TEMPE NORMAL STUDENT.

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THE NUMBER CONCEPT.

By Professor G. M. Frizzell.

(Note: This paper was read before the Territorial Teachers' Association.)

Mr. President and Fellow Teachers:

I am convinced that the subject of arithmetic, as it is too often studied, yields a smaller return for the effort put forth in its study than any other branch in the common school course.

Pupils begin the study of number at the very beginning of their school life and continue it through all of the grades. And, after all of this time devoted to its study, a large proportion of the pupils have but little appreciation of the principles of the science, and are incapable of entering business life and making the simplest calculations with tolearble satisfaction to their employers. Their work is mechanical and often unreasonable.

A subject that receives so much time for its consideration ought to give to the student a positive and lasting benefit. It ought to give him some preparation with which to meet the problems of life as they are encountered by him. It ought to do more than give him merely the power to make easy calculations with a degree of tolerable accuracy. It ought to give him the ability "to define with sharp discrimination, to analyze with fluency," to perceive with clearness, to reason logically, and to express himself with exactness.

The necessity for a more rational treatment of arithmetic has been recognized by school men for a number of years. In 1892 the National Educational Association appointed the committee of ten. This committee reported that it was the sense of that committee that the course in arithmetic should be radically changed and recommended that the course be at the same time abridged and enriched. Abridged by omitting entirely those parts which perplex and exhaust the pupil without affording any really valuable mental discipline, and enriched in a greater number of exercises in simple calculation and in the solution of concrete problems.

This report indicates something of the feeling held by many in regard to arithmetic. Some have expressed themselves as regarding it as "a necessary evil." But the "evil" arises from an improper presentation of the subject and not from the science itself, and such improper presentation should not be placed to the discredit of the science.

In this paper, I shall not attempt to describe in detail a method to be used in teaching arithmetic, but shall endeavor to hint at some general ideas concerning the things to be taught in the public school course, taking up especially the work of the lower grades.

The aim of the teacher in early arithmetic work, and in the term arithmetic I wish to include all number work, should be, first, to develop the number concept, and, second, to give the child number facts that are to be used in the work that follows. This second aim is too often the only one in the mind of the teacher. Both of these objects should be before the teacher from the first, with much care being taken to secure appreciation of the quantities considered. Quantities and quantitative relation must be clearly imaged in the mind, and as a consequence results of combinations will be apparent.

There are two methods that have been employed in the schools in the teaching of "number work" and primary arithmetic. One is the giving to the pupils numbers in the abstract with words and symbols to represent them, there being but little or no teaching by appeal to the mind through the sense excepting by spoken words and written words and symbols used in the representation of number and number relations. The pupil is expected to "cipher out" the answer." The other method, and the one now generally employed with more or less success, is the using of objects to represent number, number relations, and number operations. The fault that sometimes attends the teaching by the use of objects is that the pupil is impressed by the qualities belonging to the objects rather than by number facts represented, and also may use the object as merely a device by which to count, thus aiding in reaching a result without any appreciation of real number. This same counting by device is seen to be carried on to higher grades, where students are often discovered "counting up" by counting fingers or marks. Although there may be objects before the pupil, it does not necessarily follow that he sees quantity and quantitative relation. When results are obtained, he may proceed to commit to memory the symbols representing the numbers. He is then in the same position with the pupil who has never been given an object lesson in number. Long lists of number combinations may be written on the blackboard. The pupil may copy them, learn them and give the answers when called upon to do so, or he may learn them from tables found in the primary number book. The mental image that he is getting in all this is nothing more than an image of symbols employed in the expression by the combinations, and he repeats answers from the image of symbols that exist in his mind. In this there is little sensing of real number. There is little or no number work, but much figure work. It may be that he is given numbers that are to be combined in a stated way, and required to work out results for himself. But after the results have been obtained he proceeds to commit the figures that represent the number combinations and their results. He may merely commit the figures representing the quantities and have no knowledge of the numbers and the operations performed. Thus he goes on from day to day dealing with the expressions that represent quantity and relations between quantities. Much of all of the work, to such a pupil, is vague, uncertain and mysterious. He lacks mental image of number, and the facts with which he deals are abstract truths of which he has little conception. He passes on from grade to grade struggling with forms of operation, while the principles involved in such operations are unseen by him.

In my last arithmetic class a student presented a solution of a problem. The work was done by a division process. When questioned why the work was done in that particular way, he replied that he had first multiplied and failed to get the book answer, and that he had then divided, and thus obtained the right result. Many students are solving (?) questions in some such way. It sometimes happens that students in upper grades will ask whether a certain list of examples are "worked by multiplication or division?" Or it may be that a question is submitted in language somewhat different from the form of statement of the same question studied at a previous time. The relations of the quantities may be clearly stated, but the pupil may ob-

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TENNIS TOURNAMENT.

The dual meet between the University of Airzona and the Tempe Normal took place Saturday morning, November 17, 1906.

In arranging for games the program included a set of mixed doubles, but this was not played, due to the fact that Miss Elliot, who was to be the lady representative of the university, was ill.

The tournament opened about 9:30 a. m. The first event was the doubles, represented by Messrs. Hatcher and Talmage, of the University of Arizona, and Messrs. Clifford and Miller, of the Normal. The game was won by the university by a score of 6—3 the first set, and 6—4 the second. The teams were very well matched, each ball being played back and forth several times, this making the game very interesting for onlookers.

The second event was the men's singles, played by Mr. Salazar of the university, and Mr. Ayer of the Normal. Here again the games were even, neither player winning a love game. The first set was won by Salazar with a score of 6—2. The second set was much closer, several of the games being close and none of them love. Once the games stood four all. This score was made by Mr. Ayer from a score of 1—3 in Mr. Salazar's favor. The games were all hard and in many cases it was not a question of the best player but a case of luck. The second set resulted 6—4 in favor of Salazar.

Prof. Babcock of the university umpired both matches, and when he descended from his post his face wore a broad smile.

The day was almost too windy for sure playing; often the wind played the ball, much to the chagrin of the player.

The university players left for Tucson on the 8:55 train, taking with them the cup. This cup is a silver three-handled loving cup, seven inches high. The Normal hopes to bring back this trophy next January 12, 1907, when the return tournament is played. This tournament will be followed by the second annual tournament of the Arizona Tennis Association, to be held on the Normal tennis courts, February 12, 1907. G. HUBBARD.

TENNIS CLUB RECEPTION.

The reception given by the Normal Tennis Club to its old members on Friday night was a decided success. Misses May Benson, Leora Czarnowski, Nelly Murphy and Messrs. Clifford, Blome and Frank Czarnowski, aided by Mr. Hall, tastefully decorated the dining hall with flowers, pillows and Navajo rugs. Card tables were arranged, and five hundred was the game of the evening. A very interesting program was also rendered:

Instrumental solo,
Miss Leora Czarnowski
Recitation.....Miss Belle Stephens
Vocal solo.....Miss Hutchison
Duet,
Misses Imogene Murphy and Laura Schmidt.
Reading.....Mr. Bosworth

The last named was a very delightful feature, being a reproduction of the second act of Shakespeare's "As You Like It." It was a rare treat, as Mr. Bosworth is an actor of long experience, having been on the stage for the past twenty years. He has played every part in this act, which made it very enjoyable indeed. Among those who enjoyed this excellent program and partook of the dainty refreshments following, punch-ice-cream and wafers, were: Mr. and Mrs. Scudder, Mr. and Mrs. Bosworth, Mr. and Mrs. Clarke, Professors Babcock, Matthews, Mullen, Golden and George, Mesdames Brown, Busbie, Greenlaw, Misses Hutchison, Finnie McNulty Haulot, Alice and Ione Greenleaf, Armitage, Thomas, Kingsbury, Duncan, Matthews, Wright, Halderman, Belle Stephens, Laura Schmidt. Imogene Murphy, May Benson, Della Schaal, Nathaly Larson, Lucy and Dorothy Jones, Leora Czarnowski, Vera Greenlaw, Genevieve Hubbard and Nelly Murphy; Messrs. Burrel Hatcher, of Tucson; Alma Jones, Halbert Miller, Jesse Clifford, Wiley Hanson, Maurice Blome and Carroll Belknap.

D. S.

ARIZONA.

(By Theresa Russell.)

One land, sun land,
Rope and spur and gun land,
What is your enchantment that you haunt our dreams?
View land, blue land,
Flash-of-every-hill land,
Peak and plain and canon cradle dimpling gleams.

Glad land, sad land,
Poor old pagan bad land,
To your castle sometime we shall find the key,
Wild land, mild land,
Slumbering, witch-beguiled land,
Then you shall awaken, smiling, strong and free.

—November Sunset.

Normal Exhibits at the Fair.

To Normal students visiting the Fair, and also alumni and Normal faculty, perhaps the most interesting of the many sights were the booths of the Normal and training schools.

With regard to the work of the Training School it is evident that there can be but one sane judgment passed upon it and that, "Wonderful." All the exhibits showed careful and skillful work, especially the drawing. The booth was lined with the masterpieces of all grades, work so well done that, as a Normal class declared, "Even the fourth grade beat the juniors all hollow."

In the compartment of the Normal, blue and red ribbons were so numerous that had we not been previously warned by Mr. Matthews concerning their prominence, we would have been, to put it mildly, astonished.

In the different department of study the premiums were as follows:

Drawing—Blue, Halbert Miller, H. James, W. Anderson, N. Murphy, M. Hough; red, H. Miller, W. Anderson, M. Eichenberger, A. Rabinovitz, L. Schmidt.

Chemistry—Blue, H. Blome; red, G. Hubbard.

Rhetoric—Blue, D. Schaal, N. Trent; red, B. Leebrick.

Literature—Blue, H. Hendrix, S. Brown; red, C. Johnston.

Zoology—Blue, Alice Merritt; red, J. Quinn.

Physiography—Blue, Mary Leavell; red, G. Quinn.

Physics—Blue, N. Murphy; red, G. Hubbard.

Manual Training—Blue, T. Higley.

M. N. P.

TARGET PRACTICE.

A small party spent Saturday morning on the rifle range in the work of bringing up their records. Ray Saylor succeeded in qualifying in the marksman's class and the others, who had already classified, bettered their scores at 500 yards. The remainder of the time was used in practice in rapid fire at 200 yards and in skirmish runs, in which five men participated, the score being very fair for the first trial. The scores for the day follow:

Russell—500 yards, 17 19; rapid fire, 18 19; skirmish, 42.

Sergeant Miller—600 yards, 14; skirmish, 25 29.

Saylor—200 yards, 16 17; 300 yards, 16 13; 500, yards, 16.

Shrigley—500 yards, 12 20; 600 yards, 17; rapid fire, 15 18; skirmish, 46.

Norton Stewart—500 yards, 17; rapid fire, 19 23; skirmish, 34.

The rapid fire and skirmish records of Russell, Stewart and Shrigley are sufficiently high to put them in the sharpshooters' class if they succeed in raising their scores at the first four ranges.

TERRITORIAL TEACHERS' ASSOCIATION.

FIRST DAY.

At 8:35 o'clock, Tuesday morning, November 13th, President B. H. Scudder called to order the fifteenth annual meeting of the Arizona Teachers' Association in the First M. E. Church, at Phoenix.

President Scudder spoke of the aim of the present meeting, and what was expected of it. He next introduced to the teachers Joseph H. Kibbey, Governor of Arizona. After the greeting of the audience, Mr. Kibbey proceeded to greet and welcome the teachers. He spoke of facing many audiences, but was always least sure of himself when facing an audience of teachers. He said he had taught in Arkansas thirty-six years ago, but did not wish the present education of that state to be attributed to his teaching at that time.

He spoke of the mission of the teachers to make Arizona not only an equal, but a leader in education. "We are all proud," said the Governor, "of our public schools in Arizona. I regard the school teacher as a state officer whose duties are vaster than those of any other."

Governor Kibbey also said that opportunity did not die with Zenophon, Caesar, Spencer, or Washington, or Franklin, but is today within reach of all who are ready to grasp it.

For illustration, he told the story of the crew in the mouth of the Amazon River dying of thrist when all that was necessary was to lower a bucket and get the precious liquid. So, every school boy and girl should be taught that opportunity is always present.

The Governor extended the welcome of the capital city to the teachers and their friends.

Dr. K. H. H. Blome, whom President Scudder called his right-hand bower, responded for the teachers. He spoke of the appreciation of the welcome extended by the Governor, and the silent welcome in the decorations on the walls, the national flag reminding us that, after all, our chief interest was the good of our great country. Dr. Blome made a plea for advancement in education.

President Scudder then introduced Dr. Blome again, alluding to him once more as his right-hand bower. Dr. Blome said that he did not know what a right-hand bower was, but he was ready to do the best he could with the subject assigned him, "The Teaching of Historic Events as Problems that Men Solved."

He found fault with Swinton's and Barnes' old, disconnected histories. He told in an entirely new way the stories of "The Armada," Burgoyne, "Lexington," "Bannington" and "The Civil War."

"The children should solve the problems," said Dr. Blome, "which the men of that time had to solve." The problems were there, and they were solved. The child should be confronted with the same difficulties which confronted the Americans at Bennington, and in the solution of these he will get the patriotism of that man who said, "We must beat the red coats today or Molly Stark's a widow."

A. H. McClure of Yuma gave a paper on "Aims and Methods in Literature for High Schools."

After a recess, Miss Cora M. Finnie of the Normal school gave a discussion on Mr. McClure's topic. She believed that the study of literature should not be like the study of a plant or animals. Such a microscopic study would injure the force and beauty of a poem. She disagreed with McClure in his statement that the study of American literature should precede the study of English literature. "Such a study is not logical," said Miss Finnie, "as American literature grew out of the English."

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EDITORIAL.

We are exceedingly gratified to hear our paper praised. If the students, alumni and teachers will be patient with us and help us we believe we can improve it still more. We take pleasure in inserting a clipping from the Arizona Republican of November 19 to show what other people think of our effort:

THE SECOND ISSUE.

The Normal Publication Improves with Each Appearance.

"The Tempe Normal Student" has now made its second appearance, and it is only fair to say that the second appearance is better than the first in many respects. There is more good reading matter, more local items of interest to the public regarding the school and the paper is illustrated with several good cuts, one of them a picture of the tennis association. The paper already reflects great credit on the editors and business managers, and if it continues to improve as it has started to, those concerned in its publication may justly feel proud of their efforts.

Each week there will be published in this paper the best theme and composition written my members of either of these classes. It seems to us that this is an honor which each student should aim to achieve. The selection is made by the teachers in charge of the work, and to have one's theme or composition selected as the best out of fifty will make any parent's heart proud.

JOHNNIE MOUSE.

(Note: The best theme of the week.)

The most mischievous and venturesome member of the whole Mouse family was little Johnnie. His black eyes were always seeing something funny or very curious, and his sharp little nose was continually smelling goodies in the cupboard just above the cellar home. This home was in the darkest corner of the cellar and was considered the best in the neighborhood.

One day, little Johnnie was very restless and bothersome. It was Saturday, and the children were supposed to help Mother Mouse with the work of carrying in wood, tidying up the rooms and laying in supplies from the garden for the following week. But Johnnie had run off to the neighbors while his brothers and sisters did the work, and when he returned he was happy to find them all through with the work and ready to play with him. He was rather disappointed in them, though, as they were tired and cross—scolded if he teased them, cried if he pulled their tails, and told Mama Mouse about every little thing that he did, until she threatened to send him to bed without his supper if he didn't stop teasing them. His antics having been so forcibly checked, Johnnie decided to try a new form of amusement, one which would make the other children hold their breath and stare at him in amazement when he told them of it. He had often dreamed about the things his Father had told them that he saw upstairs, so he made up his mind that Saturday would be an ideal day to see the world. Then he could talk about it all day Sunday. He thought that if he could just wear a hat every one would think him a man and not hinder him. Suiting the action to the word, he stole into the bedroom while his mother was busy tying up Annie's finger, which had just been hurt, donned his Father's Sunday hat and set out on his exploration.

How very easy it was to find the narrow path which led through the ceiling into the kitchen! He could have found that on the darkest night. What a queer kitchen floor it was, so slippery and shining and speckled with all sorts of colors and lines! As he went through the coal box on his way to the shelf in the kitchen, he stopped a moment to imagine a game of "hide and seek" among the many nooks and crooks in the big lumps of coal. On he went, up the window casing, onto a shelf. My! what a wonderful storehouse it was; so many boxes full of nice smelling powders and bottles of black perfume, the kind his Father had often brought for Mama to cook with from the grocers; but Johnnie always thought it would be better for his handkerchief than for cakes and puddings.

The next interesting place he visited was the pantry. How he wished that his best friend, Dickie, might be with him to share its wonders! He hardly dared to breathe for fear he mightwake from a dream. There was a whole shelf of glasses filled with all colors of jelly, a plate of delicious cheese, which he sampled, a big bag of crackers and a bowl of snowy white lumps of sugar. Oh! how he did want to take a basketful of each of those good things home with him, but he satisfied himself with eating all he could and taking a small piece home in his pocket to convince the children of his adventures.

"But what is that queer noise? It sounds like thunder, but seems to be coming nearer. I wonder if it is one of the giants teacher tells about at school? I wonder if they can hear it at home?"

Suddenly the whole side of the cupboard gave way and a big black object with two little black and white marbles in the center of it appeared in the opening and poor Johnnie was so frightened he could scarcely move. Finally, when he realized his dangerous position, he made a mighty effort and started for home as fast as four legs and loaded pockets would allow. But in his haste he went in the opposite direction from home and while wandering among the cups and glasses came upon a queer little wooden board with a delicious morsel of cheese on it. He hadn't time to stop an instant, so he ran alongside of it to get a good smell. Suddenly he was startled by a loud report and a sharp pain in his tail.

"Oh! Oh! Oh! It must be one of those awful traps Papa has told us of so much. Wonder if I'll die here, or if that big black thing will catch me? I hear it coming. Oh! I wonder if I can move? Yes, I can pull the trap along by my tail, but, dear, how it does hurt! I wish Mama were here to take this horrid trap off. I know she could. Guess I'll try to jump off the shelf and maybe it will fall off too."

But alas! poor little mouse, the old trap decided to stay on the shelf and to keep a piece of the tip of Johnnie's tail, too. As for Johnnie, he managed by standing with his back to the wall and then retiring immediatelyafter supper, to the great surprise of his mother, to keep them from seeing his poor little tail. But next morning when Mother Mouse came to "inspect" before sending him to Sunday school with the rest of the children, she discovered the loss and questioned and threatened until she learned the whole adventure from him. At dinner she told all the children how dissatisfied Johnnie had been with their home life and what a sad fate befell his tail when he attempted to satisfy his curiosity.

This was Johnnie's last adventure, for his short tail was a constant reminder that life outside of a cellar is too dangerous for little mice.

LAURA C. SCHMIDT, '09.

LOCALS.

Miss Ada Halderman, '06, has been attending Institute the past week, and was the guest of Lucy Nash for several days.

We have two new students in the Girls' Hall, Misses Grace and Mary Kidd, of the Flagstaff Normal.

Rev. Benedict and son arrived Tuesday morning to spend fair week with their family.

Through the kindness of Dr. Blome, the juniors and seniors were allowed to attend Teachers' Institute in Phoenix last Wednesday.

Miss Nellie Smith, '06, of the Northern Normal, visited in the dormitory with Miss Hazel Todd on Wednesday.

Miss Hattie Merritt has had her mother and little sister with her during the past week They left for their home in Prescott Sunday morning.

Mr. Cone Webb, '05, and little sister, Norma, of Roosevelt, arrived Thursday night to visit with their brother and sisters during Fair week.

Miss Elizabeth Ullman, '06, was a guest of Miss Stauffer over Sunday.

Miss Annes Keating, '06, who is teaching in the Florence schools, has been spending a few days with Miss Joy Biery.

We are pleased to note there are no more cases of "Note-Book Fever" now that the Fair is over. Mrs. B. was becoming alarmed as to the general health of her charges, but all seem to have recovered.

Miss Helen Axtell, '04, who is teaching in Tombstone, has been visiting her sister, Miss Elizabeth.

Prof. Babcock, of the University of Arizona, spent Friday night and Saturday with us. He watched the university contestants who took part in the tournament Saturday.

On account of the Territorial Teachers' Association meeting in Phoenix last week, the Normal has been visited by teachers from all parts of Arizona. Among the most prominent were Prof. Phillbrook and wife of Bisbee, Prof. Scudder and wife of Jerome, Prof. Ruthrauff of Tucson, the Misses Smyser of Flagstaff, Prof. Henry I. Robertson of Globe, and Prof. J. Oscar Mullen, Tempe.

An informal dance was given in the dining room on Saturday night.

The S. P. depot was a scene of great confusion Saturday night, when so many of the teachers left to resume their duties in the various schools. One would think it were Christmas or June to see the number of Normal students leaving. They are "ex"-students, however, and will be called nothing but dignified teachers. Among the outgoing passengers were Berte Jones and Miss Mabel Anderson, to St. David; Misses Fannie and Florence Armitage, Benson; Karl Leebrick, Clifton; Sadie Stauffer, Morenci; Misses Hester Wallace, Alma Coman, and Vessa Wright, Bisbee; Mr. Rollin Jones and the Misses Greenleaf, Yuma, and Miss Mary Mullen, to Douglas.

THE TERRITORIAL TEACHERS' ASSOCIATION.

(Continued from First Page.)

Mr. McClure again asserted his belief that the study of literature should begin at home, the same as geography, history, and other subjects.

President Matthews of the Tempe Normal extended an invitation to all to inspect the educational exhibit at the fair and to visit the Normal school at Tempe. He advised the teachers to commence preparations for the fair of 1907 so soon as they reached their homes. Superintendent Stillwell of Phoenix invited the teachers to examine the educational work on exhibition at the Central building.

Professor George M. Frizzell was the next person on the program with a paper on "The Teaching of Arithmetic," which is printed in full elsewhere in our columns.

"The Teacher as Artist" was discussed by Dr. C. C. Van Liew of Chico, Cal. He emphasized the importance of walk, talk and dress for the teacher, and said that the very manner of some teachers begets mental lassitude in the pupils. The day's program came to a close with Dr. Blome's talk on "Types in the Teaching of History."

SECOND DAY.

The association was called to order at 8:40 by the president, Professor B. H. Scudder, after which the teachers were arranged in groups, thus showing the representatives present from each county.

The work of the day was opened by Mr. Matthews, who, though not prepared, made an excellent and highly creditable speech on "The Relation of Normal, Public, and High Schools of Arizona," in which he plainly set forth the rules of the Normal school, with regard to a matter often misunderstood, i. e., the conditions of admission to the Tempe Normal. Questions were asked by Mr. Phillbrook, and answered by Mr. Matthews.

Then Superintendent Berner of Tombstone spoke on "What Shall We Teach." As Mr. Berner was a substitute for President Taylor, his time for preparation was limited, so he was confined chiefly to a discussion of the eighth grade. Mr. Berner seemed to be of the opinion that modern schools have too many text-books, and he further advised the elimination of much of the contents of modern text-books, leaving the practical parts. Mr. Berner's subject was discussed by Professors Blount and Matthews, and Superintendent Jolly. In these discussions the original subject drifted to "the change of text-books," and was recalled by Dr. Blome.

Next on the list was President Van Liew of the Chico State Normal school of California, who proved himself amply able to the discussion of "The Neglected Art of Education." At the close of Mr. Van Liew's speech there was an intermission of fifteen minutes for conversation. The work of the day was again begun by the audience, led by Professor Todd of Phoenix High School singing "Columbia, the Gem of the Ocean."

Myrtle Smyser, who is in charge of the primary work in Flagstaff, gave an interesting discussion of the topic "Primary Work," in which she emphasized the development of character and self-government in children.

Miss Smyser's speech was followed by the subject "Physical Geography," discussed by A. E. Douglass of Tucson, after which there was an additional discussion by F. M. Irish of the Tempe Normal. Both Mr. Douglas and Mr. Irish showed their knowledge of the subject in question by their systematic handling it received.

Following this was a vocal solo by Miss Harmor of Bisbee. Miss Harmor's voice was in excellent training and control, and that it was enjoyed by the audience was amply proven by the applause which she received.

Miss A. Smyser of the public schools of Flagstaff gave an extremely interesting account of the "Indianapolis School System."

The work was then brought to a close by Superintendent Ruthrauff's discussion of 'Heredity and Environment as Factors in Education," in which Mr. Ruthrauff showed a thorough knowledge of his subject.

THIRD DAY.

A. H. Wagner of Douglas gave a paper on "The Value of Drawing in the Public Schools," and it was discussed by W. J. Anderson of the Tempe Normal.

County Superintendent William A. Moody of Graham gave a discussion on "What Can a County Superintendent Do to Help the Country Schools?" Mr. Moody's speech will appear in a later issue.

J. B. Jolly of Prescott said Yavapai paid better wages to school teachers than any other county. He said that the wages of country teachers should

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Student—"Hello, St. Peter! I want in."

St. P.—"Hast performed all duties mentioned in the curriculum of Normal?"

Student—"Yes."

St. P.—"Did'st subscribe for the 'Normal Student'?"

Student—"No, I read the other fellow's."

St. P.—"Go below!"—Ex.

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be raised. F. S. Hafford, A. H. Fulton and J. A. Rockefeller spoke on the question, after which there was fifteen minutes' recess.

After recess, Mr. Todd led in singing "Annie Laurie."

President R. C. Babcock spoke of the necessity of county superintendents visiting schools. "He should be a walking clearing house of information," said Mr. Babcock.

Dr. Babcock next proceeded with his subject, "Inspiration vs. Drill." His paper will appear in a later issue.

Drill is the application of necessary information, not always agreeable.

Inspiration is sympathy, knowledge and adaptability.

Mr. Matthews appointed the following persons to arrange a program for an educational exhibit for fair week, 1907: Primary, Miss Smyser, Flagstaff; grammar, Superintendent Berner, Tombstone; high school, Mr. Blount, Phoenix; manual training, Mr. Clark, Tempe; domestic science, Miss Baker, Phoenix; drawing, Mr. Wagner, Bisbee.

Superintendent Phillbrook of Bisbee talked about "Problems of a Teacher and Superintendent in a Mining Camp."

He said they had all the other teachers' problems and more, too, in a mining camp. In a later issue we shall have the pleasure of publishing Mr. Phillbrook's address.

Geo. E. Kimball of Bisbee gave a paper on "Music as an Aid to Other Studies," which will appear very soon in our columns.

FOURTH DAY.

The first thing Friday morning, the 16th, was an interesting article by F. S. Hafford of Kingman on "Mushrooms and Toadstools."

Dr. Van Liew spoke on "Teaching the Art of Study." He said in part:

"In teaching the art of study, teach the habit of thought. The spirit of searching for the reason why should animate the child at every turn.

Too long lessons are especially harmful, making the pupil's work merely mechanical. The pupil should be taught how to select and reject from the abundance of material in the school library.

"The selection should be made along along some topic in study. The phase of typical work should be required from the pupil.

It is a common mistake to stay after school to study.

"The period of rest should be observed."

Dr. Van Liew was requested by the association to talk on "The Double Mission of the School."

He said that if he did, he should have to go after his notes.

While Dr. Van Liew was after his notes, B. D. Billinghurst of Prescott read a paper on "The Business of School Supervision." He said that a school man was either a missionary or a fool. That the rewards were not adequate for men to engage in the business, and that three years was the average time that they remained therein. The whole paper was so interesting that in a later issue it will appear in these columns in full. After a recess of fifteen minutes, the secretary announced that during the meeting of the association 395 teachers had registered.

J. Oscar Mullen of Tempe then discussed the "Business of School Supervision." He found nothing with which to disagree in the paper of Mr. Billinghurst, but discussed the question more from the standpoint of the little principal than the big superintendent.

Dr. Van Liew next gave his talk on "The Double Mission of the School."

He said that the mission of manual training was not to make carpenters, but that there was a moral value in confidence and ability to use certain tools.

J. F. Stillwell of Phoenix next read a paper on "Teachers' Salaries." He produced United States statistics to show that teachers are the most poorly paid of all laborers in the country.

He said that male teachers in the United States get an average of $1.69 per day, and female teachers an average of $1.41 per day. Oother male laborers get an average of $3.50 per day, and female laborers get an average of a little more than $2.00 per day.

He said that the average annual amount paid to each teacher was greater in Great Britain, Germany, Austria and Holland than in the United States.

The United States, in fact, exceeded only one great country, France.

The average annual amount paid to each teacher in Great Britain was $520, while in the United States it was only $312.44.

Other advantages are offered in European countries, viz., permanent tenure of office, old age pensions and free house rent.

Mr. Stillwell showed conclusively that teachers in the United States are the most poorly paid of all.

He gave a schedule which showed that a teacher's necessary expenses for a year usually exceeded her salary "Why, then," said Mr. Stillwell, "are the young ladies still in the profession? In most cases it is because they use their salaries for spending money, and their parents pay the balance.

"Some work during the summer and come back to their schools in the fall physical wrecks."

Mr. J. W. Brown of Snowflake, in discussing the salary question, said he hoped that every teacher would be paid enough salary so that she could attend the Teachers' Association each year.

He said that there was a bright side to the profession, that he had never met a fool in it, and that if we could get through without going to the poorhouse, we ought to feel gratified.

There was a general discussion on salaries.

President Scudder then spoke of the satisfaction which he felt with the association, and he thanked the teachers for the help which they had given all along the line.

Professor A. J. Matthews reported $321.73 in the treasury.

Mr. Berner of the Auditing Committee reported that they had found the treasurer's report correct.

Superintendent Phillbrook read the report of the Committee on Resolutions.

A. H. McClure of Yuma proposed an amendment that, "In the constitution where it read 'Teachers' Association,' it be changed to read 'Educational Association.'"

He was declared out of order by the president, and then gave notice that on the second day of the next annual meeting he would introduce the amendment.

The resolutions were then carried unanimously.

The Committee on Legislation gave a report which was adopted, after considerable debate.

The discussion brought out the fact that the supervisors are responsible for the lack of school funds in the territory.

Mr. Billinghurst said that Yavapai gave plenty, but no other county was so fortunate.

Mr. Matthews said that the power to say how much tax should be levied for school purposes should be in the hands of the school superintendent, and not the supervisor's.

Mr. Phillbrook said that the law said that not less than 50 nor more than 90 cents on the $100 should be levied, but that supervisors had violated the law, and only levied 17 cents. It was necessary to levy a special tax for school purposes. Maricopa county gives 57 1-2 cents.

Superintendent Fulton thought that if we importuned the legislature on this question, it would enact some law worse than we already have.

Phoenix was chosen as the place of the next annual meeting, and Fair week the time.

The officers elected for the ensuing year were:

President—C. F. Phillbrook, Bisbee.

Treasurer—J. E. Berner, Tombstone.

Secretary—Miss Carrie Johnson, Phoenix.

It was moved and carried that the association extend a vote of thanks to President Scudder for the able manner in which he presided over the meetings of the association; and to Miss Ashhurst for her competent services as secretary during the meetings.

A motion was introduced by Mr. Stillwell and carried, that hereafter the meetings of the association open with prayer by some chaplain or minister. At 1 p. m., B. H. Scudder said, "That is all," and the fifteenth annual meeting of the Arizona Teachers' Association was a matter of history.

J. OSCAR MULLEN.

SCHOOL ORGANIZATIONS.

Philomathian Society.

Officers for the first quarter, 1906:

President.....Will Anderson
Vice-President.....Halbert Miller
Secretary.....Marjory Leavell
Treasurer.....Le Roy Stewart
Sergeant-at-Arms.....Clyde Miller

Editors:

Tom Higley. Francelle Pomeroy. Frank Czarnowski.

Olympian Society.

Officers for first quarter, 1906:

President.....Art Millet
Vice-President.....Georgia Quinn
Secretary.....Johnnie Hazelwood
Treasurer.....Doctor Jones
Sergeant-at-Arms.....Frank Parry

Alpha Society.

Officers:

President.....Sam Shrigley
Vice-President.....Mabel Davis
Secretary.....Ruth McComas
Treasurer.....Mary Corbell
Sergeant-at-Arms.....Jesse Clifford

Athenian Debating Club.

Officers:

President.....Hubbard Moeur
Vice-President.....Le Roy Stewart
Secretary.....Maurice Blome
Treasurer.....John Dykes
Sergeant-at-Arms.....Leo Hibbert

Y. W. C. A.

President.....Helen Blome
Vice-President..Mildred Eichenberger
Treasurer.....Ollie Barkley
Secretary.....Mary Leavell

Meetings are held every Monday afternoon in the Baptist Church from 4:20 to 5:00; Bible study from 5:00 to 5:30. All young ladies of the school are cordially invited.

Basketball Club.

President.....Ruth Webb
Vice-President.....Ethel Armitage
Secretary.....Jennie Devore
Treasurer.....Gertrude Potts
Manager.....Jay Webb

Tennis Club.

President.....Genevieve Hubbard
Secretary-Treasurer....Josie Critchley
Manager.....F. M. Czarnowski

Normal Cadet Company.

Officers and non-commissioned officers:

Captain.....F. M. Irish
First Lieutenant.....Fred Holmes
Second Lieutenant.....Frank Miller
First Sergeant.....Halbert Miller
Second Sergeant.....Arttie Millett
Third Sergeant.....Le Roy Stewart
Fourth Sergeant.....Doctor Jones
Fifth Sergeant.....Hubbard Moeur
Sixth Sergeant.....Jay Webb
Corporal.....John Dykes
Corporal.....Will Anderson
Corporal.....Virgil King
Corporal.....Leo Hibbert
Corporal.....Tom Higley
Musicians.....W. Fellows, Earl Moss

Baseball Club.

Captain.....John Dykes
Manager.....Halbert Miller

Amusement Club.

President.....Tom Higley
Secretary.....Leo Hibbert
Treasurer.....Jay Webb

SOCIETY PROGRAMMES.

Olympian, Nov. 21.

Philomathian, Nov. 21.

Song, page 4.....Society
Recitation.....Ulah Hudlow
Solo.....L. Czarnowski
Reading.....E. Jones
Quartette.....Girls
Current events.
Exponent.....Editors

Alpha, Nov. 21.

Piano solo.....R. Lukin
Reading.....P. Forsee
Recitation.....E. Gregg
Solo.....F. Miller
Recitation.....A. Curry
Recitation.....W. Fellows
Solo.....Mr. Webb

CHURCH NOTICES.

Methodist Episcopal Church, Rev. Wilbur Fisk, pastor—Sunday school, 10 a. m.; public worship, 11 a. m. and 7:30 p. m.; Epworth League, 6:45 p. m.; prayer meeting, Wednesday, 7:30 p. m.

Baptist Church, J. C. Chapin, pastor—Sunday school at 10, R. A. Winters, superintendent; Young People's Bible Class, taught by the pastor; morning worship at 11; Young People's meeting and evening worship at 7. All welcome.

Congregational Church, T. F. Bolger, pastor—Sunday school at 10 a. m. sharp, G. D. Buck, superintendent; morning worship at 11 o'clock; Christian Endeavor at 6:45 p. m.; evening preaching service at 7:30. For the benefit of the Normal students the hour after Christian Endeavor service has been changed from 6:30 to 6:45. It is hoped that many will attend.

THE NUMBER CONCEPT.

(Continued from First Page.)

ject to attempting its solution because he has "never had one like it." Show him that it is like those on page 166, and he will examine the model solution on that page and then quickly give you the solution. He solves long lists of examples from model solutions given in the text. It is needless to remark that such work is almost if not entirely worthless. There is no thinking the arithmetic in such exercises.

While it is true that many of the pupils in passing through the grades acquire a more or less adequate number concept, yet a large per cent do not obtain that knowledge of number necessary to accurate and thorough work.

The necessity of using concrete representation to bring number and number relations before the child's mind is almost universally conceded. In the language of another writer: "Apprehension by the senses supplies directly or indirectly the material of all human knowledge, or at least the stimulus necessary to develop every unborn faculty of mind. The product of the senses, especially sight, hearing, and touch from the basis of all the thought processes." Therefore it is necessary to bring the primary number facts before the mind through the senses. But at this point we must recognize that after all the number concept is not a quality belonging to objects but that it is a mind product. It is produced by mind activity. There is danger that objects will be observed and "vague percepts" taken for "definite numerical concepts," thus treating number as if it were "an inherent property of things themselves, simply waiting for the mind to grasp it, to abstract it from the things." McLellan and Dewey, in their book entitled "The Psychology of Number," say: "Numerical ideas can be fomally acquired and numerical operations fully mastered only by arrangement of things, that is, by certain acts of mental construction. It is not the mere perception of things that gives us the idea, but the employ of things in a constructive way.". It is the definite relations existing between magnitudes established by means of concrete representation that leads the pupil to conceive the relations of quantities which cannot be brought within the range of perception. There are comparatively few ratios that we actually see, but the mind stimulated by those we do see builds the science of mathematics. The idea of number is not conceived in its completeness instantly, but is a product of prolonged mind activity. The child begins the development of this concept by the observance of the existence of one as distinguished from more than one, that this object is larger than that, or that this one is longer than that, and later he estimates that his is twice as long as that. The more exact and difficult comparisons following the simpler ones.

The successful teacher makes careful study of mind processes and endeavors to follow along lines of rational and clear development. In the language of Mr. Frank Hall: "The arithmetical instruction must be enriched by leading the pupil to see through the symbols to that for which the symbols stand, using the symbols to express thought. Thinking is discerning relation. In mathematics the things related are magnitudes; leave these out—juggle with mere figures—and the subject is impoverished; put them in, and the subject is enriched."

The symbols employed in arithmetics are (plus) (minus), etc., to indicate operations and relations, and the words one, two, three, etc., also the figures, 1, 2, 3, etc., to represent numbers. When the child has gained the ideas for which these symbols stand he may use them intelligently. But the thing symbolized should be in the child's consciousness. Since it is true that the number concept is a matter of growth, it follows that we are not to wait until the child fully appreciates all that is connected with quantity or quantitative relation before he uses symbols for their representation, but he must know enough so that he is aware that the symbols represent something real. "The subject of arithmetic will be greatly enriched when the number symbols bring into the consciousness of the pupil their true and appropriate content."

The work is incompiete until the pupil is led to free the mind from the concrete and the particulars. To see magnitude and magnitude relation apart from particular objects must be done by the pupil before he has adequate conception of number. He may be led to do this by having him see that magnitudes vary in size. X will be seen to be twice as great as Y, also that the relation between a third quantity and a fourth is 2. He is led to compare a 6 with a 12, a 1-4 with a 1-2, etc. Through many experiences he becomes able to "dissociate" the relation from the thing, and thus the principle of ratio is developed. This is a necessary part of the number concept. A correct number concept embodies a knowledge of number as the expression of a magnitude and also as an expression of ratio between magnitudes. If we can so lead our pupils that they may know which of these is expressed in given number relations and can approach an arithmetical question in the light of a clear concept of number, we shall give them strength to think arithmetic and render them independent in investigation. But on the other hand, if we give them merely the capability to obtain answers when number symbols are presented, we have rendered them dependent and incapable of real arithmetical work.

Herein then is the true teacher successful. She does not fail to have imaged in the child's mind the truth she wishes to teach, and she tests as to the correctness and clearness of the image by requiring the use of the same truth without the presence of objects to represent it. She carefully discovers whether her pupils answer by word memory or whether from the image relations. If she discovers failure to sense the magnitudes, she quickly brings before her class some object or device that will adequately represent to the mind the facts under consideration. She has her pupils see not so much the qualities belonging to the objects as the quantities and relations represented. She again removes the objects and tests for the facts of number in the consciousness of her pupils. She knows that she may remove the objects too soon or that she may keep them before her class too long. She seeks for results other than mere answers to number combinations that may be under consideration. She "goes behind the returns" and discovers the mental processes that are taking place. Without entering into a discussion of methods by which the desired ends are to be attained, will suggest that an application of Grube's First Principle, i. e., the analysis of all numbers up to 100, will be found very beneficial. This analysis may be made very helpful in development of the concept of number and at the same time furnish to the student the "memory stuff" so much needed in future work. It may not be practical to give a thorough study of every number to 100 in all schools, but there must be sufficient analysis and drill work to make pupils familiar with common and frequent combination of numbers.

Clear conceptions of operations must be secured and vivid images of numbers and their relations must be ingrained by often repeating the same work, which may be given in new forms, and by new representation. Much drill and review are always in order.

The clear understanding of work is not to be confined to the first few years of work, but it is to begin these, and "so continue to the end." Every process must be worked out by the pupil, every step taken must be seen in its relation to other steps. At present there is too much being done by direction of the teacher or by models and rules furnished by a text-book. Let me illustrate: A pupil is being taught to multiply by a multiplier greater than 12. He is shown where to write the partial products, how to get them, and how to add them. He is told that the sum is the product sought. By drill he becomes able to apply this form of operation to other numbers, and so he learns to multiply in an arbitrary and not altogether satisfactory manner. He does not know the reason for writing the "right hand" figure of a partial product under the figure by which he multiplies, and he does not know why by adding the partial product that the complete product is obtained. It may not be necessary to his getting correct results in multiplication that he should know why. But it is necessary that he knows the reason for every step that he may be and that he may know he is master of the work he is doing. It is necessary for him to know the reason for every step that he may be a thinker of arithmteic and not a blind juggler with forms and symbols.

Rules for operations should not be given, but number relations must be discovered by the pupil, and the form and method of operation be a result of his investigation.

The solution of problems is merely the perception of relations, and the understanding of these relations is not brought about by rules and formulas. Insight into mathematics gives power to see relations of magnitudes and leads to free and rational expression, independent of formula and rules.

As advancement is being made into the work, the various parts of the subjects should be so presented that the pupils recognizes the continuity of the subject. It is unfortunate that many of our text-books emphasize by such marked headings and divisions parts subject so closely connected that very little can be found in one that is not also found in the other—often not a single new fact of pure arithmetic. But the pupil has the idea that in each part of the text-book he studies there is something new, when in fact there are only new names for old quantities and old relations. It is worth while to distinguish between pure arithmetic and applied arithmetic. Lead your students to see that a method in partial payments, or that the term premium, policyholder, principal, etc., have nothing to do with pure arithmetic save as pure arithmetic is applied to questions that arise in the business world for solution. That these are arbitrary terms, but that mathematical principles are independent of arbitrary ruling.

If students are led from the beginning to the end of the course in arithmetic so that they understand each step as it is being taken, and coupled with this there is that review and drill in the simpler and concrete problems, they will become thinkers, and "not parrots repeating other men's reasons."

MY FAVORITE TREE.

By Pearl Crook, '10.

(Note: Best second-year paper for the week.)

In the heart of the deep, cool wood, near a spring of the coldest and sweetest water I have ever tasted, stands my favorite tree, a giant oak, with luxuriant wild-grape vines clambering over it. As a child, many a happy hour have I passed in the dear old grape-vine swing that hangs from the sturdy branches of "my tree."

In winter, the spring is frozen over, the snow lies deep about the foot of the old oak, the branches are bare, the grape vine lies along its trunk and far up among the branches, resembling the grayish-brown coils of an immense serpent.

But in summer—ah! then "my tree" is indeed a source of delight! What a joy to lie on the mossy bed beneath the wide-spreading branches and dream away the long, bright afternoon, or sit in the rustic seat I have made for myself out of smooth, white stones brought from the creek nearby, and read, write or sew, while I listen to the myriad of soft and tender voices.

When Master Autumn comes, with his wealth of color, turning the leaves of "my tree" to brown, crimson, and yellow, and purpling the fruit on the wild grape-vines, then is this sylvan retreat of mine doubly dear, for I know that soon again King Winter will spread his mantle of ice and snow on the earth and that no more until spring comes, with its opening buds and nesting birds, may I idle and dream beneath the protecting branches of "my favorite tree."

THE POPLARS.

(Note: Best first-year paper for the week. Paragraph development by comparison.)

On each side of the old country road is a long row of poplars. They remind one of an army marching double file to defend their country from an invasion of the oaks or elms. They march on either side of the road as if they were guarding it. On and on they seem to stretch, file after file, with their endless tread. Perhaps you stop your buggy to pick a wildflower: behold! the soldiers have stopped also and are presenting arms. You climb in and proceed; they, too, proceed, but still in the opposite direction from that in which you travel. Here marches an old veteran, and there a raw recruit, and at intervals come taller trees whose height proclaim them to be officers of varying degrees. On your return trip they appear to be returning victorious, for their heads are proudly erect, and they are marching faster (although it may be only the horse's impatience to get home that makes them move so swiftly).

CARROLL BELKNAP, '11.