The late Chamber of Deputies, Paris, voted a million francs to be used in making small sizes, but exact models of the rifles used in the army. Three of these are to be placed in the care of each teacher of public schools, October, '81, by the departmental inspector, two of them for practice in the use of the arm, and one, which readily demounts, to show the construction and needful care. Happy we, with no neighbors to make us afraid, but free to use all our energies for the good of our race—for the abundant supply of food, clothing and comfort, and for the sanitary saving of health and life—instead of spending our time and means in studying the ways of destruction.

The Congress of Electricians, which has held several sessions during the Exposition in Paris, voted unanimously in favor of a resolution charging the International Committee on the study of terrestrial currents and atmospheric electricity to report on the practical value of the system proposed for sending automatically a continuous register of meteorological movements and change to distant stations. It is thought that this will lead to a far more exact and intimate knowledge of the laws of weather changes, and to the early establishment of lines of telegraph devoted to meteorological interest and continuously conveying to a central station complete information as to the extent and rapidity of every change.

Magazine für Stenographic, of Berlin, states, in its September number, that the Daployan stenography is used now in more than 4000 of the primary schools of France, as a means of dictation of spelling and language lessons. Children learn the signs readily, with the common letters, and then read from them with ease, as they are phonetic. Its use for dictation gives the pupils any desired time to write out the copy in current spelling, with all the proper orderings of the sentence, yet takes no time from the teacher. The same paper states that a French adaptation of the Pitman phonography by Barre was lately extolled highly, in a leading article in Le Petit Journal, a paper which has 600,000 subscribers; and that M. Daploye says that he was asked 3000 francs for the insertion in it of a paragraph condemning his system. He proposes publishing a political daily paper in his character, now that the press is freed. Quite a number of small monthlys are printed in the Daployan alphabet.

While it is true that there are myriads of incompetent school teachers in the common schools of this country, it is certainly true that the proportion of fairly educated and trained teachers is continually growing. It would afford us great gratification to be as certain that the ratio of qualified school directors and members of municipal boards of education is increasing with equal rapidity. But the fact is that the average school director is as far behind the demands of the schools of the present time as his predecessor of a half century ago was behind the common schools of his day: The office is given to the heavy tax-payer, to curry favor with him and his class, or to some member of the board of managers of the political machine, or for almost any reason but the only one which should control the selection of such officers—his fitness for the place. The first of the census bulletins giving full statistics of the public schools and illiteracy for any of the states, which has come to our hands, is that for Maryland. Here it appears that out of a total of 3.092 teachers (white and colored), the number educated at high schools or academies was 1.785; the number educated at normal schools, 424; and the number educated at universities and colleges, 213. This indicates a great improvement during the last ten years. Then, a much larger proportion of the teachers were possessed of no preparation for their work but such as they had picked up in the country schools, by watching preceptors whose preparations had been absorbed in the same way, the traditional sort, handed down from generation to generation through a long succession of back-woods pedagogues. Some of that class of instructors, men of large brains, quick perceptions, and careful self-culture, were grand teachers, but for every one of whom this could be said there were a score of thorough incompetents. The day for this sort of teachers is declining towards its sunsetting. The universities and colleges, normal schools and academies, and the many excellent public schools themselves, are raising up an improved class of teachers, but what is being done to improve the caliber and quality of school boards? We are sorry to say—nothing. The law requires nothing, and the politicians and careless parents and tax-payers in general seldom show any disposition to go beyond the law. Is it not time to move for a proper law touching this matter? Why not do so this winter in states which hold legislative sessions? This is a question which calls for an early answer.

Teachers who are sometimes at a loss for good subjects for pupils' compositions, or for good and easily obtainable object-lesson material, should have Professor W. J. Beal's lecture on the Best Method of Teaching. It is printed in the Transactions of the 39th annual meeting of the Michigan State Teachers' Association, or probably may be had for forwarded stamps, from the author, (chair of Botany, Agri. College, Lansing, Mich.) in a pamphlet of sixteen pages. Its method is that of Agassiz; objects are studied before their book description. Each pupil of a class, having the same given part of a plant or a tree, studies it at the desk; and leaving it there when the class is called before the teacher, tells what has been discovered. Note is made of every visible feature, however minute; and in case of disagreement there is further
study, and exhibition of proofs at the next recitation. Books are referred to later, as a dictionary may be, and thus 'become interesting accordingly. As examples of matter for composition, two branches, or leaves or flowers of different plants, contrasted, make fertile subjects; and all these exercises induce and encourage habits of close observation and pleasing and loving companionship of nature. The almost boundless field of useful exercise and knowledge supplied by the vegetable kingdom, everywhere at hand around us, will be seen on a mere glance through Prof. Beal's valuable pamphlet.

Robert C. Winthrop, in his oration at the Yorktown Centennial celebration, spoke sharply of the needs of education of the country, and especially of the South, drawn from his experience of fourteen years in the administration of the Peabody fund. "Slavery," he declares, "is but half abolished, emancipation is but half completed, while millions of free men with votes in their hands are left without education." Here, here, is our greatest danger for the future. The words of our late lamented President, in his inaugural, come to us today with redoubled emphasis from that unloosed grave on the lake: "All the constitutional power of the Nation, and of the States, and all the volunteer forces of the people, should be summoned to meet this danger, by the saving influence of universal education." The great trust with which he has been associated has been insufficient to this work.

"It has been thus far as a voice crying in the wilderness—calling on the people of the South to undertake the great work for themselves, and preparing the way for its successful prosecution. It may be looked back upon, one of these days, if not now, as the little leaven which has leavened the whole lump. But the whole lump must be kneaded and molded, and worked over, with unceasing activity and energy, by every town, village, and district, for itself, or there will be not sufficient bread for the hungry and famished masses. And there must be aids and appropriations and endowments, by cities and States, and by the Nation at large, through its public lands, if in no other way, and to an amount compared with which the gift of George Peabody is insignificant as it was for an individual benefactor—is but the small dust of the balance."

ON THE GRADED SYSTEM.

BY MARION.

[Judges are not always just, even when they intend to be so. The one whose criticism of the graded school system forms the staple part of the following contribution to The Weekly, will find many teachers who sympathize with him in some of his complaints against a rigid graded system, but who will repel some of his charges with a feeling of indignation. This feeling will not prevent the most thoughtful of them from giving proper consideration to his best thoughts. Ed.]

There has been complaint for some years, and it is now growing louder and more emphatic, concerning the graded system of our public schools. It is not the ignorant portion of the community who make these complaints, not the hod-carriers and day laborers, it is those citizens whose standing in the community gives them the best right to criticize, and whose culture undoubtedly gives them the clearest vision in perceiving just objects of criticism.

Said a gentleman to us, the other day, an honored member of the bench, a fine scholar, and an ardent supporter of the public schools:

"I must put my boy into a private school. I have become convinced that there is no other way."

"Why, how is this?" we asked.

"We thought the public schools of H—were admirable."

"Admirable! Oh, yes! no doubt of that. Carefully graded, thoroughly superintended, and all that sort of thing. But my boy has wasted as much time in them already as he can afford to spare."

"Wasted time? How?"

"How? I am sure I do not know how they manage it, but the slow pace at which the pupils advance is something phenomenal. This is because of the very carefully graded system, I suppose. So much time in each grade. Why, my Johnny has been two years in the B—school, and all he has learned there in that time I could have taught him at home in six months, if I could have undertaken the work. So I have decided to send him to Prof N—'s school, this fall. He must go to college some day. I should like to live to see him enter, if not to see him graduate. If I kept him in the public school, I should probably do neither. But Prof N thinks he can prepare him in two years."

"It is all wrong," went on our friend, impetuously, "this rigid, iron-bound system of grades. No child must move faster than his grade. Oh, no! and the pace for the grade is adjusted to suit the movements of the lamest, laziest tortoise—not that is in it now, but that might by some unfortunate circumstance be found in it at some time. I have seen a whole roomful of bright boys and girls kept dilly-dallying over a few pages in percentage, week after week, because, forsooth, they must not exceed the limit of their grade! And there was not one in the room who might not go over four times the work allotted in the given time. It was just the ruin of the children. They had not enough to occupy their minds, and no incentive to put forth their best powers, and so they grew idle and indifferent. Some one thought that President Eliot used too hard labor when he called the public school the 'graveyard of genius,' but I am not sure that the remark is not justified. Nothing could so effectively destroy that eager habit of mind which belongs to all those bright ones that we call geniuses, as this wooden system. The thing is like the thirst for liquor, it is but increased with the deeper draughts that are quaffed. Cut the allowance down to a few drops per day, and the desire for it soon vanishes. The foundation assumption of the whole graded system is that the standard is the safest. But this assumption, I take it, may not only be doubted, but disproved. The low standard is neither safe nor wise. It is a foe to scholarship, a perpetual bar in the road to culture. The highest standard will be reached by all, of course, but many will strike it, and all, remember, will strike a point above the mediocre level. I know there is harm done by attempting too much, but where little is attempted only a little is ever performed. I have heard a complaint made of overworked pupils in our public schools. There may be cities where an undue amount of work is required of the children, but I do not know where it is. My boys and girls have never had enough to do, since they left the primary grade, to keep them out of mischief when in the schoolroom; certainly not when out of it. Little children should never be obliged to study out of school-hours, but outside study is good for the older ones, keeps them from growing restless in the evenings and wanting to run about town. Just think of it! my sturdy boy of fifteen comes home evening after evening, throws his books under the table, and plays dominoes for four hours at a stretch. Not that there is any harm in dominos, I do not want to quarrel with my boy's pastime; I had no doubt I should be thankful that he chooses so harmless a sort, but I do hate to see him wasting thus the best study-time that he will ever know. When I was his age, I worked on the farm all day, and in the evening, after the wood and water had been brought in, the kindling chopped, and all the house-chores were done, what a precious hour was that, spent in working out the problems in old Davoll, by the light of pine knots! What would I not have given for the advantages my boy has had from his very babyhood, without understanding or caring for them! No doubt you will say that the boy would be better for a little healthy deprivation, and so he would—so he would. Here is our error, that parents and teachers alike make the world too easy for boys and girls. And an easy world is a very pleasant place for boys and girls, no doubt, but it is not a good place wherein to make men and women of them. The best plants do not always grow in the richest soil."
JENNY LIND'S SECRET OF SUCCESS.

In a very interesting paper lately contributed to "Scribner's Magazine" by Sir Julius Benedict, concerning the life and talents of Jenny Lind, there is an incident related that contains a lesson for every worker. In all her singing, whether of the most difficult classical music or the lightest aria, she always required of herself the highest standard. Her devotion to her art would not allow her to sing at all unless she sang at her best. Is not this the secret of her almost matchless success in the divine art, and would not a similar resolution to give the world only the best at his command make life in any vocation—more especially a teacher—a grand success?

Here is the incident:

"I remember that at a concert at Natchez, on the Mississippi, when the steamer stopped to take fuel, she sang before an audience of about a thousand persons, composed of a small number of planters and their families, the great bulk being colored people. There, as in another small place, Memphis, and at the unusual hour of eleven o'clock in the morning, she executed her solos with a finish and perfection which would have astonished the frequenters of Her Majesty's Theatre, in London, or the Académie de Musique, in Paris. When I complimented her and expressed my surprise that before so many who probably heard for the first time an artist of her renown, and would have been satisfied with even an ordinary performance, she should have taken so much pains to do her very best, she replied: 'I value my art much too highly to degrade it, even occasionally, by any willful disregard of what I consider due to it.'"

JOHN ADAMS AS A PEDAGOGUE.

WORCESTER, Mass., October 19, 1881.—While the rest of the country has been agog over the transactions at Yorktown, this city has been having a quiet celebration of its own. It seems that, more than a hundred years ago, John Adams, afterward second president of the United States, taught school in this place, and the 19th of October being his birthday as well as the anniversary of Cornwallis' surrender, it was deemed the appropriate thing to present an oil painting of the old patriot to the High School. During the summer, E. T. Billings, a Boston artist, made an excellent copy of the painting by Stewart, of the ex-president, the same being in the possession of the Adams family in Quincy. All who have seen the copy give it the highest praise, claiming that Mr. Billings has done the subject great justice. This work was paid for by several of the public-spirited citizens of Worcester, who always stand ready to help forward such a cause. The following are, in brief, some of the interesting features in the career of Adams. When, at the age of twenty, he graduated from Harvard, in 1755, he attracted the attention of Thaddeus McCarty, the pastor of the First Parish, and by him was interviewed in reference to assuming the headship of the Latin Grammar School. This interview seemed to be satisfactory, for in a short time afterward a man rode into the town of Braintree, leading an extra horse, on which the future president made the trip to Worcester, distant about fifty miles. He immediately began his school, and it would seem that he taught without any vacation, and for a salary not exceeding $150 per annum. The peculiarities of the coming statesman even then began to develop themselves, and he was, by turns, placid and irascible, taciturn and talkative. Until one year ago, the building in which his school was taught stood on one of our side streets; but not one in a hundred who passed it by had any idea of the illustrious personage who once ruled there supreme. For three years he was the only teacher; but as his school was studying law during two of them, it may be feared that Latin grammar sometimes suffered for Coke and Lyttleton. At any rate I have heard it said that the years spent here were the least meritorious in his life. The day he was admitted to the Bar he ceased to teach, going hence to his old home, where he speedily married, and entered upon that course which resulted in his high position, and think it their high happiness and pride to see the generous boys and girls who more than any inspired his pupils, and who more than any inspired him to counsel them; that the gratitude of the community, which has been apparent in the interest shown in the public school system, is only a fragment of the true story of the system, and that all who have the power of instructing the masses in the ways of thinking and doing, who will find the true road to happiness in the service of their fellow men, and who will make the world better known to each other, will realize this fact.

CEDARS OF LEBANON,

that he very much feared in so doing he would reduce himself to a sickly shrub. But such was his discontented nature that in after years he was found saying for the quiet and rest of his Worcester schoolroom. Old people here are wont to tell the story, that he was examined for a license to teach, and was found wanting; but this we may set down as apocryphal. Some idea of this school and his characteristics may be had from the subjoined letter, written to the first Hon. Josiah Quincy:

"Worcester, September 2, 1755.

"Dear Sir: I promised to write you an account of the situation of my mind. The natural strength of my faculties is quite insufficient for the task. Attend, therefore, to the Invocation, O, thou goddess, muse, or whatever is thy name, who inspired immortal Milton's pen with a confusion ten thousand times confounded when describing Satan's voyage through chaos, help me, in the same cragged straits, to sing things contrary to the laws of my country! When the nimble hours have tackled Apollo's courser, and the gay deity mounts the Eastern sky, the gloomy pedagogue arises, shivering and lowering like a black cloud begirded with uncommon wrath, to blast a devoted land. When the destined time arrives, he enters upon action, and, as a haughty monarch ascends his awful, great chair, and dispenses right and justice through his whole empire. His obsequious subjects execute the imperial mandates with cheerfulness, and think it their high happiness to be employed in the service of the Emperor. Sometimes paper, sometimes his pen-knife, now birch, now arithmetic, now a ferrule, then A B C, then scolding, then flatterer, then thwacking calling for the pedagogue's attention. At length, his spirit too exhausted, down comes pedagogue from his throne, and walks out in solemn solemnity through a cringing multitude. In the afternoon he passes through the same dreadful scenes, smokes his pipe, and goes to bed. Yours, JOHN ADAMS.

It is claimed that this is the first letter extant from Adams' pen, and, certainly gives promise of greatness. Thirty-three years after leaving Worcester, he became the successor of Washington in the presidential chair. His great grandson, John Quincy Adams, writing to the school, says: "I know of no honor which would please the heart of John Adams more than if the community which he has served so well, would conceive of it, as such a monument in that place, after such a lapse of time." A crowded room greeted the reception of the picture. Old and young alike rejoiced at the honor done themselves and the stanch old citizen. Readings from his life and letters were given, interspersed with patriotic music by the school, made up the exercises of the day.

SIXTY-SEVEN REFORM SCHOOLS.

THE AMERICAN INDUSTRIAL SCHOOL SYSTEM.

Who says that our public school system does not teach the yeunest youth honest living? True, the boy or girl must first rebel against teachers, parents, and society, play truant, bully, wham, or steal, to gain admission to these schools; but there are the schools, and once inside, there are work-benches, and sewing-machines, and all sorts of means of instructing the inmates in ways of earning a livelihood. "O, if these opportunities were only outside!" exclaim some poor, broken-hearted parents; "if our boys could have enjoyed such instruction before they learned to consort with idle and vicious companions, what misery it might have saved them and us!" But much better it would have been, if the children dwelt in the philanthropist, and ordinary people, with nothing more than common sense to enlighten them, end the chorus with "This is so!" and cannot help wondering why nobody ever thought of it before.

Some people are so dull that they cannot understand that it is easier to get the attention of the American public school system to teach honest boys and girls how to get an honest living and yet remain virtuous. Depend upon it, this is a knotty question. The moment you begin to discuss with a politician, especially if he be a legislator, you realize this fact. When one takes a quiet, common-sense view of the subject, it seems perfectly clear that if the State can teach boys useful trades after it gets them into the public or parochial system, it should find means of teaching them such trades before they have lapsed from virtue. But this is omitting;
Association is wakening the continent from the center to the sea, to the great questions of preventive medicine. Public health officers are wanted by the hundred—trained men full of knowledge and skill to lead the people from pestilence to our numerous cities. Where shall we look for the men of this great public trust except among the graduates of our medical schools? Public good demands that this lack should be met. May I not, therefore, in the name of the great outside population which I represent, cause this plea, ask the medical colleges of our State, this and all others, to add to their chairs, if they have not already done so, call to them for the full and large discussion of sanitation, public and private, shall be heard? Teach it in the common schools. And as all these social progress implies and demands, the progress of the people in some line, may we not ask of the medical profession the voice of their counsels, and the weight of their influences, that the elements of hygiene and of sanitary science shall find their way into all the schools where the children of the people are trained and informed for the duties of their lives?

We can find multitudes of school-boys who can tell us the southermost cape of Kamtschatka, but who cannot tell the place of their own stomachs or livers. They know the heart of the wild African continent, but they know nothing of the structures and functions of their own hearts. This red river of life that courses through our own bodies is wholly unknown to them, but they can tell the river systems that drain the northern seas, and Asia. The knowledge on which their own life and health hang, is not taught them, and the simple sanitary processes which might save health and life are never mentioned. We ask the medical profession to see that these things also go into the schools, that some years are taken off from the study of the everlasting arithmetic, and the almost useless geography, which teaches simply that this insignificant piece of land is there, and another plate is yonder, and that those years are given to studying the world within, the wonderful world of the body, and those laws of life and health which may help them to guard against needless suffering and sickness, and to live safe and strong until nature's forces.

PROFESSORS OF SANITATION.

Hon. John M. Gregory, President of the Illinois State Board of Health, delivered a thoroughly instructive and entertaining address at the opening of the new Haberman College building and Hospital in Chicago. His subject was Sanitation. Among other matters he rebuked the medical colleges for neglecting to establish professorships to expand and enforce the laws of sanitation—to prevent diseases—instead of confining themselves to instruction in the healing art. If he states the facts correctly, and there are few persons more thoroughly well informed in such matters, he has struck a weak spot in the training of the medical colleges of this country. He says:

"We want in this country, and in our medical schools in America, only thirteen included, hygiene in their courses of instruction. How much less is it today? I cannot tell, but I have looked in vain in the announcements of several medical colleges for the lectureship on hygiene, and I do not know if there has been one. But all full course of sanitary science is provided. Boards of health are being organized in most of the States and great cities of our country. A National Board of Health in league with a National Public Health

Mathematical Department.

Editor, David Kirk, Bloomer, Wis.

Problem.

What thickness of slab must be cut from a log 2 ft. in diameter, to take 3/4 of the log.

A solution of this was received last summer from E. Barton Wood, Principal of the Oshkosh High School, but was mislaid at the time. As it is not convenient to give the diagram, an explanation of the same will be given. Draw a circle with horizontal diameter, C F. Parallel to C F and above it, draw the chord B S, which will be the base of the segment cut off.

From O, the center of the circle, draw O D, perpendicular to the diameter and extending to the circumference. Draw the radii, O B and O E. These radii with segments of diameter and perpendiculars between C F and B E, form triangles.

Denote distance between B E and C F by Y. The segments of B E by X; the angle between radius and diameter, by Z°—perimeter.

Now we are prepared to follow Mr. Wood's solution which is as follows:

Since segment B D E, by hypothesis=

\[ TR^2, \text{and } CDF = \frac{1}{2} TR^2 \, \text{BEFC = } \frac{1}{2} TR^2, \text{and since } R = \frac{1}{2} \text{ of } 2536 \text{ sq. ft. Now } BEFC = \text{BOE + two equal sectors, BCO and EOF.} \]

\[ Y \times \sin Z, \text{ and } X = \cos Z. \]

2 sectors, with I Z + \( \sin Z \times \cos Z \) = 1256. If the figure be exact, a protractor will show the angle Z to be nearly 15° 22' and greater than 15° 21 14'. If we take 15° 21 50', two sectors—

\[ TR^2 + \frac{22}{360} \times 1256, \text{ and } \sin Z = \frac{360}{2542} + 1256 + \frac{1}{2} \times 1256 = \frac{5256}{1256} + \frac{1}{2} \times 1256, \]

15° 21 50' is the slab required. 12 inches X 26924 (sin z) = 29794 inches. And 12 inches — 2,979 inches = 9,021 inches, thickness of slab.

Percentage.

The subject of percentage presents no difficulty to those who have been drilled in intellectual arithmetic, but pupils not fortunate enough to have been exercised in arithmetical analysis according to the methods most successfully presented by Warren Colburn, and since improved by Eaton, Walbot, Robinson and many other writers, never, or at least "hardly ever," gain a clear understanding of the various cases in percentage. It is a sad day for a school when intellectual arithmetic, as a separate study, is discarded, on the supposition that the written arithmetic claiming to give both mental and written work will serve the same purpose. Combined arithmetics, like combined reapers and mowers, are not entirely satisfactory.

Suppose we are required to find 5 per cent. of a number. By analysis we say 5 per cent. is \( \frac{1}{20} \), therefore, 5 percent of the number is \( \frac{1}{20} \) of the number, or \( \frac{1}{20} \) of the number. The written rule says, "Multiply the given number by the rate per cent. expressed decimally." Suppose the problem is to find what per cent. 6 is of 36. By analysis we inquire what \( \frac{6}{36} \) is of \( \frac{36}{36} \), first finding what part of \( \frac{36}{36} \) is. Six is \( \frac{1}{6} \) of 36. One-sixth of any thing is \( \frac{1}{6} \) per cent. The written arithmetic says, "Divide the percentage by the base, \&c., which rule pupils may or may not follow."

To find a number, knowing that 10 is 5 per cent. of it, is easy, if we say, "Since 10 is 5 per cent. of a number, 1 per cent. of the number is \( \frac{1}{2} \) of 10 which is 2 and 100 per cent. of the number, or the whole number is 100 times 2, which is 200; therefore 10 is 5 per cent. of 200."

The written arithmetic says, "Divide the percentage by the rate per cent, ex-
pressed declamatory, and the quotative will be the base. The pupil, in intellectual arithmetic analyzes each question, according to its own conditions, without the aid of a special rule; going through a process which in general consists in reasoning from the given numbers to unity, and from unity to the required numbers. The pupil in written arithmetic tries to think of the number of the case under which the example falls, and then he tries to think of the rule, or the algebraic formulas from which the rule is derived. A good treatise on intellectual arithmetic is worth its weight in gold, provided it is placed in the hands of the pupil, and not consigned to dust and darkness in some box or case. Teachers, if you are not familiar with arithmetical analysis, study it at once. If you are not teaching it, commence to-morrow to teach it.

GENERAL NEWS OF THE WEEK.

"A number of ladies who are opposed to combining the temperance movements with the woman suffrage agitation have organized the 'Women's Evangelical Temperance Society.'"

The Russian Government has consented to a reduction of the enormous war indemnity exacted from Turkey by treaty, at the close of the last Turcho-Russian War, but it insists upon its being placed on a footing with the anti-bellum Turkish bonds held by various European bondholders.

The oldest son of Rev. Dr. McCooth, died at Princeton, N. J., last Monday.

The Iron Mountain road has put on a through train from St. Louis to Galveston, to accommodate winter tourists.

Major Younger and Mrs. Regan, uncle and aunt of the Younger brothers, are arranging for an appeal to the legislature of Illinois, at its next session, for the pardon of those notorious desperadoes, who were captured and convicted for robbing a Mississippi bank. Governor Pillsbury refused to exercise clemency, and the pardoning power rests solely with him. The uncle claims that the imprisoned bandits are the last victims of the civil war, driven to lead lives which they hated. It will be hard to satisfy the people of Minnesota that these villains should be released.

The Committee of five appointed by the National Association of Fire Underwriters, at Niagara Falls, to examine the workings of the St. Louis Fire department, have made their report. They severely criticize it, stating that it needs more and better apparatus, more water, and more discipline. In consequence of this report, insurance rates have been advanced for St. Louis.

Sergeant Mason, the man who tried to shoot Guiteau, the assassin, September 11, is to be tried in a few days by court-martial. His counsel is in a plot of insanity for him.

A vein of coal, five feet thick, was struck at Matou, Ill., Saturday, at the depth of 720 feet.

Bellevue, Ill., is panic-stricken over small-pox. Five cases have occurred there in three days.

Dr. Rice of Merton, Wis., has been subpoenaed as a witness in the trial of Guiteau, to testify that he examined him three years ago, and found him suffering from softening of the brain.

The German guests of the Nation, escorted by Mayor Harrison, General Sheridan, and members of the Common Council, were shown the sights of Chicago Monday, concluding with a visit to the Union Stock Yards.

Slowly but surely the aboriginal tenants of the Great West are dying out. The closing payment will be made next month to the Miami Indians, who signed the famous treaty of Ohio and Indiana, who were the first Indians to oppose the settlement of the Northwest territory and who ceded their rights over one portion of territory after another; until all was gone.

We have another example of the looseness of bank examinations: The Mechanics' National bank of Newark, N. J., regarded as the strongest in that city, has suspended payment. At a conference of the directors on Sunday, the cashier, O. L. Baldwin, stated that it would be useless to proceed with business. He states that, in 1873, he began to make loans to C. Nugent & Co., morocco manufacturers, without security or the knowledge of the director, and soon found himself in the power of the firm, who promised to restore all advances and protect him. The loans steadily increased to $2,000,000, which he carried in his statements of account with the Mechanics' bank of New York. The defalcation has, since then, been shown to amount to over $2,600,000.

Chief Justice Hunter, of Utah, has decided that no naturalization has ever been issued to George Q. Cannon in that territory, and that he is not a citizen of the United States.

Telegrams relating to the Garfield monument at Lake View cemetery will be delivered free, by the Western Union Telegraph Company, in any part of the United States, and American Express companies will also gratuitously forward contributions to the fund, from any of their offices.

John Waling, a desperate crank, was at the White House yesterday, with a note for an imaginary person whom he believed to be President. He was armed with a formidable six-shooter, but was arrested before he could get the chance to use it.

The result of the recent elections in Germany has been overwhelmingly liberal, and that in spite of the utmost efforts of the supporters of the government. In the new Reichstag, Bismarck will either have to adopt a liberal policy else bring about a complete standstill in domestic legislation.

The New Orleans Produce Exchange indemnified the action of the Mississippi River Convention, and pledged themselves to continue to advocate the cause until the importance of Mississippi improvement is accorded its just due, not only by the valley but by the entire country.

During October the national debts has been reduced about $1,700,000, making a revalidation for the first four months of the fiscal year $57,000,000.

Irish affairs are still in a unsettled condition. On the one hand the Land Court is overwhelmed with cases, two hundred applications having been made to have farms rents fixed, with the intention of giving the land in a fair trial, and on the other the Land League is in illegal organization and its "two rent" war cry. The London Times editorially advises English landed proprietors to assist the Irish landlords in the emergency which may ensue on the refusal of any considerable numbers to pay rent. This is to be done by the employment of "emergency laborers" to work the farms of evicted tenants. Arrests continue to be made daily, under the coercion act, of the leaders of the league. The police in London prevented a public meeting called by the branch Land League of Great Britain.

In the court of review, at Montreal, under the new electoral act, a judgment for $40,000 was awarded against William Beckett for sitting and voting in the provincial legislature without being legally qualified.

Archbishop McCabe has issued a pastoral denunciation of the no-rent manifesto of the Land league. The governor of Kilmainham jail was suspended for allowing Parnell's letter to get outside the wall. Anthony Mc Hale, a Catholic candidate at Killala, has been arrested for holding a Land league meeting in a chapel.

Three hundred democrats, lately allied to the dynasty, drank toasts on Sunday to the alliance of the democracy with the monarchy under the ægis of liberty. Moret and Gen. Pendegrast, appointed governor of Cuba, exiled King Alfonzo and were loudly applauded.

Many houses in Prague have been searched, and several arrests made, owing to the circulation of socialist pamphlets.

A letter per the Corwin reports very heavy weather in the Arctic sea. The Northerners, while attempting to make a sound landing in Wrangell land, had her rudder disabled, and was obliged to cut away in the breakers to save the ship. On Chamouso island was found an astronomical station bearing the inscription of several British ships, including H. B. M. S. Blossom, 1826; the Herald, 1818. At Elephant Point, nearly the entire skeleton of a mammoth, with the remains of an arm, thigh, and reindeer were found.

STATE NEWS.

ILLINOIS.

Superintendent John T. Ray, of Ogle County, III., has returned with his bride from their wedding tour, and is settled down to county business again. A few extra-wedding weeks of this kind which has brightened Oregon for many a day, so may their union prove to be one of the happiest of marriages, life's journey through, is the sentiment prevalent among Ogle county friends. Few men in that county have so many friends as Superintendent Ray.

Professor O. E. Haven, Superintendent of the Evanston public schools, has been sorely afflicted during the past few months. Soon after the death of his father, Bishop Haven, at Portland, Ore., last summer, he was taken ill with malarial fever, and for a time he was very dangerously sick. Before he had fully recovered, his children began to suffer from malarial fever, and for some days past his oldest daughter has been hovering between life and death. Her life was despaired of at one time, but she is now thought to be improving.

Among the new subjects of Hymen is Miss Emma A. Waggoner, for a time a teacher of the Mt. Morris school, and then assistant of the Adeline School, who is now Mrs. E. M. Lowell, of Lancaster, Wis.

In the list of appropriations asked for next year's expenses of Cook County, there is an item of $375,000 for the Cook County Normal School, and the Superintendent's clerk.

The Inter-Ocean says: "Not until that energetic
Illinoisian, Professor J. H. Ilodge, formerly Superintendent of the West Rockford schools, was made Chief Clerk of this division, scarcely three months ago, had we a small list of graduates in this portion of the census work. Although, for want of further appropriations, the force of the Census Bureau has been largely reduced, yet in the educational division there seems now to be greater progress than ever before.

The members of the Philadelphia Society of the State Normal University, at Normal, has been greatly improved by the laying down of a new Brussels carpet and the addition of three beautiful chandeliers. Chicago University Items—Professor Hough, teacher of astronomy in Chicago University, is fitting up rooms in the university, which he expects to inhabit soon, convenient to the observatory. The professors of the university are being continuously visited through the generosity of Mr. and Mrs. J. F. Gillette.


In the contest to take place at the Normal university, the Philadelphi. Society contestants are: Frank Williams and M. M. Morrison on debate; May F., George F. Anderson on the paper; Mr. George Howell for the oration, and Lida Kelly in instrumental music. The Wrightonian contest ants are: W. J. Watts and John Fleming on debate; Harriet Scott and Malvinna Hodgman on the paper; W. D. Edmunds for the oration, and Sadie A. Noleman in instrumental music.

R. M. Hitch, a candidate for the County Superintendent of Pike County, is one of the three persons in that county who hold State certificates.

Franklin has to have a new school building. The present principal, Mr. R. Richardson, is a graduate of the State Normal University, at Normal.

Michigan

Albion College is in a flourishing condition. A number of students from the hurit district who were in attendance at various colleges and academies of the State, have been forced to abandon their studies, and go to help rebuild their desolated homes.

The new school building at Vassar is an immense improvement on its predecessor.

The State Normal School is prosperous under the superintendence of its present principal. There were fears when the change was made that it might not be for the best. Success is the best panacea for all such natural misgivings, when a new administration is inaugurated.

It is held by the State superintendent that the State Normal Board of Examiners, convenes before Aug. 23, (the date of organization of the county boards of examiners, under the new law,) are valid only until Nov. 23, whatever the grade of such certificates. It is important for teachers to keep this fact in mind, and act accordingly. They should remember, also, that the law requires them to pass examinations in the theory and art of teaching. Books may help them to prepare for this part of their examination, but the law is intended to serve the purpose of testing the teacher's practical acquaintance with the duties of his craft. Under this rule, a teacher may be enabled to pass examinations such as most of the county boards are competent to make in this matter, but where county examiners are thoroughly fitted for their work, they will readily detect the difference between the mere book taught teacher and one of experience and judgment.

The attendance of nonresident pupils in the Flint high schools is 25 per cent. more than it was at this time last year.

Wisconsin

Milwaukee Notes.—On Saturday, Oct. 22, most of the school children of the Milwaukee schools visited the Exposition. They were admitted free, and many little ones were therefore given a treat they had otherwise lost. No visit to this can not fail to act as a powerful assistance to the teacher.

Miss Sarah A. Stewart, well and favorably known to educational people of Wisconsin, late principal of the city Normal School here, has returned from her European tour. Miss Stewart will spend the winter in New York.

Prof. Geo. H. Fowler is the nominee of the Republicans for the position of county superintendent of Milwaukee.

The appointments for the evening schools are not yet known. There is no city in the Union, perhaps, where a greater demand for kindergarten schools exists than in the city of Milwaukee. Largely populated by Germans who send their children to school as soon as they are four years of age, the primary teacher finds on her own hands a class of little ones with whom ordinary primary methods are more or less ineffectual. Again, the theories of the school board assign one teacher to every sixty-four pupils, but the practice of principals often gives a teacher seventy, ninety, and in one or two cases one hundred and twenty little ones, to instruct. For these and other reasons, very poor results have been shown in primary work. A movement is now underway to train kindergarten teachers and establish kindergarten schools in all wards of the city. Under efficient management these schools will fully supply a long-felt want.

Mr. Henry C. Gray, the energetic school commissioner from the twelfth ward, delivered a very interesting lecture on chemistry at the sixth district school. Mr. Gray takes an active interest in educational matters. Popular courses of lectures in the schools originated in his ward; and through his efforts.

Prof. L. Webb, of the seventh district, read an interesting paper before the Fortnightly Club, detailing some defects in our educational system.

The University-Press complains that the University library is closed on Saturdays afternoon, the very time, when students feel most free to use it, without neglecting their regular studies.

The Inter-Ocean says, and The Weekly heartily endorses its sentiments. Professor Graham, nominated by the Republican ticket of Wisconsin, as their candidate for State Superintendent of Public Instruction, has the rare honor of being adopted as the candidate of both other parties. The Professor is certainly eminently qualified for the position. Not only is he a thorough educator, but in the State Normal School service he has proved one of the most popular instructors, both in the recreation room and in the work of county institute conductor, in which capacity he has had years of successful experience. The teachers of the State, without regard to party, may be relied on to cast a solid vote for him.

Miss Lucy E. Foote, of River Falls, has been appointed, by the State Superintendent, a member of the board of visitors to the Platteville Normal school.

The Misses L. D. Harvey, of Sheboygan, A. C. Dodge, of Monroe, and C. D. Tillinghast, of Bloomer, are the board of visitors to the River Falls Normal School.

The freshman class of the University of Wisconsin is larger this year than any former class, and it is said to be unusually well prepared.

John Fisk, of Harvard University, has commenced a series of six lectures at Madison.

Eastern States

The New York State Board of Health has just issued a circular to teachers, calling upon them to give detailed information concerning the sanitary construction and arrangement of the schoolhouses, and the effect upon the pupils' health of existing regulations of study and school discipline. It is now asserted that drawing is to be given up by the Philadelphia public schools, as an utter failure. This is attributed by some to the fact that no special teacher has been employed for the work, and it has been allowed to fall upon teachers who not only had no talent, but not even needed knowledge, for the work. Further, these teachers are already overworked, and have neither time nor desire for this addition to their labors.

Miss Harris, the daughter of the late Secretary of Harvard College, is to have charge of the office of secretary of the university during the coming year.

Smith College, Northampton, Mass., one of the most successful schools in the land for the higher education of women, has now over one hundred students in its freshman class alone.

Lewisburg, Pa., citizens have subscribed $10,000 to secure the location of a university in their city.

The government has a very small quantity of land in Washington, much of it idle and some of it entirely eligible as a site for a congressional library building which it is proposed to erect; but the speculators, of whom there are an abundance at the national capital, have a scheme afoot for the purchase by the government of a $1,500,000 site for this library building, and they are pushing it with an energy which every cause receives where the interests are direct and personal. The probabilities are strong that they will be able to defeat the selection of any site now owned by the United States.

Professor Francis I. Patton, formerly of the Presbyterian Theological Seminary of the Northwest in this city, was duly installed Monday last in the new professorship established in Princeton College, N. J.

At the session of the American Missionary Association at Worcester, Mass., Wednesday, General O. O. Howard spoke of its special needs, and General Armstrong of the Hampton, Va., Institute, and Captain Pratt advocated continuation of the work of educating and evangelizing the Indians. On the subject of Christian education in the South, addresses were made by the Rear. Roy (Atlanta, Ga.), Collins (Cleveland, Ohio), and Professor
Northrup and the Rev. Dr. Braston, of Yale College.

SOUTHERN STATES.

Virginia has now 4,854 public schools, and has gained 15,000 in attendance since last year. She has a school population of 314,372 white and 240,560 colored, and the value of her school property is $1,177,448.6. Her receipts from school taxes this year were $596,515.93. The North Carolina schools cost $352,882.62 last year, and instructed 135,461 white pupils, and 85,125 colored ones. Georgia, with a school population of 433,444, expended $471,029.46. Alabama spent $72,927.59, and instructed 107,285 white, and 72,007 colored children. Mississippi paid $226,000 for the instruction of her 112,904 white, and 132,710 colored pupils. Louisiana spent $226,000 upon her 273,345 pupils, and Texas $171,727 upon her school population—onethird colored—of 266,709. West Virginia has a school revenue of $620,126.46, and a school attendance of 142,850, out of a school population of 213,444.

SCHOOL LAW.

IN IOWA.

Sunday rulings of State Superintendent C. W. Von Coelln:
1. Section 1721, S. L. 1880, requires residence within the district as one of the qualifications of a member or officer of the board. This is reinforced by the following from Dillon's Municipal Corporations, Chapter 59, § 195 (134):

"Residence for a certain period within the municipality is almost invariably required in express terms, as one of the qualifications of the right to vote at elections therein and as one of the conditions of eligibility to hold a municipal office."

2. When it is proposed to issue bonds, under sections 1821 and 1822; chapter 136, laws of 1875; or chapter 1 or 123, laws of 1880, the provisions of law should be carefully complied with, and all requirements, such as notice of meeting, object of the bonds, amount proposed, and form of bond, must be strictly adhered to, since a slight informality, while it may not invalidate the bonds, will often unfavorably affect their sale.

3. It is the presumption of law that when a special meeting of the board is to be held, all the members should be notified. If the vote of an absent member who was not properly notified, might have changed the result, the action taken should not be regarded as a legal one.

4. If a teacher, when contracting, requests a duplicate copy of the contract entered into, he is entitled to receive it. C. W. Von Coelln.

Supt. of Public Instruction. * Des Moines, Oct. 18, 1881.

IN WISCONSIN.

Rulings of State Superintendent W. C. Whitford:
Q. A treasurer of a district was appointed and filed his bond, approved by the clerk only. The director refused to approve the bond, but would give no reason, beyond the one, that he did not want the appointed man to have the office. What is the remedy?
A. A mandamus to compel him to approve the bond or show the cause for not doing it. It is his duty to approve the bond, according to the statute (see sec. 443, R. S.), but if he shall deem the

sureties insufficient, he would probably be justified in refusing, since the same section empowers himself and the clerk to demand an additional bond whenever they deem the first insufficient. No officer has a right to delay or embarrass the public business because of a personal prejudice or pique.

Q. A clerk and treasurer made and signed a contract with a teacher after the treasurer had been appointed, and before he had filed a properly approved bond, and also before the ten days had expired within which he was required by law to file such a bond. Was the contract binding?
A. No. A treasurer is not an officer of the district until his properly approved bond is filed. The election or appointment is only a part of the necessary processes by which he becomes an officer, and the statute must be complied with in every part. Where the statute is explicit upon any matter, there is no correct way but to obey to the very letter.

Q. A district voted at the annual meeting to admit foreign pupils free of tuition. Was it legal?
A. No. The statute authorizes the district to empower the board to admit such pupils, "and to fix a fee for tuition," (see sec. 440, R. S., subdivision 12), which does not enable the district to admit them free. Of course the district may make the fee merely nominal; but if they act at all upon the matter, the only thing they can do is "to fix a fee," which in the very nature of the case must be something "per term, quarter, or year," and not nothing.

Q. A District voted that "higher arithmetic" should not be taught in the school. Was that action legal?
A. No. The statute does not give the district control of that matter. Sec. 447, R. S., provides, that "arithmetic," among other things shall be taught in the common schools, but does not discriminate as to kinds. Sec. 440, R. S., provides that, board under advice from the State superintendent, shall determine "what school and text-books shall be used in the several branches" taught in the school, and that would seem to confer the power to determine whether "higher" or only "practical" arithmetic should be taught.

Q. Can the district or board admit pupils to the schools who are under four years of age?
A. The constitution fixes the school age of children, and the statute empowers the district to authorize the board to admit pupils over twenty years of age, and says nothing about children under four years of age. It must be held that the admission of such children to the privilege of a school is without warrant of law.

Q. "Can a county superintendent grant a certificate to a former holder of his certificate regularly granted, without re-examination?"
A. No. The holder of a certificate, must be considered an "applicant for a certificate" in the same sense as any other person, and the statute makes no exception in his favor, and makes no provision for the granting of certificates except upon examination.

In the University of Vienna, Austria, there are 3,457 students, and also 594 unattached students, that is, occasional attendants upon the lectures, whose names are not enrolled with the others in the college. The law department has the largest number—1,358—while there are 300 in the Department of Philosophy (science and letters). There are thirty-five American students in the university.

THE SCHOOL ROOM.

THE PLEASURES OF SCHOOL TEACHING.

BY A TEACHER.

"Delightful task to rear the tender thought; To teach the young idea how to shoot!"

How sweet it is to watch the mind’s unfolding! To train the young thought and the guileless word!

To see where plastic characters are molding—"Can I go out?"—"My lesson isn’t here!"

Half-formed ideas through the young mind floating—"Don’t George be still warm?"—"Joseph keeps a spluttering!"

There is a throng of glad young faces round me, Bright with the freshness of life’s early spring; And books, and slates and maps on all sides bound me, ("Shall they girls stop? they’re playing with a string!")

And eager looks and minds intent on study—"I’m pushed away and do get my books all muddy!

No shade of earthly sorrow e’er has clouded Their brief, bright lives, so innocent and fair— ("Please, ma’am, make John move down! my seat is crowded!")

No grief nor sadness—("Sammy pulled my hair!")

Existence is in them all sunny weather— ("Bill’s been a pinchin’!")—"No, I haven’t neither!"

A precious charge to me has been intrusted, The guidance of their spirits— ("Can’t write with this steel pen! it’s got all rusted!"

To nourish gentle thoughts and feeling kind, To lead them in the path which bearenblesses, ("My spelling book has got all torn to pieces!")

Oh! for more strength! more gentleness of spirit! More wisdom in the better way to guide— ("I’ve got my lesson now! Oh, please to hear it!")

More patience to endure when "ills betide!" ("Jim Taylor gave my arm an awful twist!")

Oh, such confusion school may be dismissed. — Troy Morning Telegram.

EXPLAIN THE REASON.

Anna C. Brackett, in the American Journal of Education, calls the attention of teachers to the liability of children to be punished or corrected without their clearly knowing why. "They may thus perhaps understand," she adds, "what often seems to them so incomprehensible—why a child who has been rebuked for some disorderly conduct repeats the offense almost immediately, giving the impression of willful and malicious wrongdoing. The same mistake is frequently made in recitations. A pupil’s answer is pronounced wrong, and the question passed to another, when he does not know what his error is, and often guesses that it lies in quite a different direction from that in which it really lies. One of the most successful teachers we know is almost invariably in the habit, after having passed a question and received a correct answer, of asking the pupil who had failed, "Why did I pass that question?" A few trials of this simple interrogation will soon, we think, convince any teacher of the truth of what we say. The most astonishing misunderstandings are thus continually brought to light, and we become convinced of how double-edged a thing is this language which we use so thoughtlessly and freely."
TEACHING NUMBERS.

Children very early grasp the idea of numbers. One of the first things taught the little one, when nurse and playmates are inducing him into the mysteries of his unknown world, is, how to count. How proud are they, and surely he is no less proud when he can name the units up to ten. Then he is led on to the counting of a score, and soon still farther... The wide-awake faculties readily perceive what counting means. We begin by enumerating objects, one book, two books, three books, etc. The child has no difficulty in comprehending what is expressed by this enumeration. When he fully understands how three objects of any kind are distinguished from one, he may then learn what arbitrary character indicates three of any kind. He now understands what number is, and how it is expressed. From this the child goes on to learn and to express the largest numbers.

Children should have frequent exercises in counting and in writing numbers from one to one hundred, and back again. They should also be taught to count by tens, by threes, and so on. This gives them the addition table and the framework of the multiplication table, without labor.

Children should be taught how all the elementary operations of arithmetic grow naturally out of the process of counting. Thus the mastery of the fundamental rules of arithmetic becomes something better and easier than a mere arbitrary effort of memory. They understand these processes, and because they understand them, they remember them with much greater readiness. That education which appeals to the understanding is far more useful than that which trains the memory only.

TEACHING HISTORY.

History, when taught in the common way, to wit, by means of a text-book to be memorized by the pupils, is the veriest "dry bones" of knowledge that can be imagined. It is invariably the hopeless stumbling-block, the utter droll of dull pupils, and the fate not of bright ones. None can get on with it and yet walk path under the burden, except a few parrots who can pack their memory with half-understood words and wholly uncomprehended facts.

The way to make history delightful to a child, the one way to be sure that he will understand and remember it, is to give it a personal interest. Make the children feel that it is not a list of bald facts, arbitrary dates and names, more or less unpronounceable, with which, for the sake of following out the regulation curriculum, they are to store their already too-well-filled memories, but that it is the story of the deeds and words of men, men as real, when these deeds were done, as any who walk our streets, who take part in the busy, active world to-day. The teacher should combine biography with history, therefore. If he has a text-book of the ordinary sort, in which historical facts are given in the barest, boldest manner, he must "make these dry bones live," by help of personal sketches and stories, by incident, from more elaborate histories, and from biographies. By this means the study of history, which is one of the most important, the most developing of those pursued by our young people, may secure its rightful place in their favor also.

The University of Geneva, Switzerland, has during the past year had 260 students, 13 of whom were foreign.

GOOD TEACHING.

No rigid system of disciplining, no elaborate rules of order, iterated or reiterated, and enforced with severe punishments; can ever take the place of good teaching. In fact, good teaching is such an aid to discipline that it has been known in more than one instance to take her principal's place, while no one noted the difference. And there is no other auxiliary known to school management, that can at all make up for the absence of discipline.

We have not—some of us—forgotten that wise couplet of Dr. Watts:

"For Satan finds some mischief still,
For idle hands to do lone.'

and the shrewd old fellow looks out for "idle minds" also. Give children useful employment, and their desire to get into mischief vanishes. Keep your scholars busy and interested and the question of discipline will vex you but little. Here is where the power, the supreme usefulness of good teaching comes in.

What is required in good teaching? Not information only. Imparting stores of facts to children, taking the young minds as though they were empty bottles, and pouring in the matter which you think they should know, is not good teaching. Rather, good teaching requires much more than this. It calls for the power on the part of the instructor to awaken the mind of the child, to set its dormant faculties at work, to develop all the powers of the mind, and the qualities of the heart, to their very best and highest degree. To do this well, the mind must become thoroughly acquainted with the subject which he undertakes. No half knowledge will answer. The children will soon find it out. But a complete knowledge of the subject will enable the teacher to present it in the most pleasing, forcible manner. This will awaken the child's interest, and stimulate his powers of thought. Good teaching also calls for the skillful use of questions. Queries, well worded, and aptly applied, form a stimulus to thought which is almost perfect, and are the best means of known of awakening the reasoning power. And this fact shows us that good teaching implies on the part of the instructor an understanding of the knowledge of the human mind, and of the order in which the faculties are developed.

The powers and possibilities of good teaching are practically limitless. There is no difficulty that it cannot surmount, no good result which lies beyond its accomplishment. Patience is its talisman, and hope its sure token of success, while love, tender and satisfying, is its exceeding great reward. Strive for it, believe in it, wait for it, and boundlessly will be your blessing.

NATURAL HISTORY.

SOMETHING ABOUT THE RUMINANTS.

The order Ruminantia, the tenth of the class of mammals, is a very large one. It is one of the most useful orders to man, supplying him largely with food and with the assistance he requires from beasts of burden.

The different families of this order, with but one exception, present strikingly similar general characteristics. These are to be noticed chiefly in the construction of their feet, and in the number and arrangement of their teeth. The upper jaw has no front teeth, and the molars in each of both upper and lower jaws are deeply ridged, to aid the animal in its mastication of food.

The peculiar method of mastication in this order gives it the name of ruminants. The food, which is without exception vegetable—grasses and the like—is cropped by the single row of incisor teeth, which are very sharp, and first swallowed without mastication. In the first compartment of the stomach—for the digestive cavity of these animals is divided into four compartments, usually referred to as four stomachs—the food is moistened, rolled into pellets or cuds, which are returned to the mouth to be thoroughly masticated when the animal is at rest. This operation is familiarly known as "chewing the cud," and when it has been performed to the entire satisfaction of the animal, the food is returned to the true digestive stomach. This method of masticating food seems to have a peculiar adaptation to the habits and natural characteristics of the animals of this order. As a rule, they are very timid, being destitute of any powerful means of defense against their foes, and having many foes, they can easily be overwhelmed by the combined force of them. In order to make up for the absence of discipline, no elaborate is without the animal's being thoroughly taught how to use his feet. The animal is a very handy kicks, and when it has been performed to the putting his foot in the right place, and so on. It is thus able to take their food very quickly, and stowing it away in the pouch stomach, complete the process of eating in safety at leisure.

The only means of defence possessed by the running animals are their feet, which they use so go to their enemies, and when close pressed they will use their hind feet for kicking. As a rule, however, single animals of this species will never act on the offensive, or even attempt to defend themselves from larger animals, if they can escape from conflict by running. They are all, except the ox and camel tribes, remarkably fleet of foot, the legs being long in proportion to the size of the body, and the spinal column being very flexible. They are endowed with very acute senses of smell and of hearing, the ears being placed far back, and easily moved so as to catch sounds from behind. The eyes are also placed far around on the side of the head, so that the animal can readily look behind when pursued.

No other order of animals is so useful to man as the ruminants are. They supply him with far the largest proportion of his animal food, including that valuable and nutritious substance called milk. Their skins, their hoofs, their horns, in fact every part of them, is put to use by him, while some species, which is especially desired by all carnivorous animals, man.

One of the few differences by which these animals are arranged is in families is the construction of their horns, of which we shall speak in enumerating the peculiarities of each.

There are seven families of the ruminants, 1. The Antilopinae, or antelope tribe: 2. the Caprinae, or goat tribe; 3. the Bovidae, or ox tribe; 4. the Cervidae, or stag tribe; 5. the Camélidae, or giraf tribe; 6. the Suidæ, or wild boar tribe; and 7. the Camelidae, or camel tribe. Of these, the two last mentioned are without horns; No. 5 has short, permanent horns, covered with a pronounced keratous cap; No. 6, the Suidæ, or wild boar tribe, has none; and the first three families have horns that increase by layers during life, and never fall a
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hor, be it noticed, is essentially a protuberance of the bony substance of the skull, covered in most instances with a sheath of another substance, bony-like, but far more elastic than bone, known as horn.

The family of the antelope contains over seventy well-defined species, yet all bearing a strong general resemblance for their slenderness of form and fleetness of foot. Africa has the largest number of these species, a few inhabit Asia, a still smaller number are found in America, and one only, the chamois, is now left in Europe. These animals are usually found in large herds, which go from one place to another in search of pastures. In South Africa is one species called the spring-bok, well known to the colonists and much dreaded by them, for in times of drought, when the pasture on the hills grows slim, they come in almost numberless herds, down upon the cultivated lands and devour every green thing they find. Those species of the antelope, which, like the chamois, inhabit rocky and mountainous districts, exhibit remarkable agility and fearlessness in climbing, and are so swift in their movements that it is very difficult indeed to hunt them.

The family of the Capricle includes only the goats and sheep. The goat is supposed to have originally come from Persia, where it now, in its wild state, exists on the mountains in large numbers. The goats of the cold summits of the Asian mountains, are noted for the length and fine quality of their hair. The ibex, a variety found on the Caucasus mountains principally, has very large and very powerful horns. The sheep differs from the goat mainly in the quality of its covering, which is of hair very fine and crisp and called not hair but wool. Of the origin of the sheep we have no certain knowledge, but of its domestication we have earlier records than that of any other animal.

We shall in another article give some account of the other families of the ruminants.

PRIMARY DEPARTMENT.

AN OBJECT LESSON ON "FRUITS."

As the autumn advances our attention is naturally turned from the flowers to the ripened fruit. A complete study of fruits will be found a difficult one; still, children may learn some of the characteristics and differences of various kinds, and be enabled to recognize them readily.

In many cases fruits are confined with seeds. Show the distinction carefully. In the early study of flowers, the pupil studied about the part called the ovary, containing the little ovules. They can easily be led to understand that the ovary when ripened forms the fruit, that the ovules which it contains becomes seeds, and that therefore seeds are found within the fruit.

Let it be understood that some fruits open naturally to discharge the seeds, and others do not. Ask the children to bring you illustrations of each; as in the first case, the pea, larkspur, and milkweed; in the second, the apple, maple, and elm.

Several lessons may be given in teaching the kinds of fruit. A simple division may be made into—

I. Dry fruits.
II. Fleshy fruits.

Let examples be given you by the children, before you take up the subject yourself. After the most common fruits have been divided by the scholars into these classes, you may add to their lists. Among the dry fruits you may speak of various forms:

1. The pod, as in the pea.
2. The winged fruits.

These are so arranged that they may be easily carried about by the wind, and are of several kinds.

a. Those having a wing, or key as it is often called, on the end, as the white ash.

b. The whole fruit, wing-margined, as the birch and elm.

c. A pair of fruits, as in the maple, with a wing from the end of each, often made concerning the children "knives and forks."

3. The grains—often mistaken for seeds.

4. The nut with its shell, and meat within.

Call attention to the fact that the nut often has a whole or partial covering, as the cup of an acorn, the bur of the chestnut, and the leaf-like covering of the hazel nut.

Coming now to the careful consideration of fleshy fruits, you may speak of several varieties:

1. The stone-fruit, as the cherry, plum, and peach.

Do not allow the little ones to confuse the very small stone-fruit with berries, thinking the stone a fruit. This is not true; the stone-fruit is made of the seed of a single flower, while the fruit is made of the flowers of two or more together.

2. Those with thin skins, as the apple, pear, and quince.

3. The gourd-fruit, with hard or firm rind, but flabby externally; for example, the squash, melon, and cucumber.

4. Those with leathery rind, as the orange, lemon, and lime.

5. The berry. Examples: grape, current, banana, and tomato.

Having dwelt thus upon simple fruits, it would not be wise to attempt to explain to little children those fruits more complicated in their structure. It may be well, however, to correct a few mistaken ideas which most children will be found to have. Take for example a blackberry, and show them that it is not a single fruit, but is composed of many attached to a central part. The raspberry and the thimble-berry have the same structure, but the fruit easily separates from the central part in picking.

It will be a surprise to many that the strawberry is not a real berry, but that the true fruit consists of small bodies, often called seeds, on the outside of what we consider the berry.

Perhaps some of the children may not know that the cones of the fir and pine could correctly be called fruits.

In all these lessons, it is to be understood that the real fruits should be brought before the school, and every scholar may have constant practice in examining and observing, for himself, each difference of which the teacher may speak. Unless this can be done, the most careful teaching upon this subject will be almost useless, and will not be long retained in the memory.

There is danger, in giving oral lessons, of yielding to the temptation to give too many new ideas at one time, and of forgetting that constant repetition is needed in order to fix ideas in the minds of children. If one has very young children, it may be well to select some of the most common fruits to be used as object-lessons. Let us take an apple:

Teacher.—What have I here?

Scholar.—An apple.

Teacher.—What color is it?

S.—It is red.

T.—Who will tell me something else about the apple?

S.—It is round.

S.—It is mellow.

Cut the apple that the children may see the inside.

T.—What do you see now?

S.—It is white inside.

S.—I can see some seeds.

T.—What color are the seeds?

S.—The seeds are black.

T.—What do the seeds look like?

S.—They are hard.

T.—ShoW that the apple is ripe.

S.—Are all apples like this?

S.—Some are green when they are ripe.

S.—Some are yellow.

S.—Many apples are smaller than this one.

Continuing questions somewhat in this style, you may tell the children where apples were first found, when first brought to this country, and other items of information that will come to mind.

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