facts, and whether he is able to fill the place, the future alone can tell. As the latest applicant for your favor he will try to merit your esteem and friendship; whether you need him or not he is very certain that he needs you.

He modestly declines making any great promises for the future but thinks that he may hope to be no unworthy representative of the great school from whose midst he comes, and to fairly reflect its spirit. He will try to be, as his name suggests, a companion for students everywhere and of every degree. From such particularly he hopes to receive a cordial welcome.

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We shall endeavor to issue THE STUDENT on the first of each month. A variety of circumstances have combined to make our first number late, and its tardiness will delay the February number. We hope however to mail the March number about the first of the month, and thereafter will try to be on time.

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The attention of resident students is called to our local advertising pages. All the advertisers are personally known to us and are responsible and honorable men.

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It is proposed to publish each month in THE STUDENT a resume of news. Something valuable ought to be accomplished, and yet the work is a difficult one. A mere *melange* would be of little value, and anything of local interest would be ruled out by its very character. Descriptions of places and things might be made interesting, as the illustrated magazines have proved, but without the help of the artist and engraver, the teacher could profit little from them.

The interests of the schools are so closely identified with the general interests of the community, its social, political, religious, and economical interests, that anything that will give the teacher a more intelligent view of these great interests must have permanent value. The teacher who has clear and definite information upon such subjects as free coinage, the election bill, the farmers' alliance, the tariff, compulsory attendance, the bible in the schools, the using of languages other than the English, etc., etc., will do more intelligent work for his pupils, than one who has no interest in such subjects, or only a vague and

transient interest. The information need not be such as the specialist requires, exhausting and minute ; and it must not be partisan in any sense of the word. It should not be such information as the controversialist needs, but such only as plain people need to enable them "to walk more surefootedly in this present world."

Of course, this method of dealing with the matter, if carried out with even a good degree of success, would demand an amount of time, and knowledge, and judgment which the present writer cannot command. Yet he hopes to do something which may prove helpful to some teachers ; and probably most helpful in making their work less isolated and suggesting its intimate connection with all the great progressive and conservative forces, which build communities and nations. There can be no doubt, that the school which departs as little as possible in all its methods from the best usages of common life, is the best school ; and the teacher who most skillfully and faithfully carries out the principle, is doing most to meet the ends for which the State maintains its schools.

So, in some such way as is implied in the foregoing words, a beginning will be made in the next number of THE STUDENT.

H. N. C.

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"Along the Lower James," by Charles Washington Coleman, is the first paper in the January *Century*. It is profusely illustrated and full of interest. William A. Coffin gives the public a good introduction to the new and talented artist Kenyon Cox. Octave Thant's "Irish Gentlewoman in the Famine Time" will find many sympathetic readers. W. Woodville Rockhill contributes a second paper on those curious people, the Mongols. "Among the Mongols of Azure Lake" will deepen the interest already awakened by his "Border-Land of China," which appeared in the December number. Like the first paper, the present one is accompanied by instructive illustrations. The first of the series of papers on "The memoirs of Talleyrand" is presented in this number. These promise to be particularly valuable, and are preceded by an "Introduction," by Whitelaw Reid, our American Minister to France. The California papers are continued. "Pioneer Spanish Families in California," by Charles Howard Shinn, and "The Missions of Alta California," by John F. Doyle, are fully as interesting and delightful as any of the former papers. "California" is rich in short articles. "A Romance of Morgan's Rough Riders," by Basil W. Duke, Orlando B. Wilcox, and Thomas H. Hines, will be read with deep interest by all who enjoy reminiscences of the Civil War.

H. E. Krehbiel gives a valuable paper on "Chinese Music." This is illustrated by several pages of Chinese notes and songs. "Colonel Carter of Cartersville," by F. Hopkinson Smith, and "Sister Dolorosa", by James Lane Allen, are continued this month. The department of "Fiction" is rendered still more enjoyable by numerous short stories from the pens of able writers.

"Topics of the Time," "Open Letters," and "Bric–A–Brac," are filled with spicy and seasonable things.

The January *Century* is one of the finest and most entertaining numbers of this peerless Magazine. The Century Company, New York.

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"Noto: An Unexplored Corner of Japan," by Percival Lowell, is the charming opening paper of the January number of *The Atlantic Monthly*. Japan

has of late been an attractive part of the world to us Americans, and this paper will intensify our interest. Cleveland Abbe has in "A New University Course" a masterly plea for the claims of "terrestrial physics." In "Compulsory Arbitration, "Charles Worcester Clark discusses that absorbing question "State Arbitration." The rights of railway corporations and the right of states to arbitrate concerning them are topics well and fairly considered in this article. Josiah Royce presents the first of a series of papers on "Two Philosophers of the Paradoxical." This first has for its subject Hegel, and is interesting and valuable, inasmuch as it very clearly sets forth some things not always understood about this philosopher. "An Inherited Talent," by Harriet Walters Preston, gives its readers an excellent idea of the domestic life of the old French nobility at the beginning of the last century.

Nathaniel Southgate Shaler's article on "Individualism in Education" will well repay a careful reading. "Boulangism and the Republic," by Adolphe Cohn, is an interesting paper, showing the effect of the Boulangist adventure upon the French Republic, and how it may influence that Republic's future.

In a short and vigorous paper, Henry Charles Lea tells "The Lesson of the Pennsylvania Election." Sophia Kirk's "Swiss Farming Village" is a delightful word picture of Swiss farm life. "A Novelist of the Jura" gives interesting information concerning two Swiss writers, M. Cherbuliez and M. Rod.

In the department of fiction are found Chapters XIV-XVII of Frank R. Stockton's "Martha", and Chapter XIII of Fanny N. D. Murfree's "Felicia." Interspersed among these various papers are poems of merit, while "Holiday Books," "Comments on New Books," and the "Contributors' Club" contain much that is instructive and valuable.

Taken all in all, the January number of *The Atlantic Monthly* is most excellent. No other magazine for this month presents a more attractive and enjoyable list of papers. The Atlantic Monthly, Houghton, Mifflin and Co., Boston.

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Our School was never in as good condition as it is now. Never before have there been as many classes, nor as great variety of courses of study offered to students. From half-past 6 in the morning till 9 at night every recitation room is filled. The Scientific class numbers over 140 and the Classic class is nearly double its usual size. What a change since the morning of Sept. 13., 1873, when we organized the school with an enrollment of 35 students all told. Now the annual enrollment exceeds the enormous number of ~~3500~~. This school grows, not only in numbers but in the character of the work done. The new plan of making elective a large number of branches formerly required in some of the courses of study seems to be working admirably.

Early in the spring a new chapel will be erected which will have a seating capacity of 2500. We are also to have a new physical and chemical laboratory, several new recitation rooms and more commodious quarters for the students in mathematics. The first floor of the west wing is to be given to the library, just doubling its present size. The future never looked as bright to the friends of the school as now.

We read of a great general that he never knew when he was defeated. Quite unlike him, Prof. Brown never seems to know when he is successful, for the greater his success the greater his efforts. Neither he nor Prof.

Kinsey ever seem satisfied with the advantages they are offering to their students but labor early and late to increase those advantages.

The Normal Sunday School is larger than it has been for several years. The Superintendent is an enthusiastic worker.

A Y. M. C. A. and also a Y. W. C. A. have been organized; the former with a membership of forty-nine and the latter of fifty.

U. G. Houston, a former student, who during the last year traveled through Palestine and Greece with T. DeWitt Talmage, was back a few days ago, and gave a lecture describing his journey.

Mrs. J. H. Kellogg's talk, to the ladies, has had some good effects. A lady remarked the next day, "This is a turning point in my life and it remains to be seen whether I am a woman or not."

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WHAT THEY ARE DOING.

D. E. Minor is at Horse Creek, Ala. Mr. Minor is a business man; a good one too.

Lester B. Dresser of '85 has just finished a 4 years' term as County Sup't in Wis. He is now the senior member of the firm of Dresser and Olcott, St. Croix Falls.

C. A. Harmon is serving his second term as Register of Deeds, in Cass Co., Mich. Mr. Harmon is a staunch Republican, and writes that he "survived the November cyclone." He expects to return to school at the expiration of his official term.

B. S. Harris of Dousman, Mich., writes that he will be with us again in March. He will receive a cordial welcome.

E. W. Blackhurst is principal of the Indianola, Ill. schools. Of course he is doing a good work there.

C. H. McCann writes a kind and encouraging letter from White Heath, Ill. We congratulate Mr. McCann on his success.

J. L. Simcox is conducting a successful business in Patoka, Ill. He sends good reports from a number of our students. He says that it is now written *Dr.* J. S. Morton, and *Dr.* Murfon.

The good news has just reached us of the marriage of our friend Earl Cilley of Ottowa Co., Mich. to his assistant. J. F. Fortney, who makes the report, remarks that "both rooms are Cilley now." By the way Mr. Fortney is one of the five teachers in his county who holds a first grade 3 years' certificate.

L. H. Carson is doing good work as County Superintendent of Schools, Washington Co., Ill.

We were pleased to hear from W. A. McVey. He is now located at Hammond, Ind.

Supt. Perkins of Liberty Mo. has recently invented an excellent little device for recording class grades. It is cheap and convenient and should meet with a large sale. Teachers can purchase one by addressing J. H. Perkins, Liberty, Mo.

W. H. Hawkins is now sheriff of Sullivan Co., Ind., and is doing well. C. W. Welman and A. B. Williams are also in Sullivan, the former being the editor of the Sullivan Times and the latter a member of the law firm of Beasley and Williams.

THE STUDENT is the recipient of a kind letter from A. L. Tidd, who is now teaching mathematics and Latin in the Oconto, Wis. High School.

The lectures given the last of Dec. by Dr. and Mrs. J. H. Kellogg were the best attended and probably the most appreciated of any in the course. The Chapel was not large enough to hold the crowd anxious to hear them. They were replete with good advice and good sense.

Dr. Kellogg is one of the busiest men in America but we hope that he may find time to be with us again.

W. S. Booth, Sylvester Thompson, C. J. Godfrey, A. J. Frost, Vesta Meader, Cassie Gregory, Fred Stroup and Jos. Conroy, are all teaching in Ind.

C. E. Hall of '90 who now is attending the Chicago Medical College, was visiting among us a few days ago.

D. S. Robbins also of '90 stopped on the Hill for about an hour last week, while on his way to Volga City, Iowa, where he is teaching school. He reports a good time at home and says he enjoys his school work.

J. C. Roberts and T. P. Reep from Ill., F. M. Hall from Ohio, and D. E. Minor from Ala. were on the Hill during Christmas, shaking hands with their fellow workers of '90.

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A GREAT AMERICAN MAGAZINE.

THE SUCCESS OF "THE CENTURY" AND ITS PLANS FOR 1891.

THE CENTURY MAGAZINE is now so well known that to tell of its past success seems almost an old story. The N. Y. Tribune has said that it and its companion, St. Nicholas for Young Folks, issued by the same house, "are read by every one person in thirty of the country's population,"—and large editions of both are sent beyond the seas. It is an interesting fact that a few years ago it was found that seven thousand copies of THE CENTURY went to Scotland,—quite a respectable edition in itself. The question in England is no longer "Who reads an American book?" but "Who does not see the American magazines?"

A few years ago THE CENTURY about doubled its circulation with the famous War Papers, by General Grant and others, adding many more readers later with the Lincoln History and Kennan's thrilling articles on the Siberian Exile System. One great feature of 1891 is to be

"THE GOLD HUNTERS OF CALIFORNIA.

describing that great movement to the gold fields in '49, in a series of richly illustrated articles written by survivors, including the narratives of men who went to California by the different routes, accounts of the gold discoveries, life in the mines, the work of the vigilance committees, (by the chairman of the committees), etc. General Fremont's last writing was done for this series. In November appears the opening article, "The First Emigrant Train to California,—crossing the Rockies in 1841,—by Gen. Bidwell, a pioneer of pioneers. Thousands of American families who had some relative or friend among "the Argonauts of '49" will be interested in these papers.

MANY OTHER GOOD THINGS ARE COMING,—

the narrative of an American's travels through that unknown land Tibet (for 700 miles over ground never before trod by a white man); the experiences of escaping War-Prisoners; American newspapers described by well-known journalists; accounts of the great Indian Fighters, Custer and others; personal anecdotes of Lincoln, by his private secretaries; "The Faith Doctor," a novel by Edward Eggleston, with a wonderfully rich programme of novelties and stories by most of the leading writers, etc., etc.

It is also announced that THE CENTURY has purchased the right to print, before its appearance in France or any other country, extracts from advance sheets of the famous Talleyrand Memoirs, which have been secretly preserved for half a century—to be first given to the world through the pages of an American magazine. All Europe is eagerly awaiting the publication of this personal history of Talleyrand—greatest of intriguers and diplomats.

The November CENTURY begins the volume, and new subscribers should commence with that issue. The subscription price ($4.00) may be remitted directly to the publishers, The Century Co., 33 East 17th st., New York, or single copies may be purchased of any newsdealer. The publishers offer to send a free sample copy, a recent back number, to any one desiring it.