

Technical and Bibliographic Notes / Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for scanning. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of scanning are checked below.

L'Institut a numérisé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de numérisation sont indiqués ci-dessous.

- | | | | |
|-------------------------------------|---|-------------------------------------|---|
| <input type="checkbox"/> | Coloured covers /
Couverture de couleur | <input type="checkbox"/> | Coloured pages / Pages de couleur |
| <input type="checkbox"/> | Covers damaged /
Couverture endommagée | <input type="checkbox"/> | Pages damaged / Pages endommagées |
| <input type="checkbox"/> | Covers restored and/or laminated /
Couverture restaurée et/ou pelliculée | <input type="checkbox"/> | Pages restored and/or laminated /
Pages restaurées et/ou pelliculées |
| <input type="checkbox"/> | Cover title missing /
Le titre de couverture manque | <input checked="" type="checkbox"/> | Pages discoloured, stained or foxed/
Pages décolorées, tachetées ou piquées |
| <input type="checkbox"/> | Coloured maps /
Cartes géographiques en couleur | <input type="checkbox"/> | Pages detached / Pages détachées |
| <input type="checkbox"/> | Coloured ink (i.e. other than blue or black) /
Encre de couleur (i.e. autre que bleue ou noire) | <input checked="" type="checkbox"/> | Showthrough / Transparence |
| <input type="checkbox"/> | Coloured plates and/or illustrations /
Planches et/ou illustrations en couleur | <input checked="" type="checkbox"/> | Quality of print varies /
Qualité inégale de l'impression |
| <input checked="" type="checkbox"/> | Bound with other material /
Relié avec d'autres documents | <input type="checkbox"/> | Includes supplementary materials /
Comprend du matériel supplémentaire |
| <input type="checkbox"/> | Only edition available /
Seule édition disponible | <input type="checkbox"/> | Blank leaves added during restorations may
appear within the text. Whenever possible, these
have been omitted from scanning / Il se peut que
certaines pages blanches ajoutées lors d'une
restauration apparaissent dans le texte, mais,
lorsque cela était possible, ces pages n'ont pas
été numérisées. |
| <input checked="" type="checkbox"/> | Tight binding may cause shadows or distortion
along interior margin / La reliure serrée peut
causer de l'ombre ou de la distorsion le long de la
marge intérieure. | | |
| <input checked="" type="checkbox"/> | Additional comments /
Commentaires supplémentaires: | | There are some creases in the middle of the pages.
Continuous pagination. |

If not called for within one month, the Postmaster will please send to the School Inspector.

JOURNAL OF

Province of



EDUCATION

Ontario.

Vol. XXV.

TORONTO, SEPTEMBER, 1872.

No. 9.

CONTENTS OF THIS NUMBER :

	Page
HISTORY OF PAYMENT BY RESULTS IN HIGH SCHOOLS.....	129
I. PAPERS ON PRACTICAL EDUCATION.—1. Teaching from real objects. 2. Toys as Teachers. 3. Two hours in a Kinder-garten. 4. An English Kinder-garten. 5. The child or Frubel's principles of Education.....	130
II. VARIOUS PAPERS ON EDUCATION.—Teacher's professional books 2. The door of admission to the Teacher's profession. 3. What a Teacher should be. 4. Hints on the use of corporal punishment. 5. Personal presence as an aid to School discipline. 6. Educating young women with young men. Educational lessons of statistics. 8. The burning of School-houses.....	133
III. MONTHLY REPORT ON METEOROLOGY OF THE PROVINCE OF ONTARIO.....	134
IV. MATHEMATICAL AND SCIENCE DEPARTMENT.—1. The romance of Arithmetic. 2. Investment of a dollar. 3. The Natural Sciences School. 4. The study of nature as a means of intellectual development. 5. Remarkable facts in nature. 6. Weather indications. 7. Injury to physical health in the Schools. 8. Plant trees. 9. Boys using tobacco. 10. Technical Schools in Germany. 11. Hebrew Chronology, from the Exodus to the building of Solomon's Temple.....	135
V. MISCELLANEOUS.—1. Monosyllabic Poem on words. 2. Words and sense. 3. Curious facts about words. 4. Words of wise men, etc.....	138
VI. EDUCATIONAL INTELLIGENCE.....	143
VII. DEPARTMENTAL NOTICES.....	144

HISTORY OF PAYMENT BY RESULTS IN HIGH SCHOOLS.

As considerable misapprehension appears to exist in regard to the introduction of the new principle of "Payment by Results" into our school law, we propose to refer to the subject in this article.

The principle of "Payment by Results," as it is technically termed, has long been applied to the English Elementary Schools, and it has within the last year or two been recommended by the Royal Irish Commission of Inquiry for introduction into the Schools of the Irish National Board.

In 1865, when the amended Grammar School Act was passed, the Education Department for this Province had the matter under consideration. The subject was discussed at the time, and enquiries made into the working of the system. The want of an additional Inspector for the Grammar Schools was, however, felt to be an obstacle to its introduction at that time, apart from the inferior character of very many of the Grammar Schools which then existed.

An important step was, however, taken at that time; and the principle of payment according to the "average attendance of pupils" was then first applied to Grammar Schools. This change was thus explained in the memorandum which was published with the new Act in 1865:—

"The 7th Section of the new Grammar School Act is intended to remove a gross anomaly in the present system of apportioning the Grammar School Fund—a relic of the old law of 1806-8—which gave to the Senior County Grammar School more than to the junior schools unless the average daily attendance should fall below 10 pupils—although every one of these schools may have been vastly superior to the senior school of the county. This section of the new Act reduces the system of apportioning the Grammar School Fund to a simple and equitable principle of aiding each school according to its work. The application of this principle to the Common Schools in the rural sections has given them a much greater impulse forward than the old mode of apportionment on the basis of school population, or length of time during which they might have been kept

open, whether the work was done or not. It has also induced the trustees to keep the school open one or two months longer in the year than formerly. Then, as to the basis of apportionment itself, the subjects of teaching in a Grammar School were designed to differ from those in a Common School. Grammar Schools are intended to be intermediate between Common Schools and Universities. The Common School law amply provides for giving the best kind of a superior English education in *Central Schools*, in the cities, towns, and villages, with primary ward schools as feeders (as in Hamilton); while to allow Grammar Schools to do Common School work is a misapplication of Grammar School Funds to Common School purposes; Common Schools are already adequately provided for. By the law of 1807, and subsequently, the number of classical pupils was fixed at 20, and afterwards at 10. In our regulations we take the latter number."

Under these circumstances it was felt to be undesirable at that time to make any further change in the mode of apportioning money to the High Schools. The subject of "Payment by Results" was, however, not lost sight of; but on the visit in that same year (1865) of Revd. Mr. Fraser (now Bishop of Manchester)—one of the Royal Commissioners to enquire into the State of Education in the United States and Canada—the matter was discussed with him. The Chief Superintendent also that year referred the question to the then Inspector of Grammar Schools, (Rev. G. P. Young,) who thus reported upon it (in his annual report) to the Chief Superintendent, for 1866:—

"I have come to the conclusion, after having devoted much thought to the subject, that, until *educational results* are combined with *attendance* as the basis of apportionment, it will be impossible to devise any scheme of distribution, that shall not be open to grave objections. *More than a year ago*, you asked me to consider whether results might not in some way be reached with sufficient accuracy to be taken into account, to a certain extent, in deciding the grants to be made to the several schools. I stated to you my conviction that it could not be done, with the present provision for the inspection of Grammar Schools. But I feel no doubt that, if the Provincial Legislature were willing to make an additional annual grant of one thousand or eleven hundred pounds for Grammar School inspection, or if such a sum could properly be deducted from the Grammar School Fund, a system of inspection could be organized, that would make the blood flow in a new style through every limb of the Grammar School body, from Windsor to L'Orignal, and from Owen Sound to Port Rowan, and which, at the same time, while leaving several perplexing questions to be settled on their own merits, would render a just and right apportionment of the Grammar School Fund possible."

At length, having secured the appointment of two Inspectors of Grammar Schools, the Chief Superintendent in a Section of the

new Act submitted to the Legislature for its adoption in 1870-71, embodied the new principle in the 37th Section as thus explained in his report for that year :

“ THE NEW PRINCIPLE OF ‘ PAYMENT BY RESULTS.’ ”

“ Our School Law of 1871 has introduced a new principle into the mode of payments to High Schools. Formerly the system adopted was (as in the case of Public Schools,) to distribute the High School Fund on the basis of average attendance of the pupils at the school. This was found to work injuriously to the best class of schools. For instance, a very inferior school with an average attendance, say, of fifty, would be entitled to receive precisely the same apportionment as another school with the same attendance, but which might be greatly superior,—if not the very best school in the Province. To remedy this defect and remove this injustice, a new principle of payment was introduced into the Act—viz: the payment (as it is technically termed in England) “ *by results*,” or, as in the words of the Act itself, according to “ proficiency in the various branches of study.” This principle has been for years strictly applied to Elementary Schools in England, and it is now extended to other classes of schools. The thoroughness of the system of inspection adopted there has enabled the school authorities to do so. We shall not be able at present to go further than the High Schools with the application of this principle ; but we trust that by and by, if it be found to work well in the High Schools, we shall be able to apply it to the Public Schools as well.

“ In Victoria, (Australia,) ‘ payment by results,’ to the schools, is the system adopted. In the last report of the Board of Education for that country published this year, the Board says :—‘ The system of ‘ payment by results,’ now in use, appears to be working well, and to give general satisfaction. The fact, that at each examination, each school’s force is recorded as having gained a certain percentage of a possible maximum, affords a means of comparison between different schools which, if not conclusive as to their relative merits, is sufficiently so to cause considerable emulation amongst teachers. Indeed, the wish to obtain a high percentage, materially increases the stimulus afforded by the ‘ result payments.’ ”

“ The three-fold principle upon which High Schools are hereafter to be aided, is declared by the new law to be as follows :—

“ Each High School conducted according to law [and the regulations] shall be entitled to an apportionment * * * accord-

First—“ To the average attendance of pupils.

Second—“ Their proficiency in the various branches of study.

Third—“ The length of time each such High School is kept open as compared with other High Schools.”

“ With the aid of the additional Inspector of High Schools, the Department will be enabled to obtain the information required, which will enable it to give effect to the new and equitable system of apportionment.”

In the month of August, after the passing of the New School Act, embodying the principle of “ payment by results, the Rev. Mr. Young thus referred to the subject of the new Act in his address before the Ontario Teachers’ Association :—

“ I have chosen, as the subject of my address, the Act recently passed regarding Public and High Schools, with the regulations made, under the Act, by the Council of Public Instruction.”

“ INSPECTION OF THE HIGH SCHOOLS—CLASSIFICATION OF THE HIGH SCHOOLS—APPORTIONMENT OF THE HIGH SCHOOL GRANT.”

“ I now pass to the subject of High School Inspection.

“ Increased provision for the inspection of the High Schools is undoubtedly required to be made. The task of visiting, twice a year, more than a hundred schools scattered over the Province, is too heavy to be laid on the shoulders of any one man ; and (what is of more consequence) the Council of Public Instruction was unable, so long as there was but one inspector, to frame suitable regulations for the apportionment of the High School Fund among the different schools. In the last two reports which I had the honour, as Grammar School Inspector, of giving in to the Chief Superintendent, I showed that the effect of apportioning the Government grant, according to attendance merely, was to empty into the Grammar Schools all the upper classes of the Common Schools. This was the case particularly in Union Schools. Of course nobody used any undue influence to bring such a result about ; nevertheless, somehow, it came about. The Common Schools were degraded by having almost all their pupils, male and female, drained off as soon as the children were able to parse an easy English sentence ; and the Grammar Schools were crowded with boys and girls for whom a Grammar School course of study was not adapted. For these evils, the only remedy possible, as far as I can see, is to make

the amount of the Government grants to the different High Schools dependent not on numbers alone, but on results likewise. To speak mathematically, what each school shall receive out of the public treasury should be a function of the two variable quantities, the number of pupils in attendance, and the character of the instruction imparted ; but, in order that results might be taken into account, more than one inspector is indispensable.”

As it was clearly impossible to apply the new principle of “ Payment by Results” to the High Schools until a classification of them had been made, the Council of Public Instruction requested the High School Inspectors to make such a classification, and report the result to the Chief Superintendent. This was done some time since, and a plan has been devised for carrying the new system into full effect, if possible, in 1873.

It is a question, however, whether any system of classification of the High Schools will be entirely satisfactory, or at best, anything more than (probably a just) approximation to the relative standing of the several High Schools. The only really satisfactory method of determining the relative standing and excellence of these schools, for the purposes of correct classification, would be to subject the whole of the pupils in them to a uniform test examination on questions prepared and printed for that purpose. The result of such an examination would be to determine, with an almost exact certainty, the relative position which every school should occupy in an official preliminary classification of them. It would also furnish an undisputable starting-point, from which future progress or retrogression could be easily ascertained by the half-yearly examination of the High School Inspectors on their visits to the schools.

I. Papers on Practical Education.

1. TEACHING FROM REAL OBJECTS.

Much has been written within the past few years on the best methods of teaching the younger class of scholars, and nothing has contributed more to improve those methods than the introduction into the school-room of material objects, to be carefully examined and subsequently described. This exercise has been carried to a greater extent in the juvenile schools called *Kindergarten* than in any others, though it has been by no means confined to them, nor was the idea first suggested by the Germans. The writer well remembers exercises of this kind in a school of which he was a member over thirty-five years ago, and which redounded greatly to his own benefit, as they no doubt did to that of all who participated in them. The objects selected were nearly always natural, and he vividly recalls a very close examination which he then made of an expanded chestnut-burr which was to be the theme of his little essay on one occasion. Ever after, if not before, he too could, with the poet,

— “ in the ragged burr a beauty see.”

This exercise is better than any other calculated to cultivate habits of close attention, at a period when such habits are most easily acquired and to do away forever with all possibility of those loose and superficial ones which characterize most people throughout life, leading to continual inaccuracy and consequent misapprehension of the facts of nature and of life.

Many years after the little exercises alluded to above, the writer was teaching in a country school in Pennsylvania, which was situated in the midst of a pleasant grove—just the kind of situation, by-the-way, for a school-house. Sometimes the interest of the younger scholars in their column of the multiplication table or the spelling lesson would flag. On such occasions he found no other means of stimulating them so successful as the promise of half an hour in the woods, where they could collect wild flowers and acorn cups, and, in the fall, the beautifully tinted autumn leaves. This promise almost universally insured perfect lessons from the whole class, who were generally ready for recitation before the hour for it arrived. On their return they were allowed to lay down a scalloped maple-leaf or a sinuous oak-leaf on their slates, carefully to draw the outline, and then delineate the larger veins and the stem. This exercise was to them a source of never-failing pleasure ; and while, instead of interfering with the other lessons, it secured a better performance of them, it also cultivated admirably the organs of form and color, thus training the imagination and developing æsthetic tastes as no other exercise could. I suggest it to teachers, in the hope that some of them may test its efficacy.—z. *Pennsylvania School Journal*.

2. TOYS AS TEACHERS.

The primary use of toys to children is to keep them occupied. A mother thinks what her infant, even when only a few months

old, requires to amuse him, and she selects a bright coloured bird, or a rattle, or something which it can feel, shake and look at. An elder child complains of having nothing to do; and a toy or game is found or a book of pictures or little stories, with which he may amuse himself. The great aim of all those who understand the bringing-up of children is to keep them constantly engaged, and at the same time, though encouraging them to play as long as possible with one toy, yet to change and vary their occupations and amusements as soon as they show signs of mental fatigue or weariness. This constant employment is not only desirable for children, but is really essential for them; they must be doing something, and, as has been well remarked, even mischief is but misapplied energy. Toys are the natural instrument on which this energy and activity should be expended. It is the province of the toy dealer to find objects for the exercise of their minds and fingers, just as much as for the baker to supply them with bread, or the shoemaker with shoes.

Children are essentially active in every sense; and toys cannot properly be called toys at all if they are merely capable of being looked at, and do no more than amuse the eye for a few moments. This fact will often account for the peculiar way in which children take fancies to their toys. Of course the glitter of a new thing, whatever it may be, lasts for some time; but it will be remarked how they generally return to some old plaything, long since bereft of its beauty, because they can do something with it. A broken doll, even with no legs and arms, may be dressed and handled as a baby; a horse without legs may be dragged about the floor, and so on; whereas a new picturebook is soon put aside after the novelty of the illustrations is forgotten; and a very elaborate mechanical toy, too delicate even to be handled, is not much cared for after it has been exhibited a few times and has ceased to be a novelty.

While carefully avoiding the mistake of making play a lesson, some few toys if well selected, may impart a vast amount of instruction, and that without the child having to undergo any undue mental strain. It would, of course, be undesirable to give a little boy five or six years old a direct lesson on the principles of the bridge and the use of the keystone. Give him, however, a box of bricks capable of making a bridge with the centering, and show him how to put it together; he will puzzle over it for days, try every sort of arrangement, and unwittingly become gradually and practically acquainted with some important mechanical laws. Again, a little model of a steam engine made to work by gas or spirit, which may be bought for a few shillings, is a most attractive toy. Children will watch it for hours. They see the water poured in; they remark that it is made to boil, and soon has to be replenished; they notice the action of the valves, the piston, the crank, and all the parts. When they come to study the theoretical laws of steam and machines, half the difficulty of their first lesson vanishes. If during his play, the child is so fortunate as to have a really educated nurse or mother, herself acquainted with the outlines of such general knowledge, the child's play may be made, by simple toys, far more educational and interesting than any set lesson, and the result of the instruction far more fixed on his mind than the simplest theoretical idea could ever be by any number of repetitions and learnings by heart.

What is true concerning the box of bricks and the model engine is also true of a number of other toys; that is, they depend for their actions upon certain laws, with which, by a little skill, children may be made practically familiar without any undue taxing of their minds, and during the time they are engaged in play. Of these may be mentioned, the kite, the magnetic fish; hydrostatic toys, with water wells, fountains, &c.; pneumatic toys, such as pop-guns, &c.; tops of all sorts, the kaleidoscope, the magic wheel, &c. All these involve scientific laws which a child may understand familiarly with no more difficulty, if properly put before him, than he usually finds in learning to read.

The feature of the Kindergarten School is that play is really made to a great extent the means of instruction. This idea seems to be capable of greater development than it is at present, even in those excellently conducted institutions. With very young children, particularly in infant schools, the less the instruction partakes of the nature of a regular lesson the better. The importance of early teaching, among the poor especially, is obvious; and yet the evils of straining the mind and overtaxing the energy of very young children, by too rigid a course of training, are most serious. Toys, when carefully selected, seem to supply the means of avoiding the latter evil, and at the same time of securing the early imparting of knowledge.

Reading may be taught entirely by means of the various games and toys with letters and words which are in common use. These toys depend for their interest and attraction on the way they are put before children. With one teacher, they are little better than a dry spelling book; whereas with another, the finding out the differ-

ent letters and the placing them together like a puzzle may interest a child for hours, during which the infant is learning to read and spell in the best possible manner, and in a way he is least likely to forget. The first four rules of arithmetic, again, may be taught almost entirely by means of cube bricks, and a great step made in the formidable multiplication table, before the child is wearied out with the monotonous repetition of what too often appears to him to be an endless and meaningless list of figures. Writing is the only subject which perhaps requires more direct lesson-work. Even here, however, the 'print' letters used to teach reading may be copied on a slate, their shape learned, and, what is of still greater importance, the power of holding and guiding a pencil imparted, before the copy-book, pot-hook and hanger has made writing an unpleasant and tedious task.

Cookery as a regular subject of instruction in girls' schools has hitherto been looked upon as one of those things which, though no doubt desirable, is unfortunately impossible. Toys, however, seem to prove that this is a mistake. Judging from the collection of cooking-stoves which Mr. Cremer has brought together in his International collection of toys in the Exhibition this year, it is clear that 'pretending to cook' is played at largely by the children of all countries. These stoves, though in miniature, are made large enough, and are so fitted with gas, as to be capable of dressing a small dinner. It would seem that by a regular course of instruction in practical play-cooking, a most agreeable and permanently useful game might be introduced in all schools, to the immense advantage of all classes.

Not only in direct instruction, however, is the use of toys to be considered educational, but those playthings to which a child is accustomed have no small influence on his general tone of thought. To those who are naturally over quiet and studious, those toys should be given which are likely to develop the physical powers, such as a rocking-horse, a cart requiring to be drawn about, a wheelbarrow, a set of gardening tools, a drum, and the like. It would be better to encourage such children to this description of plaything, rather than to allow them constantly to amuse themselves, after the bent of their inclinations, with books, puzzles and other sedentary amusements. For those full of life, and whom it is impossible to keep still for many minutes at a time, the occasional use of the quieter toys which are to be avoided in the former case is desirable. In France, guns, swords, and miniature war implements are looked upon as almost the only plaything for a boy, and this national taste has undoubtedly had a considerable influence on the national character.

A few words should be said of the doll, which is the most natural and universal toy. It must be owned the English taste in dolls is better than that of our neighbours on the other side of the Channel. An English doll is almost always an imitation of a child; the French, on the other hand, is a very fashionable young lady, too often made to imitate as nearly as may be a class of the community concerning whose ways and style all will agree that little children should be as far removed from them and as little familiarized with as possible. It is true that the French dolls have other uses; they serve first as models of fashion; but what we urge is that children's playthings are in themselves sufficiently important not to be merely out of date models of the follies of grown-up persons.

The dressing of dolls may be made a most pleasant mode of teaching a little girl to work. All girls are fond of dressing their own babies, though they soon weary of hemming dusters. By making dolls' clothes exact miniatures of children's garments, so that they will take on and off, agreeable occupation in needlework will be found for a little girl. The child will be easily made to take a pride in having her doll's wardrobe as neat and well worked as she can; and good habits of care, neatness and order may thus be inculcated. In this way, as has already been pointed out, play, and useful instruction, and training may be combined through the agency of toys. In watching a little girl play with her doll, an insight may often be obtained into the mode in which the child herself is being brought up. When young, we all imitate more or less the habits of our elders; and in whichever way a child is seen using her doll, whether it be roughly, kindly, or gently by making a great fuss over its appearance, such as thinking chiefly of the fashion of its dress and ornaments, so may the characteristic features of the treatment that child herself receives at home be frequently inferred.

The cost of toys cannot be taken as a guide to their usefulness or value. To a certain extent, as in all other articles, it is true that, good things cannot be had for nothing, but the most expensive playthings are by no means necessarily the best. Nothing is more desirable than to encourage children as much as possible to make some of their own toys; when they do this, it affords them immense pleasure and amusement. It should also be borne in mind that the fewer playthings a child has in use at the same time the

better. Too many at once encourage restlessness and a continual want of change and variety, and prevent habits of attention and contentment being developed. The art of shewing children how to play to the best advantage, to make toys, and, in short, to enjoy play as much as possible, though natural to some persons, is frequently wanting to a lamentable extent with many nurses, mothers and teachers. A few practical hints on this subject might and should be included in the course of training given to all teachers, and especially to those who devote themselves to infants. (See page 139.)

3. TWO HOURS IN A KINDERGARTEN.

While in the City of Hamburg, I saw a door over which was the single word "Kindergarten." I had seen something of higher education in Prussia, and now saw something of the lower. Sitting upon the little forms, and engaged in a peculiar rhythmic exercise, were sixty-two children, or rather infants, from three to seven years of age. No books whatever were visible. Each child was furnished with drawing-materials, and on many desks were variously cut bits of tin. Little squares of blue perforated paper and yellow crevel, slips of wood fibre, and the various geometric solids, were stored away for use: and the shelves placed the animal, vegetable and mineral kingdoms under contribution.

None of the children could read, and many could not talk plainly. No effort was made to teach them the "mystical lore" of books. This child-garden seemed no place for tasks and work, but only for play—for spontaneous play, so systemised and directed by an adult as to furnish valuable discipline to mind and body. One could readily see that the children were getting, through the testimony of the senses—the foundation of all knowledge—an accurate acquaintance with the external world of matter. Happy in the guidance of a sympathetic and skilled teacher, they were getting naturally and easily what they otherwise would have got with many a blunder, or never got at all. They were discriminating colours, hues, and tints; were learning the forms, measurements, distances and properties of bodies; were passing judgment on the uses, construction and adaptability of organs in the vegetable and animal kingdom. They were making models, drafting plans, developing their muscles by calisthenic concerts, learning the "music of motion" by such marching as would rejoice the strictest drill-master in the realm, and practising the "symphony of sound" by the utterance of cooing songs, and by the unrestrained, improvised melody of children and birds.

This Kindergarten seemed to be really a nursery, where, by systematic training, all the right powers of the being were developed in a just order and proportion. It was simply a supplement to natural processes. There being no infliction of tasks, either mental or bodily, and light athletic sports alternating with the more sedentary employment, there seemed as little probability of dwarfing the body as of stultifying the intellect. And, on the other hand, if nature's processes are safe, to teach a boy to make skilful and intelligent use of his body, and to know much of the natural world, at a time of life when every faculty is alive to sensuous impressions, cannot tend to produce a dangerous precocity of mind.

But this training seems not only harmless, but very valuable, and very direct in its uses in life. The viciousness of street children is proverbial, and chiefly because of the hap-hazard, Topsy-like development. Again every one who has remarked the meagre results produced by those who teach the nicer mechanical arts and trades to young apprentices can testify to the importance of senses trained to accurate observation, and of fingers and hands skilled in delicate manipulations.

You who sit with self-congratulation in the high places of pedagogy, what would you not give to see in your own pupils the gleaming eye of intelligence, and the calm consciousness of victories won, which I saw in the faces of those infants! We cannot say that education begins in the school-room, but rather with the first darting of the eye in infancy, and from the first flushings of the face from an alert curiosity. At the legal school age our children might be such philosophers in their knowledge of natural objects, and so expert in the management of their bodily powers, as to put our wrinkled cheeks to blushing. A child *must* grow and learn, and that with unexampled rapidity: and, were it possible to arrest the desire for sensuous impressions, he would enter the school-room, when the state admits him, a driveling idiot. But systematize his culture, follow the course of natural development, lend the guidance of sympathy and skill, and in due time he will pass from the exclusive study of things to the study of books with an awakened interest and an unfeigned devotion to mental pursuits.—*Edna and Taylor, in Indiana School Journal.*

4. AN ENGLISH KINDER-GARTEN.

A new book has just been issued in London, in illustration of the German system of the Kinder-Garten. It is a complete exposition of Froebel's system of infant training. Froebel was the founder of these wonderful schools. At first he took a peasant's cottage at Keilhau, and established a village boy's school, living on potatoes and two rye loaves a week, and labouring with earnest zeal. Then he went on a tour through Germany and Switzerland, to lecture on infant training, and founded Infant Gardens where he could. He founded them at Hamburg, Leipsic, Dresden, and elsewhere. While on his travels, he took many a night's lodging in the open fields, with an umbrella for his bedroom, and a knapsack for his pillow. So beautiful a self-devotion to a noble cause won recognition. One of the best friends of his old age was Ida, Duchess of Weimar, sister to Queen Adelaide of England; and his death took place at a country-seat of the Duke of Meiningen, June 21, 1832, when he was seventy years of age. By this time Infant Gardens are in operation in most of the larger towns of Germany and on the Continent.—*New York School Journal.*

5. THE CHILD, OR FRÖBEL'S PRINCIPLES OF EDUCATION.

BY MATILDA H. KRIEGE.

Published by Mr. E. Steiger, New York. pp. 150. Price. \$1.

Though early impressed with the beauty and real importance of the New Education systematized and promulgated by Friedrich Froebel, Madame Kriege wisely deferred to the judgment of others that the public would require first to be shown what it is, before listening with favour to theories however sound.

In what respects is the new system of education superior to that which can lay claim to time-honoured possession? What is its leading idea, and how is it worked out? To what extent is it suited to American conditions? These pertinent questions receive a complete and most satisfactory solution in "The Child, Its Nature and Relations."

It took time to convince even educators that the earliest education is of the first importance, and it took still longer to satisfy them that primary education demanded the best qualified teachers. Any grandam, often of contracted mind and very illiterate, was thought good enough to teach the A B C, followed by the unintelligent spelling of words with their meaning left out. The hornbook, or primer, was the first step in a child's education, and the child unnaturally awed into silence and inactivity, and frequently either chided for inquisitiveness or misinformed, was tortured into learning it by rote. Such an outrage on the childish nature at length forced itself on the attention of thinking men, when nature was discovered to be the only fit and proper subject for contemplation in devising a scheme of education for beings incipiently rational. It was necessary that the scheme should be new, because adequate reform was impossible in the old, radically unsound system; and as great opportunities generally call forth great men, an acknowledged educational exigence brought out the genius of Friedrich Froebel.

With loving earnestness Froebel discerned manifestations in the infant's gambols; intently he watched its first approach to knowledge through the experience of the senses, the awakening of its imagination, its imitative faculty, its first utterances, the dawn and growth of its reason, its every phase of development in its relation to nature, to man, and to God. None of the mute mysteries of childhood escaped his penetrating mind, his marvellous intuition; "the child is father of the man" was the key-note of his analysis, and in him child-nature found its oracle. He may be said to have enhanced the joyousness of children by making it intelligent. Before his day children's plays had been deemed not unworthy of the attention of the philosophic mind, but Froebel turned them into instruments of knowledge. Songs, plays, the delights of the garden became in his hands the means of imparting impressions of the beautiful, the true, and the good; and to foster the love of children, so characteristic of them, for the companionship of children, he invented the Kindergarten. An essential element in Froebel's system is a religious spirit. "I have based my education," said Froebel, "on religion, and it must lead to religion." A religious tone consequently pervades a work of this kind, and it is calculated to awaken the mother's "consciousness that a divine spark glows in the little being in her lap, and to kindle her enthusiasm to nurse it, and to educate a true citizen of Heaven." The system thus tends, in a true sense, to the elevation of woman, and who can doubt that in that is comprehended the well-being of humanity?

Madame Kriege's book may safely be pronounced to be the completest elucidation of the Kindergarten system in the English language; and it appeals at once to the heart and the intellect, to

parents, especially to mothers as the first educators, to all who are interested in human progress, to all who view education as the discharge of an affectionate duty or a grave responsibility, to all indeed who are animated with a love of God or man.

II. Various Papers on Education.

1. TEACHER'S PROFESSIONAL BOOKS.

The older we grow in educational business, and the more we see of teachers and try to realize their needs, the more thoroughly convinced do we become of the high value of good professional books. Each may be an effective, portable normal school to the earnest teacher, better than any number of institutes or association meetings.

The Educational Department has a large supply of these books, and suggests the establishment of Teachers' Professional Libraries, for which the 100 per cent. is allowed to municipal and school corporations.

2. THE DOOR OF ADMISSION TO THE TEACHER'S PROFESSION.

There is no feature of our school system so vital to its success as that which places at the door of every school-room a board of examiners to determine who is qualified to enter there as a teacher and guide of youth. They are the sentries of the school system, and upon their fidelity and efficiency depend, to a great extent, its character and usefulness. No other school officers need a truer conception of their duties, or a more ardent devotion to the cause of education.—*White*.

3. WHAT A TEACHER SHOULD BE.

A good legislator, a righteous judge, a prompt executive, an efficient workman, a competent leader, a liberal partizan, a pleasant master, a warm friend, a good man: apt to teach, acquainted with human nature, earnest, prompt, clear, accurate, enthusiastic; diligent, emphatic, dignified, firm, courteous, forbearing, gentle, cheerful, patient, persevering.

4. HINTS ON THE USE OF CORPORAL PUNISHMENT.

Prof. W. H. Payne closes No. V. of his articles on "School Management," in the *Kansas Educational Journal* with the following: "Corporal punishment is universally regarded as a disgrace; and in cases where the propriety of its infliction is questionable, troubles near or remote are almost sure to arise. As a means of inducing caution, where it is so much needed, the following rules are suggested:

- "1. Use corporal punishment only as a last resort, in case of grave offences.
- "2. The pupil's guilt should be established beyond a doubt.
- "3. As far as possible both teacher and pupil should be free from passion.
- "4. The rod should never be applied to the body above the hips."

5. PERSONAL PRESENCE AS AN AID IN SCHOOL DISCIPLINE.

The power to control and develop character in children is greatly the power of personal presence. Mr. Emerson says the aristocracy of Great Britain have ruled the British Empire for centuries by the magic of lofty manners. John Adams once said Washington succeeded because he knew enough to keep his mouth shut. To talk well and wisely is a great power, and many people greatly influence society by their power of expression. But the teacher who can preserve a manner at once affectionate, powerful, and dignified, and is economical of speech, enters the school-room with a prodigious advantage. Nothing amuses a mischievous crowd of children like a teacher who flies about like a restless hen protecting her brood, with ruffled feathers, clucking her displeasure, and filling the hours with a never ceasing cackle of useless talk. They enjoy the spectacle hugely, knowing she will in due time "run out" and they be left to their own pleasant devices. Our oral system of teaching, with all its advantages, has this great temptation; that it offers the opportunity for one of these loquacious teachers to flood her audience with a thin decoction of learning, seasoned with the pepper and

salt of reproof and moral precept. Avoid too much speech and a restless manner as the worst foes of true success. Cultivate a pleasant dignity and grace, a method of speaking plain, direct, but decisive, and as brief as you can handle. This matter of presence is an outgrowth of character, and you must observe all I have said previously if you desire to succeed in acquiring it. It will surely come with ripening culture and experience, and it is one of the most decided tokens of power in the teacher. There are some people so electric with life that they sway all souls by their presence; wherever they go a virtue seems to pass out of them; their face is a benediction and an inspiration, and dependent souls turn to them as the sun-flower turns to the sun. Aim perpetually to be to your children, not a stern governor or a marplot to all their happiness, but a gracious incarnation of wisdom, justice, and love. The ancients rightly symbolized wisdom in the form of the Goddess Minerva; for only where science is embosomed in a lofty and loving presence, are children won and moulded to a higher life.—*Ohio Ed. M.*

6. EDUCATING YOUNG WOMEN WITH YOUNG MEN.

President White, of Cornell University, has recently visited all the Colleges of the country in which young women are educated with young men, and has given his views on the subject at a meeting in Boston. We infer that, on the whole, he is favourable to the plan, and it is probable that it will be introduced in his University. He says that at Oberlin the best reading of Tacitus was by a young lady; at the Michigan University, a lady carried off the mathematical honours, and the girls stood the highest in the Botany classes; and at Antioch College they ranked very high in the German classes. So far as he could learn, the young ladies held their own remarkably well.

The training of women in the duties of domestic economy is now attracting great attention in England, and an institution is soon to be established under the patronage of the Earl of Shaftesbury, and other distinguished philanthropists, for the purpose of teaching the art of housekeeping. Lessons in cookery and baking bread are to be given, and lectures are to be delivered on food, cooking, housekeeping, the laws of health, and other subjects of importance.

7. EDUCATIONAL LESSONS OF STATISTICS.

At the late National Convention at Boston, a paper, on the "Educational Lessons of Statistics," was read by the Hon. John Eaton, Jr., National Commissioner of Education. Many amusing anecdotes were related of the style of education in the olden time, taken from the ancient records. In Boston, in 1825, public schools were opened for girls for the first time, but two years afterward the applications for admission became so numerous, that Major Josiah Quincy had them closed as a failure. Among the lessons taught by the census of 1870 were the facts that there were 6,550,808 youths under instruction in our public schools, at a cost of \$94,190,166, or \$14 per capita; that the cost per capita in private institutions was over \$8 more than in public ones; that there were 5,553,470 persons in the country who could not write; that while 300,000 voters in America, turning from the one side to the other, would control a Presidential election, this was 1-6 less than the number of illiterate males entitled to vote; that it was proved that educated labour was worth one-fourth more than uneducated labour, and in most of the States this increase would amount to many times the cost of the support of public schools. These facts had a meaning which would be apparent to every one.

8. THE BURNING OF SCHOOL-HOUSES.

As the season of the year draws near when fires are needed to make our school-rooms comfortable, it will be well for teachers and school-officers to take the trouble to examine with care the flues and heating arrangements in their school-buildings, in order to make sure that all is safe. A little care in this matter now may be the means of saving much money and, perhaps, the lives of some of the children. Every year, as the cool weather of the fall comes upon us, we read of the destruction of school-houses by fire, and of the narrow escape of those within. Some of these casualties, doubtless, are due to causes which could not have been discovered; but many of them might have been discovered and prevented by the exercise of a proper care at the right time. We do not think that there is of necessity more danger of fire with the modern furnaces than with the old fashioned stoves, but the furnace is further removed from the eye of the teacher, and hence is more likely to be left to take care of itself. *Illinois Teacher*.

III. Monthly Report on Meteorology of the Province of Ontario.

I. ABSTRACT OF MONTHLY METEOROLOGICAL RESULTS, compiled from the Returns of the daily observations at ten High School Stations, for JULY, 1872.

OBSERVERS.—Pembroke—R. G. Scott, Esq., M.A.; Cornwall—James Smith, Esq., A.M.; Barrie—H. B. Spotton, Esq., M.A.; Peterborough—J. B. Dixon, Esq., M.A.; Belleville—A. Burdon, Esq.; Goderich—Hugh J. Strang, Esq., B.A.; Stratford—C. J. Macgregor, Esq., M.A.; Hamilton—J. M. Buchan, Esq., M.A.; Simcoe—Dion C. Sullivan, Esq., L.L.B.; Windsor—J. Johnston, Esq., B.A.

Table with columns: STATION, BAROMETER AT TEMPERATURE OF 32° FAHRENHEIT, TEMPERATURE OF THE AIR, TENSION OF VAPOUR, and MONTHLY MEANS. Rows include stations like Pembroke, Cornwall, Barrie, Peterboro, Belleville, Goderich, Stratford, Hamilton, Simcoe, and Windsor.

Approximation. dOn Lake Simcoe. eNear Lake Ontario on Bay of Quinte. fOn St. Lawrence. gOn Lake Huron. A On Lake Ontario. i On the Ottawa River. j Close to Lake Erie. m On the Detroit River. k Inland Towns.

Table with columns: STATION, HUMIDITY OF AIR, WINDS, NUMBER OF OBSERVATIONS, ESTIMATED VELOCITY OF WIND, AMOUNT OF CLOUDINESS, RAIN, SNOW, and AURORAS. Rows include stations like Pembroke, Cornwall, Peterborough, Belleville, Goderich, Stratford, Hamilton, Simcoe, and Windsor.

Where the clouds have contrary motions, the higher current is entered here. Velocity is estimated, 0 denoting calm or light air; 10 denoting very heavy hurricane.

c 10 denotes that the sky is covered with clouds; 0 denotes that the sky is quite clear of clouds.

REMARKS.

Pembroke.—Lightning and thunder with rain, 16th, 23rd, 27th. Rain, 2nd, 3rd, 10th, 12th, 16th, 17th, 23rd, 26th, 27th, 29th. CORNWALL.—Thunder, 22nd. Lightning with thunder, 8th. Thunder with rain, 10th, 17th, 29th. Lightning and thunder with rain, 1st, 2nd, 3rd, 12th, 16th, 24th, 26th, 28th. Rain, 2nd—4th, 6th, 10th, 11th, 13th, 17th, 18th, 22nd, 25th—27th, 29th, 30th. BARRIE.—Lightning and thunder with rain, 2nd, 3rd, 15th, 16th. Hurricane on 3rd; trees blown down and crops much damaged. BELLEVILLE.—Thunder with rain, 1st. Lightning and thunder with rain, 2nd, 3rd, 10th, 21st. Rain, 1st, 3rd, 15th, 16th. Thunder, 1st, 2nd, 3rd, 10th, 12th, 16th, 17th, 23rd, 26th, 27th, 29th. PETERBOROUGH.—Thunder, 22nd. Lightning with thunder, 8th. Thunder with rain, 10th, 17th, 29th. Lightning and thunder with rain, 1st, 2nd, 3rd, 12th, 16th, 24th, 26th, 28th. Rain, 2nd—4th, 6th, 10th, 11th, 13th, 17th, 18th, 22nd, 25th—27th, 29th, 30th. SIMCOE.—Lightning and thunder with rain, 2nd, 3rd, 15th, 16th. Hurricane on 3rd; trees blown down and crops much damaged. WINDSOR.—Thunder, 2nd, 3rd, 15th, 16th. Lightning and thunder with rain, 10th, 12th, 16th, 17th, 23rd, 26th, 27th, 29th. Rain, 1st, 3rd, 15th, 16th. Thunder, 1st, 2nd, 3rd, 10th, 12th, 16th, 17th, 23rd, 26th, 27th, 29th, 30th. GODERICH.—Lightning, 1st, 2nd. Wind-storm, 3rd. Rain, 3rd, 7th, 9th, 10th, 16th, 17th, 21st, 23rd, 26th, 29th, 30th. STRATFORD.—Lightning, 2nd, 9th, 10th, 26th. Thunder, 10th. Lightning with thunder, 7th. Lightning and thunder with rain, 8th, 16th, 30th. Wind-storm, 21st, 26th. Rain, 3rd, 11th, 16th, 18th, 21st, 23rd, 29th, 30th, 31st. Excess of mean monthly temperature over average of 11 years, +2° 5. HAMILTON.—Lightning, 2nd, 28th, 31st. Thunder, 30th. Lightning

with thunder, 3rd, 9th. Lightning and thunder with rain, 1st (some trees blown down), 10th, 11th, 29th. Wind storm, 1st. Fog, 29th. Rain, 1st, 4th, 10th, 11th, 16th, 18th, 21st, 23rd, 25th, 26th, 29th, 30th. A faint rose hue in the sky on 2nd, about 8.45 P. M. The observer continues his record of the blossoming of plants.

SIMCOE.—Lightning, 2nd, 12th. Lightning and thunder with rain, 9th. Wind storms, 1st, 10th, 12th, 30th. Rain, 2nd, 4th, 9th, 21st, 25th, 26th, 31st. Remarkably hot, dry month.

WINDSOR.—Lightning, 2nd, 11th, 12th, 15th. Thunder with rain, 12th, 29th, 31st. Lightning with thunder and rain, 11th. Meteors as follows: 1st, one through *Ursa Major*, towards N.; 5th, one through *Cassiopea*, to H.; 6th, two in N. toward S. W.; 13th, two through *Cassiopea*, towards E.; 24th, one through *Cygnus* to *Ursa Minor*; 28th, one in E. toward N. Rainbow, 3rd and 16th. Halo, 15th. Rain, 10th—12th, 16th, 17th, 23rd, 25th, 29th—31st.

IV. Mathematical and Science Department.

1. THE ROMANCE OF ARITHMETIC.

The most romantic of all numbers is figure nine, because it can't be multiplied away or got rid of anyhow. Whatever you do, it is as sure to turn up again as was the body of Eugene Aram's victim. One remarkable property of this figure (said to have been first discovered by W. Green, who died in 1794) is that all through the multiplication table the product of nine comes to nine. Multiply it by what you like, and it gives the same result. Begin with twice nine, 18; add the digits together, and 1 and 8 make nine. Three times nine are 27; and 2 and 7 make 9. So it goes on, up to 11 times 9, which gives 99. Very good; add the digits; 9 and 9 are 18, and 1 and 8 are nine. Going on to any extent, it is impossible to get rid of figure nine. Take a couple of instances at random. Three hundred and thirty-nine times nine are 3051; add up the figures and they give nine. Five thousand and seventy-one times nine are 45639; the sum of these digits is 27; and 2 and 7 are nine.

M. de Maivan found out another queer thing about this number, namely, that if you take any row of figures, and, reversing their order, make a subtraction sum of it, the total is sure to be nine.

For example:

Take 5071
Reverse the figures, 1705

$$3366 = 18, \text{ and } 1 + 8 = 9.$$

The same result is obtained if you raise the number so changed to their squares or cubes. Starting with 62, begin the sum over again. By reversing the digits, we get 26, which subtracted from 62, leaves 36, or $3 + 6 = 9$. The squares of 26 and 62 are, respectively, 676 and 3844. Subtract one from the other, and you get $3168 = 18$, and $1 + 8 = 9$. So with the cubes of 26 and 62, which are 17576 and 238328. Subtract, they leave $220752 = 18$, and $1 + 8 = 9$.

The powerful *be-nine* influence of this figure is exemplified in another way. Write down any number, as for example, 7549132; subtract therefrom the sum of its digits, and no matter what figures you start with, the digits of the product will always come to 9.

$$7549132 = \text{sum of digits } 31.$$

$$7549101 = \text{sum of digits } 27, \text{ and } 2 + 7 = 9.$$

A very good puzzle has been based on this principle, as follows: Get another person to write down a horizontal row of figures, as many as he likes, without letting you see what he is about from beginning to end of the whole performance. He is then to reckon up the sum of the digits, and subtract that from his row of figures. When he has done this, bid him cross out any figure he pleases from the product, and tell you how many the figures add up, without the crossed-out figure. From the numbers so given you will be able to tell what figure he has crossed out, by only bearing in mind the fact learned above, namely, that if no figure at all had been crossed out, the result would necessarily be 9 or a multiple of 9. Hence you will see that the crossed out figure must needs be the one required to bring the sum given to the next multiple of 9. Supposing, for instance, he gives his result at 37; you may be sure that he has robbed the product of 8, that being the figure needed to restore the total to the next multiple of 9, namely, 45. His sum would stand as under:

$$405678237 = \text{sum of digits } 42.$$

$$405678195 = 45; \text{ and } 45 - 8 = 37.$$

There is only one case in which you can be at fault, and that is in the event of a multiple of 9 being returned to you as a pro-

duct. Of course then you will know that *either* a 9 or a 0 must have been struck out. Had the 9 been struck out in the above instance, the result would have been 36; and if it had been 0, the product would have been 45. Both being multiples of 9, it would be impossible to tell with certainty whether the missing figure were 9 or 0; but a good guess may generally be formed, because if the figures appear suspiciously low in proportion to the time taken to add up the sum, you may speculate that your product has most likely sustained the loss of the highest number.

There is a clever Persian story about Mahommed Ali and the Camels; and though it will be familiar to many of my readers, they will scarcely be sorry to be reminded of it. A Persian died, leaving seventeen camels to be divided among his three sons in the following proportions: the eldest to have half, the second a third, and the younger a ninth. Of course camels can't be divided into fractions; so in despair the brothers submitted the difficulty to Mahommed Ali. "Nothing easier," said the wise Ali. "I'll lend you another camel to make eighteen, and now divide them yourselves." The consequence was, each brother got from one-eighth to one-half of a camel more than he was entitled to, and Ali received his camel back again; the eldest brother getting nine camels, the second six, and the third two.

Johann August Musæus, one of the most popular German story writers of the last century, in his story of "Libussa," makes the Lady of Bohemia put forth the following problem to her three lovers, offering her hand and throne as a prize for the true solution: "I have here in my basket," said the Lady Libussa, "a gift of plums for each of you, picked from my garden. One of you shall have half and one more, the second shall have half and one more, and the third shall again have half and three more. This will empty my basket. Now tell me how many plums are in it?"

The first knight made a random guess at three score.

"No," replied the lady; "but if there were as many more, and a third as many more as there are in the basket, with five more added to that, the number would by so much exceed three score as it now falls short of it."

The second knight getting awfully bewildered, speculated wildly on forty-five.

"Not so," said this royal ready-reckoner; but if there were a third as many more, half as many more, and a sixth as many more as there are now, there would be in my basket as many more than forty-five as there are now under that number."

Prince Wladimir then decided the number of plums to be thirty, and by so doing obtained this invaluable housekeeper for his wife, The Lady Libussa thereupon counted him fifteen plums and one more, when there remained fourteen. To the second knight she gave seven and one more, and six remained. To the first knight she gave half of these and three more; and the basket was empty. The discarded lovers went off with their heads exceedingly giddy, and their mouths full of plums.

Double Position, or the Rule of False, by which problems of this sort are worked, ought to demolish the commonplace about two wrongs not making a right. Two wrongs *do* make a right, *figuratively* speaking, at all events. Starting with two wilfully false numbers, you work each out to its natural conclusion. Then, taking the sum of your iniquities as compared with the falsehoods with which you started, you have only to multiply them crosswise to get terms which will bring you straight to the truth. To be more precise, after the cross multiplication, if the errors are alike, that is, both greater or both less than the number you want, take their difference for a divisor, and the difference of the products are a dividend. If unlike, take their sum for a divisor, and the sum of their products for a dividend. The quotient will be the answer. This is good arithmetic, and for those who can receive it not bad philosophy. There is an enormous self-righting power about error; and if we could only manage the cross multiplication properly, we might get some surprising results.

The number thirty-seven has this strange peculiarity: multiplied by 3, or any multiple of 3 up to 27, it gives three figures all alike. Thus, three times 37 will be 111. Twice three times (6 times) 37 will be 222; three times three times (9 times) 37 will be three threes; four times three times (12 times) 37, three fours, and so on.

I will wind up the present with a rather barefaced story of how a Dublin chambermaid is said to have got twelve commercial travellers into eleven bedrooms, and yet to have given each a separate room. Here we have the eleven bedrooms:

1	2	3	4	5	6	7	8	9	10	11
---	---	---	---	---	---	---	---	---	----	----

"Now," said she, "if two of you gentlemen will go into No. 1 bedroom, and wait for a few minutes, I'll find a spare room for one of you as soon as I've shown the others to their rooms."

Well, now, having thus bestowed two gentlemen in No. 1, she put the third in No. 2, the fourth in No. 3, the fifth in No. 4, the sixth in No. 5, the seventh in No. 6, the eighth in No. 7, the ninth in No. 8, the tenth in No. 9, and the eleventh in No. 10. She then came back to No. 1, where, you will remember, she had left the twelfth gentleman along with the first, and said: "I've now accommodated all the rest, and have still a room to spare; so if one of you will please to step into No. 11, you will find it empty." Thus the twelfth man got his bedroom. Of course there is a hole in the saucepan somewhere; but I leave the reader to determine exactly where the fallacy is, with just a warning to think twice before deciding as to which, if any, of the travellers was the "odd man out."—*Chambers' Journal*.

2. INVESTMENT OF A DOLLAR.

If one dollar be invested, and the interest added to the principal annually, at the rates named, we shall have the following result as the accumulation of one hundred years:—

One dollar, 100 years, at 1 per cent.	\$23
do do 3 do	19½
do do 6 do	340½
do do 8 do	2,203
do do 9 do	5,543
do do 10 do	13809
do do 12 do	84,675
do do 15 do	1,174,405
do do 18 do	15,145,207
do do 24 do	2,551,799,404

—*N. Y. Mercantile Journal*.

3. THE NATURAL SCIENCES SCHOOL.

In his inaugural as President of the Ohio Teachers' Association, Mr. Ormsby said.—Bordering the field of our moral nature, combining both the intellect and soul, are those subjects which appertain to art and design, inventions and mechanical skill. A foundation for these may be laid in the public school. The germ of man's æsthetic nature may be unfolded there. The eye may be cultivated to see things and forms of beauty, the soul to appreciate them, and the hand to produce them. This is partly secured by that system of free hand drawing that is so rapidly becoming universal. But free hand drawing is not sufficient. The architect and mechanic use the scale for determining lines and distances; and we neglect one essential part of practical education when we stubbornly refuse the use of instruments in school. If it is an accomplishment to be able with the eye to estimate with great accuracy the length of a line, it would certainly be regarded as a very great defect not to be able to determine it accurately with a scale.

It is supposed that the great master-builder used the square and compass when the foundations of the temple were laid; and every stone in it was prepared in the quarry with instruments. The dome of St. Peters was projected by one who could use instruments with hands almost divine; and why should we in our laudable earnestness in the work of free hand drawing reject the necessary complement of it. We may not introduce extensive systems of mechanical drawing into our common schools, but we can do so much as to develop a taste and talent in this direction; and all over the land, from sea to sea, the temples of grandeur, the dwellings of munificence, and homes of beauty shall tell its utility. Artists, artizans, men in every department of skilled labour, shall work with a more cunning hand.

4. THE STUDY OF NATURE AS A MEANS OF INTELLECTUAL DEVELOPMENT.

"For many years," says Carlyle, "it has been one of my constant regrets that no schoolmaster of mine had a knowledge of natural history, so far at least as to have taught me the grasses that grow by the wayside, and the little winged and wingless neighbours that are continually meeting me with a salutation which I cannot answer! Why didn't somebody teach me the constellations, too, and make me at home in the starry heavens? I love to prophesy that there will come a time when every schoolmaster will be strictly required to possess these two capabilities (neither Greek nor Latin more strict), and that no ingenuous little denizen of this universe be thenceforward debarred from his right of liberty in these two departments, and doomed to look on them as if across grated fences, all his life."

This sentiment of Carlyle's finds an echo in the minds of many scholars of the present day. Having spent years in study, they are yet ignorant of the most important facts concerning the external world, unable to explain the simplest phenomena of nature, blind

to the wondrous beauty of God's creation, and deaf to the divine melody which is uttered in the harmonies of the material universe.

Some affirm that the study of natural science is fatal to the development of our higher emotions, and tends towards gross utilitarianism, but who can study the harmony existing in the works of nature, the manifest order and design displayed in endless change and variety, and the immutable laws which govern the physical world without having his thoughts and aspirations lifted to Him who inhabiteth eternity, the Alpha and Omega. "The heavens declare the glory of God! Day unto day uttereth speech, night unto night showeth knowledge!"—*C. Allen, in R. I. Schoolmaster*.

5. REMARKABLE FACTS IN NATURE.

Everything in nature indulges in amusement of some kind. The lightnings play, the winds whistle, the thunders roll, the snow flies, the rills and cascades sing and dance, the waves leap, the fields smile, the vines creep and run and the buds shoot. But some of them have their seasons of melancholy. The tempests moan, the zephyrs sigh, the brooks murmur, and the mountains look blue.

Thus nature teaches the Old Bible doctrine of a "time for all things."

6. WEATHER INDICATIONS.

A rosy sunset presages good weather; a ruddy sunrise bad weather.

A bright yellow sky in the evening indicates wind; a pale yellow sky in the evening indicates wet.

A neutral grey colour in the evening is a favourable sign; in the morning it is an unfavourable sign.

Soft and feathery clouds betoken fine weather.

Deep, unusual lines in the sky indicate wind or storm. Mere tints bespeak fair weather.

A rainbow in the morning,
The sailors take warning,
A rainbow at night,
Is the sailor's delight.

If the moon shines like a silver shield,
Be not afraid to reap your field;
But if she rises haloed round,
Soon will we reap on deluged ground.

The evening red and morning grey,
Are certain signs of a beautiful day,
When rocks fly sporting in the air,
It shows that windy storms are near.

7. INJURY TO PHYSICAL HEALTH IN THE SCHOOLS.

It is painfully evident that, with very few exceptions, our primary schools especially are doing much to injure the physical health of the children who attend them. At first sight, this may seem to be only a physical evil; but it really proves to be both an intellectual and a moral evil. If the young plant becomes bruised and deformed by bad culture, it must be equally true that young minds may become dwarfed and distorted by improper physical culture. As young plants need the fresh open air and the sunlight, so do young children's bodies.

Our school-houses, as the gardens in which young children are to receive much of their culture, if they do not happen to be so contrived and located as to be little better than pest houses, they are very often made so by improper use. Children are closely shut up in them, in confined air which becomes impregnated with odours from unwashed bodies and clothing and also from diseased and over-loaded stomachs. They are kept inactive and still for four and five hours daily, when their natures require exactly the opposite treatment. These evils alone are so great in multitudes of cases that all the knowledge or training usually acquired, can not be a sufficient compensation.

Physical confinement of young children is unnatural and destructive to their health; but when to it is added the fetid atmosphere of a close unventilated school-room, diseases are not only generated, but perpetuated. Yet one of the most lauded excellencies of a school of fifty or sixty children, is a teacher's success in keeping them all still, and of course inactive, for four or five hours each day. No wonder that the children of such a school become like sickly plants, and die prematurely.

Our healthiest men and women would not only be disgusted, but they would sicken and die as the children do, if they were immured in such school-rooms, sitting quietly five hours daily upon a hard bench. The teachers themselves would not live out half their

days, were they subjected to the same bodily inactivity as their pupils. As it is, how many of our female teachers are tortured from day to day with headaches, foul breath, dyspepsia, and physical exhaustion. We have drawn no fancy picture, neither have we given all the colouring it will bear.—*Ohio Ed. M.*

8. PLANT TREES.

The Gold Hill, Nevada, *Daily News*, says: "in various parts of the country efforts are making to stimulate the cultivation of forest trees, and to check the reckless and wasteful destruction of woods for which Americans have been distinguished. California has engaged a professional arboriculturist, at a salary of \$15,000 a year, to superintend the selection and planting of trees in that State; and if the man is a master of his business, the money paid to him will be well invested. The legislatures of several States are moving in this matter, which commends itself to the favourable consideration of every practical mind.

9. BOYS USING TOBACCO.

A strong and sensible writer says a good, sharp thing, and a true one, too, for boys who use tobacco: "It has utterly spoiled and utterly ruined thousands of boys. It tends to the softening and weakening of the bones, and it greatly injures the brain, the spinal marrow, and the whole nervous fluid. A boy who smokes early and fre-

quently, or in any way uses large quantities of tobacco, is never known to make a man of much energy, and generally lacks muscular and physical as well as mental power. We would particularly warn boys, who want to be anything in the world, to shun tobacco as a most baneful poison."

10. TECHNICAL SCHOOLS IN GERMANY.

Germany has an extraordinary number of schools for special preparation for industrial pursuits, including schools for architects, engineers, business-men, soldiers, farmers, musicians, sailors, surgeons, gymnasts, and for mechanics, designers, telegraphers, artists, wood-cutters, builders, pharmacutists, printers, sewing-women, glass-makers, and for women in various useful branches of arts and sciences, mechanical trades and pursuits. The census of the literary productions in Germany showed over 10,000 works in 1870—1,400 in theology, 100 in philosophy 1,000 in "pedagogy" (the art and science of teaching), 700 in history, 1,000 in law, 100 in mathematics, 250 in geography, 250 in war, 400 in medicine, 500 in natural history, 300 in modern languages, 400 in technical education, 200 in architecture, 350 in agriculture, 100 in woods and forests, 275 in popular works, 275 in young folk's literature, 390 mixed works, and 250 maps.

The Minister of Education of Austria has requested the United States to present at the Vienna exposition a representation of common school instruction adopted in this country.

HEBREW CHRONOLOGY, FROM THE EXODUS TO THE BUILDING OF SOLOMON'S TEMPLE.

BY R. LITTLE, ESQ., INSPECTOR, COUNTY HALTON, A'CTON, ONTARIO.

Number of Judge.	Number of Oppressor.	LEADERS, II: JUDGES, XV: OPPRESSORS, VI: KINGS, III.	From Exodus to Building of Temple.				AUTHORITIES.	YEARS B. C.
			YEARS	YEARS	YEARS	YEARS		
		MOSES.....	40	...	...	...	Num. xiv. 33.....	1592
		JOSHUA.....	6	...	...	...	Josh. xiv. 7. 10.....	1552
		(1) Before the Division of the Land.....	19	19	19	...	Jos. Ant. v. 1. 19.....	1546
		(2) After the Division of the Land.....	9	9	9	...	.....	1527
		ELDERS.....	18	18	18	...	Jos. Ant. vi. 5. 4.....	1518
		ANARCHY.....	8	8	8	...	Judg. iii. 8.....	1500
		CHUSAN.....	40	40	40	40	Judg. iii. 11.....	1492
		OTHNIEL.....	18	18	18	18	Judg. iii. 14.....	1452
		EGLON.....	8	8	8	8	Theop. Ad. Aut. L. 3.....	1434
		EHUD.....	1	1	1	1	Jos. Ant. v. 4. 3.....	1426
		SHAMGAR.....	20	20	20	20	Judg. iv. 3.....	1425
		JABIN.....	40	40	40	40	v. 3.....	1405
		BARAK AND DEBORAH.....	7	7	7	7	vi. 1.....	1365
		MIDIAN.....	40	40	40	40	viii. 28.....	1358
		GIDEON.....	3	3	3	3	ix. 22.....	1318
		ABIMELECH.....	23	23	23	23	x. 2.....	1315
		TOLA.....	22	22	22	22	x. 3.....	1292
		JAIR.....	18	18	18	18	x. 8.....	1270
		PHILISTINES AND AMMONITES.....	300	...	...	...	xi. 26.....	1252
		JEPHTHAH.....	6	...	6	6	xii. 7.....	1246
		IBZAN.....	7	...	7	7	xii. 9.....	1239
		ELON.....	10	...	10	10	xii. 11.....	1229
		ABDON.....	8	...	8	8	xii. 14.....	1221
		PHILISTINES } AND } SAMSON, }	40	...	40	40	xiii. 1.....	1181
		ELI.....	40	...	40	40	xv. 20.....	1141
		SAMUEL.....	45	...	45	45	1 Sam. iv. 18.....	1096
		SAUL.....	40	...	40	40	Acts xiii. 20.....	1056
		DAVID.....	40	...	40	40	Acts xiii. 21.....	1056
		SOLOMON.....	4	...	4	4	1 Kgs. ii. 11.....	1016
		Years from the Exodus to the } Building of the Temple... }	580	...	...	480	1 Kgs. vi. 1.....	1016

The great design of the above Chart, in the construction of which no violation of Scripture language has been made, is to determine the exact length of the period extending from the Exodus to the building of Solomon's Temple.

The basis of calculation is founded on the two statements that from the entrance into Canaan until the overthrow of the Ammonites by Jephthah was 300 years, (Judges xi. 26), and that from the division of the Cisjordan territory by Joshua until (the end of) Samuel's Judicature was 450 years (Acts xiii. 20).

The complete harmony existing between these two dates results from the adoption of 8 years as the length of Ehud's judgeship in accordance with the reading of the copy of the Bible of Theophilus, the celebrated Bishop of Antioch, (Ad. Aut. L. iii), though he preferred and used the more general reading 80.

The number 8 is corroborated by Josephus, who says in his Antiquities (v. 4. 1.) that "the Israelites were brought under slavery by Jabin, the King of the Canaanites, and that before they had a short breathing time after the slavery under the Moabites." The historian would never have applied the italicized expression to a period of eighty years, which, however, is quite applicable to one of eight years.

Our readers will observe that the 480 years of 1 Kgs. vi. 1, seem to be counted from the first year of the first Judge Othniel, and that the whole period from the departure from Egypt to the building of the first temple was 580 years.

V. Miscellaneous.

1. MONOSYLLABIC POEM ON WORDS.

The following curious illustration of the power of short words in the English language was written by Dr. Addison Alexander:—

Think not that strength lies in the big round word,
Or that the brief and plain must needs be weak;
To whom can this be true who once has heard
The cry for help, the tongue that all men speak,
When want, or woe, or fear is in the throat,
So that each word gasped out is like a shriek
Pressed from the sore heart, or a strange wild note
Sung by some fay or fiend! There is a strength
Which dies if stretched too far or spun too fine,
Which has more height than breadth, more depth than length.
Let but this force of thought and speech be mine;
And he that will may take the sleek, fat phrase,
Which glows and burns not, though it gleam and shine;
Light, but not heat—a flash without a blaze.

Nor is it mere strength that the short word boasts,
It serves of more than fight or storm to tell—
The roar of waves that clash on rock-bound coasts,
The crash of tall trees when the wild winds swell;
The roar of guns, the groans of men that die
On blood-stained fields. It has a voice as well
For them that far-off on their sick-beds lie,
For them that laugh, and dance, and clap the hand
To joy's quick step, as well as grief's low tread,
The sweet, plain words we learn at first keep time
And though the theme be sad, or gay, or grand,
With each, with all these may be made to chime,
In thought, or speech, or song, or prose, or rhyme.

New Dominion Monthly.

2. WORDS AND SENSE.

Words are like leaves; and where they most abound,
Much fruit of sense beneath, is rarely found.
False eloquence—like the prismatic glass,
Its gaudy colours spreads on every place:
The face of Nature—we no more survey,
All glares alike, without distinction gay;
But true expression, what'er it shines upon,
It gilds all objects, but it alters—none.
Expression is the dress of thought, and still
Appears more decent—as more suitable.

3. CURIOUS FACTS ABOUT WORDS.

Marsh tells us that the number of English words not yet obsolete, but found in good authors, or in approved usage by correct speakers including the nomenclature of science and the arts, does not probably fall short of one hundred thousand. A large portion of these words, however, do not enter into the living speech, the common language of daily and hourly thought. Some celebrated English and American orators have been able, upon occasion, to summon at their command one-half of this vast array of words, although they habitually content themselves with a much less imposing display of verbal force. Few writers or speakers use as many as ten thousand words; ordinary persons of fair intelligence not above three or four thousand. If a scholar were to be required to name, without examination, the authors whose English vocabulary was the largest, he would probably specify the all-embracing Shakespeare, and the all-knowing Milton; and yet, in all the works of the great dramatist there occur not more than fifteen thousand words, in the poems of Milton not above eight thousand. The Old Testament uses but 5,642 words. The whole number of Egyptian hieroglyphic symbols does not exceed eight hundred, and the entire Italian operatic vocabulary is said to be scarcely more extensive. *Illinois Teacher.*

4. WORDS OF WISE MEN.

—A fault concealed is a fault doubled.
—Each one is the son of his own words.
—Song charms the sense; eloquence the soul.
—Prosperous friendship has more bran than wheat.
—The childhood shows the man, as morning shows the day.
—It is easy to undertake, but more difficult to finish a thing.
—Temptations are enemies outside the castle, seeking entrance.
—You may find your best friend or your worst enemy in yourself.
—A knowledge of our weakness creates in us a charity for others.
—A slowness to applaud betrays a cold temper and an envious spirit.

—The greatest ornaments of an illustrious life are modesty and humility.

—He who buys too many superfluities may be obliged to sell his necessities.

—Above all other features which adorn the female character, delicacy stands foremost.

—Sentiments of friendship which flow from the heart, cannot be frozen in adversity.

—Real happiness is cheap enough; yet how dearly do we pay for the counterfeit.

—The light of friendship is like the light of phosphorus, seen best when all around is dark.

—A wise man will desire no more than what he can get justly, use soberly, and distribute cheerfully.

—A cheerful temper, joined with innocence, will make beauty attractive, knowledge delightful, and wit good natured.

Suffering, rightly borne, weakens the part of us which should be weak, and strengthens that part which should be strong.

—Such is the force of imagination, that we continue to fear long after the cause which produced the fear has ceased to exist.

—As pride is a vice that seldom escapes without punishment, so humility is a virtue that scarcely ever goes without a blessing.

—There is a kind of magic in truth which forcibly carries the mind along with it. Men readily embrace the dictate of sincere reason.

—We should be careful to deserve a good reputation, by doing well; and when that care is once taken, not to be over anxious about the success.

—False happiness renders men stern and proud, and that happiness is never communicated. True happiness renders them kind and sensible, and that happiness is always shared.—*Virginia Monthly Visitor.*

5. LITERARY MEN HOLD OUT WELL.

Mr. Carlyle, Sir Charles Lyell, and Mr. Darwin are all over three score and ten. Sir Roderic Murchison recently died in full harness at a very advanced age. Of French authors, Michelot, who has just published his thirtieth historical work, "History of the nineteenth century," is seventy-four; Guizot, at the age of eighty-five, is publishing a history of France in monthly parts; another busy historian, Mignet, is seventy-six; Victor Hugo is in his seventy-first year; and Littré of the same age still contributes an occasional book, and edits a review. America's older literary gentlemen are all well advanced.—Alcott, Emerson, Longfellow, Bancroft, Holmes, and numerous others. Socrates, in an extreme old age, learned to play on musical instruments; Cato, at eighty years of age commenced to study the Greek language; Plutarch, when between seventy and eighty commenced the study of Latin; Boccaccio was thirty-five years of age when he commenced his studies in polite literature. Yet he became one of the greatest masters of the Tuscan dialects; Dante and Petrarch being the other two. Sir Henry Spelman neglected the sciences in his youth, but commenced the study of them when he was between fifty and sixty years of age; after this time he became a most learned antiquarian and lawyer. Dr. Johnson applied himself to the Dutch language but a few years before his death. Ludovico Monaldesco, at the great age of one hundred and fifteen, wrote memoirs of his own times. Ogilby, the translator of Homer and Virgil, was unacquainted with Latin and Greek till he was past fifty. Franklin did not fully commence his philosophical pursuits till he had reached his fiftieth year. Dryden, in his sixty-eighth year, commenced the translation of the Iliad, his most pleasing production.

6. TRUE AND FALSE MANNERS.

The difference between the true manners and the false is just that between the real features and flesh of the face and a mask. So all effective cultivation of manners must begin with man. Make him generous, intelligent, refined, affable, sympathetic, and his actions will naturally tend to politeness as the smoke curls upward. True, this is not all: but this is the alphabet of which all else is application. Having these, it needs but a constant effort to express them in the simplest, noblest, most natural manner, to acquire the best manners.

7. READ THIS, BOYS.

A gentleman advertised for a boy to assist him in his office, and nearly fifty applicants presented themselves to him. Out of the whole number, he in a short time selected one and dismissed the rest. "I should like to know," said a friend, "on what ground you selected that boy, who had not a single recommendation." "You are mistaken," said the gentleman. "He had a great many. He wiped his feet when he came in, and closed the door after him,

showing that he was careful. He gave up his seat instantly to that lame old man, showing that he was kind and thoughtful. He took off his cap when he came in, and answered my questions promptly and respectfully, showing that he was polite and gentlemanly. He picked up the book which I had purposely laid upon the floor, and replaced it upon the table, while all the rest stepped over it or shoved it aside, and he waited quietly for his turn, instead of pushing and crowding, showing that he was honest and orderly. When I talked with him I noticed that his clothes were carefully brushed, his hair in nice order, and his teeth as white as milk; and when he wrote his name, I noticed his finger-nails were clean, instead of being tipped with jet, like that handsome little fellow's in the blue jacket. "Don't you call those things letters of recommendation? I do, and would give more for what I can tell about a boy by using my eyes ten minutes than all the letters he can bring me."—*Virginia Monthly Visitor*.

8. THE WILLS, THE WON'TS, THE CAN'TS.

There are three kinds of men in the world—the Wills, the Won'ts, and the Can'ts. The first effect everything; the others oppose everything. "I will" builds our railroads and steamboats; "I won't" don't believe in experiments and nonsense: while "I can't" grows weeds for wheat, and commonly ends his days in the slow digestion of bankruptcy.

9. WHAT MAKES THE MAN?

Good clothes do not. Money does not. A handsome face does not. Learning does not make the man. But it is

"A beautiful soul, a loving mind,
Full of affection for its kind;
A helper of the human race,
A soul of beauty and of grace,
That truly speaks of God within,
And never makes a league with sin."

This makes the man—the real man. Such men do good in the world. They are a benefit to themselves, and a benefit to society. Such men will finally shine as stars of the universe, illuminating the vast vault of eternity. Such men let us strive to be through life, in death, and throughout eternity.—*L., in Kentucky Collegian*.

10. TO INTEREST BOYS IN FARMING.

Mr. J. Harris, of Rochester, N. Y., one of the editors of the *American Agriculturalist* and who was tendered a professorship in the Cornell University, illustrates some of the means by which boys may be interested in the affairs of the farm, by the following personal reminiscences and suggestions:

When I was a boy my father made me keep the accounts of his farm, and I soon began to take an interest in it. He had ten children, and worked hard to give us a good education. When crops were poor, or prices low, it was with a heavy heart he sat down at night to tell me what to write in the book, and though young, I soon learned to sympathize with him. Like all good men, he loved his children. He worked hard for us, denied himself many luxuries, that we might have a good time; would wear an old hat that we might have new shoes, and often walked that we might ride. Never was a happier set of frolicking young ones on a farm. And there is not one of us this day that does not love farming. But those who talk of the "independent life" of a farmer—of his freedom from care and anxiety—merely show their ignorance.

There was plenty of anxiety on our farm. There was anxiety about the weather, about the crops, about the stock, and above all, about the health and life and limbs of the children. We ought all to have been killed half a dozen times over. One was kicked by a horse, and ran a narrower chance of life than he has ever done since, and yet he has been through the war, has been up and down the Mississippi on a steamboat, and travelled the whole length of the Erie Railroad. "Aunt Hattie," as we now call her, had her head cut open with a donkey cart, and a sad house we had for many days, as she lay between life and death. Another sister, when three years old, caught hold of the spokes of the fore wheel of a heavily loaded waggon, and was thrown forward, and the wheel grazed her whole body. My father was driving, heard the scream, and looked round in time to see the danger, but not in time to stop the team. Fortunately the nurse held on to the child and jerked her out of the rut before the hind wheel reached her. Last fall the eight children, who are still living, all met together, and it was found that every one of us had some scar that remained to remind us of the accidents of early life.

But what I wanted to say was, that the habit of keeping the books of my father was not only a benefit to me, but a great comfort to him. He told his fears, and I know now that it must have

been a great relief to him. It certainly was a great advantage to me. If I know anything about farming, I learned most of it from my father. And I am fully persuaded that if a farmer would provide a nice substantially bound book, and induce his son to write down every day, at his dictation, all that was done on the farm, it would go a great way towards making a good farmer of him. It would be useful. I can imagine some such record as this:

September 1st.—"Very dry weather. Cultivating for wheat." And then the boy would be very likely to ask when he was going to sow, and what kind, and why.

Sept. 2.—"Sow had ten little pigs last night, but killed two of them." "It is too bad," says the boy, "to lose them now, pigs are so scarce and high, and they say a rail nine inches high put round the pen, six inches or so from the boards will prevent a sow from lying on the pigs." "I thought of doing it," says the farmer, "but I could not find the hammer, and we have no spikes." Mental reflection by the boy: "Those two pigs at six weeks old would have sold for ten dollars."

Sept. 3.—"Thrashing. The five acres of Diehl wheat on the summer-fallow gave 150 bushels; the ten acres of Mediterranean after oats, gave only 120 bushels." "If we had sown it all Diehl," says the boy, "we should have had 450 bushels instead of 270." If the father is a sensible man he would correct this remark, and point out the fact that it was not the variety, but the condition and character of the land that made the difference.

Sept. 4.—"One of the horses sick." He had been on the thrashing machine all day, and the driver, to save his own horses, had made the farmer's do pretty much all the work. This horse was on the outside, and his end of the evener was no longer than that of the horse having the inside track, and he had to draw just as hard as the other and walk much faster.

Sept. 5.—"Drew the wheat to the city. Left at home ten bushels of Diehl for seed, and twenty bushels of Mediterranean. The Diehl overrun four bushels, and the Mediterranean fell short three bushels. Got \$2 a bushel for the Diehl, and \$1.75 for the Mediterranean." The five acres of Diehl came to \$280, and the ten acres of Mediterranean \$175.

Now let a farmer tell his son such facts, and let him write them down as they occur, and the chances are that five years will not pass before the farm will be at least partially drained, weeds will have disappeared, thirty bushels of wheat and two tons of hay per acre will be the rule rather than the exception, and there will be little danger of that young man seeking a clerkship in the city.

11. CHILDREN'S TOYS—WHERE THEY ARE CHIEFLY MADE.

Toys for the million are peculiar to the age. Wood is by far too dear in this country for their production, consequently the chief seat of their manufacture is in the dense woods of Germany. From out the old sombre pine forests of Thuringia issue the penny boxes of toys destined to make the homes of all Europe ring with joyous laughter—children's tea things, Noah's arks filled with only the leading animals, soldiers, &c., and the most "screechingest" articles that ever delighted the urchins' ear and maddened the old folk. How so many pieces as go within these boxes can be made, brought from such a distance, and sold with a profit for a penny, is a marvel that can be only understood when the mystery of their manufacture is inquired into. In the first place the pine wood costs next to nothing; women and children are chiefly employed in their manufacture; and great speed in their production is obtained by the division of labour, every toy passing through half a dozen hands. It would, at first sight, seem impossible that the lathe should be used in the production of animals, but here we have an example—a ring of elephants if we may use the term. All those who have been abroad are familiar with the round rings of bread, eight or ten inches in diameter, seen in bakers' shops. In a toy case we saw what at first sight appeared to be one of these, but upon examining it more narrowly we perceived that it was a ring of pine wood turned in a lathe, not exactly in the form of a ring, but in the form of a ring of elephants—there were the trunk, the peculiar shaped head, and the legs cut around the ring, as it were: and it was evident that the workman had only to split this ring into a sufficient number of segments (according to appropriate thickness) to transform the circle into a

GIVEN NUMBER OF ELEPHANTS.

These segmental elephants require, of course, to be rounded and finished by the hand, but the process is most curious, and is applicable to the production of any other animal and accounts for the cheap rate at which these wondrous toys can be produced. When manufactured, they come to this country by water carriage. Of course art is out of the question in these penny articles; but the

imagination of children is lively enough to fill up all deficiencies, and, as may be expected, their sale is immense. But quality is also to be looked for from Germany. Some of the best modelled toys in the world come from Grunheincher, in Saxony, where modelling is attended to in a most artistic manner. Prussia where the schools of art are fast educating the people in all matters of design, is the seat of those elegant little toys in which the details are made of papier-mache. In Germany the Government educates its children in the construction of toys, hence the comparative cheapness with which we procure from that country models of interiors made in paper, and coloured to the life. So excellent are some of these designs, especially of animals, that they are used in this country as ornaments rather than playthings.

Nuremberg is the great seat of the metal toy trade, such as leaden soldiers in boxes, locomotives and railroads. Leaden toys, as a rule, are not to the taste of healthy robust lads; indoor games seldom are. There is something derogatory and feminine in sitting round a table setting up toy soldiers. Boys who indulge in such amusements are either weaklings or of an effeminate disposition. It may be said that a love for mechanics would be fast elicited by model steam engines or locomotives; but there is no subterfuge here, and no lad but one with a turn for mechanics would crave after these mechanical toys. It is extraordinary, the completeness to which toys of this description are finished. Only in England would care be taken to complete every detail in the most elaborate beam-engines, locomotives and marine engines. We do not allude to the tin affairs which are mere shams—these are of German production—but the brass specimens we see in the windows of the opticians. There are some establishments in London where the whole process of constructing these elegant toys is taught. The rough castings ready for the lathe and the bench can be purchased separately, and the youth of a mechanical genius taught

TO CONSTRUCT THESE MACHINES;

this is a speciality worthy of note. Perhaps they can scarcely be strictly placed in the category of toys, but we feel certain they afford an amusing training of mind for pursuits in which large numbers of English lads are pretty sure to be thrown. The military toys are all German, they mainly come from Hesse Cassel. It seems strange that these peaceful people should help to feed the warlike spirit of childhood. The French, we should have imagined, would more naturally have turned to this kind of trade, but it is as we have said. The swords and guns, and breast plates we see in the shop windows, all come from the pretty dukedom we have referred to.—*Cassell's Magazine.*

12. USES OF DISCIPLINE.

Beethoven said of Rossini that he had in him the stuff to have made a good musician if he had only been well flogged when a boy; but that he had been spoiled by the facility with which he produced.

When Mendelssohn was about to enter the orchestra at Birmingham, on the first performance of his "Elijah," he said laughingly to one of his friends and critics, "Stick your claws into me. Don't tell me what you like, but what you don't like."

Washington lost far more battles than he gained, but he succeeded in the end. The Romans in their most victorious campaigns almost invariably began with defeats. Wellington's military genius was perfected by encounters with difficulties of apparently the most overwhelming character.—*Dr. Smiles.*

13. FAITH AND PRAYER OF A LITTLE PRINCE.

A thanksgiving hymn was sung at St. Lawrence Jewry, on the recovery of his Royal Highness the Prince of Wales; and the vicar, in his sermon upon the subject, paid a high tribute to the way in which the Prince and Princess bring up their children. The night before the Queen left Windsor to go to Sandringham, when the Prince was most dangerously ill, she told his children that their father was very ill, and perhaps they would not see him again, and bade the elder, Prince Victor, pray to God for his father. The next morning Prince Victor said to the Queen, "Grandmamma, father will not die." I have been to God; and He says father shan't die. Such an instance of faith is indeed worthy of record.—*Church Times.*

14. THE FLOWER MISSION.

The following account of a beautiful charity is taken from an American Juvenile Magazine. We copy it in the hope that it may suggest to our "Young Folks" new means of doing good:—

The Flower Mission of Boston is one of the simplest and sweetest of her charities. This is the fourth season that it has dispensed comfort and blessing to the bedsides of sickness and the work-rooms of weary toil. As it was the idea of a Boston girl, it seems fitting

that it should be brought to the notice of the girls who read this Magazine. And the boys, too, I am sure, need no less to learn how a little thoughtfulness may contribute to the happiness of many.

Walking along the streets one hot summer day, with a bunch of flowers for a sick friend, this girl noticed, as probably many others would have done, how many of the passers-by turned to look at it; how little children begged for "just one flower please;" and the weary and dusty seemed to brighten a little as it passed. And the thought occurred to her, Why could not the flowers so abundantly lavished upon the country be brought to those who cannot go to them,—to those who by sickness, or poverty, or toil, are confined all the long, hot summer months in the city.

Being not only a thinker, but a doer also, this idea resulted, by the aid of others, in what is known as the Flower Mission of Hollis Street Chapel, so called because of the pleasant room kindly offered for its headquarters, and not because of the patronage of any one church. All denominations delight to aid in its gentle labour of love.

From May until October this room is open every Monday and Thursday morning from eight till twelve, for the reception of flowers; and young ladies are in attendance, to make up and distribute the bouquets. All are free contributions from the fields, the gardens, and the conservatories. First comes a basket of wild flowers, lupines, and columbines, and bright green ferns, and then a large box full of aristocratic tea-roses, and dainty and hybrid heliotropes; then great branches of lilac, and the sweet wild azalea; or, perhaps, rich pansies with their laughing faces, from the "Pansy Man," who has made this contribution a speciality.

Here comes a lady with a basket of nosegays picked early this morning from an old-fashioned garden—bachelor's buttons, and spicy pinks, and feathery grass. Now some boxes of strawberries arrive—not as many as we could wish; but the lady with the list of sick well knows to whom these will be the greatest treat. 'Tis a busy and a pretty scene—the table piled high with its floral offering, and the cheerful tongues keeping time to the flying fingers. As fast as the bouquets are made, they are put in a tank of water, there to await deposit in the baskets, dozens of which hang upon the wall gaping for their fragrant burdens. By noon a hundred or two bouquets are made, and the baskets are filled for the hospital. Carriages are sent to convey them there, where their coming is awaited with eagerness by the suffering inmates.

We who are well, and so surrounded by nature's beauties as to be almost unmindful of them, can scarcely realize how a simple bouquet will brighten the tedious routine of hospital life and suffering. Smaller baskets are also filled, and sent to private persons who are known to the different young ladies. And it is not unlikely you may overhear snatches of low conversation, which show that the gift of flowers is but a cover for other and more substantial bounties.

Indeed, the flower itself is but a trifle compared with the thought and good-will which prompts the offering. And it is *this* which makes the Flower Mission thrice blessed.

The flowers that are left after these donations are generally sent to the work-rooms of the city. Of course they are utterly inadequate to supply the number of people to whom they would afford pleasure. Three hundred bouquets a day, with two hundred to hospitals, &c., leaves hardly enough to supply a single work-room of many large tailoring establishments. But as far as they go, they give great pleasure. And if the boys and girls in the country could tell how much, more hands would be picking them on evening walks and afternoon holidays, I am sure.

These who distribute the flowers can tell many interesting incidents attendant upon their pleasant task. Oftentimes the flowers are declined at first, the girls thinking they must be paid for; and it does not take a profound mathematician to calculate how much, out of a week's wages of four or five dollars, a girl can spare for the luxury of flowers. But when they understand that they are a free gift from those in the country to those in the city, the pleasure with which they are received and put in some improvised vase, and set upon the sewing machine or on the window seat, where the sight of them may shorten the weary hours, and suggest, in the midst of heat and steam, and stifling air the green woods,—and this, if seen would repay, many times over, the trouble that the gift has cost.

Sometimes they are sent to the city jail and state prison; and wherever they go, they are seen to touch and awaken that which is best in every human being. They are also sent to the city missionaries for distribution in miserable quarters which they strive to purify. And one of them told, with tears in his eyes, how he had seemed to reach, by the simple gift of a flower, hearts which for months he had been trying in vain to touch. Their report tells us that during the working months of 1871 between eleven and twelve thousand bouquets were distributed; and of fruit there were nearly

seven hundred donations besides a special distribution of two thousand pond lilies. Thirty-four towns had the pleasure of contributing to this happy result.

To be generous with flowers brings its own reward; for the more they are cut, the more will the plants bloom, as any gardener will tell you. You can represent the matter in this light to your friends who have gardens; and not be afraid of begging in so good a cause. Then, the woods and fields yield their treasures without a murmur. There are the yellow and flame-coloured field lilies, the gorgeous cardinal flower, the whole tribe of orchis, all of which are formidable rivals to the garden beauties.

If you live in a city that has no flower mission start one of your own. The only capital required is the wish and the will.

Two young ladies of New York, during a visit to Boston, became interested in its Flower Mission, and on their return determined to copy so beautiful a thing. Two or three discouraging mornings, with not a single flower, was the beginning of a mission which now sends out its bouquets by the thousand; and the end is not yet.

If flowers are grateful to the eye of the sick, still more grateful is fresh fruit to their capricious tastes. Would it not be pleasant, in those places where berries abound, to form berry parties, the result of the day's labour to be forwarded in the same manner? I will not mention all the fine plans which suggest themselves for the promotion of this labour of love, leaving some for your own quick wits to invent, but will close with the hope that some hearts may be made lighter, and some sad homes the brighter, by efforts of our girls and boys.—*From Oliver Optic's Magazine.*

15. A YEAR'S BRAIN WORK.

Over thirty-five hundred new books appeared in England last year, besides thirteen hundred new editions—the exact total of both classes being 4,835—and the most notable circumstances in the literary history of the twelve-month was the decrease of novels, from 200 in 1870 to 155 in 1871. Still, lest it might be inferred that the English novelists are falling into disfavour the statisticians are careful to add the explanation that the number of new editions of romances has largely increased during the year—which is a tribute to the older writers. Works on Political Economy are rapidly increasing in numbers—45 last year against 26 in 1870. Theological books are in greater demand than formerly—nearly 800 having appeared last year. Educational books are also in demand—nearly 700 having been published during 1871. The number of American importations into the English book market sensibly diminished last year—the figures being 322 in 1871 against 426 in 1870.

Two countries of Europe present a striking contrast—the comparatively new literary life of Russia being represented in the statistics of 1871 by no less than 1,359 works published in thirty-one different cities of the Empire, while Spain makes a beggarly show, although her civilization and her literature are four centuries old. Spanish writers produced 115 new plays last year, but other contributions to the literature of the country are very inferior to those of Russia, in number as well as in quality. Of the books of the year in Russia, according to Mr. Eugene Schuyler, 153 were on language, 133 on jurisprudence, 118 were historical works, and 242 were novels, poems, and essays. The most remarkable feature of the Russian book returns is the great progress, made by native writers in the production of political works.

In regard to Germany, Robert Zimmerman writes that it is a significant indication of the present state of philosophy, that in place of philosophical systems, biographies of philosophers and of their wives appear. Varnhagen's "Remains" seem to be inexhaustible, fourteen volumes of the "Diaries" having been published, a new work follows under the title of "Biographical Portraits."

16. UNCONSCIOUS BRAIN WORK.

Sir Benjamin Brodie has referred, in his "Psychological Inquiry," to a very remarkable quality of the brain, a quality Dr. Carpenter calls unconscious cerebration. It often happens that after accumulating a number of facts in an inquiry, the mind becomes so confused in contemplating them, that it is incapable of proceeding with its labours of arrangement and elaboration; dismayed at the chaotic heap, it backs, as it were, upon itself, and we feel certain it is no use cudgeling our dull brains any longer. After a little while, however, without having once consciously recurred to the subject, we find to our surprise, that the confusion which involved the question has entirely subsided, and every fact has fallen into its right place. It is possible that the brain can, without our knowledge, select and eliminate, aggregate and segregate facts as subtly as the digestive organs act upon food introduced into the stomach.

Sir Henry Holland is inclined to dissent from such a conclusion,

and leans rather to the explanation of the phenomena which Sir Benjamin Brodie has himself suggested—namely, that the seeming ordering process may be accounted for by supposing that all the unnecessary facts fade from the memory, whilst those which are essential for the ultimate arrangement and classification of the subject under consideration are left clear of the weeds that before encumbered them. But this explanation involves a confession of an eliminative process going on unconsciously in the brain, which appears little less wonderful than a hidden cogitation. Why should the non-essential facts alone fade? We see no reason why we should refuse to recognize masked operations of the mind. Surely we see every day examples of cerebral acts being performed, of which the individual afterwards is totally oblivious.

Let us instance, for example, the mental impression engraved with a searing iron as it were, upon the brain in moments of delirium. Under chloroform, again, the mind is often in a great state of exaltation, and goes through mental labour of a kind calculated, one would imagine, to leave traces behind it on the memory; nevertheless, water does not more readily give up impressions made upon it than does the tablet of the brain under this influence. Even in our dreams, of which we take no notice, but which are patent to by-standers by our speech and action, there must be plenty of "unconscious cerebration." Indeed, Sir Henry Holland, in reference to a vague feeling that all of us have experienced when engaged in any particular act, that "we have gone through it all before," endeavours to explain it by supposing that the faint shadow of a dream has suddenly, and for the first time, come to our recollection in a form so unusual, that it seems as though we had acted the part before in another world. That we go through brain work unconsciously, we have, therefore, no doubt, and we see no reason why we should deny the existence of power seated in the brain, whose duty it is silently to sift the grain from the husk in the immense mass of mental pabulum supplied to it by the senses.—*Edinburgh Review.*

17. THE NUMBER SEVEN.

In all ages and in all countries the number seven has had a peculiar significance. Among the Hebrews it was called the number of perfection. Apuleius speaks of dipping the head seven times in the sea for purification, Pythagoras taught its efficacy, and Cicero in the vision of Scipio calls seven a complete number which is "the connecting principle of almost all things." The learned Prof. Bush, says in his Notes on Genesis, that "the original word for seven, comes from a root, signifying to be full, complete, entirely made up." No other numeral is used so frequently in the Bible, and the septenate structure of many passages is remarkable.

"On the seventh day God ended his work which he had made." The week of seven days was established, the last to be a day of rest, the seventh year was made a year of rest, not only for man and beast, but even for the fallow ground; and at the expiration of seven sabbaths of years, the year of Jubilee allowed liberty and homesteads to all the inhabitants. Enoch was the 7th from Adam, Abraham the 21st, and St. Matthew enumerates forty-two generations from Abraham to Christ.

Noah had 7 days' notice of the flood, during which time he gathered the clean beasts and fowls of the air into the ark by sevens, and in the 7th month the ark rested on Mt. Ararat. He sent out a dove which returned, but after 7 days he again sent forth the dove, which brought back the welcome olive leaf, and after 7 days more he repeated the experiment but lost the dove.

Jacob served 7 years for Rachel, made a mistake in the bride, and served 7 years longer, and when he met Esau he bowed 7 times before him. Pharaoh's dreams of the 7 years of plenty and 7 years of famine were apparently of 7 fat and of 7 lean kine, and of 7 full ears and of 7 suckers. Joseph mourned for his father 7 days, and Zipporah the wife of Moses was the 7th daughter of Jethro. Moses came out of the cloud on Mt. Sinai on the 7th day, and he made 7 lamps of pure gold, and on the 7th day no manna fell. The feast of the tabernacle lasted 7 days, and on various occasions 7 animals of various kinds were to be offered. Jericho was besieged 7 days when 7 priests, with 7 trumpets of rams' horns went 7 times round the city, but on the 7th day they went round 7 times and the walls fell. Solomon's temple was 7 years in building. Job's 7 sons were slain in one day, and Homer relates that Achilles slew the 7 brothers of Andromache in a single day. The dead son of the Shunamite sneezed 7 times and opened his eyes. The servant of Elisha went to the top of Carmel 7 times to see the probabilities of rain.

Naaman the Syrian was told to bathe 7 times in the Jordan, and Nebuchadnezzar went with the cattle grazing 7 years. We also read of 7 golden candlesticks, 7 seals, 7 loaves, 7 baskets full, 7 devils, 7 deacons, a 7 headed beast, 7 angels with the 7 last plagues, and 7 golden vials.

Samson's marriage-feast lasted 7 days, and he told Delilah that 7 green withs would hold him bound, also that she could fasten him to a beam by the 7 locks of his hair. The loss of his 7 locks quite conquered him.

The Seven Churches of Asia were at Ephesus, Smyrna, Pergamos, Thyatira, Sardis, Philadelphia, and Laodicea. The seven Catholic or general epistles are the three of St. John, two of St. Peter and one each of St. James and St. Jude. The Lord's Prayer contains seven petitions, and the Apostles' creed has seven articles relating to the divinity and seven to the humanity of Christ. Christians are enjoined to make 7 additions to their faith, viz:—virtue, knowledge, temperance, patience, godliness, brotherly kindness, and charity. St. John in the Apocalypse often groups 7 names together, as "Blessing, and glory, and wisdom, and thanksgiving and honour, and power, and might." Also "Worthy is the Lamb that was slain to receive power, and riches, and wisdom, and strength, and honour, and glory, and blessing." Solomon says seven things are an abomination to the Lord, viz: pride, lying, murder, jealousy, mischief-making, perjury and slander. It has been maintained that seven evils proceeded from the fall of man, and hence are seven sacraments as remedies, viz: original sin is to be taken away by baptism, mortal sins by penitence, venial sins by extreme unction, ignorance by ordination, weakness of spirit by confirmation, frailty of the flesh by matrimony, and the evil nature by the Eucharist. The seven virtues have been classified as three theological virtues, *faith, hope, and charity*, and the four cardinal virtues, *prudence, justice, fortitude, and temperance*. The Catholic Church teaches seven corporal works of mercy, viz: to feed the hungry, to give drink to the thirsty, to clothe the naked, to visit and ransom captives, to harbour the harbourless, to visit the sick, and to bury the dead. Also seven spiritual works of mercy, viz: to correct the sinner, to instruct the ignorant, to counsel the doubtful, to comfort the sorrowful, to bear wrongs patiently, to forgive all injuries, and to pray for the living and the dead.

The seven deadly sins are pride, covetousness, lust, wrath, gluttony, envy, and sloth, which have the seven opposite virtues of humility, liberality, chastity, meekness, temperance, brotherly-love, and diligence.

In performing the rite of *suttee* the Hindoo widow walks 7 times around the pyre, repeating *mantras* or prayers, scattering rice and sprinkling water on the bystanders. The corpse of the husband is carried round 7 times and placed in the lap of the widow, when the fire is kindled to consume them both.

Aeneas lost all his vessels but 7, he saw 7 stags and killed them, and was afterwards told by the Cumæan Sibyl to sacrifice 7 bullocks and 7 unspotted ewes.

Seven witnesses were sufficient to prove a Roman nuncupative will, and after the Roman kings, farms of *septemjugera* or 7 acres were allotted to each citizen. Cincinnatus, Dentatus, Fabricius, Regulus, &c., found 7 acres enough for their wants.

Seven years' absence of a husband, without intelligence of his whereabouts, justifies the marriage of his wife à la Enoch Arden's, without subjecting her to the charge of bigamy; also a child under 7 years of age is supposed to be without discretion. The seven champions of Christendom were St. George of England, St. Denis of France, St. James of Spain, St. Anthony of Italy, St. Andrew of Scotland, St. Patrick of Ireland, and St. David of Wales.

Solon the Athenian law-giver, Chilo the Spartan sage, Thales the philosopher of Miletus, Bias the Prienean, Cleobulus of Lindos, Pittacus of Mitylene, and Periander of Corinth, have for ages been known as the seven wise men of Greece.

Seven ancient wonders of the world are often spoken of, referring to the *pyramids* of Egypt, the *hanging gardens* of Babylon, the *tomb of Mausolus*, the *temple of Diana* at Ephesus, the *colossus* of Rhodes, the *statue of Jupiter* by Phidias, and the *Pharos* of Alexandria. In more recent times the coliseum at Rome, the catacombs at Alexandria, the Chinese wall, the altars of Stonehenge, the leaning tower of Pisa, the porcelain tower at Nankin, and the mosque of St. Sophia at Constantinople have been called the seven wonders of the middle ages. In former times there were reckoned 7 sciences, Grammar, Logic, Rhetoric, Arithmetic, Geometry, Astronomy and Music. The 7 hills of Rome, were the Aventine, Capitoline, Esquiline, Coelian, Viminal, Quirinal, and Palatine. The 7 Roman kings, were Romulus, Numa Pompilius, Tullus Hostilius, Ancus Martius, Tarquinius Priscus, Servius Tullius, and Tarquinius Superbus. In England 7 kingdoms called Kent, Northumberland, East Anglia, Mercia, Essex, Sussex, and Wessex constituted the Saxon Heptarchy, before the time of Egbert.

The seventh son, and especially the seventh son of a seventh son has long been popularly supposed to be endowed with wonderful powers of healing diseases by the touch, particularly on Good Friday. In France the seventh son without an intervening daughter

is called a *Marcou*, and sometimes in Holy Week a genuine *Marcou* will have hundreds of patients to touch.

There is a curious eastern legend of 7 sleepers who slept in a cave 187 years, a tale that perhaps suggested Rip Van Winkle, and to this day many Mahometans believe the names of the sleepers and their dog, posted on their doors will keep away ghosts and demons.

There are several curious coincidences of the occurrence of the number 7 in nature. Seven eclipses is the greatest number possible in a year, and 70 in 18 years. There are seven bones in the neck of all mammals, there are 7 true ribs on a side, and 7 bones in the tarsus. The great ocean currents are 7 in number, and meteorologists describe 7 forms of clouds. There are seven symmetrical forms of crystals, 7 kinds of attraction described by philosophers, and 7 general properties of matter.

The 7 notes of the musical scale and the 7 tints of the rainbow, suggest the idea of completeness. So also do the 7 recognized attributes of Deity, viz:—Wisdom, knowledge, goodness, power, justice, mercy and truth, and the 7 relations of the Creator to man, viz:—Creator, Lawgiver, Benefactor, King, Judge, Saviour and Father.

Ruskin has charmed the world by his pleiad-like grouping of the 7 Lamps of Architecture, and artists have told us that the foot of the renowned statue of Venus de Medecis is one seventh the length of the statue.

The Budhists who embrace over 150 millions of the human race, believe in 7 gods who rule the 7 days of the week. They say *Hiru* rules Sunday, *Kandru* Monday, *Angaharu* Tuesday, *Budahu* Wednesday, *Braspatri* Thursday, *Sicura* Friday, and *Henaharu* Saturday.

Chaucer devotes a verse of the Canterbury Tales, to a description of the seven metals of the alchemists.

"Sol gold is, and Luna silver threpe;
Mars yren, Mercurie quyksilver we clepe;
Saturnus leed, and Jubiter is tyn.
And Venus coper, by my fader kyn."

The old column of the 7 dials in London, faced 7 streets, radiating therefrom.

The partial constellation of the 7 stars has given the word *Septentrional*, to be seen in the treasury seal on every "greenback."

Much interest has been taken by antiquarians to find the site of the "7 cities of Cibola," and the wonderful expedition of Coronado to find those Aztec or ante-Aztec wonders has recently been discussed in the publications of the Smithsonian Institution.

I will only remind the reader, that he is himself supposed to grow by *sevens*. At the age of 7 months the first teeth appear, to fall out in 7 years and give place to others; and that every 7 years appears to form a distinct week or period of his existence.

As Shakespeare has it, the players on the world's stage, have for their acts "seven ages," or as some seven-struck poet writes

The first seven years of life—man's break of day—
Gleams of short sense, a dawn of thought display;
When fourteen springs have bloomed his downy cheek,
His soft and bashful meanings learn to speak.

From twenty-one proud manhood takes its date,
Yet is not strength complete till twenty-eight;
Thence to his five-and-thirtieth, life's gay fire
Sparkles and burns intense in fierce desire.

At forty-two his eyes grave wisdom wear,
And the dark future dims him o'er with care;
With forty-nine behold his toils increase,
And busy hopes and fears disturb his peace.

At fifty-six cool reason reigns entire;
Then life burns steady, and with temperate fire;
But sixty-three unbends the body's strength,
Ere the unwearied mind has run her length;
And when, at seventy, age looks her last,
Tir'd she stops short, and wishes all were past.—Prof. N. B.

Webster.—Monthly Visitor.

18. PREPARING SKELETON LEAVES.

A correspondent of *Science Gossip*, after referring to the tediousness of the ordinary way of preparing skeleton leaves, which is enough almost to tax the patience of Job, and which most experimenters give up in despair before getting through with it, describes a new method, which is easy, cleanly, and takes but little time. It is as follows:

"First dissolve four ounces of common washing soda in a quart of boiling water, then add two ounces of slacked quicklime, and boil for about 15 minutes. Allow this solution to cool; afterwards pour off all the clear liquor into a clean saucepan. When the solution is at boiling point, place the leaves carefully in the pan, and boil

the whole together for an hour. Boiling water ought to be added occasionally, but sufficient only to replace that lost by evaporation. The epidermis and parenchyma of some leaves will more readily separate than others. A good test is to try the leaves after they have been gently boiling for about an hour, and if the cellular matter does not easily rub off betwixt the finger and thumb beneath cold water, boil them again for a short time. When the fleshy matter is found to be sufficiently softened, rub them separately but very gently beneath cold water until the perfect skeleton is exposed. The skeletons at first are of a dirty white colour; to make them of a pure white, and, therefore, more beautiful, all that is necessary is to bleach them in a weak solution of chloride of lime. I have found the best solution is a large teaspoonful of chloride of lime to a quart of water; if a few drops of vinegar are added to the bleaching solution, it is all the better, for then the free chlorine is liberated. Do not allow them to remain too long in the bleaching liquor, or they will become too brittle, and cannot afterwards be handled without injury. About fifteen minutes is sufficient to make them white and clean-looking. Dry the specimens in white blotting-paper, beneath a gentle pressure, after they are bleached.

“Simple leaves are the best for young beginners to experiment upon; the vine, poplar, beech, and ivy leaves make excellent skeletons. Care must be exercised in the selection of leaves, as well as the period of the year and the state of the atmosphere when the specimens are collected, otherwise failure will be the result. The best months to gather the specimens are July and August. Never collect specimens in damp weather; and none but perfectly matured leaves ought to be selected.”

19. THE LEAVES OF AUTUMN.

AUTUMNAL tints of leaves are attributed to various causes. Some chemists determine that it is due to certain acids which are developed. Others aver that a diminished vitality in the plant causes the change of colour; if this be true then we must assume that there is such a thing as a “vital power” in plants which presides over their cyclical changes, and this cannot but be accepted as true as far as our present knowledge goes. One phenomenon, however, must not be lost sight of, in seeking the cause of tinted leaves. Wherever one leaf overlaps another in the forest the under leaf will longest resist discolouration. The very form of the upper leaf may thus be stamped on the one beneath when the covering is only partial. This indicates that frost is a very important agency in the problem.

20. DISCOVERY OF COFFEE.

Toward the middle of the fifteenth century, a poor Arab was travelling through Abyssinia, and finding himself weak and weary, from fatigue, he stopped near a grove. Being in want of fuel to cook his rice, he cut down a tree which happened to be covered with dried berries. His meal being cooked and eaten, the traveller discovered that the half-burned berries were fragrant. He collected a number of these, and, on crushing them with a stone, he found that their aroma increased to a great extent. While wondering at this, he accidentally let fall the substance into a can which contained his scanty supply of water. Lo, what a miracle! the almost putrid liquid was instantly purified. He brought it to his lips: it was fresh, agreeable, and, in a moment after, the traveller had so far recovered his strength and energy as to be able to resume his journey. The lucky Arab gathered as many berries as he could, and having arrived at Aden, in Arabia, he informed the mufti of his discovery. That worthy divine was an inveterate opium smoker, who had been suffering for years from the influence of the poisonous drug. He tried an infusion of the roasted berries, and was so delighted at the recovery of his former vigour, that he called it *cahuah*, which in Arabic signifies force. Thus coffee was discovered.

VI. Educational Intelligence.

—In Japan there are 826 schools, attended by 68,000 pupils.

—Corporeal punishment is not allowed in the schools of Chili.

—The total number of children in California is stated to be 130,116, of whom 99,152 attend school.

—There recently graduated at Howard University, in Washington, thirteen negro law students, one of whom was a woman.

—The phonetic system of reading has been introduced into one of the schools of Burlington, Iowa, and received with marked approval.

—There are eight thousand female teachers in Massachusetts. The whole number of teachers employed in the State is ten thousand.

—Indiana, according to the United States School Commissioner's Report, has 127,015 persons over ten years of age who cannot write their own names.

—During 1869 there were in operation in Portugal, and on the adjacent islands, 1997 schools for boys, and 362 for girls, attended by about 135,000 pupils.

—In Connecticut, according to the report of the Board of Education for 1871, there are fewer adult persons unable to read and write than in any other State in the Union.

—An empty treasury has necessitated the closing of all the schools in South Carolina under the patronage of this State, except in counties having on hand local school funds. The select schools of the State are in quite a flourishing condition.

—The Germans have established no university for the last half-century. Their plan is to strengthen those they have, rather than to found new ones.

—The President of Columbia College receives \$8,000 a year, the professors \$6,000 each. These salaries are the largest paid by any college in the country. The property owned by this institution amounts to \$3,500,000, and yields an income of nearly \$200,000.

—As a proof that education is, even in Russia, on the way to progress, statistics have been forwarded us showing that in the Province of Moscow at least one child in ten now enjoys the benefits of an elementary education. It should be remembered that the proportion in highly educated countries is one in six.

—Mr. Mori, the Japanese minister at Washington, has decided to have the five Japanese girls, placed under his charge, educated by the Kindergarten system, and will place them under the supervision of Miss Loring, of Boston. Already there are four Japanese cadets at the Annapolis Naval Academy.

—Father Secchi communicates to *Les Mondes* the particulars of a violent solar explosion on the evening of the 7th of July. The internal movements of the incandescent vapours were so intense that the luminous clouds were seen to change form rapidly, their height being six times greater than the earth's diameter. The eruption continued about two hours. On the same date an aurora borealis was seen at Madrid and many other parts of Europe, and the magnetic perturbations were very violent at all the observatories.

—Brain-work costs more food than hand-work. According to careful estimates and analyses of the excretions, three hours of hard study wear out the body more than a whole day of severe physical labour. Another evidence of the cost of brain-work is obtained from the fact that, though the brain is only one-fortieth the weight of the body, it receives about one-fifth of all the blood sent by the heart into the system. Brain-workers therefore require a more liberal supply of food, and richer food, than manual labourers.

—A Vienna contemporary speaks of an encouraging phenomenon in the promotion of practical education. The Society of Stenography in Austria has opened a competition in shorthand-writing to the pupils of the middle-class schools in Vienna. It appears from this and many other matters that in Austria as well as in the German empire time is looked upon as money. In Belgium also the practice of short-hand writing has of late been strongly recommended as a useful branch to be added to the curriculum of scholastic instruction.

—According to the census of 1870, the total number of schools in the United States was 141,629; the number of teachers, 221,402, of whom 93,329 were males, and 127,713 females. The total number of pupils was 7,209,938, 3,621,996 being male, and 3,587,942 female. The total income of all the schools was \$95,404,726, of which \$3,663,785 came from endowments, \$61,746,039 from taxation, and \$29,992,902 from all other sources, including tuition. The total income reported is nearly three times that for 1860, and nearly six times that for 1850. It is considered quite impossible that there should have been any such increase; and the apparent augmentation is, without doubt, referable to

a failure on the part of the former census officials to secure complete returns. Of the total number of schools reported, the public schools were 125,059; classical, professional, and technical, 2,545; and others, 14,025. The total number of teachers in the public schools was 183,198; and in the classical, professional, and technical, 12,767. The number of pupils in the latter class was 245,190, and in the public schools, 6,228,069.

PRESCOTT AND RUSSELL TEACHERS ASSOCIATION.—The first regular convention of the Teachers of the U. C., of Prescott and Russell, was held in the High School Room in L'Original on Wednesday the 17th inst. at 5 p.m., Rev. T. Garrett, J. P.S. in the chair, Rev. F. F. McNab, secretary. The convention proceeded forthwith to organize a "Teachers' Association," for the U. C. of P. and R., and elected the following gentlemen and ladies as office bearers for the ensuing year, namely: Rev. F. F. McNab, Principal, L'Original, H.S., President, Mr. A. Agnew, P.H.S., Vankleekhill, Mr. Dorland, P.H.S., Cumberland, and the principals of any other high schools that may be organized during the year in the counties; Vice Presidents; W. J. Summerby, secretary; Rev. A. Brunet, Treasurer, and R. Lee, Librarian; Messrs. Ross, Hay, Derby, and LèFrancois; and Misses Emma Cook, Annie Armstrong, and Agnes Harvey, to be an executive committee. Subsequently the convention was favoured with an address from the president, (Rev. F. F. McNab,) then followed an essay, by Mr. Ross, on "The best method of teaching arithmetic," by Mr. Lee, on "School Teaching," and one by Mr. Summerby, entitled "Practical hints," to teachers on the various kinds of Education and the means of imparting knowledge—organization and discipline in schools, power of Teacher's example, &c. The essays, which were pleasantly criticised by the Inspectors and others, and translated into French by Rev. A. Brunet, were most appropriate and instructive, and seemed to please the large audience assembled on the occasion. An address was also delivered by T. O. Steele, J. P.S.; after which an essay on "History," was read by Miss Hyde, who was received with great applause as the pioneer of the Lady Teachers. Then followed a recitation in good style by Mr. Lee; an address by the Rev. Thomas Garrett, J. P.S., and the closing address of the President, after which "God save the Queen" was sung, and the assembly dispersed, highly delighted with the evening's entertainment. The association has opened under promising auspices, and I trust that every Teacher in the United Counties, and also every other friend of Educational improvement, will at once put his or her shoulder to the wheel, and urge on the good cause. The next convention of the association will be held during the time of the Teachers' examination, and I trust that there will be a very large attendance of the Teachers of the United Counties.—*Communicated*, T O. S.

VII. Departmental Notices.

PUBLIC SCHOOL TEACHERS' COUNTY EXAMINATIONS.

In accordance with a general wish as expressed last year and concurred in by the Council of Public Instruction, an examination of Candidates for Public School Teachers' SECOND and THIRD-CLASS CERTIFICATES will be held (D.V.) in each county town of Ontario, commencing on MONDAY, 16th DECEMBER, at 2 P.M.

The examination of Candidates for FIRST-CLASS CERTIFICATES will be held at the same place, commencing on THURSDAY, 26th DECEMBER, at 9 A.M.

Candidates must notify the County or City Inspector (as the case may be) NOT LATER THAN THE 20th OF NOVEMBER, of their intention to present themselves for examination; and the Inspector will inform the Department NOT LATER THAN THE 25th OF NOVEMBER, of the number of Candidates for admission, as the Examination Papers cannot be printed until this information shall have been received from every one of the Inspectors. An omission of one Inspector in this matter, beyond the time specified, may delay the printing and despatch to the Inspectors, of the Examination Papers.

The Examination Papers will be sent to the presiding Public School Inspector (who will be responsible for the conduct of

each examination according to the regulations). The presiding Inspector will, immediately after the meeting of the Board of Examiners, at the close of the examinations, and not later than the 10th of January, transmit to the Department the report of the Board of Examiners, and also the whole of the answers of the candidates. The surplus Examination Papers are also to be returned for binding.

The Normal School Students will be examined in their respective counties, with the other candidates.

TIME OF HOLDING TEACHERS' EXAMINATIONS.

In reply to questions as to the time of holding the Teachers' County Examinations, we desire to say that they will be held this year about the same time as they were last year. In 1870 they were held in January, but as this time was found to be inconvenient, it was changed in deference to the wishes of the Provincial Association of Teachers, which adopted a resolution to that effect last year, on motion of the Inspector of Kent. The request was a respectful one, and was complied with by the Department with pleasure. The Inspector of Durham, in referring to the change, says: it "was a wise one; as, by the change, schools were enabled to get into working order at the proper time, and rejected candidates could be advised of their failure in time to enter the Normal School if they wished to do so."

TEACHERS' ABSENCE AT EXAMINATIONS.

Several Teachers are asked, whether in attending the County Examinations they shall receive their salaries as usual, and that the time lost by them shall be made good to them by the Trustees and schools in which they teach. We reply, that all attendance at examination is a private matter with the teacher, and is for his own personal advantage and advancement in his profession. The lawyer, physician, and other professional men, have to go to the expense, trouble and loss of time to acquire proficiency in his profession; and even many young men teaching schools, with a praiseworthy ambition, leave for a time to attend university examinations, who never ask, as a right, that the Trustees and schools shall bear the pecuniary loss entailed by their absence. Besides, many teachers come to the schools fully qualified (at their own expense) for the discharge of their important duties. Of course, if the Trustees, to show their appreciation of the labours of the teacher or to mark the esteem in which they are held, choose to allow the teacher his full time when absent, they have full power and should be encouraged to do so; but in no case can teachers demand as a right what can only be regarded in the light of a personal favour.

NOTICE TO CANDIDATES FOR CERTIFICATES, RESPECTING THE EXAMINATION IN THE SUBJECT OF NATURAL PHILOSOPHY.

Candidates, for *second class certificates*, will be examined in statics, hydrostatics and pneumatics. They are referred to "Peck's Ganot," but it is recommended that on the subject of *statics*, that part of "Tomlinson's Rudimentary Mechanics," which relates to the mechanical powers, be also consulted.

As the examination will be on the subject generally, those who have already provided themselves with Dr. Sangster's work, will find the necessary information in it.

Candidates, for *first class certificates*, will be examined in statics, dynamics, pneumatics, hydrostatics and hydrodynamics. They are recommended to consult, besides "Tomlinson's Rudimentary Mechanics," the "Manual of Mechanics," by Rev. Samuel Haughton, M.D.

NOTE.—The highest standard in all subjects will be maintained for first class certificates.

Candidates are strongly advised to procure copies of the examination papers used at previous examinations, as they will be of material assistance in indicating the kind of examination they will be required to undergo. Bound copies may be procured at the Depository at 60 cents per set, free of postage, or 50 cents exclusive of first class papers.