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OUR YOUNG PEOPLE AND THE BIBLE.

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Early in September the writer prepared the following set of twenty questions bearing upon well-known Bible facts :

1. Name the first book in the Bible.
2. Name the book just before the Psalms.
3. Who was the oldest man ?
4. To what age did he live ?
5. Name two sons of Abraham.
6. Who was the youngest son of Jacob ?
7. Where is Mount Sinai ?
8. For what is it noted ?
9. Who was the husband of Ruth ?
10. Name the three friends of Daniel.
11. Name the birthplace of Christ.
12. In what city did he spend the most of his life ?
13. Where was his first miracle performed ?
14. Where was Christ when he was betrayed ?
15. Who betrayed him ? Give full name.
16. What two disciples were the sons of Zebedee ?
17. Who was the first Christian martyr ?

18. To what city was Paul going when he was converted ?

19. Where was the apostle John in banishment ?

20. Name the first epistle.

It will, I think, be admitted by all that these are very simple questions, and should all be readily answered by anyone even superficially acquainted with the Bible. They deal with such Bible facts as children would be most likely to hear about and know. Several of them refer to great outstanding names and events referred to in the International Lessons of comparatively recent date.

Through the courtesy of masters who are interested in religious education, these questions were submitted to certain classes in four of the High Schools and Collegiate Institutes of Ontario, one in a city, one in Eastern Ontario, and two widely separated, in the Western Peninsula. In three of the schools they were given to Form I., the lowest, comprising in the main pupils who have just passed the Entrance Examination ; in the other they were given to Form II., pupils who have passed Form I, or the Public School Leaving Examina-

tion. There were 172 of these in all, aged from 12 to 17, average age nearly 15. The questions were also answered in two of the schools by the pupils of Form IV., the highest, comprising pupils who have passed the Junior Leaving or the Junior Matriculation Examination, aged 16 years and upwards. There were 13 in these two classes. I also sent the questions to a former pupil, now a teacher in a denominational academy in Indiana, and by the kindness of the staff there they were used as a test to all the students of the school, though the papers of only 14 of the lowest or Preparatory Form pupils were sent to me, as these were all I wanted for my purpose. I received the written answers from the other schools also, so that I had in all 199 sets of answers from young people aged from 12 to over 20, hailing from city, town, and country; coming from all classes in the community, from every leading Protestant denomination. All these in Ontario at least have received a good Public School education; a number have been for four or five years in the High School; nearly all have attended Sunday School with greater or less regularity for from five to a dozen years; nearly all come from professedly Christian homes.

And what is the result of a careful scrutiny of the answers? Not one of the 199 answers the twenty questions with absolute correctness; not one answers nineteen. One, a pupil of the Indiana Institute, aged 18, answers eighteen quite correctly and the other two very nearly so. He wrote "Methuslah," and said he lived only 960 years. No paper had seventeen or sixteen answers just right, while three had fifteen; one from the city school and one each from the peninsular schools; and the eastern school came not far be-

hind, one of the papers having fourteen. No paper had thirteen correct answers; 6 had 12; 5 had 11; 5 had 10; 3 had 9; 5 had 8; and 2 had 7. When we get down to half a dozen we reach a more popular standard, for 20 had 6 right; 20 had 5; 13 had 4; 32 had 3; 25 had 2; 34 had only 1; and 24 out of the 199, over 12 per cent., had not a correct answer at all.

Answers that were not precisely right, being misspelled or incomplete, but which showed some knowledge, however remote or inaccurate, of the subject dealt with, were marked as approximately correct. One paper had twelve answers so marked; 1 had 10; 5 had 9; 9 had 8; 15 had 7; 34 had 6; 35 had 5; 32 had 4; 36 had 3; 14 had 2; and 17 had 1.

Combining the answers quite correct and those approximately correct one pupil answered 20 questions; one answered 19; 3, 18; 6, 17; 2, 16; 7, 15; 5, 14; 9, 13; 8, 12; 15, 11; 18, 10; 20, 9; 16, 8; 18, 7; 16, 6; 20, 5; 14, 4; 8, 3; 10, 2; and 2, 1.

Pupils of the Indiana School, whose papers were not sent me, gave answers of the following value, as reported by my friend there: Those who entered this year, age from 19 to 23, average about 20 (too old for the comparative test), made an average mark of 57 per cent. Students who were there before from a term to a year, age from 18 to 26, average about 23, made over 78 per cent. One student of 25, who entered this term, made 100 per cent., five made from 90 to 98 per cent., and five made from 80 to 89 per cent. Some of these are taking Bible studies in the Institute, but none have completed the course.

Following is a tabulated statement of the results obtained from the papers examined by myself:

No.	Class.	No. in Class,	Average Age.	Average No. of Correct Answers.	Average No. of Approx. Answers.	Av. No. of Correct and Approx. Answers Combined	Average No. of Wrong Answers.	Average No. of Blank Answers.
1	Form I. Ont. Coll. Inst.....	73	14.5	4.16	4.72	8.89	5.71	5.38
2	Form I. Ont. Coll. Inst.....	47	14.75	3.08	4.44	7.53	3.78	8.6
3	Form I. Ont. High School.....	27	14.	2.92	4.11	7.03	4.37	8.59
4	Form II. Ont. Coll. Inst.....	25	15?	2.66	4.64	7.6	4.16	8.16
5	Prep. Form. (Juniors) Ind. Inst.	14	17	5.78	3.92	9.71	3.57	6.78
6	Form IV. Ont. Coll. Inst.....	8	18?	8.62	4.12	12.75	3.25	3.87
7	Form IV. Ont. Coll. Inst.....	5	18?	9.	5.2	14.2	3.8	2.

These results are surprising alike. Where differences exist they may be accounted for by differences in age, or by the various conditions under which the answers were written. In order to obtain the results from as many of the same grade as possible a detailed examination was made of the answers given to each question by the pupils of the first five classes noted in the above table, 172 pupils in all, and these results we shall now proceed to state concisely. Numerals after answers indicate the number of pupils that gave that particular form of answer. In reading the answers it was curious to notice how pupils writing scores or hundreds of miles apart often made the same peculiar kind of blunder.

1. 13 of the 172 pupils did not know the name of the first book in the Bible at all. 5 did not give answers at all, while the following wrong answers were given: Old Testament, 2; Exedus, 2; Exodus, 3; Mathew, 73 had Genesis spelled correctly, while 86 approximated more or less, nearly in 23 different ways.

2. 64 knew the name of the book before the Psalms, 4 however spelled it "Jobe." 49 did not answer, while 59 gave 22 different wrong answers, among which were: Ruth, 9; Proverbs, 17; Judges, II. Samuel, Kings, Chronicles, "Ester," Isaiah,

Song of Solomon, Ecclesiastes, Revelation, David, Solomon, Divine Tradition.

3. Apparently 68 had never heard the phrase "As old as Methuselah." 37 of these did not answer at all; by the others the honor of being the oldest man was ascribed to Adam, 6; Noah, Abraham, 10; Isaac, Jacob, Moses, 5; Elijah, and "Melcesdick" Only by 17 pupils was the name correctly spelled, while the other 87 succeeded in spelling it in no less than 55 different ways, which are here given as a literary curiosity: Methusalem, 10; Methusala, 9; Methusalah, 7; Methusela, 4; Methusaleh, 3; Mathusalem, 3; Mathusalum, 2; Methusla, 2; Methusilea, Mus.hlesum, Mathusalum, Mathusaleh, Methuseleth, Methusila, Methuzalum, Muthusalem, Matheusal, Methusaleth, Methuselia, Muthusalem, Methusalem, Methuzilum, Methuselum, Methusalem, Methuslam, Mesulah, Methusla, Mathasala, Masthuthla, Methusalem, Metheuslah, Metheseul, Methousalah, Methusleh, Nethuzelah, Methuslaem, Muthuleza, Moothesleum, Mathuslamum, Mauselum, Mathusalah, Mathelumen, Mathusleum, Mathoselum, Mathusulum, Nethoselum, Mathusalea, Methusalem, Metusalah, Meculzea, Methusaly, Methuzela, Mathus, Meth, Matholamue.

4. Methusaleh's age was set down almost anywhere between 125 and 9,000 27 had it exactly right, and 77 more placed it between 900 and 1,000, but did not hit the right number. 50 did not venture to guess.

5. Only 2 pupils could name two sons of Abraham. 83 gave Isaac under nearly a score of orthographic forms. 47 were silent altogether, and 40 made a great variety of guesses, e.g., Joshua and Johna, Jacob and Esau, Saul and Cain, Joseph and Reuben, Isiah and Immanuel, Cain, Able, Sham, Ham. No hint was given of any but two sons.

6. 36 knew who the youngest son of Jacob was; but in 15 of these answers the name was incorrectly spelled in 8 different ways. 74 refrained from answering, and 62 answered wrongly. Among the wrong answers were: Joseph, 33; Isaac, 6; Esaw, 3; David, 3; Daniel, 3; Ebriam, Lot, Chris', Able, Samual.

7. 66 did not venture an opinion as to the location of Mount Sinai, and only 16 located it correctly. It was put in: Palestine, 32; Asia Minor, 10; Jerusalem, 8; Persia, Italy, Egypt, and several other places.

8. 45 connected Mount Sinai with the giving of the ten commandments. By others it was associated with a great variety of events—Christ's betrayal; the sermon on mount; the transfiguration; the crucifixion; the temptation in the wilderness; the ascension; Abraham's offering of Isaac; the resting of the ark; the death of Moses; Elisha and the prophets of Baal, etc. 68 gave no answer.

9. Although it is only so very recently that we have been studying the Book of Daniel, only 8 pupils named Daniel's three friends correctly and 90 did not attempt an

answer. 66 gave approximate answers, there being much originality in the spelling. Shadrach assumed about 25 different forms; Meshach, about 30; and Abed-nego, 23. Except in one instance there was no attempt at the Hebrew names.

11. 41 had the birthplace of our Saviour correctly spelled; 87 had it misspelled in nearly 30 different ways; 28 had a totally wrong answer and 14 had none at all.

12. Just 30 knew where Christ spent the greater part of his life, and half of these misspelled the name. 17 left the question unanswered. 115 answered "Jerusalem," spelled correctly by 80, misspelled in about 25 different ways.

13. But 18 named correctly the place where Christ's first miracle was wrought; 40 others misspelled the name or simply mentioned the wedding or the nature of the miracle; 39 gave a wholly wrong answer and 75 knew that they didn't know it and refrained from guessing.

14. In the Garden of Eden, 3; Mount Sinia, in the Temple, 2; in the wilderness, 3; Calvary—were some of the guesses as to the place of the betrayal. There were 33 of such guesses. 19 had Gethsemane; 68 had approximate answers, the name of the garden being misspelled in 37 different ways.

15. A full correct answer to this question was given by 55, a partial or incorrect answer by 82. The name Judas was misspelled in 8 ways; Iscariot in 32 ways; 21 gave no answer, while 14 gave such wrong answers as: Peter, 5; Simon, Simon Peter, the Jews, Pontius Pilate, 3; Jacob and Satan, 2.

16. Both the sons of the father of Zebedee's children were known by name to 48; 24 others named one of them coupled with some wrong name, mostly that of an apostle; 17

made divers guesses ; and 83 did not venture a reply.

17. 72 could not name the first Christian martyr ; 41 gave sundry wrong answers ; 59 gave the right name, though misspelled by 5.

18. That Saul was going to Damascus when converted was known (with 15 misspellings) to 42, 85 gave no answer and 44 sent him to such places as Jerusalem, Tarsus, Antioch, Cyprus, Athens, Rome, Corinth and "Tire."

19. 17 knew about John's being in Patmos (thrice misspelled) ; 29 located him in over a dozen other places ; while 126 set down no answer.

20. This question was answered thus : No answer, 81 ; Romans, 32 ; (St.) Mathew, 12 ; St. Matthew, 5 ; Acts, 4 ; (St.) Paul, 5 ; Corinthians, 7 ; Peter, 2 ; Hebrews, 2 ; Corinthians, Corinthians, Petter, St. John, 3 ; 1 John, etc.

The masters by whose kind assistance these results were obtained are all of the opinion that they are far from satisfactory—an opinion with which few competent to judge will venture to quarrel. They certainly indicate an amazing amount of ignorance among the pupils of the schools tested ; but that is not all, they indicate a state of affairs which obtains in all the Secondary Schools of the Province, that is, among our more intelligent and better educated boys and girls ; they indicate an even greater degree of ignorance among the youth of Canada and the United States generally. In some parts things may be somewhat better, in others somewhat worse, but the writer believes, from what he has heard, and read, and observed, making exception of the comparatively few localities where Biblical instruction is regularly given in schools, that the general status in Bible knowledge of the brighter and

more studious young people of Anglo-Saxon, of Christian America is pretty well defined by the answers given to these questions. We have here a fair criterion of the efficiency of the means in vogue for the imparting of Scripture knowledge—of the Sabbath school, of the church, of the home. Is it creditable to these institutions? And if not what are the reasons and what the remedies for such a state of affairs?

The reasons are not far to seek : the State, the church, and the home have been foisting upon the Sunday school a responsibility which it is quite impossible for that institution effectively to bear. Systematic religious instruction by the parents, especially the father, has been on the rapid decline. These have come to imagine that they are discharging their God-given obligations by sending their children with more or less regularity, with very indifferent punctuality, so long as the latter can be coaxed to go to the Sunday school of their own or some other church. Their interest, in nineteen cases out of twenty, does not extend so far as to lead them to attend themselves, either as teacher or scholars. The Church very inadequately provides for what may be called the physical wants of the Sunday school. The "almighty wall," as Edward Thring used to phrase it, is in most schools in a very unsatisfactory condition. Basements or barns many of our school-rooms are, with very little provision for effective teaching. Congregations take more delight in spending money to get brilliant sermons, and sensuous music, and upholstered pews, and frescoed walls than in providing for the religious upbringing of the children. The State, for many years past, has dexterously managed to evade its responsibility altogether. In our Ontario schools

what does the mere reading of a garbled selection of scripture amount to? When it is done (and often it is not done at all) reverently, and followed by prayer, it is all very well as a devotional exercise, but it amounts to very little as instruction.—there must be no comment, no question and answer.

The remedies may be readily found, but some of them cannot be so easily applied. First, there should be, and there will be, if an army of earnest men and women can effect it, improvements in the line of Sunday-school work itself. A great deal has been done in recent years, but much more remains to be done. Greater attention should be paid, and in some places is paid, to the proper construction of edifices for this purpose, with ample provision for isolating classes. The story books should, for the most part, be banished from the libraries. The discipline should be improved. The teachers, I think, are fairly faithful to the extent of their own information and ability, and so far as the untoward circumstances amid which they labor will allow; but in numerous instances improvement is quite possible. Efforts should be strenuously put forth to get the efficient co-operation of the Home. Systematic memorizing of Scripture should be encouraged, not merely of Golden Texts, not perfunctorily of the memory verses connected with the lesson, but thoroughly of the literary and doctrinal gems of the Bible. Some provision should be made for securing for our young people a sufficient knowledge of the great outstanding facts of Bible history, biography and literature. And, above all, the spiritual aim of the Sabbath school, the inculcating in the young the spirit of reverence, the saving of souls from sin, should never be lost sight of. In fact, as a

matter of theory, I hold that the precious hour a week should be wholly devoted to worship and to moral and religious stimulus, the teaching of facts being largely relegated to the parents and the schools. But we are dealing with conditions and not theories, and we must do the best we can to fall in with these conditions, if we cannot change them. The Church and the home must co-operate in order to carry out these reforms; the former by providing men, money and time to carry on efficient work, attending themselves as a body, even if one of the Sabbath preaching services has to be sacrificed. "The whole Church in the Bible-school and the whole Bible-school in the Church" should be the motto of all our congregations.

But even if this happy ideal were realized it is very doubtful if matters would be completely satisfactory without the aid of our secular schools. Why should our much-vaunted system of education, "from the Kindergarten to the University," practically ignore the most interesting book of biography, the most instructive history, the noblest literature the world has ever seen? To adopt the line of argument pursued by Richard H. Dana, Jr., the well-known author of "Two Years Before the Mast," before the Supreme Court of Maine, given in an article by Dr. Turnbull in the *S. S. Times* of July 1, 1899, we say: "That our ordinary English Bible is the foundation of our common views of morality, is the basis of our common civilization and is the bond of our common language; that, apart from any opinion as to its religious teachings, every American (and Canadian) child is entitled to be instructed in this book, his acquaintance with which is essential to his understanding of very much that he hears in public address

or reads in the public press, and this, though he be of a family which is Protestant or Catholic, Jewish, Mohammedan or Buddhist . . . As a well of pure English, undefiled, as a fountain of pure, idiomatic English, it has not its equal in the world. . . . From the common English Bible, too, we derive our household words, our phrases and illustrations, the familiar speech of the people. Our associations are with its narratives, its parables, its histories and its biographies. If a man knew the Bible in its original Greek and Hebrew by heart, and did not know the common English version, he would be ignorant of the speech of the people. In sermons, in public speeches from the pulpit, the bar and the platform, would come allusions, references, quotations—that exquisite electrifying by conductors by which the heart of the whole people is touched by a word, a phrase, in itself nothing, but everything in the power of conducting—and all this would be to him an unknown world. . . . As a preparation for life, an acquaintance with the common English Bible is indispensable.”

And we, in Ontario, can have the Bible in schools, too, with Separate Schools and a “conscience clause” as safety-valves, if we evangelical Christians will just lay aside our little denominational jealousies and work unitedly to this great end. Have we the will to demand it? This reform transcends in importance any other that is before the public to day. It lies at the root of all others.

Now I must bring my own remarks to a close. This is not the first time that an attempt has been made to draw public attention to this theme in a somewhat similar way. Years ago Mr. Archibald MacMurchy, who as long as I can remember, has

staunchly stood by the cause for which my feeble voice to-day has been pleading, published in the CANADA EDUCATIONAL MONTHLY the result of an examination held in his school on some simple Bible references in Tennyson's poems (In Memoriam, I think), with very unsatisfactory results. In the fall of 1895 an examination was held in an Ontario High School asking for the explanation of a number of Biblical references in various selections from prose and poetry. The result was reported by the Rev. P. K. Dayfoot, of Port Hope, in the *Globe*. The answers were a set of curiosities, the only one among the pupils whose answer even approached to accuracy was a young man whose childhood had been spent at the famous Blue Coat School in London, England, where the Bible is used as a text-book. Mr. Dayfoot, in an obliging note to me, tells the following: In a certain college, 40 students of a freshman class, six of whom were sons of ministers, were examined as to their Bible knowledge. None had read the Bible through; 5 had read the New Testament; 1 had read as far as Proverbs, 12 had read the books of Moses, none had read the prophets, and not one could name the books of the Bible.

No class of persons is so competent to pass an opinion on the scriptural information of Ontario youth as the teachers of literature in our High Schools and Collegiate Institutes. At the suggestion of one of these I wrote to a number asking them for their opinion as to the condition in scripture knowledge among High School pupils, and among Ontario young people generally, and as to the efficacy of the present means of Biblical instruction, and for any improvements they could suggest. In reply I received a most interesting series of letters. It

would, I am sure have been most profitable to read them in full, but time will not permit, and I shall have to confine myself to the most pertinent portions, leaving it to you to say whether in the main they bear out my contentions or not. The writers are men who either are teaching, or have taught English literature in our schools, and who, most of them, either do at present take or have in the past taken an active part in the work of religious education.

The following interesting letters have been sent to Mr. Wright on the subject of his paper:—

From C. S. Kerr, Classical Master Woodstock Collegiate Institute.

“The Scripture knowledge of pupils attending our Secondary Schools is very meagre. I am judging now from my experience in teaching English literature, of which I used to teach considerable. Biblical allusions and occasional allusions seemed to reveal a great lack of real knowledge of the Bible. . . . We have used the International Lessons here for a long time. I believe they are perhaps as good as can be found for intermediate grades, though for primary and senior classes there might be something better. . . . One of the great weaknesses in Sunday Schools is the poor material available for teachers. I am not speaking of teachers in my school, for we have an exceptionally intelligent and well read body of teachers, but this fact has been mentioned by many with whom I have spoken. Then there are several other points, such as memorization, home study, etc., in which great improvement might be made. . . . If the Bible could be taught in our Secondary Schools we certainly could have better results. There are

hindrances to this, however, which seem insurmountable.”

From J. E. Wetherell, B.A., Principal of the Strathroy Collegiate Institute.

“The ignorance of Scriptures among the pupils of our Secondary Schools is deplorable. Only this week this ignorance was illustrated in my class of Form III. (thirty pupils). In ‘Evangeline’ only one pupil could explain the allusion in line 107, ‘touch the hem of his garment,’ and only one the allusion in line 153, ‘as Jacob of old with the angel.’ Twenty of these thirty pupils are, or have recently been, Sunday School students. This is a sufficient commentary on the efficacy of the present means of Biblical instruction. . . . I have often felt that I should like to have half an hour each week in every class for a study of the Bible *as literature*.”

John Jeffries, B.A., English Master, Peterboro’ Collegiate Institute.

“My experience in both Sunday School and High School work warrants me in saying that our young people are strikingly lacking in Scriptural knowledge. I have been especially impressed by this in teaching literature when I have found pupils generally unable to deal at all satisfactorily with Biblical references. I believe there will be no appreciable improvement in this respect until the churches come to feel a duty in the matter and respond to it. There is a feeling among our young men and women, and it does not exist without reason, that the Sunday School is a *children’s* school. The reasons for this are several in number. How often superintendents themselves, in the presence of the entire school, address them as children. There is an age at which even boys and girls do not like to be dubbed children. The

same impression is not infrequently conveyed by preachers in their references to the school from the pulpit. Then the methods of teaching and disciplining senior-intermediate pupils are of a character that does not win the respect of scholars of such age and acumen as we find in that grade. There is much room for improvement in the teachers as regards fuller and readier knowledge and up-to-date methods.

Again our larger boys and girls are very likely to feel that the Sunday School is beneath their dignity as long as so very few parents regularly attend. I am convinced there would be a marked improvement in the attendance of our youths if the men of our churches turned out in such numbers as they should. . . . Further, more attention must be paid to the planning of S. S. apartments. A suite of rooms should be designed and built that will enable the work to be carried on with the greatest convenience, comfort and success attainable. A much larger measure of attention should be paid to the needs of the S. S. The very best qualified man in the church should be secured as superintendent, even at the cost of squeezing out a poor man, and he should be made to feel in some practical way that his success is recognized and appreciated. Is not an efficient superintendent worth at least as much to a church as an equally efficient organist or choir master?

Lastly, I should like to see more teaching and less preaching from the pulpit. Instruction in the facts and principles of the Bible, systematic as that of the International series of lessons and supplementary to it, should, I think, be the chief aim of the morning service, at least should take the place of the ordinary sermon."

E. A. Hardy, B.A., English Master Lindsay Collegiate Institute, a former Secretary and President of the Y. P. S. C. E. for Ontario.

"I am profoundly convinced that what the Ontario youth doesn't know about the Bible is beyond computation: his ignorance is immense. It is a serious problem. I am growing more and more impressed with the great importance of the S. S. and with the need of the church's increased activity in the matter.

We need better teaching in our Sunday Schools. We need *more adult classes*. We need more directly spiritual work. Every teacher of literature with whom I have discussed the matter is of the opinion that our rising generation is deplorably ignorant of scriptural knowledge. I hope your paper will do something towards impressing the situation on our S. S. workers."

D. S. Patterson, B.A., Principal Chatham C. I.

"I have often been astonished at the ignorance of H. S. pupils about scripture. In literature classes Biblical allusions often come up, and I have found that perhaps one or two of a class of 30 or 40 would be able to answer some very *familiar* question. My knowledge of scripture was largely gained from the practice of my father's house in having family worship *twice a day*, after breakfast and after tea. Old Testament and New Testament alternating, a chapter from each, every day. This in conjunction with a very regular attendance at church and Sunday School, has made me fairly familiar with Bible lore. . . .

The Sunday Schools are, I believe, doing all that can be expected of them, at the rate of a half-hour a week. . . . It occurs to me, now, that the written exam's in

literature are out in senior Public School and Junior H. S. work, that the literature teacher might with great profit take up a book, or a portion of a book, say Proverbs, or a Gospel, or a Prophecy, and treat it from a literary point of view, and, incidentally from a moral point of view. This would be one good kind of supplementary reading. Of course it would depend for its success on the *taste* of the teacher, but many of them, I believe, would fall into line."

Lyman C. Smith, B.A., Principal Oshawa High School.

"I have formed my opinion principally from what I have seen in my own literature classes. The average H. S. pupil seems almost utterly unable to detect or perceive the plainest reference to Scripture characters. If the passage is couched in language plainly scriptural the result is the same. I have some times attributed it to the present system of lessons, which may be very good in themselves, but are necessarily disconnected, and do not seem to give much encouragement to systematic reading of a whole book. Then my own observation leads me to believe that the old method of having the pupils memorize is largely discontinued. I can remember Sabbath School pupils that memorized verses by the thousand every year. Whole psalms and chapters from the New Testament, and from the Prophets of the Old, were thus committed, and though at the time they were not probably comprehended, yet in after years they were. Another reason may be that there are so many organizations of different kinds that the attention of parents and teachers is so divided they cannot possibly give so much attention as when, practically, the Sabbath

School and the regular church service were all. In fact, there seem to be so many meetings of different kinds that there is no home life at all, and parents leave to these organizations the work that was formerly done at home.

I do not know of any remedy but to return to the old methods. How many can you find among your pupils that have read the Bible through? How many that read a chapter daily?"

From H. G. Park, B.A., Principal Uxbridge High School.

"I believe it is the generally acknowledged opinion that the state of our High School pupils with regard to knowledge of the Scriptures is a matter of natural reproach to us; the simplest Scripture reference in literature fails to be comprehended now-a-days, even in the higher forms of our Collegiate Institutes. My own pupils are, of course, no exception to the general rule.

What I complain of is, that the ministers of our churches and our Sunday School teachers charge us with the fact, and impute the blame of it to us, when we are *forbidden by regulation* to introduce religious instruction, as such, into the school-room, or even to comment on such desultory Scripture reading as is done morning or evening. I have, too, the authority of a H. S. Inspector for saying that the regulation in regard to Scripture reading is 'more honored in the breach than the observance,' and I am somewhat of the same opinion myself if the 'Ross Bible' (which, with all due deference to the care with which it has been compiled, cannot carry the same respect with it as the great original) is used instead of the Scriptures.

I feel sure too, that the state of Scripture knowledge of the Ontario youth generally is the same as that

of the average High School student. . . . The fact is only too evident that those who are chargeable with the Scripture training of our youth, whoever they may be, are either doing too little or are not employing efficient means to bring about the end desired in their very laudable and much needed work."

From Thos. Carscadden, M.A., Principal Galt Collegiate Institute.

"From many years' experience as a teacher of English literature, where frequent Scripture allusion and references occur, I am forced to the conclusion that the rising generation has a very scanty knowledge of the Bible. I should not be far out if I should say that our young people are profoundly ignorant of the contents of both the Old and New Testament. This ignorance is absolutely amazing at times, when we consider to what an extent our secular literature and everyday language are studded with Bible reference, incident and character.

. . . In a class of about thirty I gave the quotation, 'In Him we live, and move and have our being,' and only four could tell that it was from the Bible, and only one could tell by whom and in what circumstances the words were used. In a class of sixteen I used the quotation: 'For me to live is Christ and to die is gain,' and not one could tell me in what book it is found, and much less the name of the writer."

From H. I. Strang, B.A., Principal Goderich Collegiate Institute.

"The amount of Scriptural knowledge (speaking of the Scriptures as history and literature merely, and leaving the doctrinal and spiritual aspects of the question out of account for the time) possessed by the pupils who pass through our rooms in the Collegiate Institute seems to me to be very scanty in

amount and vague and indefinite in character. . . . Last week I used an extract from Cowper. 'Should God again, as once in Gibeon, interrupt the race of the un-deviating and punctual sun, how would the world admire, etc.,' in two different rooms, and in each case only a small fraction of the class seemed to know what, 'As once in Gibeon, etc.' referred to, and some of these had not a clear recollection. . . . From the standpoint of literature alone it is much to be regretted that our young people seem to be growing up with such a scanty knowledge of the contents of the Bible—a knowledge far inferior to that possessed (I speak confidently at least of the Scotch element) by their fathers and mothers, or perhaps I should say (remembering my own years and that I am now at work on the second generation of pupils), their grandfathers and grandmothers.

The causes I believe to be that times have changed, and home-training in Scriptural knowledge is slighted in most cases, and in many wholly neglected. It has become the fashion to put the whole responsibility (or nearly so) on the Sunday School and the minister.

To me this abandonment of parental responsibility and control and the shunting of it on the Sunday School and day school teacher seems about the most serious defect in our modern civilization. Think of fathers and mothers coming to us and saying, as I have had them say, 'I do wish you would take John (or Mary) aside, and have a talk with him and see if you can't get him to do so and so. I can do nothing with him.'

I don't like to criticize the Sunday Schools. I went through all the grades, ending as superintendent, but gave it up—could not carry two

schools on my mind. I felt the difficulty of the noise and unsatisfactory discipline, the *plague of lesson leaves*—teachers reading off the questions, and scholars reading off the answers, and the *general scrappiness* of the information communicated and acquired."

From the Principal of an Ontario High School who wishes his name withheld.

"There is deplorable ignorance (among most of the young people of my acquaintance) of Scripture knowledge. I believe this condition is widespread in Ontario. How could it be otherwise? Sunday Schools were first used to bring the truths of the Bible to bear, however slightly, upon the lives and hearts of those whom the regular means did not reach. They were not intended for those who attended the regular church services and had systematic training in the Scriptures at home. Now, however, it is a rare thing to find parents attempt more than to have the children learn the Golden Text—often not so much as that.

The result is much like what would happen educationally if the parents of Toronto abandoned their day schools and gave half an hour a week to the education of their children, say in the night schools.

The worst feature of Sunday School work, to my mind, is its "scrappy" character. There is never a thorough study of a book of the Bible. Fancy the chaos resulting from such a treatment of the Junior Leaving literature!

I should suggest the following [improvements]:

(a) The study of one Book at a time, and that in its entirety.

(b) The memorizing of the more important chapters.

(c) More attention to be paid to the *mastery of the facts* and less to

fanciful "points" and applications. We are not continually trying to draw morals from literature selections."

From F. F. McPherson, B.A., English Master Hamilton Collegiate Institute.

"My own experience is that such knowledge is not very satisfactory. It appears to be so very plainly in teaching literature, for I often quote a passage from the Bible after vainly trying to get it from the class. And sometimes when I have a new class it creates quite a stir to hear the first quotation from the Bible. The other day in such a class I noticed two or three look at others with a sort of smile, as much as to say: Is this a church? I have heard the same thing too from other English masters. Besides even if the pupils do know the passage wanted there is a backwardness in repeating it before the others—which is in itself a sign of the times—for they would not hesitate to quote a passage from Shakespeare or Wordsworth.

I do not think that the present means of Biblical instruction are very efficacious, because the means indicated are not used to the best advantage. The reading of a chapter in family worship without, as is usually the case, any continuity in selection, and also any explanation of the real meaning, is not only worse than useless, but really harmful, because it is then merely a form and soon brings about all the results of formalism.

As to suggestions, I am not sure that I have any. The usual remedy spoken of is the teaching of the Bible as literature in the schools, but it seems to me that there are almost insuperable difficulties in the way. Of course it is not possible to study the Bible as the source of religion without first studying it as litera-

ture, i.e., to study it so as to find out the meaning of the text, both in detail and as a whole, and it is the incapacity to study the Bible as literature that causes so much narrowness and bigotry. But when it is proposed to put the Bible in schools there are difficulties. First, there are those to be considered who would have to do the teaching. Perhaps you have in your mind some teacher of literature who would be scarcely the best in the world to teach the Bible even as literature.

. . . Anglicans or Presbyterians or Methodists would object to a Baptist teacher explaining the Bible to their children—foolishly perhaps, but yet obstinately, even if it were understood that no doctrinal teaching should be given. . . . It seems to me that the fault lies largely in the churches and homes I can't help thinking that the multiplication of meetings and societies detracts from the real work of the church. And members of churches are too prone to leave the expounding of the Scriptures to the minister and do not attempt to do their best, poor though it may be, in explaining the book at home.

I can't help thinking, too, sometimes, but I would not like to state it dogmatically, that the very reverence with which the Bible is regarded, or has been regarded, especially by the good old Scotch Presbyterians, interferes with the study of it as literature, without which I do not think the Bible can be studied at all."

Mr. John Smith, B.A., High School Inspector.

"So far as my experience goes, both as teacher and inspector, the boys and girls of our High Schools are very poorly acquainted with the Scriptures. When a question has arisen involving a knowledge of Biblical history or common quotations, I have been astonished at the ignorance displayed. I can, indeed, remember no case in which more than a few pupils of a class have made any attempt to answer. My experience in such matters is of course limited; but it is also that of others with whom I have discussed the subject? It seems to me that the Sunday School should give special prominence to Biblical history."

From A. Stevenson, B.A., English Master, Woodstock Coll. Inst.; Pres. Mod. Lang. Association of Ontario.

"I find the lack of Scripture knowledge among my pupils most disheartening. And further, this ignorance is just as great among the Epworth Leaguers and Christian Endeavorers here as I found it among the Roman Catholics at Arthur—*just as great* . . . The Sunday Schools are called upon to do too much. They can never take the place of parents in religious instruction. They were intended and should be kept mainly if not entirely for those children whose parents are not religious. Fewer teachers would then be needed and perhaps a better selection could be made . . . Everybody should emphasize the home as the best place to get a knowledge of the Bible—at least in the families of professedly religious people."

SOME CHARACTERISTICS OF THE RIGHT WAY OF STUDYING.*

BY DR. J. M. HARPER, M.A., QUEBEC CITY.

Your principal gave me but short notice when he set me the task of preparing the initiatory lecture of the college course for a year which cannot lose any of its historical importance in being the last school year of the century. I am not going to say that the time was insufficient, had the time been at my disposal, or had I been working under a well-arranged time table in which periods of study had any place.* This is the busiest season in my office at Quebec, and to run from letter-writing and statistical tables to the taking up of a thesis that would interest a crowd of young people brimming over with holiday chaffings and chafferings, and staid people anxious to know what really is and what really is not good for the rising generation (especially the latter), to run from the terribly practical to the still more terribly philosophical, with such a gap to fill in between the varying intelligences of my audience, I found, and at present find, to be no easy task. Nothing, however, is so readily forgotten as pain; and if you, my audience, forget the pain of listening to me after such a long period of pleasure-getting, as your long holiday no doubt brought to you, as easily as I forget the pain of preparation in the pleasure of being at Stanstead again, I feel assured that when the morrow comes you will be willing to let bygones be bygones. Not that I am anxious to have my message to you this evening go in at the one ear and out at the other, for that would be tantamount to my saying that I have no message to bear to you; and I can think of no more terrible after-agon-

than the agony of having talked for an hour or so in public and said nothing. Indeed it is because I think I have a message for you that I propose to address you in a deliberative tone, so that you may possibly be willing afterwards to read and digest the advice I have to give.

There are many turning points in the lives of men and women, after they have left school or college, just as there are many turning-points in the lives of boys and girls before they enter school or college. The latter converge towards the school period of life, the former diverge from it; and as I stand here before you all, with my message yet undelivered, I want you to recognise the ground of convergency on which you have now set foot, to be one that ought to become as sacred to you as was the holy ground to Moses, from which he received his call to prepare for his momentous mission of life. This spot here, centred in a district of unsurpassed natural beauty, with an inner environment that cannot but take coloring from the picturesque to be seen everywhere within a circuit of many miles, this point of present convergency will ere long become a point of divergency, and as the holy ground of the present with all the possibilities of your lives within reach, it will continue to be all through your lives an object of interest or regret according as you have here made use of your opportunities or neglected them. This has possibly been said in your hearing before in many other ways; but I would repeat it and repeat it until its repetition would become an emphasis that would burn, into the in-

*An address given to the students of Stanstead College at the opening of that institution in September, 1899.

dividuality of even the youngest of you, the conviction that your school life is the probation of a probation that is destiny itself. All the possibilities of a full grown oak are said to be in the acorn, the environment being what it ought to be; and you in your heyday of youth have in you all the possibilities of a successful after-life, if you will now only give the forces of your environment fair play. And how this is to be done is the very heart of my theme this evening.

There are but few of the students listening to me whose being is matured enough to make much of the glimpse they have yet had of what the life beyond the school life may have in store for them. And yet the older you are, the nearer you have come to the final examination agony, you must not forget that the life beyond your school period has a mission for you. You may call it destiny, if you will, and be prepared to take things as they come. But let me tell you that a policy of a *laissez faire* has never made much of an excellence out of any of God's creatures. Indeed, however inexorable fate may be from the poet's standpoint, the practical man refuses to see much of an unalterable fatality in such phrases as "Let well enough alone," or "Whatever is, is right." And, as a practical man, too practical as some may say, I would have none of you pin your faith to any such lackadaisical propositions. Some of you may have heard, not a hundred miles from this platform, the phrase "All education is self-education, beginning with self-examination and ending in self-control." And I would rather be laughed at for repeating such an aphorism—and you all know what pain there is in being laughed at—than that any of you should suffer shipwreck on an excuse which has in it

no element of logical insight or self-confidence, in an excuse, however orthodox, which the *laissez faire* phrases above quoted so barefacedly embody.

In speaking, thereof, of the work you intend to do for yourselves while here. I would have you all lay down a definite plan for your guidance, even if you have not yet come to look far beyond the horizon of your final examinations. Oh, what a narrowing of our horizon these examinations produce! What a blinding effect they have even on the best of us! "I made a mistake about the course of study at the beginning of the year," said a teacher lately, "and could not discover my folly until within a month of the examination. Dear me, how I had lost all that time." "I enjoyed the study of botany amazingly well," said a pupil, "but, do you know, I was told a week before the examination that I had been studying the wrong book, and thus I had only my labor for my pains." The old story of the figure or sign taken for the number, the name for the thing itself, the symbol for the reality, the shadow for the substance, and who is there to save us from the fashion of the times, of either making too much of the examinations or of denouncing them unmeaningly!

Yes, you may well say, "Oh, these examinations!" And yet for the present we have no quarrel with the examinations. They have been called "necessary evils," and if we can only keep them in their place they are no worse than other necessary evils, that need not be mentioned. The object of education is not to pass an examination. You have been told this often enough, and many of you may be convinced of it. Some of you must have been brought to recognize the elements in your own being with

which education has to do. Although you may not yet have been sufficiently awakened to distinguish the *ego* within you from the physical, the mental and the moral elements which that *ego* or will-power is to be trained to control in a wise way; you cannot have missed knowing that physical comfort, mental activity and moral power can be fostered and furthered only by a right kind of training. Now what is that right kind of training?

You know what the laws of health are, do you not? You know some of them at least, the most important let me hope. And is it not your intention to respect these during your sojourn in Stanstead? Have you any plan which will lead you to give certain hours or parts of hours daily to the healthful exercise of your body? Is that same body of yours, the temple of your soul, to have due attention paid to it by yourself in point of cleanliness, nourishment, and recreation? Are you not going to train your muscles to be agile and your gait to be gainly under a programme of your own drawing up. Have you provided yourself with dumb bells? Do you know "the prevention better than cure" that that there is in the thermometer and the well aired bedroom? What, you laugh at these things! Your physical education is to be a mere haphazard go-as-you-please, with an occasional game at ball, a little running around, a walk now and again, and more bicycling and skating than is good for you. The professional athlete has in these times become a kind of a picture god through our newspapers, until his godhood has become more or less of a public nuisance. There is an over-doing of it in the athleticism of the day. But on the other hand, the student who would sacrifice his physical health by over-study, who has

no fixed period in the day's occupation set aside for a healthful bodily exercise, is as surely breaking the sixth commandment as does the man whose conduct makes for suicide or murder. There is indeed no such a thing as over-study if the laws of physical health are attended to. The mind is automatic and refuses to act beyond its powers while the body is directly under control of the *ego*. It is therefore the neglect of the laws of the physical health and not the effects of a continuous mental effort that brings about the break-down that we so often hear about in school and college life. Of course there are exceptions, as there are in every wide statement of this kind, but the rule and not the exceptions will bring you to understand how important it is for you to observe the laws of health in all your doings, as its enunciation enables me to say all I have to say in this part of my address on physical education. Vocal exercise is but a branch of physical education, and I would, as a final word, urge every one of you to cultivate your voice through the elocutionary effects of good reading and whatever kind of singing you can get out of it.

At this stage, with my message still to give, I need hardly say that that message refers chiefly to the periods of exercise in connection with the training of your minds. And I trust you have all come, at least the older ones among you, to recognize your own responsibility in the matter of your mental exercises as in your physical. With the teacher merely as your friendly guide, you have, of your own accord, to assume the directorship of your own work. As no mentor can assume the responsibility of making you do this or not do that in the secrecies of your moral control, no

tutor or professor can legitimately do more for you in your mental work than show you the way, though in the kindness of his heart he may help you over a stile or two that impedes the way when you are somewhat dispirited. And how many of these kindly disposed teachers there are, although they themselves cannot but be convinced, even as you yourselves are at the time of receiving the assistance, that over-help is no help at all, if there is to be more than mere memorizing in the mental exercise. As I think of the teachers I have had and known who never did anything for me or others but to hear a lesson, or direct a punishment, I myself cannot keep from thinking well of these pedagogic philanthropists. Their kindness, injudicious as it is, may be safely classified with Corporal Trim's lie, blotted out as it was by the angel's tear. Yet it is not for you to encourage it; only to forgive it. The responsibility of knowing a thing in such a way that your own mental development or behaviour may be benefited by it, cannot well be shared with another. You must learn to do your own thinking, and the sooner the better for your teacher and yourself as the pupil.

And how is this responsibility to be assumed? To be practical, it is to be assumed by following a plan with some design ahead of you, and the design must be to you always more than the plan.

You must not fall into the unseemliness of taking the means for the end and making it the end in itself. That is what the examination people too often do. That is what the miser does, making money, the means with little intrinsic value in itself, the end of his life. Shun this as you would a plague. The development of your own mental and moral stature should be the object

of all your educational plans. Preparing for the examination will of course bring many pressing duties upon you, but the duty that comes nearest to you all is the learning how to make the most of your own powers. The great gain you must look for is not standing or place or prize, but the power of application. The knowledge acquired is secondary, the acquiring of the right habits of thought is what you must strive after, the right habits of self-application, concentration, independence and originality, the aspiration *to be something* so that you may eventually be able to *do something* for others of your kind. Even out of your every day mistakes you must learn to build a ladder by which you may reach up to do the highest kind of work you can do.

To be even more practical, you must have a time-table of your own, which of course must not antagonize with the time-table of the institution. You must strive to have a time for everything, your duties first, your recreation after, but both in place. In that time-table there must be a period for the doing of things as well as for the learning of things. The life that becomes a higgledy-piggledy arrangement never attains to more of a success than an eccentricity to be laughed over. In a word all your ways must be well ordered. You must have yourself under complete control, your temper, your conceits and your powers of endurance. Give up everything that is injurious to the health of any part of your being. Lead a clean life in body, mind and soul.

These are emphatic words, with an aim high enough for the most self-possessed of us. But let no one think that the aim is too high for them. The authorities of this institution are ready to place you under conditions in which you may pursue

your plans for self-improvement to be the best advantage. You are to be comfortably housed, in rooms well heated and ventilated, and properly furnished. In a peaceful locality like this the distractions are not likely to be too numerous, unless, poetic-struck, you should become infatuated as lovers of nature, and take to singing verses before your time; though you may be sure that I for one will never feel ashamed of any of you nor speak spitefully of your efforts, should you succeed in getting into the poet's corner of the *Stanstead Journal* or take to writing for such a creditable periodical as the *College Clarion*.

And this brings me to my last word. To be able to do a thing is better than only to know how to do it. Hence the knowledge you acquire from books will never become assimilated knowledge, part and parcel of your own mental outfit, unless you learn to make a practical use of it. If you leave school or college without having acquired the practical, actual, well-assured power of expressing yourself in your native tongue, written or spoken, you will have failed in your work here, even if you have not forgotten an item of the knowledge you have collected in your classes. When called upon to address you this evening, I first thought of taking up the whole of the time placed at my disposal to emphasize this phase of a practical education, so impressed am I with its importance. Before you can use your mind aright you must know something of the workings of your mind, and to know the workings of your mind you must watch the effects it produces in thought developed into speech. There is no other way of getting at a practical knowledge of your own mental powers; and the very first step in your school education is the careful

examination of the sentence. To be a botanist you must know how to turn a plant inside out and explain its organic parts, and before you can enter upon scholarship you must be able to treat the sentence in the same way as an organism made up of words. The sentence is the tangible form of the thought it embodies, and you must know the one if you would know how the other acts in order to produce the right effect. Get therefore to your sentence-making at once; for practice in that will lead to perfection in the product of thought. Now do not make little of this, I beseech you. You will never amount to much in this world as a right kind of agency among men unless you have trained yourself either to speak correctly or to write correctly. By a practical daily drill in composition, you will come to study systematically, independently and exhaustively, and more than that we do not expect from you. You study your Latin with zest only when you know the power of the sentence as a medium of thought. You become anxious for the hour of the French exercise only when you know what a sound English sentence means from a sound French sentence means in its fullest. Your historical studies have a new interest for you when you know you can fluently, and in correct speech, reproduce the knowledge you have acquired. I never felt prouder than when I could go through a proposition in euclid without figure or blackboard as if I had been making a carefully thought-out speech in appropriate language. And so it is with all your school studies. There comes to you an enthusiasm in your student's work when you know what strength every study brings to your linguist powers and through them to your mental activities. And hence I have no fear of antagonism

from any true educationist, from your principal or his staff of associate teachers, when I urge you to see to this matter of correct speech as an incentive to the study that is the most effectual in making the most of you and your work here and hereafter.

THE GREAT ERROR OF OUR EDUCATIONAL SYSTEM.

THE medical men of the world certainly recognize the damage that is being done to the youth by the forcing system on which their education is conducted, and we believe that the school teachers realize it, but the powers that be keep on making the curriculum harder and harder year by year. We say the medical men are alive to it. So they are, and that fact makes it all the more disgraceful that our medical schools are among the most flagrant scenes of its execution. The foolishness of the thing needs to be harped upon, and we are glad to observe that Dr. John McMillan, of Pictou, made it the subject of an address delivered before a meeting of the Medical Society of Nova Scotia held in Truro on the 5th of July (*Maritime Medical News*, July). Although in his opening sentence he betrays his participation in the common error that we are "living in the last year of the nineteenth century," the substance of what he has to say is most wholesome. It was meant to apply more particularly to Canada, we presume, but it is applicable almost anywhere.

The teacher, as Dr. McMillan points out, has no part in laying down the curriculum; he has no discretionary power in following it out, and can make no allowance for the dull pupil or the nervous pupil, but must resort to the cramming process when examination time approaches. No matter what a pupil's particular bent may be, no matter what his insurmountable aversion, all the children must be put through the same course, and it bears on all of them most heavily at a period in their lives when the changes incident to puberty are a tax upon their reserve power. The result in too many instances is to engender neurasthenia; the child is positively handicapped instead of being strengthened for his coming fight for a livelihood. "The curriculum," says Dr. McMillan, "should be prepared for pupils of average mental ability and average bodily vigor, or rather for those below the average." Rudimentary education is all that the community should set peremptorily before the mass of children; those who have the capacity for more advanced instruction are few in number, and their aspirations may well be met by a few high schools. The born geniuses will find a way to attain suitable acquirements in learning, if only the rudiments are taught them; they can not be held down. Their advance, however, will be in a line of their own choosing, and not in the grooves laid down by boards of education. Under the present system too much work and, we may add, a great deal of it distasteful, is imposed upon the immature brain of the child. This is all wrong; our educational methods should be reformed.—*The New York Medical Journal*.

GRASSES AND SEDGES.

BY ALEX. H. D. ROSS, M.A., TILSONBURG.

Most people imagine that there is very little to be said about such a common thing as grass, yet there is not a single species whose structure, uses, and life history are fully known to us. Those things which are most familiar to us are apt to be regarded with the least wonder, and to occasion the least thought. It is only when we study with care the familiar objects about us that we begin to see how wonderful they really are, and to recognise the fact that "our daily life is girt with wonder and based on wonder."

In common usage, the term grass includes the green plants on which cattle and other beasts feed; or any herbage that serves for pasture. This sense includes what are sometimes called the Artificial Grasses (food plants for horses and cattle, which are not true or Natural Grasses), as clover in Canada and the United States and sainfoin in Europe, as well as some other plants, principally of the legume or bean family.

From a botanical point of view, grasses are herbaceous (or rarely woody) plants with round, jointed, mostly hollow stems bearing alternate 2-ranked leaves with the sheath split or open on the side opposite the blade. The leaves are long and narrow, and at the junction of the blade and sheath there is often a short membranous prolongation of the epidermis of the sheath, called the ligule. The flowers are enclosed in glumes and are arrayed in spikes, racemes or panicles. The stamens are hypogynous, sometimes only one, sometimes 6 or more, but very generally three, the anthers being attached to their filaments by the middle of their back and easily

moved by the slightest breeze. The styles are mostly two or two parted, the stigmas being hairy or feathery. The ovary is one celled, one ovuled, and in fruit forms a seed-like grain or caryopsis in which the pericarp is adherent to the seed. The seed consists of a small embryo, being at the base and on the outside of a large farinaceous albumen, from which arises in great part the extreme importance of this order (*Gramineæ*) of plants to man; very many of the species being valuable on account of their starchy seeds or nutritious herbage. Usually grasses are annuals of humble growth, but sometimes perennial and woody, occasionally, as in bamboos, attaining the height and magnitude of trees. The roots are fibrous, and the root stock often throws out runners. The stems, leaves and glumes contain a large proportion of silica, particularly the epidermis, so that when large quantities of them are burned, a sort of glass is formed; a fact which requires attention in questions relative to the manure suitable for particular crops, and the most profitable attention of crops in husbandry.

The grasses constitute a very natural order, or family, containing about 4,500 species distributed over all parts of the world. Some are characteristic of the warmest tropical regions, and some of the vicinity of perpetual snow; but they abound most of all in the northern temperate zone, where they form the chief vegetation of meadows and pastures, where they are seen to advantage in their social character, clothing the ground with verdure. Every kind of soil is suitable to some or other of the grasses; and

whilst some are peculiar to dry and sterile soil, others are found only on rich soils with abundant moisture. Some grow in marshes, stagnant waters or slow streams; some only on the sea coast, but none are truly marine.

Of the forage grasses, the following are the most important: Timothy or herd's grass (*Phleum pratense*), a native of Europe, and on rich soils very valuable for hay. Red-top (*Agrostis vulgaris*) is also a native of Europe, grows well on moist soils, and is valuable for hay. Orchard grass (*Dactylis glomerata*) is valuable for its growing well in the shade, and so furnishing hay and pasture in orchards and woodlands. Kentucky Blue Grass (*Poa pratensis*) is a native of the Eastern United States and of Europe. In the latitude of Kentucky it is the best of all pasture grasses, but in drier regions is small and harsh. The "Fine Slough Grass" (*Muhlenbergia glomerata* and *M. Mexicana*) of the Mississippi valley prairies is also valuable as hay.

But whilst the grasses furnish food for such domestic animals as the horse, cow, sheep, goat, etc., they are of the highest importance to man himself—furnishing a large percentage of his food and the raw material for many of the articles which contribute so much to his welfare and his comfort.

First and foremost comes Wheat (*Triticum vulgare*), a native probably of Southern Asia, and under cultivation in temperate climates for several thousand years.

Remains of wheat grains have been found in the ruins of the lake dwellings of Switzerland, proving that it was cultivated in Europe in prehistoric times. By long culture it has formed many varieties; some of these are hardy (winter or "fall" wheats), others are tender (spring

wheats); some are awned, others awnless; in some the grains are dark in color (red wheats), in others they are light colored (white wheats), Fabre's experiments of forty years ago tend to prove that wheat was originally derived from a wild grass called *Ægilops ovata*. From it, in the course of ten or twelve years, he succeeded in producing the form known as cultivated wheat. Among the better classes and more advanced nations wheat is the grain principally used for the manufacture of bread, although rye, barley, maize and rice are also used extensively in certain districts.

Rye (*Secale cereale*) is probably a native of Southeastern Europe and Southwestern Asia. It has been cultivated for ages, and the sandy soil of northern European countries is admirably adapted for its growth. In many parts of Russia, rye bread is the only kind known.

Barley (*Hordeum vulgare*) is probably a native of the same region as rye, and has been under cultivation for a long time. By the process of malting its starch is converted into sugar, and fermented liquors, such as beer and ale, are obtained from it. From this again, a spirituous liquor—as whisky—is obtained by distillation. Fermented and spirituous liquors are commonly made from different kinds of grain in different parts of the world, particularly barley, maize, rice and millet.

The Oat (*Avena sativa*) was formerly much used as food for man, especially in cool climates, where it succeeds best. Its native country is not certainly known, but it was probably northern Europe or Asia. At this point it is interesting to notice that the straw of rye, wheat, barley, oats, and many other grasses is much used in the manufacture of

paper; that some of the smaller grasses are much used for thatch; and that the stems of wheat and other grasses are split and plaited into straw hats, ladies' bonnets, etc.

Rice (*Oryza sativa*) has been long under culture in Southeastern Asia, and furnishes food to more human beings than any other single plant. It is cultivated also in Egypt, Italy, Brazil, and the Southern United States.

Maize or Indian Corn (*Zea mais*) is a native of the warmer parts of the new world, and was cultivated by the aborigines of both North and South America long before the time of Columbus. It is one of the most valuable of the cereals, and is now cultivated almost all over the world. Of its numberless varieties, the larger are grown in the hotter, and the smaller in the cooler climates. From it we obtain corn-starch, corn-meal, sugar, whisky, and food for cattle.

Sugar Cane (*Saccharum officinarum*) is a native of the warmer parts of Asia, and somewhat resembles Indian Corn in size and appearance. From its sweet juice most of the sugar and molasses of commerce are made. It is cultivated extensively in the United States, Cuba, Brazil, and other warm countries. It is a curious fact that while the annual production of cane sugar in the world is now about 4,000,000 pounds, yet 500 years ago it was but little known to our European ancestors, and even a century and a half ago it was one of the luxuries. Rum is another well known product of the sugar cane. The Chinese sugar cane (*Sorghum, vulgare*) a native of India, has within a few years been brought into cultivation in the United States for its sweet juice, from which molasses and sugar are made. One variety of this species is the broom corn used in the manufacture of brooms.

Of Bamboo (*Bambusa*) there are several species, and its uses are almost innumerable. The Chinese make paper from the young shoots. The natives of India use the larger species in the building of their houses, and every American is familiar with it in the form of fishing-poles, chairs, pipes, fans, boxes, etc. *Bambusa arundinacea* sometimes attains the height of 100 feet.

The underground runners of some species, as the Marum grass and Sea Lyme grass, make them particularly useful for binding and fixing loose sands. The perennial roots and runners of others contain peculiar substances, on account of which they are used medicinally, as those of Couch-grass. In others the stems and leaves bear a very agreeable fragrance when dried, e.g. sweet-scented Vernal-grass, Lemon-grass, Vittievayr, etc. It has been alleged that the seeds of a few grasses are poisonous, but this in every case requires confirmation, although Darnel (*Lolium temulentum*) in particular has a bad reputation.

So much for the most important members of Gramineæ, and we can only refer to the different kinds of Hair-grass, Feather-grass, Manna-grass, Panic-grass, Bear-grass, Fescue-grass, Meadow-grass, Marsh-grass, Speared-grass, Beard grass, Brome-grass, Bermuda-grass, Canary grass, Millet-grass, and Foxtail-grass before hastening on to the sedges.

Sedges so nearly resemble grasses in appearance that the one may be readily mistaken for the other. In a loose popular sense of the term sedge includes coarse, grass-like, rush-like, or even flag-like herbs, growing on the banks of lakes, ponds or sluggish streams, but in a more accurate, scientific sense they are herbaceous plants with *three-angled solid stems* having alternate

three ranked leaves with entire sheaths. The style is 2 cleft when the fruit is flattened or lenticular, and 3 cleft when it is 3-angular. Sedges belong to the order Cyperaceæ, and principally to the genus *Carex*. There are about 2,000 species, distributed throughout the world, but principally abounding in the temperate and colder parts. They grow in tufts, never forming a continuous mat, generally prefer wet localities, and being deficient in nutritive quality are of little value to man. None are valued by the agriculturist. On the farms they abound only in very inferior pastures, but good tillage and drainage lead to their speedy disappearance.

Some sedges are plants of very humble growth, others are two or three feet in height; all are of unpretending, grassy, or rush-like appearance. Some grow in wet, others in dry situations; some are of great value in the economy of nature as forming the principal part of the vegetation of swamps, which they gradually convert into fertile ground.

The running roots, or rather *rhizomes* of some help to bind the sand of the sea shore, particularly *Carex arenaria*, which is carefully planted for this purpose on the dikes of Holland. The rhizomes of *Carex arenaria*, *C. hirta* and *C. disticha*, are sometimes used as a substitute for sarsaparilla, and the Laplanders use *Carex sylvatica* as a protection from frostbites and chilblains, wearing it inside of their shoes and gloves.

But, besides the numerous species of *Carex*, the sedge family includes the Cotton-grasses, *Dulichium*, *Galingales*, Spike rushes, Bulrushes, Baldrushes, Horned-rushes, Nut-rushes, Twig-rushes, Beak-rushes, etc., not to mention the *Chufa* (*Cyperus esculentus*) cultivated along the shores of the Mediterranean for sake of its sweet tasting tubers; the species of cyperus used in India and Egypt for the manufacture of ropes and mats; and the papyrus antiquarum, from which the first paper was probably made by slicing the cellular pith, and afterwards hammering and smoothing it.

THE UNIVERSITY AND THE TEACHER.*

BY THE RT. REV. J. L. SPALDING, BISHOP OF PEORIA.

The chief concern of every man is not, as it should be, the formation of his character. The most wish merely to find a recipe for comfort or a way to acquire riches or whatever else they aim at.—*Goethe*.

Whether the rule of the people shall approve itself as a wise, beneficent, strong and enduring government will depend largely on its attitude toward religion and education, the fountain-heads and safeguards of right human life. When power is placed in the hands of the multitude, and opportunity is offered all alike, whatever makes for utility, for comfort and ease, for physical

health and well-being will be held in high esteem, will be cultivated and promoted, for the need of all this is felt by all, and where there is freedom all will labor to provide it. Consider for a moment this great metropolis, where but yesterday the wild fowl screamed among their fellows. Its growth and wealth are the marvel of a century of wonders. Not in London or Paris or other centres of the Old World shall we find more stately structures or more commercial and industrial activity.

*The Convocation Address, given on the occasion of the Thirtieth Convocation of the University, held in Central Music Hall, Chicago, October 2, 1895.

In the presence of this vast achievement of human energy, the most thorough idealist cannot but stand in awe; for such power, such energy, such efficacy of will, on whatever objects it may be exerted, is awful. Here, assuredly, it has been exerted almost wholly on what is material, on what is simply useful. Look on these lofty buildings, observe the eager throngs hurrying through these busy thoroughfares and ask yourself what it all means. Why have these edifices been erected? Why are these streets filled with people, who hasten on as though pursued by Death? One thought, one purpose, dominates the whole. This city, with its population of two millions, has been created for commercial and industrial ends. It exists to provide the useful, to feed, clothe, house, warm, and carry men, and it does this work with such enterprise and skill, with such unremitting toil, that it is not possible to withhold admiration. All honest work is sacred, and they who labor with the hands, not less than they whose mightier instrument is the brain, are, if they are filled with the right spirit, God's workmen; and since it has not yet been found possible to teach the multitude to make efficacious use of their nobler endowments, manual labor is their salvation, and therefore the *base* guard and basis of civilization.

But there are higher things than those which are merely useful, and consequently there are men whose function is of vastly more importance than that of the toilers who provide us with food and drink and clothing. These are indispensable; all must have them and the whole world takes care that they shall not lack; but genuine human life emerges, not when we eat and drink, for this we do as mere animals. We first become men and women when

we think and love, when we hope and believe, when we listen to the voice of Duty, however hard its command; when we rise through aspiration and imagination to those inconceivable heights where time and space are no more and the soul is alone with God. In this world, which is the proper human world and man's true home, it is not easy to dwell. It is within us, it is likeliest unto what we really are, but to become conscious of it and to feel the need of the blessings it holds, man must ascend from his primitive to his ideal nature; and the effort to do this with method and system is education, which is a conscious striving to fulfil in one's self the ideal of the perfect, and as a means to this end, to transform both one's self and one's whole environment. The aim is to make one's self the best it is possible for a man to become, and the world he lives in the most suitable to the development and play of the higher faculties. Even the savage succeeds in getting what is simply useful—food and drink—and, when it is necessary, some sort of clothing; but there must be at least a beginning of civilization if man is to undertake the task of raising himself from his primitive to his ideal nature—endless task, not to be accomplished by any one individual or people. It is the work God imposes on the whole race for all time; and the highest individuals and races are those that contribute most to this Divine consummation.

In this metropolis created by the very spirit of the wide-spreading and teeming Mississippi Valley, to be a purveyor and provider of whatever ministers to man's material needs and comforts, to the wants of his primitive nature, it is altogether right and desirable that a centre of intellectual light and moral influ-

ence should have been established where great teachers may dwell and work, men whose thoughts and aspirations and lives are suffused with a glow caught from higher worlds. A university, I think, is not so much a place where all that is known is taught, as a place where noble and luminous minds create an atmosphere which it is impossible to breathe and not feel the quickening of new and larger hopes and aims—minds that are less concerned to impart information about anything whatever, than to solicit, call forth, sustain, strengthen and bring into act the powers which lie latent in the human soul, striving themselves, day by day, to become wiser and more loving, that with each access of new life they may thrill, inspire and impel others to generous and persevering self-activity. It is only in a university that such minds can be brought together, and they, be they few or be they many, are the life and essence of university teaching, for they create an intellectual and moral climate in which one cannot live without imbibing the spirit of self-culture. The important consideration for those who have the will to become all that is possible for them to be, is not what they shall study, but where they shall find a genuine vital man who teaches anything, who while he teaches, still continues to learn and upbuild his own being. The teacher, then, must first of all be a real man. Scholarship is secondary. The only wholesome influence which man can have on man is exerted by his personality. It is admitted that where observation is possible we may not rest content with explanation. Let the pupil be brought face to face with the thing itself that he may exercise his powers on this and not on words about the thing. This is the method of all right teaching,

which is never merely talk about science or philosophy or literature, but is above all exemplification, concrete presentation of the subject; and since the highest we know on earth becomes concrete only in man, the first thing to be asked for, when there is question of a school of whatever kind, is a genuine, noble, wise and loving personality. This is the presupposition in all theories and problems of education. Like begets like, and to hope, to illumine, exalt, and purify, when we ourselves are dark, low, and unclear, is to hope for a reversal of the laws of nature. He who would develop in the young a sense of religion and duty, of honor and freedom, must himself be all alive with these elemental powers. There is doubtless a science and an art of education, and consequently there are principles and methods of which the teacher must make use, if he is to do good work. Is it not plain that history or literature or geography or mathematics may be rightly or wrongly taught? Is it not necessary that the methods of teaching be adapted to the subject as well as to the mental condition of the pupil? Now this is pedagogy—it is little more than good sense applied to the purposes of education. The object is to control individual experience by general experience. It is certainly most important that the teacher should live and act in the light which the history of education throws on his work. Nevertheless it is a fundamental error to suppose that the principles, rules and methods of pedagogy are the chief requirement in education. Neither a fund of accurate and pertinent information nor the most approved methods can supply the essential and indispensable pedagogical requisite—the awakened mind, the loving heart, the quick and

comprehensive view, to which as to the eye of a skilled general or physician, the exigencies of each moment and situation are revealed. The true teacher is at once a leader, an inspirer, and a healer. He is neither a slave of methods nor a victim of whims and hobbies. He knows that rules are but means, and he does not enforce them as though they were ends. He is not a machine, but a living soul, obedient to the light of a cultivated intelligence and to the impulses of a generous heart. His task is as difficult as it is important, as full of trials and hardships for himself as it is of blessings for those whom he influences. Let him then be free, let him be trusted, let him be cheered in his work. To make him the slave of minute observances, the victim of a system of bureaucratic regulations, is to render it impossible that he should find joy and delight in his work, is to superinduce in him a servile disposition, is to degrade him to the level of a machine, is to make him unfit to mold and inspire free men. If he is to train his pupils to a wise self-confidence, without which nothing great is ever achieved, he must not be made to feel that he himself is unworthy of confidence.

Montaigne holds that the teacher needs a well-made rather than a well filled head, which is his way of saying that learning is of less importance to the educator than an open and sincere mind, capable of judging with fairness and of reasoning with accuracy. Thus a father or a mother, simple and unlettered, but endowed with good sense and with the love of truth and justice, has a more profound and lasting educational influence on the child than any which may be exerted by the doctors of the universities. Nothing has such power to draw

forth human strength and goodness as love. The teacher's first business is to win the heart, and through the heart the will of the pupils; and to this end a generous faith in them is the most effective means. By trusting them he shows them how to trust themselves; by believing in them he leads them to believe in themselves, thus awakening in them a desire to realize the high things of which they see they are held to be capable. Nothing destroys the confidence of the young so quickly or so thoroughly as to know that their teachers are insincere or unjust. Better rule by brute force than by deceitful devices. If there be anything false in them it cannot be hidden from the quick glance of youthful eyes. "A man passes for that he is worth," says Emerson. "What he is engraves itself on his face, on his form, on his fortunes, in letters of light. His sin bedaubes him, mars all his good impression. Men know not why they do not trust him; but they do not trust him." The weak and the ignorant are the quickest to threaten and punish, and it is only where teachers lack moral and intellectual power that they resort to harsh measures. The bitterness they feel makes their own and their pupils' lives bitter. How pleasant it is to hear Montaigne tell that his father did not permit him to be awakened except by the sound of some musical instrument. So possibly does God awaken us from life. Whatever others may hold, let the teacher be persuaded that the faults of the young are due to weakness and ignorance rather than to malice; and if he finds a few who have inherited or acquired a vicious disposition let him not imagine that they can be corrected and improved by anything but patience and loving kindness, assisted possibly by medicine and hygiene. The master must

first be master of himself. He must be sympathetic and lowly minded; must often efface himself and suffer his presence to be felt only as a guidance and encouragement to the awakening minds of his pupils. And how shall this be made possible for him if his heart is not filled with the love of God and of human perfection? Behold the mother hen moving among her little brood, who, when she has found something of worth, lovingly calls their attention to it, and passes on, leaving them to decide whether they shall take or neglect it. If the teacher show his pupils how far he excels them in mental power and culture, he discourages them; for the more susceptible of education they are the greater is their modesty and self-diffidence. Let him be as one of his little ones—a learner and striver. Such have been and are the mightiest and noblest souls. Only a free spirit can educate the freedom, only a reverent and devout mind can inspire faith in God. The love of liberty springs from the love of truth—truth makes free. Indeed, it is only in the world of truth, speculative and practical, that man feels himself free, at home in a realm above that of physical law and determination. Healthful work is the mother of brave and joyous hearts; where learners are dispirited and heavy-hearted they are not doing the right work or they are not doing it in the right way. When young souls are bursting into bud and bloom their world should be as bright as the blue skies of spring, overhanging flowering orchards, where the birds sing and the bees hum, and the sparkling waters leap to see and hear. Throughout life they should be able to associate the memory of this fair time of spiritual growth with all that is pure, fragrant and inspiring; for, should the experience of those early years make it impossible to believe in the surpassing worth of culture they inevitably become the victims of arrested development and lead a stunted existence. In a family in which the spirit of cheerfulness reigns there is peace and happiness; each one finds his task and performs it gladly. The school is a larger family. If the masters are harsh and morose, the pupils discouraged, the school is bad. The effectiveness of school methods depends upon the character of the teacher. If he lacks intelligence and individuality they become mechanical devices, in which the pupils can take but a mechanical interest. Rules and laws are of little use to those who have not been brought up to desire and love the guidance of law. He who is grounded in faith in the principle of law will become a good man, a good Christian, a good citizen; and nothing else will make him so. Faith in the principle of law is faith in God. If we form true men the rest will form and reform itself. Schools where many things are taught, but where will, courage, seriousness, love of truth, great-mindedness, and respect and reverence for all that is high and holy are not cultivated, are institutions of perversion rather than of education. Let the teacher leave nothing undone to make brave, honest, chaste, unenvious men and women, even though they fail in scholarship. If conscience is not sovereign it is nothing. "Moral education," says Kant, "should begin, not with reformation of conduct, but with renovation of thought and formation of character." Whatever may help to make a man is the teacher's business. In him indifference is imbecility; it is impotence. The gift of eloquence is of inestimable value to him, but he should not, like the

orator, seek to captivate and carry away his hearers, but he should inspire, illumine, and prepare them for independence of thought, for freedom of view. They are the best teachers who make study most attractive. Thus the best genius does for its possessor; for what is it but an inner impulse which urges him joyfully to the pursuit of truth, goodness and beauty? Nothing fatigues like dullness. From the weariness it begets there is no escape. The teacher's character is the best reproof. The mother does not occupy herself with projects for carrying her child; she is busy teaching it to walk alone. This is the aim and end of all right education. Suggestion is a large part of the teacher's business, hence there should be a magnetic something in him—the power to interest, to charm, to inspire, to impel, while he enlightens and guides. Courage is contagious. Brave thoughts, brave words, brave deeds—courage in his whole attitude towards life and death, towards God and man—this makes the teacher an educator, constitutes him a former and creator of men; for the heroic mood leads to contact with Divine things and has vital power. Refuse to entertain thy troubles and sorrows and they will leave thee. A great mind can console, and heal, as well as time. Our attitude toward circumstances determines what effect they shall have on us. A generous and active spirit turns to Divine uses the things which weaken and corrupt the timid and indolent. To do for the pupil what he should be inspired and impelled to do for himself, does not help, but hinders his progress. Teach him to teach himself by looking, listening, observing, and reacting on the impressions he receives. The imparting of information is but a small part of the teacher's business; his chief concern should be to develop faculty, to form character, and to point out the means whereby knowledge may be acquired and, if need be, communicated. In the presence of the infinite possible, nay, of the vast accomplishment of nature and of mankind, the work of the individual, though he be the greatest, is insignificant. Let not this discourage thee. Thou wast born to do but a man's work. Do thy best—it will make thee worthy. Each one's character is largely determined by heredity, environment and the education he has received. None the less is it each one's duty to shape and build his own being into ever-growing harmony with what is eternally true and right. Only the gentle and loving know how to guide souls, for they are patient and compassionate. They alone can stoop to all infirmities without losing their trust in God or their faith in man. The teacher accomplishes more by making strong impressions than by constructing lucid arguments. If the heart is moved, if the conscience is awakened, the reasons for right doing become manifest. Hence the great moralists have been impelled to utter themselves in vigorous and sententious thoughts, in maxims which penetrate the mind and remain as an incentive or a reproach.

“Do not withhold him from doing good who is able; if thou art able, do good thyself also.” “The wise shall possess glory. The promotion of fools is disgrace.” “Get wisdom, and with all thy possession purchase prudence.” “Take hold on instruction, leave it not. Keep it because it is thy life.” “Choose knowledge rather than gold, for wisdom is better than all the most precious things, and whatever may be desired cannot be compared with it.” “The words of the wise are as

goads and as nails deeply fastened in ;" and unless for us they are as goads and as nails deeply fastened in, they profit us in no way.

All things belong to thee, if thou but love them, and what thou possesseth will give thee pure delight, if thou hold and use it for the benefit of others. The life is the best which issues in the highest knowledge and the purest virtue—all else is frivolous. When our moral convictions are profound and living, we easily communicate them to those about us ; but if the essential goodness is lacking in ourselves, the words we utter, however fine, will not bear to others the seed of Divine life. Make thyself free within, for turn outward whithersoever thou wilt thou shalt find that confining walls proclaim thee prisoner.

Educableness is man's true characteristic, and the teacher who loves his calling and understands his business will give his chief thought and labor to education, whether it be his own, or that of a few, or of the whole race. "Where is the learned? Where is he that pondereth the words of the law? Where is the teacher of little ones?" In the right spirit, which is the important thing, whatever we do, there is either knowledge or a genuine yearning and striving for knowledge ; but the teacher's knowledge, whether of method or psychology, or of whatever other pedagogical art or science, is little worth to him as an educator unless he have the right spirit ; for it is this that creates devotedness, gives insight, arouses interest and stimulates self-activity. As a wise man thinks little of his success and much of his failures, that he may learn to make them good, so when teachers shall have become educators, less attention will be paid to the bright pupils, and vastly more to the weak and

the slow. A school is more safely judged by those it fails to improve than by those it helps. What more worthy and can the teacher propose to himself than to accustom his pupils to find pleasure in the practice of virtue and to turn with disgust from what is base or wrong? If they be led to dwell habitually with high and true thoughts, they will become part of their being, give warmth and glow to their feelings and impel the will along the paths where their light falls. We are transformed by what we meditate not less than by what we do. The word which God spoke in the beginning is the word which he forever utters : "Let there be light ; let knowledge grow ; let wisdom increase ; let love prevail." The light of the mind makes the world harmonious and beautiful. The noblest people is not the richest or the strongest, but the people whose soul is filled with the highest thoughts and the Divinest aspirations. Take from any country a hundred of its greatest men in religion, philosophy, poetry, science and art, and the life of all falls to a lower plane. Let the teacher then strive day by day to lift his pupils to the world where these hundred best have made their home. The only serious instruction is that which cultivates reason and conscience. The words which the teacher utters, however true or wise, have less influence on his hearers than his character. The man, not the speech, is eloquent. A hero, like a beautiful woman, persuades by simply appearing. It is the spirit that is Divine, and words have irresistible force only when they spring from the hearts of God-like men. They who create new and beautiful ideals which give a new and holier sense of the worth and goodness of life, are our greatest benefactors. How blessed it is for

a country to have good soldiers, good thinkers, good priests, good artists, good workers in every sphere! The supreme need is of good men, for only they upbuild the kingdom of earth and heaven. It is hard to love the multitude for what they are—the wise love in them the ideal of a higher life which they strive to realize here, believing and hoping that they thereby co-operate with the Eternal for ends which are absolute.

Sadden not the hearts of the young. Their worth as men and women will be in proportion to the joys of their childhood. Forbid as little as possible, but help thy pupils to do gladly, wholesome and profitable work. Only they know how to teach who know how to rouse, to encourage, to incite. This is every-thing; for they who go bravely to work with joyful hearts will learn whatever is needful. The power to awaken ideas, so to use words, that, like an enchanter's wand, they make what they symbolize rise into view, as though it stood before the eye, is a gift of genius, but it is also a talent which may be cultivated, and there is none which gives to the teacher's work more life and charm. It is important to make things plain, to throw about them the revealing light of the mind, but they who set the world aglow with the warmth and magnetism of an ardent and passionate soul, are the true inspirers and teachers. We little suspect what power of devotion and heroism there is in the simple people by whom we are daily surrounded, and who often appear to us altogether commonplace. Let but the proper

occasion arise and we shall behold their souls transfigured by the light of higher worlds and clothed with almost superhuman strength. Thus there is in the humblest man or woman a Divine something before which the greatest may bow with reverence. Let then the teacher learn to recognize the God there is in every child's soul, and let him strive religiously to unwind the bonds which hold him prisoner. "He who undertakes to form a man," says Rousseau, "must first have developed true manhood in himself." Again: "The pedant and the teacher say much the same things; but the former says them in and out of season; the teacher only when he is sure they will produce their proper effect." What we are capable of knowing depends on the power and quality of our minds. Deep truth grows shallow in the shallow brain. Hence the genuine teacher gives little time to cramming his pupils with information for which they are not prepared, but he devotes himself to their whole being, which he exercises in every way, that they may gain strength and freedom, that they may become self active and address themselves gladly and perseveringly to the pursuit of truth and perfection.

He must know how to govern; for what is education but the art of governing? But how shall he learn to govern unless he forget and deny himself that he may think solely of the good of his pupils? Is not this the secret of the mother's power, who, if she know how to love, is the world's first and highest teacher?—
The University Record.

LET THESE THINGS BE.

RONDEAU.

Let these things be, O Time ! whate'er befall ;
The memory of corn-fields by the sea.
The tender evening light shed over all—
Pale gold and gray—a sombre symphony,
And weird music of the curlew's call.

Such sights and sounds as hold the soul in
thrall—
That other scene of Spring-time's mystery,

The budding may, fields pranked with lilies
tall,

Let these things be !

So through Life's darkened chambers I may
^{see}

These old sweet pictures dimly on the wall,
I shall not find the long, still evening pall.

Let these things be !
CONSTANCE FARMAR.

Chambers' Journal

EDITORIAL NOTES.

Deliver not the tasks of might
To weakness, neither hide the ray
From those, not blind, who wait for day,
Though sitting girt with doubtful light.

“ That from Discussion's lips may fall
With Life, that working strongly, binds—
Set in all lights by many minds,
So close the interes's of all.”

In the new administration for Ontario the Hon. G.W. Ross, L.L.D., vacates the education office and becomes Premier, and the Hon. Richard Harcourt, B.A., becomes the Minister of Education.

THE CANADA EDUCATIONAL MONTHLY thanks Mr. A. W. Wright for his valuable and important contribution in this month's issue. No community can live without the knowledge and practice of the principles of the Bible.

On another page we reprint the leading editorial from the issue dated September 16th of our esteemed contemporary, the *New York Medical Journal*, on “The Great Error of Our Educational System.” We know the article will be appreciated by our readers. It is much to the point, and only too true.

MANAGEMENT OF SCHOOLS

Speaking in general, the managers of the Elementary Schools in Britain are elected by the ratepayers. Sometimes very sharp contests take place at the annual elections, especially

in London. It may, therefore, be taken for granted that in both kinds of Elementary Schools, the Board Schools and the Voluntary Schools, the principle of election prevails. The choice for managers (trustees) has a much wider scope in Britain than in Canada. In Britain we find members of the nobility, gentry, and clergymen as well as business men of all classes and even teachers chosen for managers.

Men of the highest social position and of the widest culture and influence are frequently found on the boards of the Elementary Schools. And this, of course, is all the more apparent in the more advanced schools, such as grammar schools and colleges.

The clergyman, by his office, is a teacher, and not only is he interested in the cause of education by his preparation for his life-work, but it is his duty as a minister to see that the best is provided for the people of his charge and likewise that they make the most of the facilities offered for their benefit. Therefore it is only what a person would expect when he finds everywhere quite an important part to be

that contributed to the care of the schools by the ministers of all religious bodies. A fair estimate numerically of this part of the managing boards will be from $\frac{1}{5}$ to $\frac{1}{3}$. In conversation with a parish minister anent the schools in Scotland, he told me that in teaching his Bible class he found the classes from year to year becoming less proficient in their knowledge of the Scriptures, even of the historical parts. Upon mentioning this to his neighbor minister his experience was the same. They agreed to give more attention to the school in their parish by visiting it, encouraging the master, and giving prizes for proficiency in Scripture knowledge. The result is that better attention is now given to the Bible, which before had been passed by because Bible knowledge did not count in the annual grading of the school by the Government Inspector. This simple incident shows how the service of ministers can be, and is, utilized in the home land. All classes of the community work for the general weal. You do not meet with the spirit which breathes in the words: "Let the ministers attend to their business and we (teachers) will mind ours,"—the words which were spoken to the writer while on a recent visit to friends south of the lakes.

This country should have, in this respect, its fair and valuable contribution from the ministers of the different religious bodies in the best interests of education. Great Britain reaps the benefit of this contribution. Canada should follow the Mother Country and secure a like advantage from the clergy.

Let us now turn our attention more especially to the Secondary Schools. Fees are charged everywhere, and such fees as we in Canada would consider high fees. Evidently it is a settled question

with the people in Great Britain that if a pupil enters a secondary school his instruction must be paid for by his parent or guardian. But to meet this heavy charge there is a very rich provision of scholarships made by municipalities and private citizens. Every possible inducement is offered to and pressed upon parents to aid them in educating highly endowed sons and daughters in order that the State may reap the inestimable advantages resulting from the labors of such sons and daughters. By this process the country, in the best way, is led to discern and encourage to the highest degree her ablest sons for her public service. That our readers may be able to see to some extent how ample the provision is, two extracts are here made, one from this year's prospectus of the Grammar School, Manchester, and the other from the Allan Glen's School, Glasgow:

GRAMMAR SCHOOL, MANCHESTER.

There are in connection with the school about 160 Foundation Scholarships, conferring exemption from the school fee. Of these one-half are by the scheme preferentially reserved to scholars from Public Elementary Schools. The Foundation Scholarships are divided into two classes:

- (1) Scholarships awarded to boys on admission to the school.
- (2) Scholarships awarded to boys already admitted to the school, on the results of the midsummer examination of the whole school.

Scholarships of class (1) are tenable for nine terms, and candidates must be over the age of ten, and under the age of thirteen, on the first of November preceding the winter examination or on the first of June preceding the summer examination.

For scholarships of class (1) there

are two examinations in the year, one in June and the other in November. The subjects of examination are Reading and Writing from Dictation; English Grammar and Composition; Geography and Outlines of English History; Arithmetic; Elements of Geometry (Euclid Bk. i), and Algebra up to Easy Quadratic Equations; and Latin or French.

In connection with scholarships of class (1) a limited number of Bursaries of the value of £12 12s. yearly are given.

Scholarships of class (2) are tenable for six terms, but may be extended by the Governors for not more than three terms in the case of promising boys. These scholarships are awarded largely with reference to a boy's place in his form, provided his age does not exceed the standard fixed for that form.

Six scholarships, each of the annual value of £25, are awarded by the Manchester City Council, tenable at the Grammar School. The limit of age at the date of entrance to the school must be not less than 12 nor more than 14 years of age, and the candidates must be the sons of bona-fide residents or rate-payers within the limits of the City of Manchester for not less than six calendar months from the 1st of January preceding the examination.

I. — ALLAN GLEN'S SCHOLARSHIPS AND BURSARIES.

“67. The Governors shall institute not fewer than sixty free scholarships at Allan Glen's School. These free scholarships shall confer the right of free education in the secondary department of the school, with books and stationery, for such period, not exceeding two years, as the Governors may determine. They shall be open to such applicants as the Governors think suitable, either

being boys desiring to enter the school whose parents or guardians require aid in giving them education, or being pupils attending the school whose parents or guardians require aid in giving them education, and shall be awarded by the result of a competitive examination, in which the age of the competitors shall be taken into account. The Governors shall fix the number of free scholarships in each year, and the age or position at school of the competitors, in such manner as they deem expedient.

“68. The Governors shall apply the annual sum of not less than £200 in establishing bursaries at Allan Glen's School, which shall be awarded by competitive examination among pupils at the school whose parents or guardians require aid in giving them higher education. These bursaries shall be of such annual value, not being less than £5 or more than £15, as the Governors may determine, and shall further confer the right of free education, with books and stationery. The bursaries shall be tenable for such period, not exceeding three years, as the Governors may determine. The Governors may fix the competition for these bursaries at such period or periods in the school curriculum as they may determine, but not at a lower period in the school curriculum than may make the average age of the competitors as nearly as may be thirteen years.

“69. The Governors shall establish not fewer than three university or technical school or college bursaries, each of the annual value of not less than £25. These bursaries shall be awarded by competitive examination among pupils attending the school, and shall be tenable for a period not exceeding three years at a university or day technical school or college approved by the Governors”

During the present session the Governors will appoint, according to the above provisions—

30 FREE SCHOLARS

15 SCHOOL BURSARS.

1 UNIVERSITY OR TECHNICAL COLLEGE BURSAR.

II.—THIRTY SECONDARY EDUCATION SCHOLARSHIPS.

The Governors, in accordance with the Scheme drawn up by the Burgh of Glasgow Committee for Secondary Education, have established thirty Secondary Education Scholarships (ten to be competed for annually). These Scholarships confer the right of free education for three years in the Secondary Department of Allan Glen's School.

ONLY QUALIFICATION.—*Candidates must have been at school within the Glasgow School Board area for the three years immediately preceding the competition.*

III.—MERCHANTS' HOUSE SCHOLARSHIPS.

The Directors of the Merchants' House of Glasgow have also recently founded Day-school Scholarships in connection with this school. These Scholarships are open to boys who have passed, or are capable of passing, the Sixth Standard Examination. They may be held for two years, provided the holders of them attend this School regularly, and make satisfactory progress. In addition to the payment of school fees, a bonus of £6 is paid annually to each holder of a scholarship who passes second class, and £9 to each who passes first class in any one of the science subjects taught in the institution.

The Directors of the Merchants House have appointed five such scholars for the present session. Up to the present time these Scholarships have been held exclusively by boys sufficiently clever to earn the higher bonus of £9

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If there is any better way of discovering the highly endowed intellectually than the plan followed for years in the Old Country we should like to know it. And having found out who such are, a County Council can put its money into no undertaking which will yield such a rich return as this, enabling those who profit by it to reach out to the very farthest limit of attainment in all branches of modern knowledge. County Councils should found scholarships and fellowships in our secondary schools and colleges for the benefit and encouragement of all such as have the ability and inclination to pursue their studies. It is only by so doing that a country can legitimately expect to prosper in all branches of manufacture, trade and commerce. In urging this upon our people we are not proposing a new departure in school affairs. In Great Britain this encouragement by the founding of scholarships has been in existence for generations, and the late Rev. Dr. Ryerson, Chief Superintendent of Education, Ontario, made provision in the school law for the same plan to be followed by us. We must arise and build more strenuously than ever for the benefit of true education in every direction. Fellow-subjects, we must help ourselves.

CURRENT EVENTS.

IS IT SHAME?

SUCH is the question which many Canadians have been asking themselves during the past few weeks, when it has been brought home to them that their country, or at least their Government, has been the laggard in coming to testify its loyalty to the imperial flag, and its devotion to the unity of the Empire. Undoubtedly, this is the fact. We have been the last to declare our readiness to draw the sword. While the troops of New Zealand have been marching through the streets of London, we have been debating the question, and at least one of our ministers has been using language which can only be described as disloyal. Yet for all that it cannot be said that Canada is disloyal. The people are sound at heart, have been chafing under the delay, and now that the word has been given, are crowding to the standard. Yet a day will come when the country may take upon itself the shame which now rests only upon certain of its representatives. We believe that time will never come. We believe the country will call these men to a strict account. In the first place, it is not creditable to us, that we, the greatest of the colonies of the British Empire, should have been the most backward to come to the help of the Mother Country. It is not, of course, that she actually needs our help. Great Britain could fight out many such wars, humanly speaking, without drawing upon any resources but her own. But that is not the point. More and more the sentiment is growing that the Empire is one. We are not mere outside dependencies, hanging upon our Mother, yielding her a kind of filial support. We are part and parcel of the great Body Politic; and we want

to enjoy privileges and to fulfil duties in accordance with this idea; and we should feel mortified and humbled, if we could believe that any part of the Empire was more ready to recognize such duty than ourselves. Then, again, our dependence upon the strength of the Empire is much greater than that of any of the other colonies. We do not imagine that it would make much difference to Australia or New Zealand, whether the strength of the Mother Country were great or small. It is hardly conceivable that any other European Power should greatly desire to annex those colonies; certainly it is in the highest degree improbable that any such power should submit to any considerable sacrifices, in order to bring about any such result. But such an attempt is by no means impossible or even highly improbable in our own case. In thus writing we do not imagine for a moment that the United States Government has any design against the Independence of Canada, and we do not suppose that either the Government or the people of the United States would think for a moment of annexing the Dominion of Canada to their own territory—that is to say, in any direct and immediate manner. But everyone can see that, in the case of certain emergencies, such a desire might very easily arise, or at any rate that such measures might be taken as would seriously injure the interests of the Dominion. And, if we stood alone, how would it be with us? And what is the difference between our entering into controversy with our powerful neighbor, by ourselves or with the power of the British Empire behind us? We do not suspect the United States of the least desire to do us harm in any kind of way. We re-

joice to think of the greatly improved state of our relations with them. But to whom is that improved state attributable? And how should we wish ourselves to be situated if our relations were different? Now, are we prepared to lay down the principle that we are to fall back upon the strength of the Empire when we have need of it, but that we are not to render aid to the Empire when it seems to be required? We fancy not. But there is one thing still more serious that we must deliberately lay to the charge of a member of the present Government, Mr. Israel Tarte, and that is the evident purpose of arousing an unfriendly feeling towards the Empire and British supremacy among the French people of the Dominion. To this Mr. Tarte has received no provocation whatsoever. No English speaking politician or private citizen (that we are aware of) has hinted anything of a hostile or unfriendly character towards the inhabitants of Lower Canada, or of their kindred in any part of the Dominion. We believe that the vast mass of English speaking Canadians would resent any such attempt on the part of any of their own people. Yet Mr. Tarte goes to France and poses as a Frenchman and declares that if his position in a British colony interfered with this, he would be, as he is, first of all, a Frenchman, and so forth. And he comes back and talks in the same fashion here. Now, Mr. Tarte may be a Frenchman whenever he likes. He may go and live in France, or he may throw off his allegiance to the British Crown. But at this present moment, he is a British citizen, a British subject, and a British Minister; and he ought to behave, as such, in a decent manner. And we believe that he will be taught this before long. Sir W. Laurier will find him

a burden too heavy for him to bear—or if not, they will sink together. —*Canadian Churchman, Oct. 26th, 1899.*

About fifty members of the George Howland club occupied the tables at its October meeting to consider the topic "The promotion of pupils from the eighth to the ninth grade."

The discussion was opened by Dr. Nightingale, Superintendent of High Schools, whose points we give in brief:

In the first place we are trying to teach the masses in overburdened classes to the detriment, discouragement, and I fear in many cases, destruction of the individual. It took more than 10 years to reduce the number of desks in a room from 72 or 63 to 48, and no sooner was it done than the cry of "lack of funds and accommodations" sent them quickly back to 54 and 63, instead of bringing them down to 25, which should be a maximum. It is out of nature, it transgresses the limit of human endeavor to expect a teacher of the type which must be employed, to instruct under the egis of any sort of scientific pedagogy so large a number without leaving behind many an intellectual and physical wreck in the process. The classification by grades in our Public Schools, Elementary and High, is based on the fatal theory that 50 pupils of about the same age are capable of about the same advancement in all the subjects of our congested programme of work.

I am an advocate of the assembly room plan of school building and of specialized work on the part of teachers. In every assembly room of 150 pupils, more or less, there should be a teacher; I mean a teacher, not an instructor, a taskmaster, a tyrant, but a teacher who should know when her pupils should be at school and when at home,

whether they need an instructor or a physician; who should keep all their records, attend to all their wants, give them talks on various subjects, aid them in their studies and in every respect be a mother or father to them. These pupils should go in groups of not more than 25 to a class-room teacher for arithmetic, to another for geography and history, and so on through a much briefer list of studies than now prevails. All the pupils should not take all the studies necessarily. Some should not stay at school all day. All classes in the same subject should not be expected to go at the same rate; rigid grading and classification should be abolished; the Procrustean system dispensed with; elasticity in the curriculum and in the methods of presentation should prevail everywhere. All pupils should be permitted to advance as rapidly as they can, as slowly as they need, and take such subjects and parts of subjects only as they can digest and assimilate.

I am out of harmony with our present congested and compulsory program of studies. I am inclined to believe that no study can be made compulsory, except to the extent of withholding a diploma. We have been piling up the studies the last ten years without relaxing the strain at any important point, until I am surprised that any one dares to advocate the existing state of affairs. To what end, for what purpose are all these studies? When I was a boy I did not have one third as many and my time was fully occupied. When do the children prepare their lessons? What time is there for study? When is that most important of all lessons learned, How to Study? Ah! there's the rub.

So far as text-book work is concerned, I would eliminate from the programme bookkeeping by single entry, civil government, the philoso-

phy of English history and physiology. I would reduce geography about one half, and make the other half readable, interesting and profitable. I would do away with arithmetic at the end of the seventh year, if not the sixth year. I would carry algebra through the eighth grade as furnishing real mathematical discipline. I would teach the laws of hygiene in a practical way, and have all the nature study, observational and experimental.

I am cordially in sympathy with the prevailing regulation that admission to the High Schools shall be on the recommendation of the Grammar School principals, and I would add, with the advice and consent of the teachers of the seventh and eighth grades. I would not, however, have this recommendation based upon a mere matter of per cents secured at an examination. I am out of all patience with examinations, and I wish the word were expunged from the educational dictionary. If principals and teachers of the seventh and eighth grades who have had these pupils under their care and instruction and discipline for years do not know whether they are capable of passing from the eighth to the ninth year without subjecting them to a written test in the oppressive heat of June, they would better err on the safe side and let them all pass on. The passage from the eighth to the ninth year should be just as easy, just as natural, as from the 6th to the 7th, or the 7th to the 8th. I am opposed to the building of any Chinese wall around the High Schools. Every child who has received good in the eighth year can receive good in the ninth, and there may be Admiral Deweys among those who we think are not worth saving.

The failures in the High Schools, provided we are willing to admit that they are failures, are due partly

to the fact that the pupils in the Elementary Schools do not learn how to study, because of their conglomeration of work, and the little tid-bits they get of so many subjects, partly because the large classes in the High Schools do not allow the teachers to become acquainted with individual characteristics, until it is too late, and partly because the pupils at this critical time are in the age of adolescence, when the strain is too great for them. I wish to see all this friction between the Elemen-

tary and High School disappear. There is no place for it, no need of it. This custom of a teacher in a higher grade complaining that the work of a teacher in a lower grade has not been well done is unprofessional, unreasonable and unjust. The principal or teacher of a High School who indulges in it ought to be in better business, and the principal or teacher of the Elementary School who constantly criticizes the work of the High School ought to join the same class.—*Intelligence.*

BOOKS AND MAGAZINES.

The *Atlantic Monthly* contains an admirable article on the novels of George Meredith, by Paul Elmer More. He calls Meredith the master of analytical novelists, and naturally contrasts him with Thackeray, whose masterpieces were novels of manners. Letting in the Light is an article on his particular subject, the New York Slum, by Jacob A. Riis. Through Old-Rose Glasses is a charming short story of rather unusual character, by Mary Tracy Earle. Mrs. Preston contributes an interesting review of the autobiography of Mrs. Oliphant.

Marion Crawford's serial, *Via Crucis*, is concluded in the October *Century*, and while Mr. Crawford could not do other than good work, this latest work of his seems a little like a devotional experiment. His readers would not be disappointed if he would continue the story of Katharine Lauderdale as he once promised. The Streets of Peking is another of Mrs. Scidmore's interesting articles on China. James Burton Pond begins in this number an account of his early experiences, called a Pioneer Boyhood.

The most interesting feature of the October *Book Buyer* is an article on John Ruskin as a writer, by M. H. Spielman. There is also a

beautiful reproduction from a drawing by A. F. Jaccaci of Ruskin's home, Brantwood, printed in connection with the article. The *Rambler* contains a number of interesting announcements and criticisms.

In the *American Monthly Review of Reviews* a good deal of space is devoted to Dreyfus. The first article by W. T. Stead is Alfred Dreyfus, a chronicle; the second by Homer Davenport is called a Cartoonist at Rennes. These two articles are followed by one on England and the Transvaal, by the Editor. He deals severely with England, rather as if he were under the impression that he is doing an uncommon thing.

It is no wonder that the *Ladies' Home Journal* has an extraordinary circulation, the editor every month manages to gather together so much that will interest the class of readers to which his publication particularly appeals. In the October number for instance appears the Anecdotal Side of Admiral Dewey, Her Boston Experiences, by Margaret Alston, and the Autobiography of a Girl, by Katharine Ferguson. This does not more than begin the table of contents, but it is an indication of what may be found there.

No. 5 John Street, by Richard Whiteing, Methodist Book and Pub

lishing House, Toronto. No book published in England during the past year has attracted more attention than No. 5 John Street. The author in common with so many of his countrymen is genuinely and deeply interested in the poorer classes. His book is a study of the jubilee year in London, and it is most stirring and unaffected in its manner of presentation.

S. R. Crockett's latest novel, Kit Kennedy, Country Boy, has been issued by William Briggs, Toronto. The story—the scene is again laid in Scotland—is in the author's well-known and highly popular style. The account of Kit leaving his old home on the farm is particularly well done.

ALGEBRA—FORM III.

PROF. DUPUIS, QUEEN'S UNIVERSITY, KINGSTON.

1. (a) Prove that $(p+q)m = mp+mq$, m being an integer.

It is doubtful if this should have been given, for being fundamental in the usage of algebraical symbols, it involves a definition of what is meant by the brackets, what by juxtaposition of symbols, etc.

In fact, this is the distributive law for multiplication in the usage of algebraical symbols, and in that sense it cannot be proved *per se*. It is a convention adopted to satisfy the demands of arithmetic, because our algebra originated in the endeavour to generalize and symbolize the well known operations of arithmetic which apply to numbers. And if algebra is to apply to arithmetic, it must follow the operative laws common to the latter science. So that the only way to prove what is here given is by fundamentally reasoning it out upon numbers, and then putting the result into the symbol-form of algebra.

(b) Find the coefficient of x^4 in the product of

$$1 + \frac{x}{2} + \frac{x^3}{3} + \frac{x^3}{4} + \frac{x^4}{5} + \frac{x^6}{6} + \dots \text{ by } 1 - \frac{x}{3} + \frac{x^2}{5} - \frac{x^3}{7} + \frac{x^4}{9} - \frac{x^6}{11} + \dots$$

Write these up to the term containing x^4 as follows :

$$1 + \frac{x}{2} + \frac{x}{3} + \frac{x^3}{4} + \frac{x^4}{5}$$

$$\frac{x^4}{9} - \frac{x}{7} + \frac{x^2}{5} - \frac{x}{3} + 1$$

and multiply each term by the one under it, we have

$$\frac{1}{9} - \frac{1}{14} + \frac{1}{15} - \frac{1}{12} + \frac{1}{5} = \frac{97}{420} \text{ as the coefficient of } x^4 \text{ in the product.}$$

2 Prove without expanding

$$(a) \text{ that } (x+y-2z)^3 + (y+z-2x)^3 + (z+x-2y)^3$$

$$= 3(x+y-2z)(y+z-2x)(z+x-2y).$$

We may prove this without making an actual expansion of the expressions put down in brackets, but we cannot do so without making some expansion, or carrying an expansion in our heads. So that it appears to me to be of very little importance whether we make one expansion or the other.

The sum of the quantities in the brackets is zero.

$$\therefore \text{ Take } a+b+c=0 \text{ and cube. Then } 0 = \Sigma a^3 + 3 \Sigma a^2b + 6a^2bc.$$

But $\Sigma a^2b = a^2b + b^2c + c^2a$; and because

$$a+b+c=0, a+b=-c, b+c=-a, c+a=-b$$

$$\therefore 2a^2b = -3abc; \text{ and } 3 \Sigma a^2b = -9abc$$

$$\therefore 0 = \Sigma a^3 - 3abc; \text{ or } \Sigma a^3 = 3abc.$$

and putting $a=x+y-2z$, $b=y+z-2x$, $c=z+x-2y$ we have the result.

(b) If $a^2 + ab + b^2 = \frac{a^3 - b^3}{a - b}$, show without expanding that $(1 + x + x^2)(1 + x^3 + x^6)$
 $(1 + x^9 + x^{18})(1 + x^{27} + x^{54}) = 1 + x + x^2 + x^3 + \dots + x^{80}$.

The word "if" is out of place here, for $a^2 + ab + b^2$ is the equivalent of $\frac{a^3 - b^3}{a - b}$.

$$\text{Then } 1 + x + x^2 = 1^2 + 1 \cdot x + x^2 = \frac{1 - x^3}{1 - x}$$

$$1 + x^3 + x^6 = 1^2 + 1 \cdot x^3 + (x^3)^2 = \frac{1 - x^9}{1 - x^3}$$

$$\text{Similarly } 1 + x^9 + x^{18} = \frac{1 - x^{27}}{1 - x^9} \dots \text{ etc.}$$

$$\therefore (1 + x + x^2)(1 + x^3 + x^6)(1 + x^9 + x^{18})(1 + x^{27} + x^{54}) = \frac{1 - x^3}{1 - x} \cdot \frac{1 - x^9}{1 - x^3} \cdot \frac{1 - x^{27}}{1 - x^9}$$

$$\cdot \frac{1 - x^{81}}{1 - x^{27}} = \frac{1 - x^{81}}{1 - x} = 1 + x + x^2 + x^3 + \dots + x^{80}.$$

This question 2, is, in my opinion, much too difficult for the class in which it is set.

3. (a) This is book work and will be found in almost any work on algebra.

(b) Prove that if a and b be any two integers greater than unity, $a^3 b - ab^3$ is always divisible by 3.

$$a^3 b - ab^3 = ab(a - b)(a + b).$$

If a or b is divisible by 3 the result follows. But if neither a nor b be a multiple of 3, they must be of the form $3m \pm 1$ and $3n \pm 1$. But, whichever sign of the ambiguity you take, either the sum or the difference of these is divisible by 3, etc.

$$4. (a) \text{ Solve } \frac{x+4a+b}{x+a+b} + \frac{4x+a+b}{x+a-b} = 5$$

$$\text{This is } 1 + \frac{3a}{x+a+b} + \frac{4-3a-6b}{x+a-b} = 5.$$

$$\therefore 3(x+a-b) = 3(1-2b)(x+a+b),$$

$$\text{or } x(a-a+2b) = (a+b)(a-2b) - a(a-b)$$

$$\therefore x = -\frac{2b^2}{2b} = -b.$$

$$(b) \text{ Solve } \frac{x-y}{a} = \frac{y-z}{b} = \frac{x+z}{c} = \frac{x-a-b}{a+b+c}; \text{ assuming that,}$$

$$\text{if } \frac{a}{b} = \frac{c}{d} = \frac{e}{f}, \text{ then } \frac{a+c+e}{b+d+f} = \frac{e}{f}$$

$$\text{Here, } \frac{x-y}{a} = \frac{x-y+y-z+x+z}{a+b+c} = \frac{x-a-b}{a+b+c},$$

$$\text{Whence } 2x = x - a - b \therefore x = -(a+b)$$

$$\text{Then } x - y = a \cdot \frac{x - a - b}{x + b + c}$$

$$\therefore y = x - a \cdot \frac{x - a - b}{a + b + c} = -(a+b) - a \cdot \frac{-2(a+b)}{a+b+c}, \text{ by substituting}$$

$$\text{for } x, = -(a+b) \cdot \frac{b+c-a}{b+c+a}.$$

$$\text{Otherwise, } \frac{y+z}{c-a} = \frac{x+z-(x-y)}{c-a} = \frac{-2(a+b)}{a+b+c} = \frac{y-z}{b}$$

$$\therefore \frac{2y}{b+c-a} = \frac{-2(a+b)}{a+b+c}, \text{ and } y = -(a+b) \frac{b+c-a}{b+c+a}.$$

$$\text{and } \frac{2z}{c-a-b} = \frac{-2(a+b)}{a+b+c}, \text{ and } z = -(a+b) \frac{c-a-b}{c+a+b}$$