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MARCH, 1891.

THE EQUALITY OF GREEK WITH FRENCH AND GERMAN.

BY PROF. HUTTON, TORONTO.

(*Continued from February number.*)

IN the last number of this periodical I quoted certain evidence in support of my contention that Greek was a fair equivalent to French with German. I desire to add to that testimony the following words of one of the best-known graduates of our University—an honour man in moderns as well as gold medallist in classics—Professor Fletcher of Queen's College: "In my opinion a student can become more proficient in French and German together in a given time than in Greek alone, and I have still to meet the man who, having a tolerable acquaintance with the three languages, will deny it. Indeed, the argument for the study of French and German as against Greek is usually based on this very fact: 'you acquire two languages,' it is said, 'instead of one.' So the fox in the fable, 'I have three cubs; you have only one'; 'yes,' said the lion, 'but a lion.'"

I have spoken first of French because it appears to me self-evident that French is infinitely easier than Greek to an Englishman. Would it not be easy to construct whole sentences of intelligible and rational French, which could be translated by an intelligent, well-read Englishman, whose knowledge of French was acquired in a dozen lessons; simply owing to the very large number of words common (except for a letter or two) to the two languages? In the case of German, the difficulty of the language is obviously much greater, and the deplorably limited time which I have given to it prevents my speaking with as much confidence. After devoting to it not one hundredth, nor, I think, one thousandth part of the time given to classics, I find not unnaturally that Latin is easier now to me, and, on the whole, Greek also; though if I should open at random a book of Greek and of German poems, there would be, I believe, a fairly large minority of cases in which I should catch the idea of the German more quickly than of the Greek. I need hardly add that this inability to read German with ease is one of the worst features of ordinary English classical education, and one which personally I most regret. I look forward to the

time when the circumstances of our Canadian schools and schoolboys will permit every boy to learn German as well as French, and when no classical honour man of our University will be without a pass knowledge of German. Conversely I look back with unceasing regret in this respect to a certain typical English classical school, where the entrance of the French and the German master was the sign for a welcome "vacation" from the intellectual exertion and strain of Latin prose and Thucydides; and a welcome conversation (in English) with entertaining foreigners (one of them an exile of note) on the iniquities of Napoleon III., or the victories of the Prussian army. But I can assure the champions of the modern languages that even in this case the indifference shown to the languages implied no disrespect to their professors, who were particularly popular and admired. They held, for example, an entirely different position from the teachers of mathematics, who were only allowed to take the boys in hand in the evening when they were tired, and whose academic status was damaged by the fact that one pair of hands at least, which, in the evening, dispensed arithmetical sums to us, dealing with the prices of sugar, butter, and tea, was redolent of the articles themselves, and had, in fact, been dispensing them to us during the day across the counter of a neighbouring corner grocery. Not to dwell longer on this part of the question I may be permitted to observe that I have done what I safely could to secure the ideal I have described above by already exacting in the new curriculum the pass French or German of the two first years from classical honour men. I would exact both if circumstances permitted any but a very small minority of Canadian schoolboys to take honour classics with two modern languages in addition to their other subjects. I will not exact both pass French and pass German at the expense of an honour standing in classics, but directly there is any hope of the average would-be classical specialist being able to take a pass course in both modern languages, I will vote for the exaction of both, as I wish most sincerely both had been exacted from me, instead of those interludes —agreeable, but misplaced—of French and German politics.

I come now to discuss an objection which is sometimes offered to the old scheme of making Greek equivalent to French with German. "If," it is said in effect, "it is impossible to attain in any given time to that same degree of familiarity with Greek which can be attained within the same time with French or German, still why make Greek equivalent to French and German and thus cast a stigma on the modern languages? Why not so increase the work in French and in German for the pass course in these languages till in both cases it is equal in difficulty, and in the amount of time and labour involved, to the pass Greek? Cannot this be done?" Of course it can be done; nay, I will go further, and say, that every one who has had a seat at the Board of Examiners at recent examinations knows that the standard in modern languages has already been raised both in the pass and honour course; as for the honour course, the class lists of last May amply prove this assertion, nor can any objection be taken to such a raising of the standard. But in the case of the pass course there are two questions: (1) are the examiners trying to raise the standard? (2) Is it reasonable that the standard should be very much raised? In regard to the first question the lecturers in modern language and the examiners contend that pass French and pass German should each be as difficult as pass Greek, and that

if each is not so already it should be made so, and I do not for one moment doubt that they are prepared to make each, in their judgment, not less difficult than the Greek. It will not be their fault if students are bribed into the modern language option as the easier. All this is perfectly true (were it not true the controversy could hardly be as impersonal and friendly as it has been), but I contend that those who desire to make either French or German equivalent to Greek are confronted with a dilemma from one of the horns of which there is no escape: either French and German must be made as difficult as Greek by an unnecessary and mischievous elevation of the standard (in some such way as I shall afterwards discuss), in which case every pass student of these languages is sacrificed to this metaphysical subtlety called "equality"; or if a reasonable pass standard in those languages—a standard dictated by the students' interests, not by metaphysics—be exacted as heretofore, then the attempt to treat the pass French or pass German as either of them alone equivalent to the pass Greek must be finally abandoned and the present curriculum amended. It is possible, I repeat, to make pass French or pass German an equal to pass Greek, but it would be a mistake, for many reasons, any one of which is sufficient. In the first place, I can only repeat that the "stigma" in question is entirely imaginary and can be shown to be so. The department of English is one of the four necessary departments of our university course, and as such it takes its place with Latin, mathematics, and history at the head of our curriculum, and no one, I fancy, can discover a stigma attached to it. Yet conversely no one will dispute the proposition that pass English is infinitely easier than pass Greek. For precisely the same reason pass French and German are easier than pass Greek, though not of course in the same degree as pass English, their general structure and usages of speech being akin to our own, and, in the case of French, the vocabulary also being largely similar. There is then no more serious a stigma attached to French and German when they are combined to form an equivalent to Greek, than is attached to English; or rather, the stigma attached to English must be branded more deeply, since no amount of English, however great, is accepted as equivalent to pass Greek. In the second place the university curriculum is designed for the students, not the students for the curriculum; to increase the difficulty of the pass course in any one department, not in the interests of the pass students of that department, but in the fancied interests of the department itself, that it may be considered "equal" to another department, is to betray the highest interest which the university exists to serve—the interests of education. The proposal is barely intelligible; it will not bear examination for five minutes; once apply this preposterous demand that the departments, if not already equal, be made equal, and we shall have the university conducting during one day at least of the May examination an elaborate spelling bee, in which it will be the businesss of the Professor of English to vindicate the "equality" of pass English with pass Hebrew by ransacking scientific dictionaries for the most portentous growths of English scientific terminology. As the students of Greek will suffer least from such an ordeal, I will not protest against it further.

But in the third place this scheme, unjust to all students, would be specially unjust to the honour men of all departments except moderns. The honour men of all these departments including classics want a pass know-

ledge of French or German or both; they come to the department of moderns asking for a simple homely fare, sufficient to support intellectual life, but nothing more—since they look to other departments for the condiments and luxuries of their menu. They ask for nothing more difficult of digestion than plain bread and the department answers by thrusting upon them fish, stones and scorpions all at once; history, archæology and philology at one fell swoop; anything and everything the addition of which tends to make the pass French or pass German sufficiently difficult. The ideal time when every undergraduate of the university whatever his department will be eager to possess a pass knowledge of French and German, will never come if this is to be the nature of pass French and German. A course more calculated to rob moderns both of its popularity and its usefulness than the addition to it of history, archaeology and philology, entirely unnecessary for a working knowledge of the French and German languages, cannot be conceived. And this brings me to a fourth point: is not this a sound principle to lay down, that the object of all language-education for undergraduates so far as the intrinsic value of any language is concerned (and in the case of moderns this intrinsic value rather than the educational value is prominent) should be to furnish them with a working knowledge of this language? Nothing less than this, but on the whole, and for most students—in the pass undergraduate course—nothing more. Nothing more for three reasons: first because the undergraduate course does not contain time usually for extreme specialization if the other subjects contained in it are not to be neglected nor a defective one-sided development fostered; in the second place because once given this working knowledge, and upon the foundation thus laid a superstructure can be reared ever higher and higher as long as life lasts; and in the third place but most of all because as a general rule the minutiæ connected with language-study, the history of the growth of words, of their change of meaning, of their change of sound, all that is included in the science of philology, is out of place in an undergraduate course; its educational value being infinitesimal however great its intrinsic interest.

This principle applies to classics of course no less than moderns. Directly it shall please Providence so to alter our mental structure, that our classical honour-men shall attain a working knowledge of Greek and Latin literature in less than four years, directly they shall be ready to plunge into post-graduate study of the history of the Greek or old Italian dialects before finishing their undergraduate course, by all means let them be rudely arrested in their mad career and set down to some less superfine and more profitable study: to biology, chemistry, physics, trigonometry or modern languages, the last named recommended. All these things have an educational value, though not the same educational value; all of them or almost all have also an intrinsic value; and all of them from one or both points of view will compare favourably with either classical or modern philology. Modern languages, for example, have an educational value—even though it be not the chief value attaching to them—they have also an intrinsic value, wide as the human mind itself, extending to every department of thought. On the other hand from the educational side philology has practically no value; from the side of intrinsic interest its value is great but almost confined to one department of thought and attrac-

tive to but one type of mind. It has but little claim upon undergraduates but it may be confidently recommended to elderly gentlemen with a little money, no occupation, virtuous habits, a sanguine temperament and a judgment not too exact or too exacting in the measurement of evidence. If then, I repeat, the pass course in moderns were to be made difficult by philology (and it is not easy to see how it could be made very difficult, except by some branch of philology or something even still more irrelevant and foreign)its usefulness and its value—especially its educational value—would be greatly diminished. Another alternative for increasing the difficulty of the course, the addition of strings of authors to be referred to and books to be read, the exaction in fact from the student not so much of fresh principles as of a very much more elaborate vocabulary, seems equally ill-fitted for enhancing either the attractiveness or the educational value of the course. He was a wise man who told the undergraduates of his college to spend but half their work-time or less turning over the pages of their authors and their dictionaries, and the other half in chewing the cud of reflection and sifting and digesting and cross-questioning the author's thoughts and their own.

Finally it would be possible to increase the difficulty of the pass course in modern languages by the addition of the higher criticism; by lectures on the style and the art, the melody and the diction of the great French and German poets: of Corneille and Victor Hugo, of Schiller and Goethe, or again by lectures on the moral political and religious atmosphere which clothes their poems. The objections to the other changes have no application to this; on the contrary, of course, the degree to which an intelligent comprehension of the higher criticism can be developed is the measure of the lecturer's ability to place his subject on the highest educational plane and make it most fruitful, but such an experiment with pass classes is always open to grave difficulties. If it be true even of the honour man that the deepest and truest beauty of ancient or modern literature falls upon ears unappreciative and wakes a full echo in his heart or mind only at a later date; only when age and experience have made all his authors new to him, have opened his eyes and intellect and made him, in some degree, like the genius whose words he had heard without hearkening and seen without perceiving "a spectator of all time and all existence," if this be true even of the honour man of all undergraduate universities, it is doubly true and more of the pass man, and to cast the pass lectures into the tone of the higher criticism is to lecture above the heads of the class, to say nothing of the difficulty of examining from this point of view; and examinations —whatever objections may be urged against them in connection with honour men—cannot legitimately be overlooked in the pass course.

In short, it seems to me that even were there any reason for adding work more or less extraneous to the pass course in moderns—and there is none —such additions would be detrimental to the usefulness of the course. A tolerable working knowledge of the Latin, Greek, French or German language is, or should be, the aim of the pass man, just as a good working knowledge of Latin, Greek, French and German literature is, or should be, the aim of the honour man. If nature or circumstances have so constituted us that this working knowledge of language or literature be more speedily acquired in one department than in another, then the balance of the time unnecessary for

the study of the easier language and literature should be devoted to another language and literature or to other subjects, and no endeavour should be made to "cook the accounts," so to speak, of these lighter departments, in order that the capital of time and labour which must be invested in them, if they are to pay the desired dividend, may appear greater than it really is. Least of all should this be done for no reason better than because a rival speculation requires a larger outlay of time and labour.

It only remains, I think, that I should explain why, granting the practical injustice of the new curriculum in this respect, an amendment is necessary. Cannot Greek, with its educational and intrinsic value, take care of itself without the Senate's vigilant impartiality to protect it? Can it not put up with injustice? I confess my opinion last summer was that it could, and that no substantial injury to it could ever proceed from changes such as this. But the Classical Association, the members of which are in touch with the schools, took more or less strongly a different view. After collating their opinions, I arrived at the conclusion that I had not made sufficient allowance for the difficulties with which many of our students and a proportion even of our very best students are confronted when they begin to work for matriculation.

In an English public school or a good grammar school the boy of good intelligence who is looking forward to a university course is never tempted for a moment to shape his school work with the university curriculum in front of him; he is never tempted to examine what are the options permitted, and what subjects promise the "softest" course at the university, and to frame his matriculation options accordingly. He selects his course to suit his own tastes or for similar reasons, and it is ten to one whether he has ever heard or will hear how other departments compare with his in difficulty, or at least, if he hears, that he will pay any attention to the subject.

But I am told by classical teachers who have the best means of judging that numbers of our students and a few of the very best, owing to the difficulties under which they pursue their education, are compelled to consider the character of the university curriculum rather than their own tastes or aspirations, and often to give at matriculation the preference to those options which promise the smoothest course afterwards. And looking back more carefully to my own experience in Canada, the years of which have now reached double figures, I can recollect at least two instances where men who turned out in the end accomplished classical scholars, as good or better than any other members of the class, began their matriculation work in Greek under circumstances of so great discouragement and difficulty that a little additional "bonus" * to modern languages, such as the present curriculum affords, would have tempted them in sheer desponding prudence to choose the unwelcome but gilded alternative. I will not, if I can help it, lose such men to classics. Greek has no bonus and wants none; all that is wanted is that the curriculum be so framed that the matriculant shall choose between Greek and moderns (if he cannot unfortunately take both), influenced only by legitimate motives; the educational and intrinsic value, and the usefulness of the two departments respectively; that he shall not be tempted to decide on the strength of sordid considerations, such as the present curriculum puts before him, when it shows him that if he take Greek, then, even though he confine

* I am indebted to the *Mail* for this phrase; but the *Mail* to me for its correct application.

himself to a pass course, he will still need either French or German in addition to Greek, while if he take French and German from the beginning he can dispense with Greek altogether, and satisfy the examiners with half or less than half the expenditure of time and labour.

I may observe here in passing that even when this injustice has been removed there is still the heavy "bonus" to moderns, in the circumstance that every honour department without exception requires in effect one modern language, while six require two, against three honour departments which require Greek. But possibly there is some economic truth in the theory that a "bonus" is after all a hindrance to an industry rather than a help, and possibly after all the *Mail's* "bonus to Greek" was only a phrase of Greek euphemism, or Socratic irony. In any case let us have no more hard knocks in the Greek department even though they be agreeably glossed over in literary circles, and leading articles as "bonuses."

I repeat that Greek only wants fair play, nor is its position discouraging. The very useful statistics compiled lately by the lecturers in modern languages while they show that its number of pass men has fallen off almost fifty per cent., show an increase of twenty per cent. in the numbers of its honour men. I cannot affect to hail this falling off of pass men with satisfaction, but it is a tolerable calamity, and incidentally it proves beyond question and cavilling that so far as the pass men can judge (and it is they who are most interested in this aspect of education and give it the closest attention), it is as easy or easier to take French with German as to take Greek alone. How satisfactory then to such pass men must be the present curriculum! The last curriculum made their yoke easy, and the new one has diminished their yoke. As for the future of Greek as an honour subject, it is, I take it, as assured as the future of the University itself. No department of study nor the university itself is assured against the catastrophes of nature or circumstance. An era of acute poverty, and of consequent national collapse, would pull down moderns and classics impartially, art, literature and the university itself, with all the other mere luxuries of existence which hide from us the thinness of the plank between ourselves and drowning. If the deluge comes, if the volcano become active, we shall all be brushed away as speedily as the first October frost lays out the flies who have spent a pleasant summer not without sugar in our kitchens. But apart from such a problematic cataclysm the order of history is likely to repeat itself, and when in the future the growth of wealth shall have slowly built up a class possessing hereditary leisure and hereditary refinement, the number of students of Greek will be greater instead of less than it is to-day; not merely for the educational value of the language and literature (that is, after all, the parent's and the teacher's point of view, not the student's), but for their intrinsic excellence, if only because, as Sir Henry Maine puts it, "there is nothing in the world that moves which is not Greek in origin"; if only because, as Emerson said, "Out of a Greek (Plato) come all things that are still written and debated among men of thought." Athens has earned the tribute paid by Tacitus to Agricola. quidquid (ex Athenis) amavimus quidquid mirati sumus manet mansurumque est in animis hominum in aeternitate temporum in fama rerum; nam multos veterum velut inglorios et ignobiles oblivio obruet: Athenæ posteritati narratæ et traditæ superstites erunt.

THE HIGH SCHOOL CURRICULUM IN SCIENCE.

BY W. L. GOODWIN, D.SC.

IT seems to be a pretty general opinion that, as a school subject, science has not fulfilled the expectations of her friends. The study of science in the schools has too often developed neither accuracy of observationnor clearness of thought—qualities which should confessedly receive from her their strongest and most enduring stimulus. In Great Britain the undertone of discontent has gradually risen into a true British growl, which has resulted in several things, *e.g.*, the appointment of a committee by the British Association for the Advancement of Science; the reading of papers before that body; and vigorous discussions of the whole subject of school curricula in elementary science. The general conclusion seems to be that these curricula cover too much ground and deal with a subject-matter too far removed from the pupils' possible or probable experience. In the early days of the natural and experimental sciences the range of investigation was still so narrow that there was little difficulty in selecting the fields most suitable for beginners. As a consequence, we find the elementary text books at such early periods dealing with familiar material, showing to students the scientific aspect of their every-day life. But, as facts accumulated, the temptation to take in a wider field became stronger, and in many cases led to an abuse which is still too common — the presentation of the sciences as collections of definitions and generalizations; in fact, they were, and are, taught as if deductive instead of inductive.

I propose in this paper to examine some of our courses in science; and I shall in the first place state certain general principles which will, I think, be accepted without question. These are educational maxims, quite familiar to all who have made a study of educational methods. The natural method, and the only profitable method for immature, untrained minds is (1) from the known to the unknown; and (2) from the particular to the general. The application of these principles to the presentation of elementary science implies (1) That the subject-matter shall be familiar in the early stages, and gradually pass on to the unfamiliar; and (2) That facts shall be studied copiously and carefully before the explanatory theories are introduced or generalizations made.

How often have trembling tyros in science been brought without the slightest warning or preparation into the shadowy terrors of the protoplasmic or atomic presence! How many would-be followers of Faraday, Priestley, or Black have been abashed and confounded by a premature introduction to Dalton, Avegadro, or Mendeleff Many a promising latter-day Darwin has been nipped in the bud by an untimely blast from the evolution theory!

Perhaps the deadliest educational sin of this age, so far as the sciences are concerned, is that of presenting to students ready-made classifications, definitions, generalizations, and theories. It is obvious, I think, that students should, as far as possible, classify after, and not before, fore, they have studied the things to be classified. I am inclined to think

that it is better for young minds to make their own classification, even though they group things according to superficial resemblances. Their classification may not be scientific, but to them it is real—it repr · nts the present state of their knowledge. The accurate scientific classification may require for its real comprehension several years of study.

The same line of thought applies to definitions. To be worth anything to the young student of science they must be a natural outcome of his own observation and thought, guided more or less by a teacher or a book. There is a text-book of elementary chemistry which has passed through numerous editions, and has been received for more than twenty years as the best extant treatise on the elements of chemistry. The first sentence in the Introduction is as follows: "By chemical action we signify that which occurs when two or more substances so act upon one another as to produce a third substance differing altogether from the original ones in properties, etc." The average student beginning the subject does not even understand the sense in which the word "substances" is used. The examples which follow may make this clear, but they are not likely to make the strongest impression on a mind preoccupied with the definition. The examples should come first.

Those generalizations which are often called laws of nature are too generally misused. It is quite clear that to an immature mind the statement of such laws can have a significance commensurate only with knowledge of instances. It is otherwise with minds well-stored and accustomed to pass from the general to the particular. This leads me to emphasize the fact that I am discussing the methods of presenting *elementary* science. I do not perhaps need to remind you that in every subject the method must become more and more elliptical as the powers of the student increase; and that at some stage it may be real economy of time and energy to reverse the order and give the general before the particular.

It is very hard to decide when to introduce theories in teaching a science. One is tempted to bring them in with the minimum of preparation. They seem to smooth away so many difficulties in the presentation of the subject. But I am of the opinion that it is only seeming. A theory can surely form no substantial basis upon which to build the elements of a science. It belongs rather to the later stages—the finishing touches. A theory is an explanation. But the necessity for an explanation must surely first be forced upon the mind. In many cases the explanation is introduced before the student has anything to be explained. Theories hardly belong to elementary science.

Hoping that I have made sufficiently clear the principles upon which the criticism is to be based, I shall now examine shortly the courses of study in physics and chemistry as laid down in the Departmental Regulations for High Schools and Collegiate Institutes. (See Circular 2, p. 6.) But I must first express the satisfaction it gives me as a Canadian to observe two things: (1) That the compilers of these regulations expect a great deal from our Canadian boys and girls; and (2) That these regulations have put to such a successful test the ability of Canadians to write good text-books of elementary science.

Having some years ago had a little experience in teaching the elements of physics, I may venture an opinion upon the High School course of study in that subject. Experimental physics covers such a wide range of experiment and observation that it is a matter of very considerable difficulty

to choose the part with which to begin; but, on the whole, perhaps the "properties of matter" form the best starting point. The curriculum for Form I. provides (and wisely, I think) for an experimental course under this heading. But, surely, the discussion of "sensations and things," of "causes and effects," of "the absence of chance in the order of nature," is out of place here. There is little or no room for elementary treatment of these subjects, involving, as they do, ideas which are clearly bodied forth to the mind only after considerable experience and much mental discipline. Still more out of place seem such subjects as "matter," "the molecule," and "constitution of matter." The average pupil in Form I. is not yet prepared to weigh the merits and demerits of the molecule. His mental capacity can hardly be great enough to receive a theory which in its modern form is the outcome of such extensive physical and mathematical investigation. And besides, he does not require the theory. It is useless to him, since his mind is still almost a blank with respect to the facts which the theory is intended to explain. This course is altogether too ambitious. Force and energy are certainly, it seems to me, subjects beyond the accurate comprehension of boys and girls of fourteen. The term "force" has been the subject of keen debates among such men as Professors Tyndall and Tait—debates in which it was more than hinted by one of these distinguished men of science that the other did not know the correct use of the term, or, at any rate, did not use it correctly. It is doubtful, too, if the inherent difficulties in the study of sound, and light-waves can be in any degree overcome by pupils in the first Form. It is true that these subjects lend themselves both to attractive illustration and to interesting mathematical treatment; but both, I think, may be better left for the Junior University class. Velocity of sound, relations of musical notes to length of strings, etc., intensity, and pitch might, perhaps, from the purely experimental point of view, be adapted to Form I. It is my opinion, too, that as an educational subject Frictional Electricity is simpler and more instructive than Voltaic Electricity. The whole course is described as "experimental," and this is rather surprising, as the experimental treatment of such subjects as "constitution of matter," "attraction," "sound waves," "refraction of sound," and "electric polarization," must tax rather severely, not only the ingenuity of the master, but the capacity of the pupils.

The course in Physics for Form II. is open to the same criticism. An experimental course in velocity, acceleration, mass, momentum, force, moment, couple, etc., must be a rather difficult undertaking. But I note that these are merely terms to be defined. It is said to be a wise thing to begin a philosophical discussion with definitions, but I doubt if this is the best method for an experimental course in elementary physics. I am quite aware that most good universities require for matriculation a course in physics somewhat like the one under discussion; but it is rather the rule than the exception to find the minds of the matriculants, stored as they may be with these definitions, laws and theories, yet profoundly ignorant of many simple and easily observed physical facts. I shall not attempt any detailed constructive criticism of this course. That I must leave to those who are more immediately concerned in the subject.

Chemistry is begun in Form II. The course is apparently a very simple one, but it violates the principles according to which the course in Physics has been criticized. Is it possible for

a student to appreciate "the relations of the physical sciences to Biology," when he has no acquaintance with Biology? Surely the place for the discussion of such relations is at the end of somewhat extended courses in the sciences compared. There are three subjects which seem to me to be quite sufficient for this course in Form II.: (1) Chemical Change; (2) Elementary Composition of Matter; and (3) The Laws of Combination. To illustrate these, a few of the common elements and compounds may be studied experimentally; but all the work can be most profitably grouped around these three ideas. The introduction of the atomic theory at this stage is productive only of misconceptions and vagueness. To see that this result is inevitable, it is only necessary to remember the relation of the atomic theory to the laws of combination, and of both to the system of symbols and formulas. The atomic weights should convey to the minds of students not only the idea of the relative weights of the hypothetical atoms, but also that of combining proportions chosen systematically according to certain theories. When the atomic theory is introduced at an early stage the latter idea is almost always crowded out by the former—the theory completely hiding the experimental basis. This is so much the case that, when a question is asked about composition of compounds, etc., in nine cases out of ten the answer contains some irrelevant reference to atoms and molecules. I am of the opinion that it would be well to defer the introduction of the atomic theory until the University First Year. The subject can be developed sufficiently without any reference to the atomic theory. Let symbols represent in the first place combining proportions, and formulas merely the composition of compounds. It may be objected to this that there is in this case no systematic way of choosing the numbers. If the student is made to understand that the combining weights are chosen so as to give (1) simple formulas, and (2) similar formulas for similar compounds, he sees a reason for choosing, say, 80 for bromine when 35·4 is chosen for chlorine. But it is not necessary to stop here. The following is a quite safe method and one which involves a much simpler hypothesis, or rather convention, than those of the atomic theory. It is, besides, much less likely to distract the attention from the practical significance of symbols and formulas: The specific weights of gases are found to have a simple arithmetical relation to their combining weights, being proportional either to the combining weights or to simple multiples of them, so that if the same standard, viz., hydrogen be used for each set of numbers, the specific weight of any gas is either the same number as its combining weight or the latter is some simple multiple of the former. But specific weights are the ratios of the weights of equal volumes. On comparing then equal volumes of hydrogen, water (gas), hydrochloric acid, ammonia, etc., it is found that, taking, say, 1 grain of hydrogen as the standard volume, the same volume of the other gases mentioned weigh respectively, 9 grains, 18.2 grains, 8½ grains, and contain respectively 1 grain, ½ grain, and 1½ grains, etc., of hydrogen. The combining weights of these gases, as determined by analysis, are simple multiples of these numbers, the multiples being a matter of choice. The simplest plan would be to take as the combining weight of a compound gas the weight of it which occupies the same space as one part by weight of hydrogen. But this involves the inconvenience of writing formulas with fractional parts of the combining weight of hydrogen. This incon-

venience disappears if we adopt the plan of taking as the combining weight of a compound gas that weight which is equal in volume to two parts by weight of hydrogen. This gives a perfectly uniform method of fixing the combining weights of compound gases; and it leads to a similar uniformity in choosing the combining weights of those elements which form gaseous or volatile compounds. Let the smallest weight of any element found in the combining weight of a gaseous compound be taken as the combining weight of that element. I have been thus particular in order to show that the most general method at our command for determining atomic weights may be taught without any reference to the constitution of matter. The same is true of the law of atomic heat; and, indeed, the case is here much simpler. It is only necessary to point out that the combining weights of most elements multiplied by their specific heats give numbers closely approximating to 6.3 or some simple multiple or submultiple of this, and that the product is 6. + when the combining weights are those fixed by the method just described. The thought is at once suggested, let the combining weights be so chosen as to give the product 6. + for all.

There is a beautiful simplicity about the molecular theory of gases and its use in determining molecular and atomic weights — a simplicity which tempts one to introduce it as early as possible. But its introduction into elementary chemistry masks or altogether conceals the fact that the atomic weights determined by its use are, after all, only combining weights chosen in a uniform way, and without any necessary reference to the constitution of matter. Also, its use as a theoretical basis for elementary chemistry unfits the mind to receive at a later stage a complete and logical development of the atomic and molecular theories. There is the difficulty of arousing the attention to a reconsideration.

The chemistry course for Form III. follows logically that for Form II.; but an outline of Mendeléeff's classification at this stage of the subject is, in my opinion, quite out of place. To see the truth of this it is only necessary to recall that Mendeléeff's (Newlands') classification is based upon an exhaustive study of the chemical and physical properties of all the elements. It is the highest generalization of chemistry, and can have no meaning for the junior student. Developed and refined by the imaginative genius of Crookes, it may do for chemistry what the Evolution Theory has done for biology; but it can never, I think, form a proper basis for the study of elementary chemistry. It is sufficient at this stage to prepare for it by dwelling upon those remarkable resemblances and serial relations among the elements which pointed the way to its discovery.

To sum up, I think that in the teaching of elementary science we should return to a subject-matter better suited to the age of our pupils, and that in the treatment of this subject-matter we should study to lead them along at a rate more nearly approaching that of their mental development.

[NOTE.—In the discussion which followed the reading of this paper I found it necessary to point out that the criticism was directed against the curricula as given in the Regulations, and not against the methods used by the science masters. With your permission, Mr. Editor, I shall add to this criticism a quotation from the Preface to Remsen's "Elements of Chemistry": "Chemical theories are treated in a subordinate way, as it is believed that the attention should first be directed to the simpler facts of the subject, and the methods by

which these facts are learned. A brief statement of a few of the prevailing hypotheses is given in Chapter XIV. Whether it will be advisable for the pupils to spend any time in studying this chapter will depend upon their age and their mental attainments. . . . It should be remembered that the object of the course laid down in this book is not to make chemists, but to help to develop sound minds, and at the same time to awaken interest in a set of natural phenomena of great importance to mankind. It is quite possible to teach the subject in such a way as to destroy all interest in chemical phenomena, and to make the pupil shudder whenever a chemical formula is mentioned. There is no better way to accomplish the latter result than by giving prominence to incomprehensible theories, and forcing the pupils to master a lot of equations which represent facts of which they are entirely ignorant." In a note to p. 122 Professor Remsen says: "Hypotheses and theories are of great value to science, if founded upon a thorough knowledge of the facts to which they relate. They become dangerous when used by those who are not familiar with the facts. The student who has not received a thorough scientific training should remember that theories and hypotheses, to be of value, must be suggested, not by a superficial, but by a thorough, knowledge of the facts."—W. L. G.]*

* This paper was read before the Science Teachers' Association at the meeting held in Toronto, December 30th, 1890.

CHAIRS OF PEDAGOGY.

BY J. P. GORDY, PH.D.

IN discussing Normal Schools one can confine himself to an attempt to determine their proper work and the means they should employ in doing it. Not so with Chairs of Pedagogy. The very small number of such departments proves conclusively that their utility is by no means universally conceded.

The first question, then, which we have to consider is, Ought our colleges and universities to establish chairs of Pedagogy? That question is, at bottom, the question as to whether the principals of our high schools and academies, the superintendents of our city schools, the professors in our colleges—in a word, all who fill the more important and responsible positions in the profession of teaching, shall receive any instruction in the science and art and history of education. Excepting the New York College for the training of teachers, which aims to be a purely professional school of the same grade as law and medical schools, and the school of Pedagogy in the University of the city of New York, the only institutions in the United States for the training of teachers are Normal Schools. These schools were founded for the purpose of training teachers for the elementary schools, and this is the work which they have done. Their graduates are, therefore, unable to compete with college graduates for the higher positions in the profession of teaching, because the latter alone have the scholarship which those positions demand.

Hence, unless schools of Pedagogy, schools of university grade, like schools of medicine and law, are founded, and unless chairs of Pedagogy are established in our colleges

and universities, those who fill the higher positions in the profession of teaching must receive instruction in Pedagogy in Normal Schools or they will not receive it at all.

That they will not go to Normal Schools is too evident to require proof. They have not done so, and it is not desirable that they should. The average college graduate and the average Normal School student differ too widely in age and attainments and culture to make it possible to instruct them together successfully. To attempt it would be like attempting to teach college graduates and sub-Freshmen in the same class.

That schools of Pedagogy ought to form an essential part of our educational system I regard as almost demonstrably evident. But that they will not do so until the importance of the study of the science, art and history of education to the intending teacher is sogenerally felt as to make it necessary for our colleges and universities to estabish departments of Pedagogy is equally evident. The object of schools of Pedagogy would be to furnish facilities for the much more thorough and extended study of the same kind of subjects as those taught by a college professor of Pedagogy. But how can we expect such institutions to be founded on a scale adequate to the greatness of their task, when it is still a debated—I will not say debatable—question as to whether a department of Pedagogy is a necessary part of a first-class college? It is evident, therefore, that the question as to whether our colleges shall have departments of Pedagogy is really the question as to whether those who are preparing to fill the higher positions in the teaching profession shall have any opportunity to be instructed in the science and art and history of education as a part of their preparation.

That that question can be asked strikes me as one of the most remarkable examples of the influence of custom and tradition over belief, that the history of our times affords. Is their work so unimportant, the work of shaping and moulding the human mind and giving the right direction to its energies, that it is foolish to make special preparation for it? Is it so simple, are the problems which present themselves to the teacher and educator so easy of solution, as to make special preparations a waste of time and labour? These, one would think, are the tests to which a mind intent only on seeing things as they are, without regard to custom or tradition, would bring such a question. Surely if anything is self-evident, it is that if a work is important and difficult, those who undertake to do it ought to make special preparation for it, and the more important and difficult it is, the more careful and thorough ought their preparation to be. Is the work of the teacher important? "Upon the right training of the child all good causes depend." Is it difficult? No less difficult than that of so modifying the influences inherited from countless generations, as to give supremacy to those that make for the well-being of man and society.

It may be said, perhaps, that however important and difficult the work of the teacher, he cannot prepare for it, except in the matter of scholarship; that teachers, like poets, are born, not made; that, therefore, departments of Pedagogy for intending teachers are so absurd as would be departments of Poetry for intending poets.

I might urge in reply that until within a comparatively recent period the theory practically held was that doctors are born, not made. I might call attention to the fact that some of those born doctors would bear favourable comparison with some of the

manufactured doctors of our time, and enquire whether that is a good argument against schools of medicine. But I will not take this course. With Professor Laurie, I freely grant that there is such a thing as "teaching genius" which is, to a large extent, independent of training. I freely grant, also, that without a measure of natural aptitude for teaching, no amount of training will make a man a good teacher. What departments of Pedagogy are intended to accomplish is, not to make teachers of those who have no natural aptitude for it, but to enable those who have it, to make the most of it and broaden their views as to the nature and end of education. I believe that those who have it will receive the same kind of benefit from the study of Pedagogy and kindred subjects that the candidates for any other profession receive from their professional study.

Upon what plea can special preparation for the work of the physician be urged that does not apply with still greater force to that of the teacher? Is it that the health of the body is important? But the body derives its sole value from the mind. Is it that the work of the physician is difficult? Is the restoring to health of a diseased body, the bringing it into a condition in which each organ performs its proper function, a more difficult work than that of so influencing the human mind that it may grow into the condition where each faculty can and will perform its proper functions? The work of the doctor, for the most part, consists in so helping the body to resume its natural functions; the work of the teacher, on the other hand, consists in so dealing with the mind as to change the functions which are natural to it in its undeveloped condition, so that it may become natural for it to do that which it is desirable for it to do.

There is, indeed, a strikingly close analogy between the professional preparation of the doctor and that of the teacher. The doctor must make a careful study of physiology, because he needs to know the laws that govern the human body. Is it not equally necessary for the teacher to know the laws of the mind? The doctor must make a careful study of the manner in which the various drugs in use affect the human body. Is it not equally necessary for the teacher to know the laws of the mind? The doctor must make a careful study of the educational values of the various agencies by which he hopes to induce the mind to develop in the right direction? The doctor should make a careful study of the history of his profession in order that he may avoid wasteful experiments. Is it any the less desirable for a teacher to undertake his work from the vantage ground of all the experience of the past? Finally, the doctor studies physiology in order that he may learn what health is—in order that he may learn what are the proper functions of the various organs of the body. Surely it is equally important for the teacher to study those subjects which will aid him in getting a definite, clear cut, sharply defined idea of what the health of the mind is—of the functions which the various faculties of the mind should perform.

But there is another reason of great importance why the college should give professional training to teachers. We never shall have good schools in the United States until the public demand them, and it never will demand them, effectively, until it realizes the necessity for thoroughly trained teachers. How to convince the public of the necessity of employing thoroughly trained teachers, is a question certainly among the most important of those before the educators of this country. "We spend,"

says President Adams, "enormous sums in large and well arranged buildings, and elegant furniture and expensive school books, and then frustrate the purpose of them all by not having the one thing, compared with which, all the other things are as nothing; namely, a good school. How is a change for the better to be brought about? In no other way than by a change of public opinion." How is this change to be effected?

The leaders of public opinion must be reached, and this can be done by establishing departments of Pedagogy in our colleges and universities. Such a substantial recognition of the fact that there is such a thing as a science and art and history of education, which intending teachers ought to carefully study, would of itself exert a powerful influence on the general public. But this is as nothing in comparison with the fact that the bulk of the students outside the department of Pedagogy would soon become convinced of its importance. The discussions in the department of Pedagogy would filter through the whole body of students to a sufficient extent to enable them to see that there is at least as much reason why the teacher should make professional preparation for his work as there is in the case of a candidate for any other profession. But the students of to-day are the men of influence of to-morrow, and, with the leaders of opinion on the right side, the rank and file may be safely trusted.

If, then, we may fairly assume that a department of Pedagogy is an essential part of the work which a good college ought to do, we may next enquire what work such a department should undertake.

It should lay great stress on the History of Education. This should be taught in connection with two parallel courses—the history of philosophy and the history of civilization, and all three should be so taught that their interdependence may be clearly seen; the history of philosophy, as the self knowledge of each age, the history of the processes of bringing into clear consciousness the fundamental assumptions which each age makes about the universe and man and their relations to each other; the history of education as the history of the institutions by means of which each age undertook to realize its ideals; the history of civilization, as the history of all the agencies by means of which progress has been made in the history of the world.

And here we are able to see from a new point of view the value of education, as a university study. How can the history of civilization be adequately studied without including a history of the educational ideals which helped to determine its character? Or in what way can a system of philosophy be more clearly illustrated than by pointing out the educational theories and practices in which it expressed itself? In truth the history of education may be called the objective side of the history of philosophy and the dynamic side of general history. And it is precisely this side of history which we are most interested in knowing. What we are most interested in knowing about the Athens of Pericles, the Rome of Augustus, the England of Shakespeare, is the influence that made them what they were. If we ever fully determine them, we shall *do it by studying the history of education*, which is equivalent to saying that the history of education in its most comprehensive sense is the philosophy of history.

The history of education should include also a careful survey of contemporaneous educational institutions in the leading countries of the world. And here again the aim should be not simply to bring out the nature

and workings of these institutions, but to show their relation to their environments. It is not enough, for example, for the student of educational history to learn what the people's schools, the gymnasia, the universities in Germany are. What work they do, what methods they employ. He should learn why they exist. Does popular education exist for the same reason in Germany as in the United States? Is it an expression of the same political philosophy? are samples of questions which he should be constantly led to ask himself.

The Professor of Pedagogy ought not to be burdened with the department of Psychology, although the two chairs should be in the closest sympathy. In the department of Psychology, the student should be encouraged to enlarge his knowledge of mind by a constant use of the objective method, particularly in the study of children. And when he begins the study of Pedagogy this work should be continued under the direction of the professor in a more systematic way, and far more specific and definite ends. Such experiments as those made by President G. Stanley Hall and Superintendent Greenwood for the purpose of ascertaining the contents of children's minds should be conducted, and the results carefully recorded. Such work as we have seen would have a two-fold value: it would gradually put the professor of the department into possession of a large amount of original data of which he could make effective use in enlarging the world's knowledge of mind; and it would at the same time give his students training in original research in the Psychology of children.

But the greatest stress in this line of work should be laid on experiments to test the kinds of good literature in which children may be interested. I regard this work as second in importance to none which the educator can undertake. And it is entirely practicable to encourage students to make a kind of experiment which will not only help them to a clearer comprehension of the importance of the problem, but which will enable them to make substantial contributions towards its solution.

The work in the science of education should consist to a considerable extent in the summing up and systematizing of results reached in a critical survey of the history of education. Great stress should be laid on the educational values, not merely of different studies, but of different courses of study. The work in the history of education will have made the student familiar with the educational system of the leading countries of the world, and he should be led to a point where he can have an intelligent opinion of their fitness to serve in reaching the ends of education.

So far as the Professor of Pedagogy gives instruction in the art of education, it should relate to the courses of studies proper to schools of different grades, methods of organizing and grading, modes of superintending, and kindred subjects. If he can get an experienced and able superintendent to give courses of lectures on some of these subjects, it would be the more effective, as the latter can base his instruction on first-hand knowledge. Instruction in methods should not be given by the Professor of Pedagogy. Each instructor should give a course of lectures on methods of teaching his own specialty for the benefit of those who are preparing to teach it. This is but one of many ways in which a department of Pedagogy would react favourably on the work of its own college. When professors begin to reflect on their methods for the sake of formulating them to others, they are in a fair way to improve them. With Professor E.

J. James, I believe that instruction in colleges is, in the majority of cases, decidedly inferior to that in our schools; and the reason is, as I think, because they have given so little attention to the study of Pedagogy. It would be interesting to know what proportion of the college professors in this country have ever read a single book on the history of education.

It ought to be needless to say that the answers which this article makes to the two questions discussed—as to the value of chairs of Pedagogy and the work they should undertake—should be regarded from two quite different points of view. The reasoning upon which the answer to the first one is based may be stated very briefly: As education is a matter in which society has the greatest possible interest, it must have an equal interest in the preparation of those to whom this work is committed. To doubt or deny the value of education, as a university study, is to doubt or deny one or the other of these propositions, which would require a good deal of intellectual hardihood. Indeed, once we come to realize the supreme interest which society has in education, once we come to realize that it is a matter of such transcendant importance as to make it the wisest economy to put it in the hands of the picked men of the race, and we shall see how ridiculously inadequate the training of college departments of Pedagogy is to its great purpose. We need, and we shall have some day, University Schools of Pedagogy, schools which admit none but college graduates, and devote their entire energies to the professional study of education.

But the answer to the second question is, in the nature of the case, tentative and provisional. When such departments are established in every good college, experience will doubtless throw a great deal of light on the courses of study most helpful in reaching the ends in view.

HEREDITY AND EDUCATION.

AMONG the great facts which have come to the front during the last half-century, heredity is perhaps the most prominent. It has been recognized in all ages. It never was more clearly stated than in the Ten Commandments: "For I the Lord thy God am a jealous God, visiting the iniquity of the fathers upon the children, upon the third and upon the fourth generation of them that hate me; and showing mercy unto a thousand generations of them that love me and keep my commandments." This fact, as science interprets it, shows that it is the tendency of disease and evil to run to the third and fourth generations, seldom to the fifth, and that then there is reversal to the original type, which is always beautiful and beneficent. On the other hand, in the nature of things, that which is good continues so until corrupted. Evolution has unquestionably brought the law into its present prominent place; for evolution works by two factors, namely, heredity, or that which tends to permanence; and environment, or that which tends to variation. The characteristic of the first is that it reproduces the past; of the second, that it adapts to new conditions that which has come from the past. The prominence of these forces is, whether justly or not, revolutionizing thinking,

compelling men to rewrite their psychologies, their treatises on ethics, their theological creeds. While the revival of interest in this great law influences other spheres of enquiry, it would be strange if it did not also modify theories of education. Every child is the product of all preceding generations. He is no. himself alone, but a body packed with potencies derived from no one knows how many or what personalities which have lived before him. The problem of education is by means of environment to modify and, as far as possible, destroy the evil, and bring the good into expression and power. Nor is this all; for tendencies to good, when improperly balanced, become evil Education, therefore, has to do with the elimination of tendencies toward deterioration and the proper development and balancing of tendencies toward good. The word education is a history. It implies heredity, for it indicates something to be drawn out; and as that something could not originate with the child, it must have been transmitted. The word implies powers which have come from others and which are to be trained. So of the word culture. Where does culture begin? With birth. The age of impression is quite as important as the age of reason. But culture implies something to cultivate. That something is not implanted by teachers, but is always inborn. All schemes of culture should begin with the recognition that each child is different from every other; that the lines of difference run far back, and therefore are not superficial, and that, in order to secure the highest efficiency, systems of education should be adapted to the individuals to be reached. Each child possesses characteristics which run back through generations, for which it is not responsible, and which can be changed only by the most carefully planned and wisely adjusted discipline. In each pupil there appear tendencies which have been modified here and given new impulse there, tendencies which are sometimes quickly discerned and sometimes lie too deep to be easily found. If, now, it be granted that heredity and environment differentiate the pupils in our schools so that no two, even from the same family, are exactly alike; and that they come to the teacher's hands each with his own peculiar powers and faculties to be developed, the problem of education becomes complicated and difficult. By the study of what men are, we learn of what they are capable. The word education signifies, "To lead out." To lead out what? That which is in the book? No. That which is in the teacher's mind? No. That which is in the pupil. Dr. Stanley Hall says: "There is one thing in nature, and one alone, fit to inspire all true men and women with more awe and reverence than Kant's starry heavens, and that is the soul and body of the healthy young child. Heredity has freighted it with all the results of parental well and ill doing, and filled it with reverberations from a past more vast than science can explore; and on its right development depends the entire future of civilization two or three decades hence. Simple as childhood seems, there is nothing harder to know; and responsive as it is to every influence about it, nothing is harder to guide. To develop childhood to virtue, power, and due freedom is the supreme end of education, to which everything else must be subordinated as means." Knowledge is not always desirable for its own sake. It is valuable as a means. Study which leaves the manhood narrow and contracted, and fills the head only as gold fills a miser's purse, is not worth the effort required.—*Prof. Amory H. Bradford in the Educational Review.*

THE DISCOVERY AT THE BRITISH MUSEUM.

CLASSICAL scholars of all countries will read with a lively and quite peculiar interest of the discovery which has just been made in the manuscript department of the British Museum. A political sage has declared that the unexpected generally happens in matters of more than ordinary importance; and certainly no event of literary moment could come more unexpectedly than the discovery of Aristotle's treatise on the Constitutional History of Athens. That it should have fallen to the lot of English classical experts to discover so rare a treasure is a circumstance on which English scholarship way well be congratulated; and the nation at large has cause to rejoice in its good fortune in coming into possession of a work which, be it said without any invidiousness, the whole world covets. It is agreed on all hands that not for three centuries at least has so interesting or so important a discovery been made in the field of classical learning. Some years ago, when two tiny scraps of papyrus in the Berlin museum were found to contain a few sentences from Aristotle's long-lost work, intense excitement was caused amongst the learned; but England, more fortunate than Germany, now possesses the famous treatise almost complete. The papyrus, though it has not entirely escaped the ravages of time, is in fairly good condition. the opening is missing, and the closing chapters are more or less mutilated, but the body of the work is intact. After some twenty centuries it remains legible, and may be read in our national museum by such as have the happiness to be versed in palæography.

The manner in which the discovery was made furnishes yet another illustration of the part that chance plays in the most important affairs of man. Some time ago a bundle of soiled and stained papyrus rolls was purchased in Egypt by an eminent English Egyptologist. The rolls were probably bought because they were "got cheap" and might be carried without great inconvenience. The seller, so far as is known, was ignorant of the treasure he was giving away, and the buyer, of the rare bargain he was making. It was a transaction begun and ended, so to speak, in Egyptian darkness. The purchaser, however, packed and shipped his rolls, thinking little about them, as is likely, and eventually they found a natural receptacle in the British Museum. There they were unfolded, gingerly it may be expected, and with scant hope of any extraordinary "find." But as the manuscript was spread out and the ancient characters deciphered, the imagination can picture how Mr. Kenyon's eyes glistened with surprise and delight as it flashed upon him that here was the veritable treatise which was supposed to be irrevocably lost, to the great grief of all classical scholars. The text has been printed by order of the Trustees of the British Museum, and will be published immediately, with an introduction and notes from the pen of Mr. Kenyon—then we shall have the full history of the momentous discovery, and perhaps also an indication of the discoverer's personal sensation in the supreme moment when he first knew what he had found.

With some, no doubt, joy at the recovery of the famous and precious work will be tempered with a suspicion of forgery. Forgeries have been committed in similar cases; might not this so-called ancient Greek

treatise be a forgery also? No doubt it might. And the opinions of the principal authorities on the lost writings of Aristotle give force to the theory of imposition. It would be worse than absurd, according to scholars of repute, to hope that the lost work on the Constitution of Athens should ever be found. But only incontrovertible evidence that the work was actually destroyed can be taken as proof that it has not existed all these many centuries. No such evidence has been adduced. And if it existed it might at any time be discovered. If the manuscript be a forgery, it is beyond question the cleverest forgery of its kind ever perpetrated. But all the evidence external and internal goes in proof of genuineness. It may fairly be concluded that the treatise which ancient writers unanimously ascribed to Aristotle has not only all along been in existence, but is now safe in the British Museum. Whether it is the work of Aristotle himself or of some of his immediate disciples is a matter that is not at present capable of demonstration, but there can be no question that it is one of the oldest of Greek manuscripts, and also one of the most valuable.—*The Publishers' Circular.*

GEOGRAPHY IN WHITTIER, AND HOW TO USE IT.

BY S. T. FROST, A.M.

AND why not geography in Whittier's poems? Is it probable, possible indeed, that the average text-book geographer has ever seen so much of New England as he, or has seen it to such a purpose? Has ever given that special and intimate study and thought to its coasts, its mountains, rivers, lakes, islands, its settlement, people, their industries, home life and history, which Whittier's poems indicate and their themes demand? Not that we would disparage the many good text-books, but only insist that teachers cannot reject such helps to the study of New England geography and history (for we cannot separate the two), as Whittier affords. Of the four hundred and fifty poems in the Houghton & Mifflin edition, nearly all contain passages which will classify under heads of historical and geographical study. In some instances, of course, the allusions, may be infrequent, indirect, and over pupils' heads; but in far many more, they are as plain, direct and available as the best descriptive prose. They afford, moreover, those clear, condensed, crystallized expressions which real poetry attains and which human memory in every age has carried more easily than it retains diluted simplicity —those word-pictures as impressive and suggestive as the best illustrations of the pencil.

"Snow-Bound" is a natural school study of that condition which, more than any other, has contributed to our natural character and greatness—New England farm life. Very interesting to boys and girls is the opening of "Snow Bound," with more than a score, by count, of phenomena of sun, and wind, and night, and storm, each intimated like the touching of keys, and all outlining an invaluable chapter, for observers in Physical Geography and Natural History. Then comes the early New England fireside, around which circled households like the Adamses and Beechers— that shrine which Webster made his theme when, even in political speeches, he melted

multitudes to tears. There are "the apples sputtering in a row," "the simmering cider," "the nuts from brown October wood," then the stories told by the father, of his hunting-camps, "round Memphremagog's wooded side," of the Canadian Indians, of the fashions of French settlers in dress and amusement; the fishing off Boar's head, and the Isle of Shoals with the "broiled hake and chowder." Then come the mother's stories of Indian warfare, of witches and wild animal life until the children seemed to hear the "boat-horn on Piscataqua" and the "whistling hawks at twilight," or the "loon's weird laughter."

"Or heard the wild goose calling loud
Beneath the gray November cloud,"

Then the uncle's story, richest of all in natural history, and the next morning's picture of fun—

"Breaking the drifted highways out"—
"Down the long hill-sides treading slow
We saw the half-buried oxen go."

"The Homestead" also is an impressive picture of the decline of agriculture, of farm-lands abandoned for other localities or other industries. "Mary Garvin" is a sweet story of Indian captivity, that strange feature in the old colonial wars. "Skipper Ireson's Ride" reveals the rough life and maybe the rough nature of the mariners of Marblehead—the same men, however, who manned the boat when Washington, peering into the darkness over the frozen Delaware, called out, says Bancroft, "Who will lead us on?"

Two stanzas in "The Shoemakers," tell so skilfully how and whence come the far and foreign supplies to the leather industry; and all the other songs of labour, "The Ship Builders," "The Drovers," "The Fishermen," "The Lumbermen," are all full of facts and pictures. The "Tent on the Beach" reveals seaside life even to those who have always lived it. Use now the "Last Walk in Autumn" for geographical catechism—pleasing riddles for pupils to make plain, not at all too puzzling if we teachers present them with tact, faith and enthusiasm.

To begin with the third stanza, let pupils interpret the allusions, the migrations of birds, the never forgotten sound and sight of the wild geese in the sky, their breeding places in "Arctic moors and fells," their surroundings there, the appropriate conditions of country and climate, which alone can rear the myriads, whose nests crowd whole islands.

(Consult the books on Arctic life—some of the many are in every teacher's, perhaps pupil's, reach—Kane's Diary, The Voyage of the Vega, or the abundant news from the Alaskan Wonderland.)

Why do the wild geese fly in flocks of that form? Are the snowbirds and jays also migratories?

In the seventh stanza, What climate and country do Syrian sands suggest? What peaks show purple lights on Alpine snow? Why is "watery gates" applied to Venice? Where is the vale of Arno—and in what country the Alhambra?

All these proper names are established points of interest for tourists' visits. Pharpar's fountains are waters of what city old as Abraham? In what country are the "marble palaces of Ind"? Where are crops of roses raised for perfumery? Did our pupils ever see tree-tops over forest paths? or even city streets like Temple street in the city of Elms, shaped like gothic arches? (See close of ninth stanza.) The fifteenth stanza hints at Bayard Taylor's travels. Why is Rhineland so described? What kind of country is Nubia, and where is Phrygia?

In nineteenth stanza—What must be the zone and latitude where one "sees the Cross without the Bear"?

Stanza twenty-one—Where and what is Versailles? Who lives in Windsor's halls? What great church has "Rome's sky-mocking vault"? and what is meant by "many-spired Milan"?

In working out these geographical puzzle, let the teacher give just enough aid to quicken interest.

We have not room here for the titles even of the many poems which not merely embellish, but plainly instruct, in geography and history. If these points shall not interest pupils, nothing ever can—nay rather, we teachers are then self-convicted. Finally—as it is well to know geography through Whittier, so it is also well to know Whittier through geography. There is a mutual induction here that surpasses the mystery of the Dynamo.—*Common School Education.*

The clouds may drop down titles and estates;
Wealth may seek us; but wisdom must be sought. —*Edward Young.*

For deeds do die, however nobly done,
And thoughts do as themselves decay;
But wise words, taught in numbers for to run,
Recorded by the muses, live for aye.
—*Spencer.*

COLLEGE EDUCATION IN RELATION TO BUSINESS.

HORACE GREELEY has been quoted as saying that "of all horned cattle in a newspaper office the college graduate is the worst." It is easy to see why he said so, for he obtained his own power to be there in a much rougher school than the university. He was not—to use a familiar proverb—"a captain who came in through the cabin window," but one who worked his way faithfully from the lowest position up. He knew every part and parcel in the newspaper office and profession, and had little patience with those who thought they knew so much more than that and yet were tyros in the essentials of his trade and vocation. But Mr. Greely did not despise education. He greatly coveted it, and lamented all his life that the drudgery of his exacting profession prevented him from reading more widely than he did or could. In spite of his impatience with scholastic shortcomings he knew well what scholarship was, and drew around himself a fair number of men who wore the college degree. But his pettish remark points a little moral, after all. It shows at least one disadvantage which the young man fresh from college, with his sheepskin under his arm, is apt to encounter in applying for a business situation. He is young, as a matter of course, and during the four maturest years of his young life he has been, as it were, shut out from contact with the busy, active world. In academic shades — which are solitary and somewhat conventual—his thoughts are, of necessity, separated from worldly and practical things. The student could not very well pursue his studies successfully if they were not. But for this very reason his brother, who has gone from the district or public school to the store, really obtains a business start over him. He may not maintain this always, but in many callings he does, and is most likely to continue to, other things being equal. But this remark applies in the main to businesses of a material sort—those of the mercantile line, manufacturing, banking, and trade in all its aspects. In purely professional vocations, like

the law, medicine, and the ministry, no doubt the college-bred man has the advantage all the way through. In fact, it was for these and for the profession of teaching that colleges, as I understand their history, were chiefly and originally established. And what they give to the press and the pulpit is not kept apart from the people. Nor can it be. It filters in many ways down to us all, so that men of bright, receptive minds gather untold riches from many streams, which, when you come to trace them back, will be found to flow from some great foundation of learning. It is one great peculiarity of learning and high culture that these things can not be bottled up. You can not make anything exclusive of them, as you can make scarce physical commodities by a "trust." Learning consists of an addition to our stock of ideas, and through the agency of the printing-press and the voice ideas are supplied with wings and diffuse themselves through the world. It seems to me, then, that a young man must ask himself, before he goes to college, what is to be his aim in life. If he places gain and material business activity first; if he longs to obtain great wealth, and if he is not specially gratified by the literary vocation and by books, it may be he ought not to go. But if, on the contrary, he is a devotee of books, if the great names which have made themselves famous in literature haunt and fascinate him, if he can live on a competence and fulfil what he calls a higher ambition than mere money making, I should say by all means go to college. These are the lines that it seems reasonable to draw, though no formula can be made strict enough in terms to serve as a rule in every individual case. Each person must be a law unto himself. But it is worth while to make a real distinction between "knowledge" and "education." Knowledge represents the valuable facts with which the memory is stored; while education, as the scholars analyze the word, means "a leading out" of the mental faculties. Now you can not lead a horse out of the stable, as it has been frequently said, unless there is first a horse in the stable. Where the internal faculties are potent in a boy, the torchlight and thumbed book over the cabin fire, as in the case of Lincoln, pave the way to untold precedence. If the faculties are not there, or are very weak, all the means of education in the world will not lift him greatly above his natural heaviness and dulness. — *P. T. Barnum, in the Cosmopolitan for November.*

PUBLIC OPINION.

CANON LIDDON ON EDUCATION.— "On almost all educational matters I go with the Conservatives. Practically speaking, they have insisted on the value of the religious element in education. I know from personal experience what mischief to the souls of men has been the result of Liberal legislation for Oxford—much too accurately—to pay the Liberals any compliment on their achievements here. Mr. Gladstone was in this matter carried away by the stream; and it is to me a source of grief that his most dear and honoured name should be associated in history with a measure which, under the guise of admitting Dissenters to academical privileges, has resulted in placing the children of believing Christians under the teaching of men who avow their entire rejection of Christianity. In the same way, I cannot but think that Mr. Forster's measure is transitional,

and leads to a system of secular education throughout the country. Of course, if I thought that the Christian revelation was untrue or doubtful, I should look at all this very differently. As it is, I think that, in the matter of education, the anti-religious Liberals have hoodwinked their Christian associates."—*H. P. Liddon.*

BLACK MONDAY.—Black Monday, after all, then, is not so very black, or, at all events, like a certain greatly abused individual, not nearly so black as it is painted. It commences a season of toil, it is true—toil that, to the instructor, is frequently irksome, and at times oppressive, and, possibly, little remunerative, and yet which can never be robbed of its characteristic feature of nobility. It has an intrinsic worth, this toil, that is peculiar to itself, and that is, moreover, quite independent of the results produced, since such results must always vary with the quality of the soil on which the good seed is sown. It is an uphill task with many; again and again the giants of Idleness, Inattention and Stupidity have to be met and vanquished by skill and forbearance and patience, always patience. Often the results are disappointing—time and trouble seem all to have gone for nothing, though this can never really be the case; at other times victory is gained when least expected, and then the reward it brings with it is indeed, to the teacher whose heart is in his work, an ample and more than ample compensation for the labours of the past.

CHRISTIAN SCEPTICISM.—The most fatal scepticism is that which lurks within the citadel of belief itself. For a man secretly to doubt that which he openly avows, is the last extreme of ungrateful infidelity. And yet have we not some reason to fear that this most dangerous kind and quality of scepticism is increasing in the Christian Church? The speechless testimony of the life, betraying the uttered vow and the recorded profession; the secret, but not altogether concealed, distrust of the present power of the Holy Spirit in the world; the careless or flippant utterance, betokening the real unconcern of the heart—are not these things evidences of a most disastrous spirit of scepticism which is growing up in the minds and hearts of Christians themselves? And what is this Christian scepticism, from which we are to apprehend such danger? It is no blatant, loud-mouthed criticism of God's providence or revelation. It is no merciless system of logic or of science applied to the Bible or to theology. It is simply the scepticism of silent distrust and of inconsistent living. It is the scepticism which says, "God is love," and then turns from the rod and the cross with bitterness of heart and selfishness of purpose. It is the scepticism which affirms, "I believe in the Holy Ghost," and yet so lives as if the mighty rushing wind of Pentecost had died into an eternal, helpless, hopeless calm. It is a scepticism which cries with the lips, "God's in His world, and all's well," but in its heart of hearts confesses to the dreariest pessimism of the most confirmed agnostic. Do you believe that there are but few sceptical Christians of this sort? Then account by some other hypothesis for the inconsistent lives of thousands of professors, for the apathy of hundreds of churches, for the relaxed standards of so many Christian communities, for the decline of reverence, for the increase of Pharisaism and formalism. Are these the failings of those who continue quick and firm in the faith? Must there not be some creeping in of the sceptical spirit through so many loopholes of unfaithfulness? — *Zion's Herald* (*Methodist*).

NOTES FOR TEACHERS.

EGYPTIAN COTTON.—Recently the New York *Times* announced the arrival in that port of a large cargo of Egyptian cotton. It was shipped from Alexandria, to be worked up into fabrics in New England mills. The cargo consisted of 2,150 bales, weighing about 750 pounds each, and was valued at about $350,000. This is said to be the largest importation of the kind that has ever been made in this country, but it is not the first. Although the exact figures have not been obtained, it is estimated that about 9,000 bales were imported last year.—*Atlanta Constitution.*

THE WORK WILL HONOUR YOU.—A memorial brass with the following inscription has been placed in the galilee of Uppingham Chapel. Round the brass is a border of Provençal roses, Mr. Thring's favourite flower.

In grateful remembrance of
EDWARD THRING,
Whose writings animated the art,
And whose life enriched the work of teaching,
A few English and American teachers
erected this tablet.
"*Honour the work, the work will honour you.*"——E. THRING.

HOW TO TEACH CITIZENSHIP.—"Oh, I never read editorials," was the reply made by an intelligent-looking young paying-teller in one of Boston's National banks, when asked if he had read a certain newspaper editorial dealing with a prominent economic question. Even more distressing was the confession of a young citizen, born and bred in New York city, in reply to a question as to how he should vote at the recent municipal election, that he did not know who the candidates were. When told that Mr. Grant was the Tammany candidate, he expressed the hope that he would be defeated, as he "never did like the Grant family"! The writer's experience has not been unique. Certain it is that indifference to the duties of citizenship on the part of our young men — products of our school systems, public and private—not only as regards an intelligent consideration of questions of vital importance, but even in the matter of casting a ballot at all, is altogether too common. It is in the public schools of the land that the dangers of indifference and ignorance must be met. Much has already been done in the line of improvement. Civil government is being more widely taught, though it is not universally found in the courses of study even of our high-schools. The movement to place American flags upon school houses has surely been an excellent one. But how does it happen that we witness so much indifference to citizenship among graduates of our public schools who are of voting age? How does it happen that intelligent men, in an intensely illogical spirit, advise young citizens to "let politics alone" on the ground that they are corrupt?—as if the filthy condition of the Augean stables were the best reasons why Hercules should not attempt to clean them. If our public schools are developing a set of citizens who, forgetting that they owe something to the blessings and protection of a free government, and failing to realize that corruption grows on indifference, stay away from the polls because it rains, or submit to the indignity of being sent for with a carriage; if, as a result of public school education, our young men are enabled to read

the newspaper account of the base-ball game without feeling inclined to read the editorial column, then the schools have fallen short of what ought to be expected of them. The teaching of citizenship depends more upon the teacher than upon the subject taught. It is one thing to teach the Constitution of the United States so that it shall be understood; it is quite another to teach it so that it shall be appreciated. It is even more important to instill into the minds of young pupils a thorough appreciation of the ethics of our Government than to teach them an adeptness in answering technical questions with regard to its form. In the teaching of citizenship, as well as in the teaching of morals, the teacher must be more than an unemotional machine in which a question is put and a fact extracted. To teach morals successfully, the teacher must feel the impulse to make the pupils better, and not serve as a disinterested distributer of ethical truths. So in teaching citizenship the teacher must be an enthusiastic patriot, one in love with the institutions of the country, who can preach patriotism as well as teach it. No point should be more thoroughly and repeatedly brought to the attention of those who are fitting themselves in normal schools and colleges to be teachers than that they are to have the future citizens of our country in their charge, and that they will be expected to teach ethics as applied to the duties of citizenship as well as to the other affairs of life. Our scholars ought early to be taught that the wilful failure of a citizen to exercise the right of casting an honest and intelligent ballot is a neglect of duty and an ungrateful disregard of the privilege granted by our ancestors, who fought and bled that this nation might be a government of the people; that it is a sacrifice of manhood for a citizen to allow his vote to be influenced by an offer of money; that if the practice of buying votes were to become general, our country would become a miserable plutocracy, and to be an American citizen would be no better than to be a purchasable slave; that they are living in a country whose inhabitants enjoy the greatest measure of freedom accorded to any people on the earth, a continuance of which freedom rests with them; and that honest citizens must watch much more sharply for the preservation of the integrity of our Government than political adventurers watch for the prostitution of its ends and aims. It is in the ethics of citizenship that improvement is needed in our public schools. If our children have been trained early to realize the responsibility of citizenship, they will be attracted, as they become older, to an intelligent consideration of the great questions of the day, and will gladly turn to the discussions in our newspapers and magazines to learn what the best thought is upon these questions. Ex-President Cleveland said at the recent dinner given to Mr. Thurman: "It should never be forgotten that the influence which more than all other things has made our people safe depositaries of Governmental power, and which has furnished the surest guarantee of the strength a d perpetuity of the Republic, has its source in the American home." True enough; but is not the school the ultimate factor in making the influence of the home patriotic? Our mothers can be the best cultivators of patriotism, and the mothers of the future are in our schools to-day. Shall not these mothers, then, taught in school days the fundamental principles of American independence and the nobleness of honest citizenship, feel with Cornelia of ancient Rome that the most precious jewels she can show are her patriotic children?—*Samuel W. Mendum, in the North American Review for January.*

GEOGRAPHY.

THE SABLE ISLAND CABLE.—An English cable construction company has offered the Dominion Government to lay a submarine cable connecting Sable Island with Nova Scotia, and operate it for ten years for an annual subsidy of $12,000 a year, the cable to become the property of the Government at the expiration of the ten years.—*Railway Review.*

THE RAILROADS OF INDIA.—It may be said that there is hardly ever any stoppage of the work of railroad building in the British East Indies, and the connections with the far north have been largely extended in recent times. It is eighteen years since the completion of the line between Bombay and Madras, from the Arabian Sea to the Bay of Bengal, a line which is over 1,000 miles in length, running through one of the most densely populated regions of the globe, and forming a prominent feature of the immense network of railways with which British capitalists have covered the Queen's East Indian dominions. These railways are working out profound results, bearing upon the politics, the society, the religion, the industry, trade, and commerce of the hundreds of millions of people who have been planted in India from time immemorial. They have given the British Government a far firmer hold upon India than it had before their construction. They do not seem to have shaken the ancient system of caste, but they have unquestionably had a powerful influence upon the life of the Hindoos, liberalizing their minds, undermining their superstitions, and offering them all the advantages of extensive intercourse with their fellowmen. They have given an immense impetus to reciprocity, opening new markets to British manufactures of every kind, and furnishing new means of outlet for native productions. It is evident to every observer who is able to compare the India of a half-century ago with the India of our day that railroads, telegraphs, newspapers, missionaries, and the British system of public administration are bringing about profound changes there, and preparing the way for developments that will probably be heard of in the twentieth century. —*Philadelphia Telegraph.*

THE RUSSIAN PACIFIC RAILWAY.—The great Siberian Railway, which will more closely connect Europe with the teeming millions of China, Japan, and Eastern Asia, will be commenced this spring. The total length of the line will be 4,810 miles, and the cost about thirty-two millions sterling. In case permanent bridges are built over the immense rivers Obi, Yenesei, Lena, etc., the outlay will be still greater. The commercial and political importance of this undertaking is greater than most people suppose. It will not only help to open out the immense resources of Southern Siberia, but will enable Russia to compete more successfully for the Japanese and Chinese carrying and import trade. Goods that are now sent by sea to Europe will, ten years hence, be carried overland into Europe, and a good deal of the Chinese carrying trade will go into the hands of Russia. A large portion of the railway will run through millions of acres of the finest virgin soil, over immense rivers, primeval forests which have never been cut, and through countries abounding in mineral and vegetable wealth. When

the line is ready it will be possible to work the rich gold, silver, iron, copper, and plumbago mines of Eastern Siberia, which have hardly yet been touched in consequence of the scarcity of labour and the absence of machinery. The rich and fertile regions of the Amoor and Usuri, which boasts of a climate as fine as that of France, will then be open to colonists, and also millions of acres of land which are at the present moment almost unpopulated. By means of this railway Russia will be able to convert Vladivostock into a great naval and military station like Sevastopol, and, if necessary, pour several hundred thousand troops on the Chinese frontier in less than three weeks' time. And last, and not least, among the benefits which will accrue to mankind through this undertaking, will be the possibility of visiting China or Japan in about a fortnight from Central Europe, with all that comfort that is attached to railway travelling in Russia.—*Public Opinion.*

TO CRUSH THE SLAVE TRADE.—All the nations that took part in the recent anti-slavery conference, at Brussels, have now signed the General Act in which the results of six months' deliberations are embodied. The General Act will doubtless be ratified by the seventeen governments which took part in the conference, and this year will probably witness the beginning of one of the greatest humanitarian movements of the age. These nations propose to co-operate in connecting with the coast, by good roads, regions which are being depopulated by slave raiders. They will establish stations where helpless natives may receive protection, and from which armed forces may issue to stop the slave raider in his work. They will place steamboats upon the large rivers and lakes, will try to stimulate the natives to habits of industry, will patrol the high seas to stop slave exportation, and from the centre of Africa to the sea will further every enterprise which will help to crush the slave traffic. This work will have the sympathy of the entire civilized world, and most of the leading powers will have a hand in carrying it out.—*Goldthwaite's Geographical Magazine.*

EDITORIAL NOTES

THE Science masters at the Christmas meeting of their Association had the following question under consideration: Whether Science should be taken by a whole class or only by those who intend to pass an examination upon the Science Course? The opinion of the masters was that Science should be taught to the class, as arithmetic or composition is, and not restrict the study of this branch to a few who may wish to be examined therein. We would like to hear from Science masters on this question, for there is a wide difference between the two methods.

EXAMINATIONS.

AFTER much consideration and discussion the Minister of Education and the Senate of the University of Toronto have come to an arrangement regarding the departmental and matriculation examinations. The scheme is practically as follows: A joint committee of eight members (four by the Senate and four by the Department) has been appointed by the Senate and the Education Department. The appointments are made annually. The joint committee appoints the examiners and associate

examiners from an annual list of graduates of any British university who are actually engaged in teaching, said list to be furnished by the Department, and to contain twice as many names as will be required for any one year.

The examiners appointed by the joint committee prepare the examination papers for all the departmental examinations, and, together with the associate examiners, take charge of reading the answers of all candidates for Junior and Senior Leaving Examinations. All candidates who pass these examinations are accepted as having passed the matriculation examination of the University of Toronto. Much time and thought have been given to the perfecting of the scheme, and it is to be hoped that the results will justify the expectations of the Senate and of the Minister of Education. If the province had a non-political Minister at the head of its educational system, few misgivings would be entertained regarding the success of the scheme.

THE TRAINING OF TEACHERS.

THE question of how best to train teachers for secondary schools and higher institutions is the question which at present is engaging most the attention of educators.

Four modes of training are proposed, (1) Advanced courses in existing Normal Schools, (2) Chairs of pedagogics in the colleges, (3) Pedagogical schools in connection with the universities, (4) The creation of a separate and special institution. The first plan mentioned above has been in operation for some years at Bridgewater and Salem, Massachusetts, and has afforded some college graduates and others an opportunity to fit themselves for the performance of better work in teaching than otherwise they could have done.

It appears to us that much can easily be urged in favour of making the existing Normal Schools the training schools for those who wish to prepare for teaching in high schools, or any other institutions of learning. These schools are supported for the training of teachers; programmes and time-table are arranged and subjects of study and instruction selected with this special object in view. If for good and sufficient reasons this mode of solving the question does not commend itself to the Minister of Education, then the second plan is worthy of very serious consideration. Let us have a chair of pedagogics in one or two of our colleges, and let the curriculum of studies of undergraduates who desire to become teachers be so arranged that when they take the B.A. degree, they may, at the same time, have a professional certificate, and thus avoid the necessity of being compelled to lose six months in attending a Training Institute before being eligible to teach in a High School. We do not see any insuperable difficulty in the way of this being done, and if this scheme were adopted we feel sure more of our teachers would be college bred men, and we should have in our schools teachers better qualified professionally. We have not in this number space to notice the other two proposed plans. As the question is a very important one to teachers and to the country, we invite educators to discuss it in our columns.

THE LATE INSPECTOR BOYLE.

AT midnight on the 28th February last, Mr. Boyle was found in his office, whither he had gone in the evening to finish some work, dead. He had been connected with the work of education in the city of London since 1855, when he was appointed Principal of the Public Schools. He

was of Irish birth and was a member of the Presbyterian Church, and in his long life of more than eighty years had done good and enduring work for the schools and the country. The City Council and the Board of Education showed their sense of the loss to the community by the death of one of London's most prominent citizens, and the teachers and scholars of the schools under his care gave many tokens of their sorrow and affection for their late inspector. One thousand school-boys headed the funeral procession, while hundreds of citizens lined the streets, and the flags on all the schools and public buildings were at half-mast. The Board of Education held a special meeting on the 29th and passed the following resolution:

"It having pleased God, our Heavenly Father, to remove from our midst James B. Boyle, Esq., for many years Inspector of Public Schools of the city of London, and a gentleman honoured and respected in every walk of life;

"Resolved, That it is with deep sorrow we receive the sad news; and while we bow in humble submission to Him who doeth all things well, we mourn sincerely the loss of one who for nearly forty years was actively identified with the educational interests of London, and whose name will be revered as a public benefactor from a scholastic standpoint in the minds of thousands who received their first impressions and elementary training at his hands. We therefore desire to place on record our high appreciation of his services as Headmaster and Inspector during a term of years allotted to but few. As a citizen he was held in high esteem for his uprightness of character, his unswerving fidelity to what he considered just and right, and beyond all his constant desire to see London's scholastic institutions occupy the foremost place in the Province ere he was called to that bourne from which no traveller returns. We ask God to comfort and sustain his family, who mourn the loss of a kind and affectionate parent; and while we sympathize with them whose grief is too deep and sacred to be reached by human agency, we hope that they will meet in the place where joy reigns and parting is unknown."

Mr. Boyle had been a widower for ten years. Two daughters survive him.

THE LESSON PLAN.

"The means that Heaven yields must be embraced and not neglected."

THE plan is a *sine qua non*. There is a great deal in a good beginning—then there should be *something taught* in each lesson, some substantial progress made—and then there should be the application of the knowledge newly acquired by the pupils—such as a review, a few questions on the lines of the lesson, or the eliciting of the thoughts of the pupils about the subject in hand.

The place to begin is the known. But if the same "known" is used more than fifty times, human nature will rebel a little and weary a good deal. Perhaps some striking remark, some bright story or some new setting of an old truth will make a more promising beginning than the ever-present known; and we should never lose sight of individual needs. If you can awaken some slumbering mind and stir it to activity, if you can strike a responsive chord, then you are really teaching.

No matter how simple the lesson, it should have a plan. No matter how simple the plan, it should be prepared and carefully thought out, but not cast-iron, because much of the best work may be done by utilizing the questions and answers of the

scholars, not to lay aside our plan, but to shape it anew or to approach it from the pupils' side.

Take a spelling lesson. Brighten up the words by arranging them in some new way, say as words of one syllable, two syllables, etc. Encourage the pupils to attack them vigorously by showing them clearly just what they need to learn and how. Illustrate the meaning in some way that will be easily understood by them and so appeal to them. Show them the words in some other lesson, or, if it be an advanced class, in some quotation. Spend a few minutes in a review at the end. It is not the amount that we teach, not the number of pages in the book that we go over, not *how much* but *how well*, that is the question.

For it is quite possible to go through the book and know astonishingly little about it. There are too many automata both at the teachers' desks and the pupils' desks in our schools. What we need is something that is alive. If there were more elasticity in our school time-tables and programmes and a little more room for teachers to develop any small individuality that Providence has mercifully kept alive in them, despite the efforts of the Scribes, and Pharisees and Philistines who sit in Moses' seat in the educational kingdom, then we might reasonably look for more plans and less cram, more science and less drudgery. But the examiners and inspectors will be harnessed to the Juggernaut's car at the given date in July and the teachers will, as in duty bound, throw the children under the wheels. Nevertheless the educational world moves, and we can live and learn.

FLOWERS WITHOUT FRUIT.

Prune thou thy words, the thoughts control
That o'er thee swell and throng;
They will condense within thy soul,
And change to purpose strong.

But he who lets his feelings run
In soft luxurious flow,
Shrinks when hard service must be done,
And faints at every woe.

Faith's meanest deed more favour bears,
Where hearts and wills are weigh'd,
Than brightest transports, choicest prayers,
Which bloom their hour and fade.

John Henry Newman.

SCHOOL WORK.

MATHEMATICS.

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(Continued from February Number.)

10. From the expansion of $(x+y)^2$ deduce the rule for extracting the square root of numbers.

Find the square root of $-11-60\sqrt{-1}$.

Determine for what values of a and b the expression $x^6 \times 24x^5 + ax4 + bx^3 - 31x^2 + 70x + 49$ is a perfect square.

10. First part is Book-work. The expression may be written $-11-2\sqrt{\quad}$. We now seek two numbers whose sum is -11 and product -900. Thus

$$x+y = -11,\ xy = -900.$$

Square the first equation, subtract four times the second and extract the square root, thus $x-y=61$; therefore $x=25$, $y=-36$, and the root is $5-6\sqrt{-1}$.

Extracting the root in the usual way the first two terms are evidently x^3+12x^2. Reversing the expression we find in the same way the other terms to be $7+5x$. The whole root, then, must be x^3+12x^2+5x+7.

Square this expression and equate coefficients of like powers of x; thus $a=154$, $b=134$.

11. A man divides $1,300 into two sums and lends them at different rates of interest. He finds the incomes from them to be equal. If he had loaned the first at the rate of the second he would have received $36, and the second at the rate of the first he would have obtained $49. Find the rates of interest.

11. Let x and $1300-x$ be the sums; y and z the interest on one dollar in the two cases. Then $-xy=(1300-x)z$

$$xz=36,\ (1300-x)y=49;$$

Therefore $z=\frac{36}{x}$, $y=\frac{49}{1300-x}$.

Substitute in first equation

$$\frac{49x}{1300-x}=\frac{(1300-x)36}{x}$$

$\therefore 49x^2=36(1300-x)^2$

$\therefore 7x=6(1300-x)$, or $x=600$.

Thus $y=.07$, $z=.06$, or 7% and 6% are the rates of interest.

12. Define "Surds," "Imaginary Quantities," and "Conjugate Complex Quantities."

Give the value of $(1+\sqrt{-1})^8$.

Find the rationalizing factor of any binomial surd in the form $x^{\frac{a}{b}}+y^{\frac{c}{d}}$; and apply the result to the example $x^{\frac{2}{3}}+(y+z)^{\frac{2}{5}}$.

12. See H. S. Algebra Pt. II., chap. XI.

$1+\sqrt{-1})^2=1-1+2\sqrt{-1}=2\sqrt{-1}$

$(2\sqrt{-1})^2=-4$, and $(-4)^2=16$

$=(1+\sqrt{-1})^8$

$x^{\frac{a}{b}}+y^{\frac{c}{d}}=x^{\frac{ad}{bd}}+y^{\frac{bc}{bd}}$; now we have to find a rational quantity of which the latter expression is a factor. This will be $x^{ad}\pm y^{bc}$ according as bd is odd or even. Dividing by $x^{\frac{a}{b}}+y^{\frac{c}{d}}$ we get $x^{ad-\frac{a}{b}}-x^{ad-\frac{2a}{b}}y^{\frac{c}{d}}+x$, the factor required.

CLASSICS.

J. Fletcher, B.A., Toronto, M.A., Oxon., Editor

NOTES ON CICERO, IN CAT., III.

§ 16. *Captos et comprehensos.* — Synonymous. In custody and under arrest.

Copias et opes. — Military strength and political influence (usual force of opes in Cic.).

Concidisse.—Have collapsed (con intensive and cado. Cf. below: conficio, do thoroughly, finish; compello, drive altogether, dislodge).

Quem ego.—Pronouns together, as usual when in antithesis.

Pellebam. — Was attempting to drive. Brad., 184.

Providebam animo. — I foresaw; animo, pleonastic from Roman love of the direct and concrete.

P. Lentali somnum. — Cf. Shak., *Jul. Cæs.*, i., 2: Let me have men about me that are fat, Sleek-headed men, and such as sleep o'nights.

Unus ex his omnibus.—The only one o them all.

Omnia norat.—His information was universal.

Omnium a. t.—He understood how to get at everyone (omn., obj gen.).

Appellare, t., s.—Approach, sound, temper with them.

Consilium, etc.—A mind well fitted for the commission of crime.

Quod non ipse, etc.—Quod governed by obiret (go to ∴ attend to). Tr. There was nothing that he did not attend to and superintend in person, always on the watch and at work.

§ 17. *In perditis*, etc.—So painstaking in carrying out desperate projects.

Nisi . . . compulissem.—If I had not driven him out from his hiding in the city to his brigands in the camp.

Non ille, etc.—He would not have fixed any distant S. for our destruction, as Cethegus did.

Neque tanto, etc.—Nor would he have appointed so far in advance the day of the country's destruction and doom (reip., dat. after denuntiasset).

Commisisset ut.—Would not have allowed.

Occurri atque o.—Met and opposed.

Ut levissime dicam.—To use a mild expression.

Dimicandum fuisset.—For the usual fuit. Brad., 461.

Hostis.—As an enemy.

§ 18. *Quanquam.* — Co-ordinate use. Brad., 479, obs.

Gesta et provisa.—Done and ordained. Hysteron Proteron.

Quum—tum.—Brad., 494. Tr. We might guess as much from the fact that it seems hardly possible that the guiding of such momentous events could have been within the reach of human wisdom; but on the other hand so direct has been the aid, etc.

Videre possemus.—We might have seen them. Brad., 196.

Illa.—The following.

Ab occidente.—In the west (ab, on the side of).

Visas.—Rare in the sense of *seen* unless of supernatural appearances.

Faces ardorem, etc.—Meteors blazing in the sky (Hendiadys).

Fulminum jactus.—Flashes of lightning (in a clear sky).

Canere.—Foretell. The earliest oracles and prophecies were in verse.

Prætermittendum neque rel.—Are neither to be passed over inadvertently nor intentionally omitted.

§ 19. *Cotta et T. coss.*—B.C. 65, the year in which Horace was born (O nata mecum consule Manlio).

De cælo, etc.—Were struck by lightning.

Legum aera.—Brass tablets on which the laws were engraved.

Quem, etc.—A gilt statue of whom, representing a little child sucking a wolf and straining open-mouthed to reach her dugs, stood, you remember, on the Capitol.

Nisi—flexissent.—Unless the gods were appeased in every possible way, and by their divine power turned the course of destiny itself. (Flexissent for flexerint in or. recta. Brad., 524, ii.)

§ 20 *Illorum resp.*—In accordance with the answer of the haruspices.

Idem.—They also.

In excelso.—On a high basement.

Contra atque.—In a direction opposite to what.

Curiam:—Sc. Hostiliam, in the comitium.

Fore ut.—Brad., 193, iii. Would be brought to the light.

Collocandum.—Brad., 400. (Loco, give out a contract.)

Superioribus.—Of the two preceding years.

§ 21. *Hic.*—Accordingly.

Præceps, m. c.—Thoughtless, insane.

Qui.—Brad., 505, iii.

Hæc omnia.—This universe.

Quum esset, etc.—When this answer had been given, namely, that . . .

Reipublicæ.—Dative.

Et ea.—And that too.

Quæ . . . sensistis.—You have discovered that the horrible enterprise which, owing to its enormity, seemed to some at the time incredible, was not only planned but actually undertaken.

Illud.—The following coincidence.

Præsens.—Providential.

Ut quum, etc.—Noun clause in apposition with illud.

Concordiæ.—One of the chief temples in the Forum; built by L. Opimius, B.C. 121, after the murder of C. Gracchus.

CLASS-ROOM.

ANCIENT ROMAN HISTORY.

Roman History may be divided into three periods:

1. The legendary period embracing the first four centuries.

2. The dramatic period consisting of the five following centuries. Shakespeare made but little alteration in the incidents of characters selected from this period; he found the characters ready-made for his purpose.

3. The period or stage which deals with opinion rather than with personages, extending to the close of the Western Empire.

By another classification based on the political institutions of Rome we have:

1. Government by kings from 754 B.C. to 509 B.C., about 250 years.

2. The Republic from 509 B.C. to 42 B.C, about 450 years.

3. The Empire, from 42 B.C., to 343 A.D., about 400 years.

The Western government lasted for eleven centuries.

The Eastern Empire lasted from 337 A.D. to 1453, eleven centuries, closing about the

time of the introduction of printing, of the revival of learning, of the age of discovery, in fact, at the beginning of modern history.

The name of the first king of Rome was Romulus; of one of the first consuls, Brutus; of the last officer faithful to the Republic, Brutus; of the first emperor, Augustus; of the last emperor, Romulus Augustus.

UNIVERSITY OF LONDON (ENG.)

MATRICULATION EXAMINATION, JANUARY, 1891.

ENGLISH LANGUAGE.

Examiners.—Prof. Edward Arber, F.S.A.; Prof. John W. Hales, M.A. Not more than ten questions are to be attempted.

1. On what grounds is English said to be a Teutonic language?

2. Mention six words that English has borrowed from other Teutonic languages, twelve borrowed from the Romance languages, and twelve from any Non-Aryan languages.

3. Show how frequently in English the pronunciation of a word does not correspond with its orthography. How would you account for such discrepancies?

4. How many sounds has the symbol *a* in English? Also, in what other ways can the sound it has in *hate* be expressed?

5. What is meant by the *case* of a noun? How did the word come to be used in such a sense?

6. In what various ways can difference of sex be denoted by English nouns? Explain the forms, widower, mistress, gander, bridegroom.

7. Explain these words: fourteen, twenty, riding (as in North Riding), fortnight, farthing, dozen, hundred, score, million, eleven.

8. Distinguish between the senses of *older* and *elder*, *last* and *latest*, *masterly* and *masterful*, *farther* and *further*, *virtuous* and *virtual*, *definite* and *definitive*.

9. How would you define a pronoun? And how classify the words so called?

10. Give instances of verbs that can be used both transitively and intransitively; also of some that can be used both as complete predicates and as incomplete; also of some that can be used both as auxiliaries and without another verb dependent upon them.

11. Mention some strong verbs in which the *n* of the past participle has dropped off, some in which the preterite has come to be used as the past participle, some which have two forms of the preterite.

12 Show from still familiar forms that melt, mow, shave, swell, grave, were once of the strong conjugation; and write down the past participles of shoe, light, work, knit, speed.

13. From what other "parts of speech" are adverbs formed, and what is their function? Can you cast any light on the forms darkling, whilom, piecemeal, afterwards?

14 Why are prepositions so called? Discuss the use of *past* in "He went *past* the house"; of *of* in "The Island *of* Great Britain"; of *by* in "Do your duty *by* the University."

15. Punctuate this passage, and then analyze it:

For who to dumb forgetfulness a prey
This pleasing anxious being e'er resigned
Left the warm precincts of the cheerful day
Nor cast one longing lingering look behind.

ENGLISH HISTORY AND THE GEOGRAPHY RELATING THERETO.

Examiners.—Prof. Edward Arber, F.S.A.; Prof. J. W. Hales, M.A. Not more than ten questions are to be attempted.

1. Give an account of the various settlements of Jutes, Saxons, and Angles in Britain; and state from what lands they severally came.

2. Write a life of one of the following men: St. Augustine the Monk, St. Patrick, Beda, King Alfred, Edmund Ironside, Harold, King of the English.

3. Give a general description of the institutions of the Anglo-Saxons, and a particular explanation of the following words: Witenagemot, Sheriff, Danelagh, Danegeld.

4. Give a short account of the Norman Conquest, including a plan of the battle of Senlac.

5. State what were the occasion and the purpose of one of the following documents:

Anglo-Saxon Chronicle, Doomsday Book, Magna Charta, the statute Quia Emptores, and the Habeas Corpus Act.

6. Explain shortly how the Crusades affected English affairs.

7. Write a sketch of the personal character of one of the following kings: William Rufus, Henry II., Edward I., Richard II., Henry VII., James I.

8. Give an account of either (1) the conquest of Ireland by Henry II., or of (2) the conquest of Wales by Edward I.

9. Write a short history of the Hundred Years War between England and France, giving a particular description and plan of one of its chief battles.

10. Give an account of the Black Death or Great Murrain of 1349, and trace its influence upon our national affairs in the reigns of Edward III. and Richard II.

11. Describe one of the following movements in English History, and show how it affected our national life: The coming of the Friars; the expulsion of the Jews; the rise of the Lollards, the Reformation under Henry VIII.; the revival of learning.

12. What were the chief events in the intercourse between England and Scotland, in the time of our Tudor sovereigns?

13. Give a full description of the Petition of Right.

14. Describe briefly, giving plans, any two of the battles in the war between Charles I. and his Parliament.

15. State the nature and purpose of the principal Acts passed by the Pension Parliament.

16. Name the principal English Voyages in the seventeenth century, and draw a map showing the position of our colonies on the North American Continent at its close.

17. Trace the descent of James I. from William the Conqueror.

GEOMETRY.

Examiners.—Prof. Horace Lamb, M.A., F.R.C.; J. Larmor, Esq., D.Sc., M.A.

1. Prove that the diagonals of a parallelogram bisect each other.

2. Squares are described on the three sides of a right-angled triangle; divide the square on the hypothenuse into two rectangles which shall be respectively equal to the squares on the other sides. (Give the proof.)

3. Show how to construct a triangle whose sides shall be equal to three given lines. When is the construction impossible? Show that if the square on one of the lines exceeds the sum of the squares on the other two, the triangle will have an obtuse angle.

4. Construct a square which shall be equal to a given triangle.

5. Prove that the sum of the squares on the sides of a parallelogram is equal to the sum of the squares on its diagonals.

6. Describe, on a given line, a segment of a circle which shall contain a given angle.

7. Prove that, in a circle, a chord nearer the centre is greater than a chord more remote.

8. In a triangle ABC, the perpendiculars AD, BE, drawn from two vertices to the opposite sides, meet in a point O, and AD meets the circle circumscribed to the triangle in a point K; prove that DK is equal to DO. Deduce that the perpendicular drawn from the third vertex C to the opposite side also passes through the point O.

9. Construct a regular pentagon. Prove that, if its alternate sides are produced to meet, the angles of the star-shaped figure thus formed are each two-fifths of a right angle.

10. Show, by aid of a diagram, that four circles can be drawn so as to touch each of three given lines; and give constructions for their centres.

ARITHMETIC AND ALGEBRA.

Examiners.—Prof. Horace Lamb, M.A., F.R.S; J. Larmor, Esq., D.Sc., M.A.

1. The moon describes relatively to the earth a circle of 240,000 miles radius in $27\frac{1}{3}$ days; find to the nearest minute the time she takes to travel over a space equal to her own diameter (2,160 miles), the ratio of the circumference of a circle to the diameter being taken as $3\frac{1}{7}$.

2. A man buys a house on the conditions that he shall pay £500 now, £500 one year hence, and £500 two years hence; what should be (to the nearest shilling) the cash

value of the house, compound interest being reckoned at $3\frac{1}{2}$ per cent.?

3. A man invests one-third of his capital in 6 per cent. stock at 150, and the rest in 4 per cent. stock at 112; what is the average return per cent. on his capital?

4. Give the reason of the ordinary rule for fixing the position of the decimal point in a product. The ratio of a metre to the yard is 1.094, and a cubic foot of water weighs 62.4 lbs.; express the weight of a cubic metre of water as a decimal of a ton. (Three significant figures in the result will suffice.)

5. Prove that $ab=ba$, and $a(b+c)=ab+ac$, the letters denoting positive integers.

Prove that $(a+c-2b)(ay^2+2bxy+cx^2)-[(a-b)y+(b-c)x]^2=(ac-b^2)(x+y)^2$.

6. (*a*) Prove that the sum of the cubes of any three consecutive numbers is divisible by the sum of the numbers themselves; and state in words the value of the remaining factor.

(*b*) Prove that the difference between the squares of a number of two digits, and of the number obtained by reversing the digits, is ninety-nine times the difference of the squares of the digits.

7. Simplify

(1) $\dfrac{x^4-13x^2+36}{x^4-26x^2+25} \div \dfrac{x^2-x+6}{x^2+4x-5}$

(2) $\dfrac{(1-x^2)(1-y^2)-4xy}{(1-x)(1-y)-2xy}$.

8. Solve the equations

(1) $\dfrac{x}{x+11}+\dfrac{x}{x-9}=2$.

(2) $\left.\begin{aligned} 2x+3y+5z &= 10 \\ 4x+9y+25z &= 100 \\ 15x+10y+6z &= 0 \end{aligned}\right\}$

9. (1) Prove that the expression $6x^2-29x+35$ is positive when $x=2\frac{1}{2}$, negative when $x=2\frac{5}{12}$, and again positive when $x=2\frac{2}{3}$. For what values of x does it vanish?

(2) The sum of a certain quantity and its reciprocal is 2.05; find it.

10. (1) The sum of an arithmetic progression of $2n$ terms is n times the sum of the two middle terms.

(2) The sum of all the products in a multiplication table going up to n times n is $\frac{1}{4}n^2(n+1)^2$.

HAMILTON PUBLIC SCHOOLS.

PROMOTION EXAMINATIONS, DEC. 1890.

(Continued from February Number.)

Grade 7.

GEOGRAPHY.

1. Give the waters on the boundary line of Ontario in order, beginning with the highest. [7]

2. Name the cities of Ontario, and tell in what country and on what river or lake each one is situated. [7]

3. Name the rivers in Ontario whose waters go over Niagara Falls. [7]

4. Name in order the counties that touch this county, and name the chief places and things in each, and also those in this county. [7]

5. What things are found, grown or made in the Province of Ontario, and in what places are they found, grown or made? [7]

6. If you went to Owen Sound by boat, what waters would you pass through and what places would you pass? What would the cargo consist of each way? [7]

7. Trace either the Thames or the Trent, telling what counties and places are along or near it, and where it empties. [7]

COMPOSITION.

1. Give four rules for the use of capitals. [8]

2. Write a sentence in which the subject is modified by a preposition and its object. [10]

3. Write a sentence in which the noun is modified by an adjective, and the verb is completed by a noun. [10]

4. In the following sentences change each adjective and each adverb into a proposition and its object, without altering the meaning:

(*a*) She went away hastily.

(*b*) A wealthy man bought the country house.

(*c*) Mary sings the Scotch songs sweetly.

(*d*) He spoke kindly to the sorrowful child. [16]

5. Use each of these phrases correctly in a sentence, and tell what each phrase modifies:

(*a*) Near the station.

(*b*) With the flaxen ringlets.

(*c*) Through the window.

(*d*) Between them. [16]

6. Write in your own words the story of Damon and Pythias. [20]

ARITHMETIC.

1. Find the interest on $367 for 4½ years, at 6 per cent.

Find also the amount. [14]

2. How much will $968 75 amount to in 73 days at 7 per cent.? [14]

3. A person borrows $1795 on the 19th of September and pays it back on the 1st of December; how much interest must he pay at 9 per cent.? [14]

4. If a barrel of flour weighing 196 pounds is bought for $4.90, and sold at the rate of 3 cents a pound, what per cent. is gained? [14]

5. If an agent sells 25 sewing machines at $40 each, and receives a commission of 1¾ per cent. besides his expenses which are $50, how much does the owner receive from the sale of the machines? [14]

6. I have some paper which is 9 inches wide, some which is 12 inches wide, and some which is 15 inches wide, which I wish to cut into strips of equal width. What can be the greatest width of the strips so as to have no waste of the paper? [14]

Grade 8.

TEMPERANCE.

1. What are artificial drinks? What makes you think these drinks are not required? [7]

2. How much water is given up by the human body from the process of complete drying? [7]

3. What proportion of water is there in the gastric or digestive ?uice? [7]

4. Describe the course of the current of water that is in progress through the body during life. [7]

5. What general evidence is there that water is all-sufficient drink? [7]

6. What is the best example of a natural standard food?

What is the proportion of solid and fluid matter in this standard food? [7]

7. What was the first strong drink which man used? [7]

How was this drink derived? [7]

LITERATURE.

1. Explain the expressions, "naked woods," "meadows brown and sere," "they rustle to the eddying gust," "upland, glade and glen," "yet not unmeet it was."

Write down the last two lines of this poem. [12]

2. Give the meaning of each of the following:

(1) Health and plenty cheered the labouring swain.

(2) Parting summer's lingering blooms delayed.

(3) The sober herd that lowed to meet their young.

(4) The loud laugh that spoke the vacant mind.

(5) Well had the boding tremblers learned to trace
The day's disasters in his morning face. [18]

3. Give other words, without changing the meaning, for "severe afflictions," "celestial benedictions," "dark disguise," "earthly damps," "funereal tapers," "transition," "with raptures wild." [14]

4. "She looked into Lord Ronald's eyes,
And told him all her nurse's tale."

What was "her nurse's tale?" (5)

What is the meaning of "the man will cleave unto his right," "the next in blood," "she went by dale, she went by down"? [14]

5. "I shall allude to one debt of gratitude only which Germany owes to the poet of Stratford-on-Avon." What is this debt of gratitude? Name four other great poets and tell the country in which each lived. [8]

6. Write the first stanza of "The Bells of Shandon," and the stanza of "Lady Clare" beginning "Down stept Lord Ronald." [5]

GRAMMAR.

1. Name the demonstrative pronouns, and give an example of the proper use of each. [12]

2. Write both numbers of deer, staff, pailful, salmon, thanks, die, goods, man-

servant, cactus, me, sister-in-law, talisman, it, Mr. [14]

3. (*a*) Write sentences using each of the following words as a noun and as an adjective: skating, playing.

(*b*) Write sentences using each of the following words as a verb and as an adjective: painted, lost.

(*c*) Write sentences using each of the following words as an adverb and as a preposition: above, up. [12]

4. If the preposition and the conjunction are both used to connect words, what is the difference between them? Give an example showing this difference. [12]

5. What happened to it?

He watched the cloud-banner from the funnel of a running locomotive.

You have John's book.

(*a*) Tell the number, case and relation of each noun.

(*b*) Tell the kind, person, case and relation of each pronoun.

(*c*) Tell the persons, number and subjects of each verb.

(*d*) Tell the relation of each preposition. [30]

ARITHMETIC.

1. A rectangle is four feet long and three feet wide; explain clearly how you get the area to be 12 square feet. [14]

2. There is a rectangular plot of ground 84 yards long and 75 yards wide. Running across this is a strip of grass 20 feet wide, and also another of the same width running lengthwise; what did it cost to sod these strips at 11 cents a square yard. [14]

3. A box 16 inches long, 12 inches wide and 8 inches high (outside measurements) is made of boards an inch thick. How many pints of sand will the box hold if 34¾ cubic inches make a pint. [14]

4. A coal bin is 10 feet square, find its depth in order that it may hold the least whole number of tons of either hard (33 cubic feet to the ton,) or soft, (42 feet to the ton) coal. [14]

5. What length of wall 6 feet high and 2 feet thick can be built with 12 cords of stone. [14]

6. Write down the following statement of six weeks' cash receipts; add the amounts vertically and horizontally, and prove the correctness of the work by adding your results: [14]

	Mon.		Tue.		Wed.		Thur.		Fri.		Sat.	
	$	c.	$	c	$	c.	$	c	$	c.	$	c.
1st.	28	79	34	71	35	33	30	10	27	97	47	81
2nd.	23	87	30	78	29	38	33	84	26	77	48	77
3rd.	16	99	27	09	28	69	30	16	24	95	43	07
4th.	29	13	33	72	30	81	39	9[illegible]	28	47	50	05
5th.	18	47	32	29	26	73	34	45	28	78	45	93
6th.	19	02	27	06	29	04	29	89	29	51	64	98
Total.												

GEOGRAPHY.

1. Draw a map of one of the countries of Europe, marking the mountains, rivers and principal cities. [10]

2. What do we get from England, France, Switzerland, Ireland. What do we send to Europe from Canada? [10]

3. Where are the following places, and for what are they noted: London, Paris, Liverpool, Gibraltar, Venice, Glasgow. [10]

4. Give the position of three river basins in Europe and trace the course of the rivers that drain them. [10]

5. What and where are the following: Alps, Great Britain, St. George's, Crimea, Land's End, Killarney. [10]

6. Through what gulfs, bays, seas and straits would yau pass in sailing along the coasts of Norway and Sweden. [10]

HISTORY.

1. Tell what you know of any one of the following:—Walpole, The Elder Pitt, Nelson, George Washington, Napoleon I. [10]

2. Give an account of either The Seven Years' War, or the American War of Independence. [10]

3. Tell what you know about the battle of Waterloo. [10]

4. Give an account of the Indian Mutiny. [10]

5. Name five important events in the reign of Queen Victoria. [10]

CONTEMPORARY LITERATURE.

THE *Popular Science Monthly* for March opens with an important paper on "Supposed Tendencies to Socialism." "Hypocrisy as a Social Elevator" and "Greeting by Gesture" are among the most interesting articles in the issue. The unfortunate Woman is again discussed. May she profit by it.

"To the East, Westwards!" by Sir George Baden-Powell, is found in the February number of the *English Illustrated Magazine*. The article will be appreciated by Canadians. "British Guiana" and "Norwich" are both excellent papers and will be useful to any teacher of geography. The serial—of great interest—is by Marion Crawford.

"THROWN on her own Resources" by Mrs. Croly appears in the number for February 26th of the *Youth's Companion*. It is an article of good advice to girls. "Historic Houses" and "Runaway Boys" are valuable papers. "At Evening" is a beautiful poem by Frank Sherman.

Littell's Living Age for February 21st contains an article on the "Responsibility of Reading" (*Good Words*). The pity is that of the many who need it so few will read it. Other notable papers are, "The Applications of Geometry to Praetical Life" (*Nature*) and "Concerning Inns and Taverns" (*All The Year Round*).

A specially good number of the *Illustrated London News* contains "Dreams," by Jerome K. Jerome. Walter Besant contributes a valuable article of advice to young writers.

THE February *Eclectic* is especially interesting to Canadians. Lieutenant Stairs, a Canadian, tells of his African experiences. Sir George Baden-Powell discusses the future of Canada. He is in favour of British connection.

IN *Scribner's Magazine* for February we find "A box of Autographs" by Richard Henry Stoddard which is an account of a rare and interesting collection. A short story of unusual pathos is "The Story of an old Beau." "The Water Devil," by Stockton, reaches an extraordinary and satisfactory conclusion.

English Classics:

(1) *Shakespeare. A Midsummer Night's Dream.* Edited by K. Deighton. *1s. 9d.*

(2) *Tennyson. The Coming of Arthur*, and *The Passing of Arthur.* Edited by T. J. Rowe, M.A. *2s.*

THE sensible and useful notes, as well as the valuable introductions and the general excellence of this series, are noticeable in every number. We are glad to see another volume devoted to Tennyson's poetry.

Moffat's Geography of the British Empire. (London: Moffatt & Paige.)—13th edition, *1s.* A brief and well-arranged synopsis of the chief geographical facts in relation to the Empire.

Blackwood's Shilling Grammar and Composition. (London: William Blackwood & Sons.)—An elementary text book on Grammar in which much attention is paid to practical exercises and examples in grammar and composition.

Epochs of American History: The Colonies. By R. G. Thwaites. (New York: Longmans, Green & Co.)—A hand-book devoted to the thirteen colonies, intended as a text-book for class use and as a book of reference, compact, yet generally full in its treatment of the planting, and growth of the colonies, social and economic questions, etc.

From Messrs. D. C. Heath & Co. (Boston):

(1) *The Reproduction of Geographical Forms.* By Jacques W. Redway.

(2) *Schiller's Der Geisterseher.* Edited by Professor Joynes of South Carolina University.

(3) *Materials for French Composition.* By C. H. Grandgent.

The College Series of Greek Authors. Plato. Gorgias. Edited by Gonzalez Lodge of Bryn Mawr College. (Boston: Ginn & Co.)

The books of this series are of unusual merit. The press work is beautiful and the text and notes are based upon the best German editions, though the editor has availed himself of other material in producing this excellent edition.