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DIVISION: A CRITICISM AND A SUGGESTION.

BY JAS. A. MCLELLAN, M.A., LL.D.,
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IN the September number of a leading American Journal there is an article by a Professor of Method in Cook County Normal School, in which the writer, following Col. Parker (see pages 105, et seq, *Talks on Teaching*), discusses the principles of Division, and mercilessly flays any "Doubter" who may venture to question the soundness of his philosophy. I confess myself a doubter—one of many it is to be hoped—and I shall state some reasons for the doubts that trouble me. In doing this—in examining the definitions and illustrations in the article referred to—I shall try to set forth some data and inferences which may perhaps contribute somewhat to a true theory of the division process. The article consists (a) of a sort of general introduction, and (b) of an exposition—chiefly by comments on a series of problems—of general principles. I shall (I) devote some attention to (a) and (b); and then (II) endeavor to advance a common-sense view of the nature of Division.

I.

(a) "There are," says the Professor, "thousands of children who if asked what we get when we multiply square feet by feet will answer *cubic feet* because they have never been made to see that when finding the volume of anything, we are simply repeating a certain number of units a certain number of times." He then proceeds to show, rightly enough, "that the child should be clearly taught that there are 'layers' of *cubic inches* (or feet) repeated a certain number of times."

I remark: (1) No such question should be asked the child—it is the slovenly expression of hazy thought; it is misleading, for it suggests to the child the answer *cubic feet*. It is a mere catch-question implying an impossible operation; the wrong answer of the child is more than justified by the wrong question of the teacher.

2. "When finding the volume of anything we are simply repeating a

certain number of units a certain number of *times*." Without doubt; but, also, in finding *any* product are we not simply repeating a given unit—group a given number of *times*? We have here a simple yet sufficient principle which explains the "mystery" of division, but which the professor abandons in the moment of his need to plunge into a very wilderness of error from which no Moses can deliver him.

3. He objects—after Col. Parker—very strongly to the use of *times* in the sense of repetition because it tends to perplex the learner. "The reader will observe that I say two, four cubic inches. Because two, four cents is the language of the child and needs no explanation, while *times* has to be explained and then often *times* is not understood. . . . Why will almost 50 per cent. of a class say (young pupils) *three times naught are three*." But this idea of *times* enters into every conception of number and if misunderstood, the true idea of number has never entered into thought. The simplest expression of quantity has necessarily these two components: the unit of measure (the "standard" unit), and the *times* (the how many) of this unit of measure. This *how many* is abstract; it really expresses the *ratio* of the units in the quantity to the standard unit. This is the very pith of the conception of number; and abstract though it is, a firm grasp of it is absolutely necessary to any fair mastery of the properties of numbers. The word *times* has been used in this sense for an indefinite period; it is as old as what is true in the new education. Both term and idea are familiar in the child's experience. And if, after passable teaching, the arithmetical meaning of *times* is still a mystery to any child, it is probably because niggard nature has not endowed the

poor thing with the minimum thirty ounces of brain. And if 50 per cent. of any class of children possessed of normal brains fail to comprehend the meaning of *times* in such expressions as four times two are eight, and fully believe that *three times naught are three*—it is conceivable because they have been reduced to a state of mental inanition by the drivel of some new educator. Such unfortunates may be expected to use the cumbrous phrasing, three, "four dollars," thirty-five and a half, *thirty-six and seven-tenths cubic feet* instead of the simpler expressions that have had the sanction of the ages—three *times* four are twelve, etc.

(b) We come now to the more important part of the professor's article—that in which is concretely unfolded his philosophy of division. He begins with a definition of division which violates every rule of definition. However, we cannot expect those to be strong in definition who strenuously maintain that no rules, definitions and stated principles should have place in the text-book of the future. Definitions are troublesome things—they demand at least an approach to accurate thinking. He says:—"Division is dividing a number into a number of equal numbers. As how many four apples in twelve apples? I say *three four apples*. I express it thus: $12 \text{ apples} \div 4 \text{ apples} = 3$ (four apples). Again: how many hats at \$4 each can I buy with \$12? I say as many hats as there are \$4 in \$12, which are *three four dollars*. Once more: I have $\frac{1}{2}$ of a pie; to how many boys can I give $\frac{1}{2}$ pie. In division dividend and divisor must have the same name. . . . Now we have $\frac{1}{2} \div \frac{1}{2} = 1$. Surely not one whole pie but one one-half pie." And when his imaginary antagonist (Doubter) audaciously suggests that the *one* in this case—as well as the quotients in the other examples, is *abstract*,

the killing answer is, "Oh what bosh!" We have not space to give the professor's other and equally significant examples. The inferences—some of them formally stated—which he draws from his "definition" and examples are:

(1) In division the divisor and the dividend always have the "same name." The quotient is concrete.

(2) In division the quotient *always* equals the *dividend*.

(3) The divisor cannot be greater than the dividend—"8 ÷ 8 how absurd."

(4) The divisor can *never* be an *abstract* number.

(5) Finding the equal parts of a number "is *not* division; but differs widely from it."

Now a sufficient answer to all this is supplied by the professor himself: "Oh what bosh!" We not only call it bosh; we shall prove it bosh—so far at any rate as what is self-evident is capable of proof.

(1) Had the writer borne in mind the principle stated in his introduction, viz.: that in finding the volume of anything we are *simply repeating a number of units a certain number of times*—recalling, further, the well known fact that the operation of division is the inverse of that of multiplication, he would not have been found wallowing in a slough of absurdities. The question, How often is \$4 contained in \$12, is the inverse of the question, What is the amount of \$4 repeated three times? The operation in this case is $\$4 + \$4 + \$4 = \12 ; or, using the multiplication table, which is but a series of *remembered addition results*— $\$4 \times 3 = \12 ; where clearly the *three* denotes *how many addends there are*—how many groups of *four* things each—and is therefore purely a number—i.e. an "abstract" number; for the conception would *not change with any change of addend*. This concept, *THREE*, would remain

absolutely unchanged if the *groups of things* were changed indefinitely either in number or in kind—i.e. we might have groups of 1 or 2 or 3 or 4 . . . or *n* things each and the *things* might be dollars, or apples, or any thing else in the universe of things.

No other meaning for the *multiplier* can be conceived by a mathematically sane mind. How then is the *inverse* problem connected with this? In multiplication we have the group of things and the times repeated to find the absolute quantity—or expressed in figures: $\$4 \times 3 = \12 . In the inverse operation (division) we have *two* of these things given, viz: \$4 and \$12, to find the third, viz: *three*; and both science and common sense demand that *THIS three* shall be found, and *not* a transformed three, as three dollars, or "three, four dollars," or three *anything else* in the whole realm of the *concrete*. Yet we have the astonishing statement that "the quotient is *not* an abstract number—it is three, four dollars." Expressed in symbols this would be, when the dividend is recalculated from its factors:— $\$4 \times 3 (\$4) = \$12$ —or in words, three dollars repeated three, four dollars times is equal to twelve dollars! The statement that "the divisor and dividend are *always* of the same name" will be referred to again.

(2) "The quotient is *always* equal to the dividend." "Get the children to see this, and when grown to men and women they will not make such mistakes"—as e.g., thinking that the quotient may be a pure number. That is: $\frac{a}{b} = \text{quotient } q$ (say): multiply equals by equals $\therefore a = bq$, but $q = a$ (the dividend). $\therefore a = ab!$ Or taking the professor's favourite example: $\frac{\$12}{\$4} = 3 (\$4)$

$\therefore \$12 = 3 (\$4) \times \$4 = \text{unmiti-}$

gated nonsense. "Get the children to see this, and when men and women they will not make such mistakes." At all events it is safe to say that they will not be held accountable for such mistakes, nor for any others. But why waste words? The professor's conclusion—this luminous principle of division—is *prima facie* evidence of the absurdity of the premises, or of the—well, the ineptitude of the logician—or of both.

(3) The *divisor cannot be greater than the dividend*. " $8 \div 8$ means how many eights in eight-tenths: how absurd! 8 of a pie to be divided among 8 boys—do you mean to tell me, Doubter, that you are going to find how many 8 boys in '8 pie?' By no means, my dear professor. Some faint excuse may be found for the hasty inference that "all men are liars"; there is none for the deliberate assumption that all men are fools. The *direct* proposition is: one-tenth repeated, eight times is eight-tenths. The inverse problem is: given the product, eight-tenths, and one (eight) of the two factors, to find the other factor, one-tenth. By what operation do we find this factor if *not* by division? "We want," he says, " $\frac{1}{8}$ of '8 pie, and the answer is given at once, '1 pie, but this *differs very widely from division*." How, we ask, and how widely does it differ from division?

(4) The inferences (1), (3) and (5) are given implicitly in (4): "The divisor can never be an abstract number; when a number is divided into equal parts it is not division—it is partition!" In this the disciple follows his master (see *Talks on Teaching*, pages 105, etc.), and it is to be feared that the inevitable *ditch* is the destiny of both. Never an abstract number! Then *one* inverse of the problem $\$4 \times 3 = \12 must, we suppose, be insoluble. Given the \$4 and the \$12, and we get the other

factor, 3, by mere division. But the other inverse, given the 3 and the \$12 to find the \$4—*hic labor est*: this is *not* division, it is—it is "partition"—some Newtonian thing which is away beyond division but which is, we hope, within the compass of the Calculus. One-third of \$12 is \$4, we are told, "and the answer is given at once." Just so. But in the example divide \$209671 by 539, "the answer is *not* given at once." How then is it to be found? Not by division, it seems, "because divisor and dividend must be of the same name." Not by division because the divisor is abstract and one, "cannot take (say) 539 from 209671 dollars." Not by division, because "we want to find the number of units in a group." How, then, is the quotient obtained since "it is not given at once?" The ordinary mind—the mind unblessed with the gift of genius—obtains it by *exactly* the same process that is employed in dividing by 539. And in all such (possible) problems in "partition," the "answer" is universally and necessarily found by the division process. Yes, "but bless your heart, Doubter, that, nevertheless, is not a problem in division—it is something widely (in the language of the Master, *radically*) different—it is *partition*."

II.

Let us now try to look at the problem of division from the standpoint of common sense, premising that we have already anticipated some thoughts bearing on the subject.

It is an accepted principle that *we learn with what we have learned*; the "apperception" of the *new* depends upon the *old*. Division is the inverse of multiplication; in learning division we use our knowledge of multiplication; we marshal our "apperceiving" ideas in order to attack division. We know that in multipli-

cation a group of units known as the *multiplicand* is repeated a number of times expressed by the *multiplier*—that the multiplier *must* be a pure number (i.e. abstract)—that the law of commutation holds, e.g. 3 groups of 4 things is identical with 4 groups of three (the same) things, etc. This knowledge is brought to bear upon the “mystery” of division. For the sake of simplicity let us take our old example: $\$4 \times 3 = \$12 =$, also, $\$3 \times 4$. Now in division there is given either

(a) The product $\$12$ and the factor, $\$4$, to find the other factor—3. Or

(b) The product $\$12$ and the factor, 3, to find the other factor $\$4$.

In the one case (a) we are searching for *times*, i.e. for the *multiplier*, which with the given multiplicand will make the product $\$12$. In the other case (b) we are searching for the unit-group $\$4$, the *multiplicand* from which with the given multiplier, 3, the product $\$12$ may be found. In the former case (a) the divisor is concrete and the quotient necessarily abstract—a pure number. In the latter case (b) the divisor is abstract and the quotient necessarily concrete. Speaking somewhat loosely, therefore, we may say that there are two kinds of division: division (a) in the sense that a number *contains* a given number a certain (required) number of times, and (b) division in the sense that a number ($\$12$) is to be distributed into a given number of unit-groups of required value ($\$4$). But these “two kinds of division” are *not* “widely and radically different.” On the contrary they are essentially *correlative*: The one implies the other—the number of unit-groups cannot be found without their *value*—i.e. the number of units in each—nor the *value* of the unit-groups without their number. In both cases the

searching operation is precisely the same, and in both is implied the idea of *division into equal parts*. The difference, such as it is, is *not* in the process, or in the fundamental principles which underlie the process; it is in the *interpretation of the result*—in the one case *TIMES* is meant, in the other case the number of units in the correlative *unit-group*.

For example: $\$12 \div \$4 = 3$ —not “3 four dollars”; here the quotient is a pure number, is in fact the *ratio* of $\$12$ to $\$4$? Again: $\$12 \div 4 = \3 : here the quotient not only involves the relation (ratio) of 12 to 4; but also *names the standard unit*; in other words it is a concrete number expressing the absolute value of the unit-group. In the first example, we have the answer to the question (as it might be put), What is the *ratio* of $\$12$ to $\$4$. In the second example we have the answer to the question: *four* is the ratio of $\$12$ to what number of dollars?

In view of these fundamental principles, it is indeed surprising that these *two mutually related* processes should be declared fundamentally different; so different, in fact, that different names are needed to mark properly the difference. It is perhaps more surprising that some generally thoughtful men—e.g., the author of the “Philosophy of Arithmetic”—state unconditionally that the divisor can *never* be an abstract number.” Let us venture to illustrate the real process in the “two” divisions, working (to make the illustration more inclusive) by partial quotients as in ‘long’ division.

(a) Divide $\$12$ by $\$4$: $\$12 \div \$4 = ?$ i.e. find the *multiplier* which, with $\$4$ for a *multiplicand*, will give $\$12$. Or, still further, using the idea of partial quotients, the question might be stated: $\$12 = \$4 \times (1 + 1 + \dots)$ find the number within the brackets.

$\$4) \12 (1.....1st partial quotient—a multiplier.
 $\$4$
 1st Rem'r. $\$8$ (+ 1....2nd partial quotient—a multiplier.
 $\$4$
 2nd Rem'r. $\$4$ (+ 1...3rd partial quotient—a multiplier.
 $\$4$

The complete quotient is therefore $1 + 1 + 1 = \text{THREE}$: NOT three dollars, or "three, four dollars," or three *anything else* outside of the world of *Mind*

(b) Divide $\$12$ by 4, or find the number of dollars which, with four as a multiplier, will make $\$12$. Or, using the idea of partial quotients, the problem is: $\$12 = (\$1 + \$1 + \dots) \times 4$, find the number within the brackets.

$4) \$12$ ($\$1$1st partial quotient—a multiplier.
 $\$4$
 $\$8$ (+ $\$1$2nd partial quotient—a multiplier.
 $\$4$
 $\$4$ (+ $\$1$...3rd partial quotient—a multiplier.
 $\$4$

The complete quotient is therefore $\$1 + \$1 + \$1 = \3 —the required multiplicand, which must be used in recalculating the dividend. In (a) we had to use the preliminary ("apperceiving") knowledge that *once* $\$4$ is $\$4$; in (b) the preliminary knowledge that *four times* $\$1$ is $\$4$.

Since the operations of the Common Rules may be performed by counting, the foregoing examples may be illustrated by simple intuitions. (a) Divide $\$12$ by $\$4$, i.e. find the number of $\$4$ groups in $\$12$ —Representing the $\$12$ by dots, the result is obtained directly by counting:—

.	1st 4 dollar group
.	2nd " "
.	3rd " "

Here each of the rows is not simply *four*, but four *dollars*, the absolute value of the unit-group. While the vertical column of three dots may be

taken to represent the *pure number three*, i.e. the *times* the unit-group occurs. It corresponds to the $1 + 1 + 1$ of the operation (a) with symbols.

Now take the other case (b). Divide $\$12$ by 4, i.e. find the group of dollars which multiplied by 4 will make $\$12$.

.	four groups of $\$1$ each
.	" " " " "
.	" " " " "

Counting the 1st row we get *four* groups of $\$1$ each; then the 2nd row, etc. Therefore, in all, four groups of ($\$1 + \$1 + \$1 = \3) each. Where the right hand column of dots no longer represents a *pure number*, but the absolute magnitude of a quantity, i.e. three—*dollars*. Now, once more, the operations here indicated are *not* "widely and radically different;" they are correlative; the column cannot be had without the row, nor the row without the column: The *difference* is in the *meaning* of the result.

From the foregoing it appears plain that, as to preliminary knowledge:—

1. The idea of *times* must be clearly grasped since it is essential to number-conception.
2. The multiplier *must* be abstract—it denotes simply *times*.
3. In multiplication the factors may be interchanged, i.e. $a \times b = b \times a$; or in words, *b* groups of *a* units each is identical with *a* groups of *b* units each.

As to division:—

1. The operation in division is the inverse of that in multiplication. That is the problem of division is: Given the product and one of two factors which produce it, to find the other factor.

2. Therefore there may, "in a sense," be two kinds of division, corresponding respectively to the search for the *multipiler*, and the search for the *multiplicand*—i.e. for the *number* of unit *groups*, and for the number of units in each group.

3. The mechanical and mental processes in the "two kinds," are the same. The difference between them being in *meaning of results*: in the one case "times" (repetition of unit-group) being found; in the other case the *value* of (number of units in) the unit-group. But the results are correlatives; the one cannot be had without the other.

4. That the "divisor" and "dividend" may be both concrete, in which case the "quotient" is *abstract*. Or the divisor may be abstract and the dividend concrete—in which case the quotient is concrete.

5. That an utterly false "principle or law" of division cannot simplify fractional Arithmetic.

COMMON ERRORS IN PHYSICS.

BY C. A. CHANT.

WHILE engaged in reading the candidates' papers returned at the various examinations, held by the Education Department during the last summer, many errors were so frequently met with that the Associate Examiners in Physics requested the writer, who had the honor of acting as their chairman, to prepare for publication an article indicating some of the points where students go wrong. It was thought that those who were asked to read the papers had, perhaps, some advantage over those left at home, or at their holiday resorts, and that such a statement might be of some use to all those teachers in our secondary schools to whom falls the subject of Physics.

It may not be amiss to remark that the Committee, nearly all of whom had acted for the two previous years, were of the opinion that the Primary papers were better than those of 1891 or 1892: and that the Junior Leaving papers were decidedly ahead of those in the other two years. Indeed these candidates seemed very intelligently prepared, and were a credit to the schools attended by them. It was no uncommon thing to find a dozen candidates in succession take, on an

average, over 70 per cent. The work of the Senior Leaving candidates was more ragged and fragmentary. This may have been due to the fact that this was the first time such a paper had been set, and that many had to hastily prepare for it. The complaint was also made that the prescription of work was not very definite. But these reasons would not cover all the cases as, on inquiry of other sections, where such arguments would not hold, it was found that there was, pretty uniformly, a high rate of mortality.

It will be remembered that some of the questions called for the description of some experiment, and it is truly surprising what wonderful experiments were given in many instances. To prove that sound requires a medium to travel through, it was no uncommon answer to be told to pump all the air out of a room, and some were very anxious that the examiners should go into a room from which all the air had been exhausted, being assured that when there no sound would reach their ears. To prove that air would expand without applying heat, one would take a balloon to the top of a high mountain: he knew he would

see the phenomenon exhibited. To hear a watch ticking at a distance, many fanciful arrangements were suggested. Students should be carefully warned against such answers. When a question of that sort is given, only simple experiments, such as can be easily performed in the class-room or the laboratory, should be given. They might also be told that in every possible case, clear simple diagrams should be given. It requires little skill to draw a satisfactory diagram, and it seems natural to suspect that if the candidate knows the question thoroughly he will find it easiest to illustrate with a figure.

Another serious error was the confusion of *pitch* with *intensity*. This was perhaps the most common blunder of all. As a typical bad answer look at the following: "Take a piano-string and strike it slowly and then strike it harder. We notice that when we strike it with a little force the vibrations are not so many in one second, and the pitch is lower; therefore pitch depends upon the number of vibrations in one second, the greater the number the higher the pitch." It was the same with a tuning-fork, a bell or any other instrument: strike it harder and you get a higher pitch. I cannot think that all have emphasized this distinction, or surely so many slips would not have been made.

It was also noticed that some did not know the difference between an arc and an incandescent lamp, even though they were told that the latter had a slender thread which became bright. I suppose they had never seen either, and yet this foolish error should not have been made. In some cases the telephone was described under the name of the telegraph, and many other batteries in place of Grove's. One candidate, indeed, drew a diagram of a compound microscope and called it a common telegraph circuit, though for what reason the ex-

aminers could not say. The famous *carbon button* was also frequently seen. Ever since a question was put upon this little thing, it has been found looming up in all parts of the subject—in telegraph, telephone, electric bell, and everywhere else.

The above errors relate chiefly to the Primary papers, but many similar ones occurred in the Junior Leaving examination. The matter of simple experiments was again brought to our attention. To show that a body, when projected horizontally, will reach the ground as soon as if simply dropped, the experiment of shooting a cannon-ball from a cliff, and dropping another at the same time could hardly be accepted. Yet such answers were often seen. Something practicable should always be given.

In stating the Law of Charles (or *Chas.*, as some put it), the common mistake was to omit "at 0° C." Some candidates seemed able to get the answer to the illustrative problem and yet were unable to state clearly what the law was.

It is unfortunate that the test-book does not illustrate the common electric bell; yet almost every book on electricity describes it fully, and it was surprising to see how many bungled over it.

I shall not refer at length to the Senior Leaving. Many failed to give a quantitative definition of *density*. The statement that it is "closeness with which the particles are packed" is hardly full enough for first-class certificate work. Boyle's Law and Charles's Law were often confounded, and the phrase "0° C." was also left out of the latter. It was easily discovered that many failed to see the necessity of the double time-phrase used in describing an acceleration: the first part stating the velocity acquired (or lost), the second, how long it took to secure the change; the whole expression thus indicating the

rate of change. Magnus's "Mechanics" is partially responsible for this looseness, but such should not be tolerated. In solving questions in calorimetry a most objectionable method was seen several times. It will obtain the correct result in many cases, but a little consideration will show its fallacious reasoning. It was stated that 900 grammes of water at 30° C. contain 900×30 , or 2700, units (little calories) of heat; and that 630 grammes of brass, whose specific heat is .095, contain $630 \times .095 \times 30$, or 1795.5, units of heat. It will be seen at once that this assumes that at 0° C., these substances contain *no* heat, which is very absurd. As before remarked, the correct result will generally be reached by the faulty method.

Of course when such a large number wrote—almost 7,000—it was quite natural to find some who either knew very little about Physics, or who intended to start a new science of their own. We were informed that "when a nail is driven into the wood it does not destroy its properties any, but only causes them to be driven more closely together," and that "the holes in the chalk [when it is dropped into water] come to the top." Another candidate was going to "take a thin tissue bag which wholes two points," and another bright one explained an experiment that "produces a harmonious dischord." Still another one asked the examiner to "fill a jar with hydrolic gas." Again, "it requires 536 calories to raise a unit of heat one degree," and "1 minute = 3600 seconds." Perhaps it may be a surprise to some to learn that "an electric lamp is used for determining the space between the poles of an electric light;" or that "an incandescent electric lamp consists of a circular globe of glass having a small globe of electricity inside," and "the slender [thread] becomes so bright because there is no penumbra." We learned that the

name *voltmeter* "is from Volta a Gernia scientist." A paper much worse than the usual bad ones, contained the following method for finding the specific gravity of iron: "The specific gravity of iron is 415 pounds to the square inch. Melt the iron so as to have it limpid, and put into it the acid hydrometer whose 0 mark is at level of water, and is at the top of the glass tube, the hydrometer would then rise partly out of the limpid iron and remain with one of its graduations on a level with the surface of the iron, this then would be the specific weight of iron." The hydrometer consists of "two pieces of wood fastened together so as to form a bellows;" and "the barometer measures pressures, the water barometer measures pressure of water and the air barometer measures the pressure of air." Another, apparently of the opposite sex, but probably a twin with the "limpid iron" one just above, defined Charles's Law thus: "When a body of gas has twice as much pressure exerted upon it the mass, or rather the volume is decreased according to the square of twice the sum of heat or pressure exerted." But if we do not care to accept this statement, the following may be better: "The Law of Charles is that a solid displaces an equal weight of water in a fluid." Still another, who should have had a fair knowledge of the subject, after writing a very poor paper, made a graceful exit with the remark, "No more time the examiner is onto me."

Man, proud man!
Dress'd in a little brief authority;
Most ignorant of what he's most as-
sured,
His glassy essence, like an angry ape,
Plays such fantastic tricks before high
heaven
As make the angels weep.

—*Measure for Measure*, ii. 2.

CHURCH AND STATE.

BY REV. WM. MOORE, D.D., OTTAWA.

(Special Revision.)

II.

TO be sure, these tendencies are in a large measure restrained in most Christian countries, notably in our own, by the fact that an immense majority of the people are Christians; and so, with very few exceptions, are our teachers. The teachers in our public schools being God-fearing men and women, no matter how strict the surveillance may be, they cannot but exert a wholesome influence. The character of our teachers may retard, but cannot wholly arrest the process. Principles are stronger than men and gradually mature their fruits in spite of all efforts to restrain or counteract them. Slowly but surely they form to themselves a people fashioned in their own image and then all the restraints of a timid conservatism are swept away.

If there was any other alternative; if, for example, there was any way by which our children could be withdrawn from such unwholesome influences and educated on sound Christian principles, so that their training for the earthly citizenship might be auxiliary to that which should fit them for the heavenly citizenship, perhaps this matter might be of less importance.

But there is not. The hour we have the children in the Sabbath school, which is particularly the children's church (or, for that matter, the hours of public worship one day in seven), is utterly insuflcient to enable us to counteract the influence of mere secular teaching given continuously for six hours a day for five days in the week, and that for two

reasons. (1) The mode of instruction is necessarily less direct and effective. The vicarious reading of the Scriptures and the sermonic form of address cannot compete with personal reading, and instruction by question and answers. (2) And, besides, neither in Sabbath school nor church can we teach history and the sciences permeated with a Christian spirit, which we must needs do in order to offset the spirit of the age. Moreover, there are far too many children of whom it is true that if they do not get some notion of religion at school they will stand but a poor chance of ever getting it at all. And what is more, though the sons and daughters of Christian families may be safeguarded to a large extent, I contend that it is not fair to antagonize, and undermine the home training by excluding religion from the school life and substituting for it a subtle spirit of unbelief, which, in spite of its plausible insinuating profession of respect, is distinctly hostile to revealed religion. I know perfectly the feeling and outcry there is against teaching *dogma*, but I cannot understand why it is not as just and reasonable to teach Christianity as it is to teach materialism. The latter is every whit as *dogmatic* as the former. I say, therefore, we are compelled to choose between a religious or an irreligious, a theistic or an atheistic state. This being so, I have no hesitation in saying that the State must have positively a religious character, and that it should in its own schools teach religion as a necessary part of education. If you ask what religion, I answer that for a Christian

people, which we are, as there is but one sun in the heavens so there is but one religion—the religion of the incarnate Son of God.

If you ask how it is to be taught, I answer by putting the word of God into the hands of both teachers and pupils, by making it a regular textbook to be diligently studied and to be faithfully taught every day until the youth of our country have the great essential facts of revealed religion fixed in their memories and its precepts treasured up in their minds, to become, under God, the great controlling and moulding power in after life. How else can a Christian State educate its citizens to be true, pure, honest, upright and virtuous? There is no living root for morals but the faith of Christ, and the surest guarantee of liberty, whether civil or religious, is the recognition of it as the gift of God.

If such be or should be the attitude and duty of the State toward religion, what is the relation of the State to the Church?

It may be said, and it has been said, that if the State is a religious body, in the sense of being actuated by the fear of God, and that it has a right to teach religion in the public schools, then it ought to go further and take the Church into alliance with itself, support the clergy as officials of the State, and enforce church discipline with such temporal sanctions as fine and imprisonment.

To this we reply that such an inference from our doctrine proceeds on a radical misapprehension. It overlooks the essential difference in the origin and purpose of Church and State.

II. THE CHURCH.—The Church is a society organized under the mediatorial authority of the Lord Jesus Christ to secure the present and eternal salvation of men by the

regeneration of the Holy Spirit, through the knowledge and belief of revealed truth. The domain of the Spirit is, therefore, the sphere of the Church. Its weapons are purely spiritual, the word of God, and its powers simply educational and disciplinary. As a teacher, the Church must teach divine truth, "precept upon precept, precept upon precept; line upon line, line upon line; here a little and there a little." Waiting with endless patience for the maturing of the soul in faith and knowledge and righteousness through fellowship with God.

The discipline of the Church is simply the bringing of the truth to bear on the heart and conscience for the reformation of morals and the perfecting of the soul in holiness. In those sorrowful cases in which the salutary influence of the word, and prayer, and affectionate remonstrance prove unavailing to secure a walk and conversation becoming godliness, discipline also proceeds to an anticipation of the final judgment by cutting off the unworthy member from the fellowship of the Church. The sentence of the Church carries no civil disabilities or penalties. It simply debars from the Lord's supper and from baptism and the spiritual benefits which accompany the right use of these ordinances.

The sentence of exclusion is not nugatory, because it is unaccompanied with civil penalties. It professes to be based on the word of God. It brings the offender face to face with God and raises the question of his eternal salvation. If the judgment of the Church be well founded, and the sinner persists in his sin, then exclusion from church fellowship on earth is the standing reminder of exclusion from the General Assembly and Church of the first-born, whose names are written in heaven, and the visible and present forecast of ever-

lasting doom. It is not now a question of membership in this or that branch of the Christian Church. The appeal lies not from one session, or from one Church to another, but to the bar of God.

If a man under Church censure knows himself pure from the charge which was the occasion of the sentence of exclusion, he may appeal with confidence to the righteous and heart-searching God, who will defend the right, and cause his righteousness to go forth as the noon-day. But if he knows that he cannot in all soberness appeal from the earthly to the heavenly tribunal, from fallible man to the infallible Judge, if, in a word, he knows himself justly condemned for his sin, he knows, also, that he must repent, or take the awful consequences of impenitence. The final act of church discipline is thus the last and most solemn form of religious appeal, the most solemn application of the word of God to the conscience, and can hardly fail, when done in a right spirit, to make a powerful and wholesome impression. It is, however, throughout, from first to last, a spiritual sentence enforced only by spiritual considerations.

And yet, as a matter of fact, the body which exercises these spiritual functions is a visible and public body, composed of the professing people of God. In virtue of this public character and visibility the Church necessarily possesses certain civil rights. It cannot but acquire, either as a tenant or freeholder, the land and buildings necessary for use in public worship; and the right of free and undisturbed assembly is now almost universally acknowledged and safeguarded by the power of every Christian State.

We have already set out at large the powers of the State and its necessary moral character. Repetition is unnecessary. It will be sufficient

briefly to recapitulate and contrast the points of difference.

The State is the institute of rights, whereas the Church is the institute of grace.

The State grows out of the purpose of creation as realized in the mental, moral and physical constitution of man, and holds its charter from God the Father as the universal King of nations. Whether they are heathen or Christian, the powers that be are ordained by God.

Whereas the Church grows out of the purpose of redemption and is organized under the mediatorial sovereignty and power of God incarnate, the Lord Jesus Christ.

The State exists for the protection of all within its bounds, in their rights of liberty, family, person, property, and good name, "That we may lead a quiet and peaceful life in all godliness and honesty."

Whereas the Church which, is the pillar and ground of the truth, exists for the proclamation of the word, and the ministration of the sacraments, for the conversion of sinners, the perfecting of the saints and for the edifying of the body of Christ, until we all come in the unity of the faith, and of the knowledge of the Son of God unto a perfect man, unto the measure of the stature of the fulness of Christ.

The State maintains and perpetuates itself in the last resort by the sword. As Christ said to Pilate "if my kingdom were of this world then would my servants fight."

Whereas the Church maintains and propagates itself by purely spiritual agencies, by the manifestation of truth to every man's conscience. For the weapons of our warfare are not carnal, and these weapons are furnished by the written word of God.

And finally the State endures only while this present world continues. When that dread day comes in the which the heavens shall pass away

with a great noise, and the elements shall melt with fervent heat, and the earth also and the works that are therein shall be burned up—then the kingdoms of this world and all the glory of them shall perish forever.

Whereas the Church endures to all eternity. The day and hour which marks the final vanishing of all the power and glory of the State is the very day and hour in which the Church shall arise from the dust and put on her beautiful garments and become the joy and praise of the wide universe. He shall come to be admired of the saints.

Powers so inherently diverse in origin, in purpose, in methods, and in duration are necessarily distinct and mutually independent. Hence the objection with which we are dealing assumes too much. The objector forgets that his objections may be turned against himself.

The Church as a visible society of professing Christians undoubtedly has civil rights. If, therefore, it be said that the knowledge of a religious element in the State necessarily carries with it the conclusion that the State should assume the functions of the Church, we may with equal propriety reverse the order, and say because

the Church has certain civil rights and a territorial home, therefore, it should assume the functions of the State. Put thus, it seems to me the objection answers itself. Here, then, we have, so to speak, two great corporations having something in common, but having each its own peculiar and distinctive purpose and work. The fact that these are certain things common to both, is no reason why either of these corporations should usurp authority over, much less swallow up, the other.

The conclusion of the whole matter is that the state or civil power necessarily possesses moral character; that where, as in this country, Christianity is the prevailing religion the ethical character of the state should harmonize with the Word of God; that the Christian state, in virtue of its inherent character as the creature of God, has a sphere of action in the matter of religion; and that though in connection with religion church and state have much in common, their functions do not coincide, and their duties do not interfere, much less conflict.

Excellence comes from toil, from fidelity to purpose, from intelligent effort.

THE SECRET OF DISCIPLINE.

THE use of corporal punishment, except in extreme cases, is a thing of the past. What shall be its substitute? A careful study of the conditions which will bring willing obedience.

There are material and personal conditions which help to obtain the desired result. Under the first head would be pure air and a proper arrangement of light.

No teacher needs to be told the necessity for pure air in the school-

room, and yet you may enter room after room in which the air is unfit to breathe. This is because the change from the pure to the impure air is so gradual that those who are in it are not aware of it. For this reason, it seems well that the teacher should step from her room into the corridor once or twice during the session, when, on return to her room, the condition of the atmosphere will instantly be apparent to her.

The proper arrangement of light is

not always in the power of the teacher. The windows are often very badly placed, giving cross lights which should have been avoided when the building was designed. But suppose there are no cross lights, we then find the chairs so placed that the light which should come from the back and right is more often directly in front, or nearly so. These conditions are not only injurious to the eyes, but they produce an unconscious irritation which makes children restless and disorderly.

I have often heard teachers told to have plenty of light in their rooms. Too much light is as bad as too little. Raise your curtains to the top of your windows some sunshiny day, and leave them so all day. The next day, of the same kind, draw them part way. Now tell me, were you not much more tired the first than you were the second day? Have plenty of light, but beware of too much, for it tires, and a consequent restlessness is observable.

Having arranged the material conditions to the best of your ability, turn your attention to the personal; teaching, where it is possible, by example as well as by precept. Example is often much the more effective remedy.

Order, cleanliness and plenty of work are tools which are most useful in the school-room. It is your right, teachers, to demand of the parents that their children shall have clean hands and faces and combed hair. I feel that you say the demand is wasted, for the children come just as dirty after it as before. This is only too true, but you have one remedy at your hand. Every school-building has water in, or about it, and you can oblige the culprit to wash there, if he will not at home. If he does come one day unusually clean, let him know that you are aware of it and appreciate it. Many teachers examine the faces, hands, hair and boots of pupils at the

opening of each session and they say the result is quite satisfactory.

Cleanliness and order are so closely allied that I feel that I must speak of them together. "A place for everything and everything in its place," is a great help toward cleanliness. We little realize what poor examples some of us are of this rule, which we try so hard to impress on the minds of our pupils. Can we go to our desks in the dark and take from them anything we want? Can we go to our closets and do the same? Here is an excellent chance to teach by practice as well as by precept. We should have our things arranged as carefully as we expect theirs to be, and keep them so.

Every pupil should have a place for each thing necessary for his work and keep it so carefully in its place that he can at any time put his hands into his desk and take from it, without stooping, any article he needs. It is surprising how much noise and confusion this obviates, to say nothing of the time saved.

Each pupil should understand that the chair he occupies, the desk in front of it, and the floor beneath and around it are his, and his only; that he is held responsible for the condition in which they are kept, whether the dirt which he finds on his premises were put there by himself or another.

Now, give him as much, or more, to occupy his time, as he has time to occupy, and you will not miss the old time rod.

There is one more very important thing, your voice. Imagine your feelings after sitting five hours under the incessant talk of a loud or harsh voice. If a child is hard of hearing it is better for him, and far better for the other children, that he occupies a front seat. Pitch your voice slightly above conversational tone and decline to repeat. The result is, ease to yourself, rest to the children, and a kind of attention hard to attain in any other way.—*Popular Education.*

CHRISTIANITY AND EDUCATION.

THE relation between Christianity and education is that of cause and effect. By Christianity is meant that perception of truth which has its clearest exposition in the teachings of Christ. It existed before Christ's day; it was announced by Him so distinctly that it became a working scheme for the world. Christianity has for entire aim the good of man; this was the utterance the shepherds heard.

The mark of Christianity is the effort to elevate man; the possession of knowledge is declared to be important. The knowledge urged is not religious knowledge either. Solomon sets forth both knowledge and the value of knowledge; his knowledge was of law, of customs, of ways and means, of practical advice uttered in the epigrammatic style of his times; he was the Benjamin Franklin of his day.

The Apostles had clearer conceptions of the knowledge needed by the world: the knowledge they undertook to impart was but partly religious; as in the case of Jesus they sought to set men to thinking. They had reasons above the Jewish world for inducing men to think and be governed by the highest attainable thought; it was that the Holy Spirit might find a fit temple for His work.

It was a result of the teaching of the Apostles that the monasteries and the churches nourished learning and kept it alive through the dark ages that ensued when the Roman empire was broken up. Very numerous are the evidences that the church did its best to give instruction to the young. Theodulph, one of Charlemagne's bishops, ordered that "the elders establish schools in towns and villages and if any of the faithful wish their children to be taught letters, let them not decline to receive and teach them."

There was to be no charge made for these services. Charlemagne ordered schools to be opened everywhere "to teach children to read." This is one of his laws, in every monastery some one shall teach psalms, writing, arithmetic, and grammar."

It was conceded that really to benefit man knowledge must be imparted to him; that to have a mind capable of understanding religion was absolutely the first thing. The founders of the Reformation, like the main church from which they branched off, saw the importance of education; only as it was vitally important that men should comprehend their views, they strove most for the universal diffusion of knowledge. The New Englanders as soon as the trees could be cut down founded churches and schools. It is a matter of history that within thirty years after the landing of the Pilgrims, education had been made compulsory in all the colonies except Rhode Island.

The establishment of public schools in every part of this country is not caused by a desire to establish Christianity; they are the results of Christianity, not the cause. The early New Englanders proposed to employ schools as a direct cause of Christianity; but not so with the New Englanders of to-day. The argument for schools is based on the recognition of the right every individual has to knowledge that will benefit him; Christianity has enabled man to recognize the right of his fellow-man. A person is passing along the street and inquires his way; the readiness of all he meets to give him the information he needs does not come from politeness, but from a recognition of his right to this knowledge.

The schools must on their part diffuse Christian doctrines—not the doctrines of a sect. The schools are to

build up character—by which is meant a determined willingness to act in accordance with the laws of the universe. It is the duty of the school to teach these laws and induce the pupils to obey them. The reason that criminals increase in number out of proportion to the increase in population is that character is not made the object of the instruction given; there are other standards set up, standards of scholarship. Persons are employed to teach who do not and who can not make character the object of their efforts. The effort that was made to take Protestantism out of the schools, and the rapid expansion of the school system came together, and resulted in the employment of a vast number of persons as teachers who became simply "recitation posts."

In 1850 the ratio of prisoners was in Massachusetts, 1 to 1,267; in 1880 the ratio was 1 to 615—these are the native born, remember. The causes are stated above. The care is to make the schools nurseries of character; the doctrines of Christianity must be taught in them. Those who are employed must be persons who have a Christian character themselves. This is not saying that members of any church, Protestant or Catholic, must be employed; nor is it saying there must be reading of the Scriptures and prayer. What is meant is that the doctrines of Christianity must pervade the teacher's life and thus find an entrance into the school-room. The chief difficulty in the way is that the parents are indifferent concerning moral teaching, not that they will tolerate a so-called immoral teacher. But of two teachers one who is evidently a person of high moral aims, the other "who is smart as a whip," to use the language of a school officer in describing an applicant he had just seen, the latter will be chosen every time. They do not understand that character-forming is the real work to be done in the school room.

Let us, to economize terms, call the teaching of Christian doctrine moral teaching. Let us suppose that it is charged upon teachers to give moral instruction—for example, to teach the law of veracity and the consequences of failing to obey it. When the moral laws are put on an equal footing with the laws of physics or physiology results not now apparent will make their appearance. Some will say they cannot do this because the Bible is taken out of the school. But the moral laws exist without the Bible; they are in the Bible because they are true.

Our education, therefore, to yield its appropriate fruit, must aim to deposit a firm belief in and a practice of the moral laws. The tendency now is to aim at character far more than formerly; when the parents demand it, those who are competent to teach morality will be invariably selected as teachers. Then, the public schools the offspring themselves of Christianity, will in turn become fountains of Christian belief and practice.

A book, like a person, has its fortunes with one: is lucky or unlucky in the precise moment of its falling in our way, and often by some happy accident ranks with us for something more than its independent value.—
Walter Pater.

"New times demand new measures
and new men;
The world advances and in time out-
grows
The laws that in our father's days
best;
And, doubtless, after us, some purer
scheme
Will be shaped out by wiser men than
we,
Made wiser by the steady growth of
Truth,
We cannot hale Utopia on by force."
—*Lowell, A Glance Behind the Cur-
tain, 1843.*

THE ART OF STUDY.

BY DR. B. A. HINSDALE.

THE paragraphs quoted below are taken from Dr. Alexander Bain's essay on "The Art of Study," found in his "Practical Essays." They are commended to students and teachers as sound doctrines.

The question, What is the best way to study? is one that both learner and teacher consider far too little. It controls the question, What is the best way to teach? Dr. Bain lays down three fundamental propositions :

(1) In the early days of education, instruction must be narrow. (2) It must be thorough. (3) Only when the pupil is "thoroughly at home on the main ideas," only when "one thread of ideas is firmly set in the mind," only when "one single line of thought" has been wrought into the mental substance, should the teacher begin to be discursive and "broaden" the work. In history, what folly to fall to comparing, interpreting and discussing before the pupil has amassed a store of facts on which to set his reflective faculties at work. In dealing with the history of a country or nation, the first thing to be done is to fix in the pupil's mind firmly the main points—an outline—a frame-work—in which he can dispose and arrange minor facts and details as he acquires them; or, to change the figure, to provide his mind with a supply of hooks and pegs on which he can hang up, in proper order and in due relation, new facts and ideas as he masters them.

"Our first maxim is—'Select a Text-book-in-chief.' The meaning is, when a large subject is to be overtaken by book study alone, some one work should be chosen to apply to, in the first instance, which work should be conned and mastered before any

other is taken up. There being, in most subjects, a variety of good books, the thorough student will not be satisfied in the long run without consulting several and perhaps making a study of them all; yet, it is unwise to distract the attention with more than one, while the elements are to be learnt. In geometry, the pupil begins on Euclid, or some other compendium, and is not allowed to deviate from the single line of his author. If he is once thoroughly at home on the main ideas and the leading propositions of geometry, he is safe in dipping into other manuals, in comparing the differences of treatment, and in widening his knowledge by additional theorems, and by various modes of demonstration. * * *

"Undoubtedly, the best of all ways of learning anything is to have a competent master to dole out a fixed quantity every day, just sufficient to be taken in, and no more; the pupils to apply themselves to the matter so imparted, and to do nothing else. The singleness of aim is favorable to the greatest rapidity of acquirement; and any defects are to be left out of account, until one thread of ideas is firmly set in the mind. Not unfrequently, however, and not improperly, the teacher has a text-book in aid of his oral instruction. To make this a help, and not a hindrance, demands the greatest delicacy; the sole consideration being that the pupil must be kept in one single line of thought, and never be required to comprehend, on the same point, conflicting or varying statements. Even the foot-notes to a work may have to be disregarded, in the first instance. They may act like a second author, and keep up an irritating friction.

"The subjects that depend for their full comprehension upon a certain method and order of details, are numerous, and include the most important branches of human culture. The sciences, in mass, are avowedly of this character; even such departments as theology, ethics, rhetoric, and criticism have their definite form; and, until the mind of the student is fully impressed with this, all the particulars are vague and chaotic, and comparatively useless for practical application. So, any subject cast in a *polemical* form must be received and held in the connection there by given to it. If the arguments *pro* and *con* fall

out of their places in the mind of the reader, their force is missed or misconceived.

"History is pre-eminently a subject for method, and, therefore, involves some such plan as is here recommended. Every narrative read otherwise than for mere amusement, as we read a novel, should leave in the mind—(1) the chronological sequence (more or less detailed); and (2) the causal sequence, that is, the influences at work in bringing about the events. These are best gained by application to a single work in the first place; other works being resorted to in due time."—*Moderator*.

THE TEACHER TAUGHT.

THE teacher taught—not by the normal school, nor the weekly meeting, nor the summer assembly, nor the national convention, but—in the school-room itself, by the faithful and earnest doing of the daily task and the wise appropriation of wisdom's experimental hints. That is the way every teacher, who is properly constituted and evolved, gets that final and supreme training which is the secret of professional success. The teacher may come from the training school armed *cap-a-pie* with all the equipment of knowledge and method, but he will be as awkward and ineffective as David in the armor of Saul, until he has put off his profundities and his theories, and stooped to pick some of the smooth stones of wisdom from the brook of practical experience. That is the reason why school committees, in selecting teachers, give so much importance to the matter of previous experience. The crucial question always is, not how much does one know? but, how much of

what one knows is he now capable of imparting to others?

We shall have to admit, then, that the best teaching for a teacher, that which consummates and crowns, and makes fruitful the whole educational process, is the practical experience of the school room. Nothing can take the place of this or render it in any degree less valuable, less essential.

Such being the fact, it will be interesting, I trust, to study for a few moments this subject of self-instruction in school-room work. How is the teacher taught? What are the methods by which this reflex educational process is accomplished?

First, the teacher is directly taught by the pupil. What a debt of gratitude every instructor owes to his classes, for the discovery of new points of view, for fresh and unhackneyed interpretations of truth, for keen, earnest questions that pierce to the very heart of a subject, for intuitive hints and suggestions, throwing their light far beyond the topic

under discussion! I doubt if any thoroughly wide-awake and appreciative teacher ever had a pupil from whom he or she has not learned something of permanent value.

It may be that the lesson comes in the way of rebuke. Many a teacher has blushed with honest shame at the quiet, straightforward *naïve* criticism of a clear-eyed child. No one so quick, so sure to spy a fault, and, having spied it, to frankly point it out, as a school boy or a school-girl. Respect the honest faces of children. It will not do to be anything but sincere and genuine before such batteries of innocence and sincerity as these.

Again, the teacher's instruction from the pupil may come in the way of appeal. One of the greatest benefits of dealing with young people is the magnetic way they have of drawing a person out. Their needs, their demands, even their manifest failings make a certain helpful draft upon an adult, and especially upon one who stands to them in the relation of teacher. The lack in the pupil must somehow be supplied by a greater sufficiency in the instructor; and this is a healthful invigorating demand. It puts new strength into the helping mind, just as leading and guiding and lifting over hard places puts new strength into the helping hand. The teacher who has had no experience in the way of supplementing the needs and deficiencies of pupils, has lost or neglected one of the most valuable aids to self-development and equipment for his chosen work. The appeal of the student should be one of the teacher's most potent inspirations and incentives.

But, secondly, the teacher is taught in the regular routine of school-room work, by the discipline of mistakes. No worker of any kind is worth much who has not made mistakes—and profited by them. It is the most

wholesome kind of discipline. One never forgets the lesson of a mistake. It is like a mnemonic burr, that sticks so tightly it would pain you to get it out. The first year or two of any teacher's experience is sure to be checkered by mistakes. But instead of being therefore a depressing period of life, as it too often seems to be, it ought to be a time of perpetual thanksgiving, for throughout it all wisdom is conferring her most precious gifts upon the novice. For every perceived and acknowledged mistake you receive, as a voucher, one of the golden coins of experience—and more than that, fortune supplies you with a safety-vault in which to keep your wealth! For if you had learned these very lessons theoretically, you would be apt to forget some of them, but having learned them through the hard discipline of mistake, you will never forget one of them so long as you live. "Blessed be drudgery!" cries Wm. C. Gannett. "Blessed be mistakes!" we respond; for the soundest and sweetest fruit of experience is made up of amended mistakes.

But perhaps the most effective of all the agencies of self development in practical school-room work is experiment. I fancy I see some conservative educator start at this statement, as if it were rank heresy to claim the right of experiment for the average teacher. But heresy is at the front nowadays, as one of the world-moving forces. It is right in touch with the spirit of the age. Why, then, should we not import a little of this modern, vivifying force into education? I repeat my assumption, that the teacher is entitled to the right of experiment in school-room work. We have had too much cut-and-dried instruction in elementary education. We have had too much subordination of the individual to prescriptive method. It is high time that the element of personality were taken into the account.

I assume, therefore, that the modern teacher has, or will presently have, the right to import his 'or her personality into school-room work and conduct classes in accordance with personal talents and aptitudes. This includes the necessity, to a certain extent, of experiment. This tentative process, however, need not exceed in any way prescribed educational principles and customs, so far as these are universally admitted to be beneficial. It may simply be applied to the best methods of imparting instruction entirely within the limits of these prescriptions, but with the element of the teacher's personal aptitudes and fitnesses taken into the account. It is in this adjustment of personality to the needs of the school-

room that the teacher gains much of that higher self-teaching which is necessary to successful professional work. If teaching is a science, then this is the true inductive method of pursuing it.

Such, then, are some of the means of school-room culture for teachers. It is a sad mistake to think that when one enters upon the active work of teaching, the period of preparation for that work has passed. On the contrary, the most important stage of it has just begun. The school-room is a post graduate normal course, and, like all post graduate courses, it furnishes the most advanced and important and valuable instruction which is obtainable.—*The Educational Record.*

METHOD IN TEACHING.

THE method of teaching will vary with the nature of the subject to be taught and with the age of the children receiving instruction in that subject. The right method takes into account the process of the growth of intellect in children. Three periods in school life are generally indicated, which are marked by three distinct stages of intellectual and physical development. The method applicable at one stage will not do as well at another. Great judgment and discrimination are necessary on the part of the teacher as regards matter and method, especially in elementary instruction where he has to form the mind of the children. No doubt acquisition of knowledge must be to a certain extent the scope of teaching, but in the earlier stages of instruction the educative value must take precedence; and therefore the method of imparting is of very great importance in primary instruction.

During infancy the child becomes acquainted with the external world, and his senses are in a state of constant activity. He is constantly making discoveries, and making progress more and more into the regions of the hitherto "unknown" to him. By the acquisition of new facts, and by their combination with those already known, the child gradually acquires knowledge and corrects errors into which he may have fallen. These processes of the child in his own acquisition ought to be the guide for the teacher. This is expressed in various forms and all may be summed up in one rule, "Follow Nature." This is the process by which children learn when left to themselves. But when the child is placed in charge of the teacher, the latter, while trying to make the child an instrument in his own instruction, smooths the way and renders the work of the child lighter and more interesting. If the method

of instruction is rightly chosen with due regard, as has been said, to the matter and to the receptive capacity of the children, the latter are taken from the known to the unknown by gradual steps that render acquisition of knowledge and cultivation of the power a thing of easy and gradual growth. The right method contemplates teaching any branch of instruction by a series of lessons carefully arranged and graduated like the steps of a ladder, one step leading to another till the end is reached. The teacher may attempt all these; but one condition must be fulfilled so that all his endeavors may bear fruit, *i. e.*, the regular attendance of the pupil. It unfortunately happens that in most of our elementary schools much of the efficacy of teaching is lost by the irregular attendance of the pupils. For the cultivation of the powers it is essential that any scheme of lesson worked out by a teacher is fully grasped by the pupil and that no intermediate steps are lost. If regular attendance is secured, for which the earnest and active co-operation of the parent is essential, especially in the case of little children, the teacher will find it his duty to resort to the various means at his disposal to promote their attention and diligence in connection with their school work.

Strictly speaking, there are only two methods of instruction, the Inductive and Deductive methods. These two have also been called the Analytic and Synthetic methods. The use of these latter terms has been condemned by nearly all writers on education, on the ground that great confusion exists as to their precise meaning and "different authors have not come to an understanding as to the use of these terms." In the application of the Inductive method, the teacher tarts with facts, and having made his pupils observe and test them, classifies them and leads the pupils to a

law. By the Deductive method the teacher starts with truths, rules and definitions, explains and makes them understood, and then passes to the application of these rules, etc., to particular cases that fall under the rules. These two methods are not always used exclusively in teaching, they frequently intermix, each being introduced to test and confirm the work of the other in the minds of the children. These being indicated as the fundamental methods of teaching, we should consider in what manner the knowledge is to be transmitted to the pupil. The method may be inductive or deductive; but it will make a great difference as regards the impressiveness of the instruction which of the following forms of communicating knowledge to the pupils be adopted. The teacher may by means of a continuous uninterrupted discourse, state by either method what he has to say; or he may, by means of questions and suitable hints and suggestions, lead the pupils to comprehend what is placed before them. Hence we may indicate two subordinate methods, the method of Exposition and the method of Interrogation.

Each of these methods has its own advantages and disadvantages in relation to its sphere of application. While one is the suitable method to resort to, another is to put a square thing in a round hole.—*Madras Journal of Education*

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 "Things which are near to us are seen of the size of life, but things which are away diminish to the size of the understanding," says Hazlitt, and this seems to me to embody the difficulty which confronts every teacher in dealing with a class of varying capacities and imaginations, and to suggest the possibility of arriving at some common standard of judgment instead of the varying "understanding."—*Marie J. Mason.*

NOTES FOR TEACHERS.

THE SECRET.—The secret of Thomas Arnold's success in moulding the character of his pupils is found in his deep love for them. He entered heartily into their amusements, as well as into their mental occupations. He brought his own cultivated mind near to their minds, and awakened in them a love for the truth and good conduct; and the boys who graduated from his school went away into life bearing with them something of the spirit of their great teacher. Dr. Arnold owed his success as a teacher to the insight he had into the inner life of his pupils and to his knowledge of the springs of human action.—*John W. Dickinson.*

FOR CITY TEACHERS.—Unless you are doing much outside of the school-room to neutralize the narrowing tendencies of your work, your last state shall be worse than your first. If, for instance, in your grade—first, second, third, or fourth, as the case may be—you, year after year, repeat the same rules, make same explanations and suggestions, in the same tone of voice, and reach the same pages in every text-book at the same hour in each day every year, it needs no profound philosopher to predict that you will inevitably become an automaton, unless you find antidotes and modifying influences; and these are all around you, in the form of good books, periodicals, and newspapers. You and I think of several teachers—it is always our neighbors who are going wrong, not we—who are simply cogs in a vast machine. Miss So and So, you know full well, did not during the last school year read a single book which had the power to make her a wiser woman or a more efficient teacher. If she would but read the parable of the virgins!

The temptation to vex the principal's soul with every trifling difficulty you encounter in your room is constantly present. Think of your sister out there among the solitudes, 15 or 20 miles distant from the superintendent! *She* has no principal within convenient reach to quell refractory boys or perverse girls. When disorder or mutiny rears its head, she must decide instantly, and act vigorously. From the depths of her own resources she must bring forth wisdom, strength and courage. It must be plain to you that in self-reliance she is growing day by day, and that in the long run it is a blessed thing for her to be separated by creeks, woods and expansive prairies from reinforcements.—*Western Sch. Four.*

A SPEAKING WATCH.—An ingenious watchmaker of Geneva, Switzerland, has invented a watch in which he uses the phonograph to tell the hours. In the cavity of the case is a phonographic plate on which the hours and quarters have been marked by grooves. If the dial points to 12.15 for instance, a steel point drops into the corresponding groove on the simultaneously rotating plate, upon which "12.15" is then spoken, just as by the phonograph.—*Our Times.*

AN ASPIRING GIRL OF TO-DAY.—She is bright and ambitious; she looks out at the window in the world, and thinks that if she were among men she would make a great success, and that reward of fame—money—would come to her in plenty. Now, I do not want to say one word to discourage the one who thinks she is doing right in walking this path. It is a hard one to travel, and for the traveller there is not the gentle pro-

tection, the kindly consideration which is her lot at home.

But ought you to go? May not the life-work for you be in the home? May not the reward of industry be a sense of duty done and the love of those around you? We are all too prone to accept these rewards as commonplace, and only what should come to us; whereas they are, my dear girls, the brightest jewels that shine in the crown of woman. Look at home on the work that is waiting for you there. Do not under-estimate its value. Whatever it is, do it with a willing heart and a quick hand. Think it your pleasure to do it well. Make it your delight to be so successful that the home people will praise you. And if sometimes you give a thought to the big, gay world, where each is for herself and only God for all, be ashamed of the sigh that you give; remembering that you are working where God thinks it best for you to do so, and that you only merit displeasure when you scorn your work, or do it as do those who think eye-service of value. Don't—don't, dear girl,

rush away from your home. Think it all out first, and see where mother needs you. Then, after all, you get a better reward than any other worker, for you receive the blessing of God and the loving thanks of a mother.—*Ladies Home Journal.*

MAKING POSTAGE STAMPS.—Every part of postage-stamp making is done by hand. The designs are engraved on steel, 200 stamps on a single plate. These plates are inked by two men, and then printed by a girl and a man, on a large hand press. They are dried as fast as printed and then gummed with a starch paste made from potatoes. This paste is dried by placing the sheets in a steam fanning machine, and then the stamps are subjected to a pressure of 2,000 tons in a hydraulic press. Next, the sheets are cut so that each one contains 100 stamps, after which the paper between the stamps is perforated, and after being pressed the sheets are filed away. If a single stamp is injured, the whole sheet is burned.—*Educational Gazette.*

PUBLIC OPINION.

THE OTHER EXTREME.—If the exclusively disciplinary use of the old school reader constitutes one extreme, the other extreme may be seen in the reactionary and unwise substitution of information readers, science readers, the newspaper, and manuals of current events—all falsely labelled as literature. If the one emphasizes intellectual gymnastics at the risk of mental starvation, the other may simply tickle the palate with modern sweetmeats, in the name of utility, to the fatal exclusion of wholesome nutriment. J. H. PHILLIPS.

COMPANY DRILL.—But the school-master is growing. He seems to have exhausted invention and to have reached the highest point in perfecting the machinery of teaching a platoon of boys and girls to attack in unison and with precision the problem of computing interest, or of parsing a noun, or of bounding a State. But now he has got a glimpse of something beyond. He begins to see that this company drill does not compass the true and complete aim of education. He begins to discover that there are possibilities in the child

which are not touched or realized by this brigade regimen. He begins to know that two or more growing souls cannot be yoked together and marched as a unit to the highest destiny possible to each.—*Intelligence.*

DOCTORS DIFFER.—“ I am quite sure that many trifles are not worth the serious counsels expended upon them. Reading or telling a story, for instance, has become as grave a matter as choosing a laureate, and many a mother must stand aghast at the conflicting admonitions bestowed upon her: Read fairy tales. Don't read fairy tales. Read about elves. Don't read about ogres. Read of heroic deeds. Don't read of bloody battles. Avoid too much instruction. Be as subtly instructive as you can. Make your stories long. Make your stories short. Work the moral in. Leave the moral out. Try and please the older children. Try and charm the younger ones. Study the tastes of boys. Follow the fancies of girls. By degrees the harassed parent who endeavours to obey these instructions will cease telling stories at all, confident that the task, which once seemed so simple and easy, must lie far beyond her limited intelligence.”—*Agnes Repplier, in the N. A. Review.*

EDUCATIONAL GAMES.—“ For my part, I do not believe that all the kindergarten games in Christendom, all the gentle joy of pretending you were a swallow and had your little baby swallows cuddled under your wing, can compare for an instant with the lost delight of playing ‘ London Bridge ’ [‘ Oranges and Lemons ’] in the dusk of a summer evening, or in the dimly-lit schoolroom at bedtime. There was a mysterious fascination in the words whose meaning no one understood, and no one sought to understand—

‘ Here comes a candle to light you to bed,
And here comes a hatchet to cut off your head.’—

And then the sudden grasp of four strong little arms, and a pleasing thrill of terror at a danger which was no danger—only a shadow and a remembrance of some dim horror in the past, living for generations in the unbroken traditions of play.”—*Agnes Repplier, in the N. A. Review.*

NATIONAL LIFE AND CHARACTER.—If we view the history of the progressive races of the Western world, as a whole, we may properly regard it as the history of the evolution of human personality. The two greatest factors in that evolution have been Roman jurisprudence and Christianity. At the dawn of European history neither personal freedom nor individual ownership can be said to have existed. The family, not the individual, was the social unit. The unemancipated son differed nothing from a slave. Woman was never emancipated: as daughter, or as wife, she was in perpetual tutelage. The work of the great jurists of Rome was gradually to vindicate individual freedom of person and property: to shape, on rational principles, the law of private right. Christianity took up their work and carried it further than the lawyers had dreamed of. Their conception of a person was a man endowed with civil status—*homo civili statu præditus*. Very different is the Christian conception. It accounts free volition—the power of choosing a course of action without regard to the weight of motives for or against that course—the essence, the very form of personality, for such freedom is the condition of the realization of the ethical end in virtue of which personality is predicated of man. Mr. Mill truly witnesses that the separa-

tion, upon which [Christianity] insists, between temporal and spiritual authority, had "the happiest influence upon European civilization"; for that separation "is founded upon the idea that material force has no right over the mind, over conviction, over truth."

Now no one with eyes to see can look around the Western world and doubt that this great doctrine of human personality is everywhere called in question and is widely discredited. Richter, at the beginning of the century, observed that the tendency of our civilization was to make men as so many drops of water for the service of a monstrous steam engine. This is a result, both directly and indirectly, of that absorbing devotion to physical science which so specially characterizes the age. Unquestionable it is that the minute subdivision of labor rendered necessary by the stupendous mechanical improvements of our age, has been in a high degree degrading and damnatory to a large portion of mankind. A hundred years ago Adam Smith pointed out that the division of labor, by confining the industry of the masses to mechanical and sedentary operations, tendered to render them incapable of any generous and noble sentiments, or of forming a judgment on the great interests of the country, and to corrupt both the courage of their minds and the activity of their bodies. But the indirect results of our worship of physical science have been more disastrous still. What is called "the scientific spirit"—the mode in which physicists pursue their operations being meant—is very often imported into provinces of thought where physics, as such, has nothing whatever to say, and where its methods are wholly inapplicable. Sir William Hamilton observes that "an exclusive devotion to physical pursuits, by exhibiting merely the phenomena of matter and extension, habituates us only to the

contemplation of an order where everything is determined by the laws of a blind or mechanical necessity," the effect of which is "that the student becomes a materialist, if he speculate at all." Now he does speculate in these days a good deal, especially on purely metaphysical questions, and usually without any knowledge of metaphysics, or with that smattering of knowledge which is really worse than total ignorance. And the net result of his speculations is to reduce psychology to molecular physics, to make of ethics mere generalizations from experience, to deny the existence in man of conscience, free will, and moral responsibility, in any real sense; in a word, to depersonalize man.

And the same hostility to human personality which we meet with in popular philosophy is exhibited as markedly in popular politics. The great bulwark of man's freedom is the doctrine that human authority is limited and fiduciary; that it is subject to the eternal, indefeasible and imprescriptible principles of ethics; that the essential rights of man as a person—the claims and prerogatives of conscience—are beyond its jurisdiction. But now on all sides there arises the claim that man belongs wholly to the State; that it should be the one supreme object of his love and reverence and worship. Of all the liberties which are bound up with and flow from human personality, one of the most precious is the father's liberty to educate his children as his conscience dictates. The claim has been made, and has largely prevailed, that the education of children is the immediate concern, not of the father, but of the State.

But we must go further. We do not hesitate to say that the cardinal principle on which modern radicalism rests is absolutely inimical to human personality. We must remember that personality varies almost indefinitely.

And as it varies, so do rights vary. It is not only the source but the measure of rights. There is a fundamental inequality in human nature, and civilization tends vastly to increase and to accentuate it. And every man has the right, to the best of his ability, to accomplish his manhood, to be fully himself, and to take the due place and wield the due influence of his selfhood in the social organism. To thwart the legitimate development, to restrict the legitimate influence of personality, is a wrong. And this wrong modern radicalism commits when it insists upon the absolute equivalence of all men in the body politic. Men, as a matter of fact, are

not-politically of equal value. Equal they are in their common nature. Equal they should be before the law. Equal they are not in personality, and therefore they should be unequal politically. The principle embodied in the claptrap phrase, "One man one vote," is a false principle, violating the rights of multitudes who are morally entitled to many votes.—*London Quarterly Review.*

Perseverance, dear my lord,
Keeps honour bright: to have done
is to hang
Quite out of fashion, like a rusty mail
In monumental mockery.
—*Troilus and Cressida*, iii. 3.

GEOGRAPHY.

THE TEACHING OF GEOGRAPHY.—Perhaps no school subject has been written about so variously as geography, for the sufficient reason that no subject is capable of a more variegated treatment. Were it not for the examiner, who holds us all in a team together, at least as concerns certain cardinal points, it is open for one to imagine that geography would go altogether to pieces, by its own inherent tendency to differentiate, and there would be no longer one geography any more, but many. Geography, it has even been asserted, is of the nature of a gas, and takes its form altogether from the pedagogic vessel in which it is contained; for to the physicist it brings up a vision of isothermals, volcanoes, and the scour of tides; to the biologist, a struggle of this flora and fauna with that; to the historian, the growth of strong places at strategic points and rich cities on the water-ways; to the politician, an arithmetical problem of the balance of military power and pro-

ductive activity; and to the philosopher, all these things and more. And one, in writing at one's ease on the subject, or in vacation plans, when the Lydian stone of practice has been left at home, is apt to follow these divergent suggestions too unreservedly, and to engender at last an ideal teaching of geography, beautiful indeed on paper, but requiring at its beginning the rare quality of omniscience in the teacher, and clearly aiming straight at omniscience in the pupil as its end.

School geography, or the geography of those that examine schools, is, however, an altogether different thing from the geography of pedagogic literature, and for a change it may not be uninteresting to consider this neglected branch a little, taking as our keynote for once low practice instead of high ideals.

Practically—this is written, without comment, as a matter of fact—school geography resolves itself into a knowledge of locality, the science of

"Where is A?" This may be contradicted in the books teachers write for one another, but even among those who profess higher things on paper there may be found some who are worse—after the fashion of this world—than their words. This treatment of geography has at least the cardinal merit of being, when properly handled, well within the comprehension of small boys and girls, whereas physical and historical geography on philosophical lines, too often resolves itself in practice into an attempt to explain the half-known by appeals to the incomprehensible.

When, for instance, we teach a fifteen-year-old class the commonly accepted account of the atmospheric circulation, we begin with a description of quite hypothetical currents, and then pass lightly over an elaborate tangle of diathermancy, convection, radiation, expansion, and pressure, friction, inertia, and condensation, to explain how these currents (which, as a matter of fact, do not blow precisely as they ought to do to fit the reasons stated) originate. It requires either an exceptional memory of youthful experiences, or else an exceptional sympathy, to realize how the boyish mind feels as this dry light falls upon it. On the other hand, a mere topography, that lapses into explanation only when it is or appears to be inevitable, rather than a teaching that deliberately strains after reasonableness, may be made very attractive to the immature mind.

School masters and mistresses in the past unhappily found a way of making such an intrinsically characterless thing as topography almost disgusting. They practised the list method of teaching, and reduced the mental image of the world's surface to the form of pigeon-holes. I know one dear old lady, who was a proficient at that Georgian geography, and even yet she knows quite a

respectable host of names, though many have in the course of years got into the wrong compartments. She has a kind of mental cabinet, England, with a pigeon-hole for each county, one for Europe subdivided into countries, and beyond large receptacles labelled "In Asia," "In Africa," and so on. Liverpool is in Lancashire, she knows, for instance, and Birkenhead is in Cheshire; but it has been elucidated that she is unaware whether these two places are one or a hundred miles apart.

Excellent people, by-the-by, within quite recent years have devised games of cards for the mastery of this valuable form of geography, and have modestly (or for business reasons) attributed the greater glory of their invention to Froebel. Each leading town has a card devoted to it, and there are county cards as well, with lists of towns, and the ideal George and Tommy sit round tables and make up complete counties in a mood of ecstatic enjoyment, as the picture outside the pack witnesseth to any that doubt.

However, the practical schoolmaster and parent are growing out of this kind of thing, and the next higher level is no doubt atlas teaching. Instead of having your list in books, your pupils find the places first on maps, and so construct their own lists. We go over the map in class together, dabbling our fingers on geographical features and intoning their names.

And here, by-the-by, one may notice an important matter for schoolmasters inclined to this method. Our atlases vary flagrantly. In one atlas you may find a desolate plain where in a second there is one long ridge of mountains, in a third a radiating system of spurs, and in a fourth a system of parallel chains. Let the teacher who doubts this assertion compare the contours of East Anglia in half-a-dozen respectable maps by

different publishers. Where your geographical teaching consists of the mastery of parts of an atlas, therefore, you must be extremely careful to establish a standard map, one authority of indubitable orthodoxy, to which all disputes may be carried; otherwise children may become subtly infected with scepticism, and at last doubt altogether the sincerity of the educational process.

A little higher than atlas teaching is the blank easel map. With this it is customary, pointer in hand, to drill classes first collectively, and then with unexpected appeals to individuals; and no doubt much clearer and more refined conceptions of position are to be got in this way, and a skilful teacher can keep a class alive to its remotest corners; but a still better method is mapping.

By mapping is here intended sketch maps by the pupils, in pencil or ink, of the district studied, and not that elaborate imitation of atlas maps by which the sense of colour is cultivated at the ragged ends of terms. These sketch maps must be done in class, and the teacher, it must be admitted, has to work hard to get them done. Perhaps this is best effected by the teacher's accompanying the class himself on the blackboard. If he is, as all teachers of the subject should be, sufficiently expert, he can do this without depriving his pupils of the comforting sense of his watchful eye, and with a running suggestive commentary. "Let us begin here. The coast-line runs south, you see, for some way, then about twice the same distance eastward, and out into this jagged cape," and so on. In the same way he can call attention to the characteristic sinuosities of the rivers, and ensure the towns coming in their proper positions relative to coast and river and hill.

Thus far we have been tracing successive steps upward in the teaching

of geography, but as yet it has been really simply an increasing refinement in the answer to the fundamental question, Where is A? It has been, in fact, the teaching of maps pure and simple. But now, with the teacher half-face to class, and with a simple map growing under his hands, we begin to find openings for teaching something beyond this mere localization of place names. It is so easy to pass from a mere descriptive paraphrase of your map-drawing to other matters.

It is best, at anyrate with boys, to let your declared object be merely to know the names and positions of places. But you lapse. You appear to be struck by a memory about a place, mention it involuntarily, glide into a reprehensible garrulity about this town and its people, tell of a siege, a difficulty of access, a local peculiarity, a remarkable product. The whole class listens, the bad boy best, and the good boy with a certain virtuous uneasiness. The general feeling of the class is a blissful consciousness of teaching being suspended.

And from such little slips from the path of rectitude one may lead on to the engraving and the photograph. In any heap of old illustrated papers there are dozens of suitable scenes one may clip and put by. It is perhaps a mistake to put pictures of places and peoples in geographical text-books,—pupils always look at them at the wrong times, they get "stale," and besides the suspicion is only natural that these things are intended to teach something. Such illustrations are looked at more keenly, and remembered far better, I think, if they seem to be no regular part of the school work, but genuinely accidental glimpses of the great real world outside beyond the pedagogic rule. It is ever so much more delightful to have the school room

door blow open for a moment and to peep through. Let your collection of scraps therefore seem to your class an amiable eccentricity of your own.

By such means a picture of this world may be made to grow in the most natural way in the pupil's mind. But it needs thought, time, and careful preparation. A teacher must like the subject for its own sake to do this kind of thing.

We need not stop at pictures and photographs. Almost every object has its geographical aspect and is available, if only the knowledge of the teacher is sufficiently wide. Even a collection of models and objects sold for the purpose might conceivably be utilized. The only absolutely indispensable requisites are wide knowledge and descriptive skill on the part of the teacher. Perhaps we should add a very considerable amount of leisure and energy, though these rare conditions seem to go without saying in all educational essays, possibly because most educational essayists are also enthusiastic educationalists, and do not realize, or have no patience with, the mortal nature of the teacher who does not write.

In this way we rise from mere list, map, and diagram learning to genuine descriptive geography. Not only do we attempt to teach Where is A? but also, What kind of a place is A? Possibly if that is well done it should satisfy a reasonable ambition. But, as the average age of the class rises, a little thinking of the causes of things may be allowed to creep in rather than be designedly aimed at. It *must* do so if the teacher is to any extent geologist, physicist, or historian. We may incidentally discover why most towns stand on rivers, or why London is richer than Gloucester; why Liverpool distanced Bristol in the American trade, or why Scotland is poor. But beware of too much insistence upon the inevitableness of

political geography and the positions of towns, or you may presently have pupils asking why Spain is poor, Galicia Austrian, or Babylon a desert. Sooner or later a question of this sort will crop up which it will either be inconvenient or impossible to explain.

The quality of the facts that may be chiefly considered in descriptive geography does not vary so widely as people imagine. A certain class of facts appeal most vividly to school children, and the next best is only the next best. I cannot imagine how "commercial geography" and trade details can possibly be anything else but boredom to any pupils but the precocious sons of self-discussing merchants. As a matter of fact, children have learnt the chief imports and exports of countries for years, and I think most grown-up people who can recall their school days will agree that this part of the subject stood absolutely alone in its terrific dullness. Of course children like to know where things come from, how they are made, and so forth, and if that alone is intended by commercial geography, there is no harm in it. But jargon about the markets of the world, export of nitrates and barilla, and trade in calamine, is merely so much crackling of thorns under the pot of the enterprising rather than conscientious teacher.

Physical geography, except where the science master adds geography to his duties, scarcely grows naturally out of the ordinary school subjects. It is perhaps better regarded as being absolutely separate. An opinion has already been intimated in this paper that it is anything but an elementary subject. If it is studied at all in schools, it should clearly follow a sound and experimental course in heat, and should indeed be simply a series of complex concrete instances of the principles of that science. Beyond this the subject becomes rather

speculative geology than a natural development of what is called and studied as geography in schools.

So much for geography *virginibus puerisque*. There is, however, a suggestion of something altogether wider, a great and orderly body of knowledge centering about man in his relations to space. Such a comprehensive study might well form the body of one of the courses of the University of the future, standing based upon elementary, physical and biological science, and embracing political economy and ethnography. It is however, an ideal altogether too wide for daily use in a boys' or girls' school, and the conditions of the teaching would be fundamentally different.

One method of teaching I have avoided mentioning, wherein the nominal teacher in charge gives out the portion of the text-book to be studied, and then proceeds to mark registers, toss with himself—it is always a man—left hand against right, for halfpence, or write letters to his private friends. It is really not a bad way if the text-book is well done, and it is—how common? There are some good text-books on the subject now. At the risk of being invidious, one might mention Professor Meiklejohn's. Certainly this is better than really bad personal teaching, this teaching of thousands of pupils all over the world by one clever man. But, for the young at any rate, a living present teacher to work with them, even if he is not above mediocrity, is a far better thing. Besides, logically, one should go one step further. There is no need why pupils should meet together merely to read books. That they can do as well or better at home. And, writing in a paper for schoolmasters, one naturally keeps the schoolroom in mind.

H. G. WELLS.

The Educational Times.

ICELAND.—Owing to the Gulf Stream the climate of the southern part of Iceland, with the exception that it is colder, closely resembles that of the north of Scotland, and the northerly districts, though the temperature is naturally lower, are not so wet. Thunder storms are rare, and, strangely enough, usually occur in winter, when the temperature is mild for the latitude. The mean is about three degrees above the freezing point, but there are, of course, exceptional frosts, and variations that in single month will range through twenty-seven degrees. As a whole, however, if the climate of Iceland is neither so hot nor cold as that of any part of North America, its average is lower.—*Educational Gazette.*

MORE EMIGRANTS THAN IMMIGRANTS.—For the past six weeks, at least, emigration from the United States has exceeded the immigration. Not less than 60,000 emigrants left the port of New York in July and August. Last week the steamship Werra, bound for German ports, carried back 900 steerage passengers and left 900 more on the docks because she could not make room for them. The great majority of those who are leaving this glorious republic are Germans, Italians and Finns. They are not immigrants who have "made their pile" and become emigrants to enjoy their wealth in their native lands, but they are immigrants who could not find work and happily had the means to pay for their return passage.—*Educational Gazette.*

Sorrow is not immortal; let us not aggravate our light griefs with ungenerous thoughts. If we have been bereaved of blessings, we have enjoyed them too. To be bereft is the lot of all; to enjoy is not the lot of many.—*Gregory of Nazianzum.*

THE MANITOBA TEACHERS' ASSOCIATION.

By our own Correspondent.

THE eighteenth Convention of the Manitoba Teachers' Association took place this month at Brandon. There was a large attendance and the proceedings were characterized by the greatest interest and enthusiasm. The first session was held on Thursday, 13th October, in the City Hall. After the routine business had been disposed of, an excellent paper on the teaching of Science in our schools was read by Mr. A. McIntyre of Brandon High School. This was followed by a spirited discussion on the salient points touched upon, and then Miss Ball, now of Chicago and formerly supervisor of drawing in the schools of Omaha, took the platform and for an hour or more held the attention of the audience in a talk on the Prang system of teaching drawing. She had a duplicate of the World's Fair Exhibit displayed on the walls, and she illustrated her talk by drawings on the black-board. The new idea brought out was that the object in teaching drawing is not to obtain stereotyped results which show no individuality and have little or no bearing on practical work in the Liberal and Mechanical Arts, but to stimulate and develop the power of proper perception, in the first place, and next to cultivate the ability and express in form and color the thought obtained. Miss Ball continued her talk the next day and there can be no doubt that all present were greatly benefited by the practical ideas brought out in regard to teaching constructive and pictorial drawing, as well as their bearing on all the work of the school curriculum.

On Thursday evening a reception was tendered the visitors from Winnipeg and other places, by the teachers and townspeople of Brandon. It took the form of a conversazione and was most enjoyable. The City Hall

was tastefully arranged for the occasion, sweet music was discoursed by the band and a good programme of elocution and music was presented. Later, refreshments were most invitingly served by the ladies and duly appreciated by the guests.

The chief feature of Friday's proceedings was a very able paper on English, read by Mr. G. D. Willson, Principal of the Brandon High School. It was thoroughly practical, especially in regard to the teaching of Grammar. One point in particular deserves notice. Attention was drawn to the fact that there is no adequate text-book on this important subject authorized for use in our schools, and the suggestion was made that in the lower classes an inductive study of the pupils' own language should be substituted, while in the advanced and collegiate classes, inductive study of the science of Grammar could be best carried on by means of a text-book of literary selections with probably a number of exercises, provided that no notes or explanations be in the book.

A thoughtful and earnest address was given by Mr. W. A. McIntyre, Principal of the Manitoba Normal School in Winnipeg, on the subject of Our School Programme of Studies in which he showed that such a programme should contain all subjects that tend towards the *right being, right thinking* and *right acting* of the individual.

A business session was held on Friday evening when several important resolutions relating to the advancement of education in Manitoba were moved and adopted.

The Provincial Teachers may be complimented on a most successful convention and one which clearly proves what is heard on all sides, viz., that the Western people are most progressive, and in no line more so than in education.

EDITORIAL NOTES.

Would the subscribers to the Canada Educational Monthly do the following three things :

1. Those in arrears, pay promptly.
2. Renew and send payment when renewing.
3. Speak to friends about this Magazine and get them to subscribe for it.

By helping us in these ways our friends will feel better and so shall we. The friends who speak so kindly and help so generously, have our hearty thanks. In this expression of thanks the press of Canada is included. The press has been very appreciative of our efforts for the best interests of our country.

Mr. Chant's paper will be helpful to teachers, by indicating the kind of mistakes candidates are so liable to make when under the trying ordeal of a public examination.

Our readers will enjoy and be profited by the able paper in the present issue by the Principal of the School of Pedagogy. This is the first paper of a series which he is to write for us this year.

A SUGGESTION.

No class of workers in a community receives so much attention as the teachers. Every one considers himself competent to give good advice to a teacher and justified in doing so. It makes very little difference how experienced or eminent the teacher is or how inexperienced and ignorant the adviser is, the advice is given all the same. The only other class of workers which is favoured to anything like the same extent is the clergy. The clergyman gets a good share of

public attention, is much spoken of and against, but even the minister is not so universally under the coaching process of public criticism as is his fellow labourer the teacher.

The teacher has one pre-eminent advantage over all other classes of the community—viz., that his co-workers, his fellow-teachers, consider it their duty to instruct him and especially to tell him of his many faults, failings and general incompetence for his very trying and important work. All this gratuitous service must be done in the most public manner. Not a few Educational Journals, professedly, owe their existence to the strong desire of helping the teachers of a country to do the work of teaching more efficiently than they otherwise would or could. Teachers are continually warned of the danger of doing their life work in the same grooves, in the same ruts, of becoming mere machines, mere hearers of lessons and so on without ending. We frankly and humbly, and in a proper spirit we hope and believe, confess that all teachers are human and therefore err, but we do not believe that as a class they are sinners above all men, either as regards weakness of character or obliquity of judgment. Unfortunately for themselves and also for the country the professional spirit among them, if it exists at all, is feeble. In this respect, they, as a distinct class of workers, or as a profession, have much to learn from the other professions. By the want of kindly interest in one another, by the want of self-respect of teachers towards each other, the whole community suffers loss.

The case being so, it is very proper to ask why so important a class of workers is deficient in this *esprit de*

corps? And can a remedy be found? We believe the cause is the slight confidence placed by school authorities in the teachers as a body, and that a better spirit will prevail when this cause is removed.

For instance, more confidence must be placed in them by the Education Department. Why should not head masters of High Schools be trusted and held responsible for the annual examinations held by the Department in the High Schools? Does it tend to cultivate the tender plant of self-respect, either for himself or for his fellow-workers to be told by the highest educational authority in the land, that he (poor teacher) must not go into his own rooms while the examinations are going on! In the face of such a rule, is it reasonable to expect from a teacher respect for his fellow-teachers and is it consistent with the dictates of ordinary common sense to suppose that the educational public will pay respect to a teacher as a teacher, much less to expect from the general public the deference and sympathy which teachers so much need for their best work?

Is any other class of workers in the community having the same, or nearly the same responsibilities, treated with such scanty courtesy by public authority as teachers are? Contrast the shabby manner of dealing with teachers in matters appertaining to their special work with the manner in which general society and the Government deals with lawyers, doctors and ministers? Why so great a difference? And, we contend that the difference accounts for the lack of professional spirit among teachers. Our belief is that if teachers were entrusted by the Government with the conduct of the annual examinations, properly recognized and paid, the vexing difficulties in connection with these examinations would soon largely disappear.

It is with doubt and great reluc-

tance we make the above suggestion, for if acted upon, we see no time for the work to be done by teachers except during their vacation time at mid-summer.

But vacation time is so precious to the teacher for the highest purposes of his work. It is for him recreative time for body, spirit and mind. For the teacher it is the time for making investments which keep him young in thought and feelings, and all this investment the public receives back with compound interest in the following years. Therefore the parents and children are vitally concerned in this question. The way to mend matters is, "Respect the man who carries the burden." Can we afford the cost implied in making the teacher work part of his vocation time? Will teachers please answer?

HYMN OF THE HARVEST.

Now to Thee, gracious Lord of the seasons,
 be honor and glory and praise,
 That again in the joy of the harvest our
 jubilant anthem we raise.
 Though many the tears that beset us, though
 faith waxes feeble and cold,
 Thy bow, with its promise unbroken, glitters
 still as it glittered of old.
 Though weary we grow in our watching the
 weeks of the drought as they pass,
 When the earth is as iron beneath us, and
 the heaven above us as brass,
 Yet the showers come back in their season;
 once more in the land there is seen
 The brook brimming over with crystal, the
 grass as the emerald green.
 Though troubled the spirit within us, when
 the mist upon valley and plain
 Lies thick, and the clouds in their armies
 return again after the rain,
 Yet the sun cometh forth as a giant, and
 after the tempest the morn
 Is cloudless and fair, and the color grows
 golden and rich on the corn.
 For seed time and harvest we thank Thee;
 our fears as the shadows have fled;
 Thou hast given his seed to the sower; Thou
 hast given the eater his bread.

—*Alfred Church, in the London Spectator.*

Success is coming up to the level of our best.

SCHOOL WORK.

HIGH SCHOOL PRIMARY.

PHYSICS.

Examiners: C. A. Chant, B.A.; E. C. Jeffrey, B.A.; A. P. Knight, MA.

NOTE.—Give diagrams whenever possible.

1. (a) Explain what takes place in the internal arrangement of wood when a nail is driven into it; also how the bubbles are produced when a piece of chalk is thrown into water.

(b) Describe an experiment to show that air will expand without the application of heat.

2. (a) How would you prove that sound requires a medium to travel through? State any precautions necessary for the success of the experiment.

(b) Devise a means to enable you to hear the ticking of a watch thirty feet away.

3. (a) How would you prove that pitch depends on vibration-frequency, and on nothing else?

(b) When two low notes, differing slightly in pitch, are produced at the same time, a peculiar sound is heard: describe and explain it.

4. (a) A candle is placed before a convex spherical mirror; draw the image.

(b) A double-convex lens and a concave spherical mirror each have a focal length of 12 inches, and the lens is placed at the centre of curvature of the mirror. Parallel light falls directly upon the lens, passes through it, and then falls upon the mirror. Draw a figure to show the arrangement, and also the course of the rays.

5. (a) On holding a candle before a plate-glass mirror three or four images can be seen easily: show how they are produced.

(b) Draw a diagram of a common telegraph circuit, naming each part and explaining how the signals are caused.

6. (a) Describe a Grove battery; and show how you would join up three cells to use at once.

(b) If you were given a bar of soft iron how could you make a strong magnet out of it?

7. (a) Describe an incandescent electric lamp, explaining why the slender thread becomes so bright.

(b) A dozen sewing-needles are tied together by a thread through their eyes, and are then hung by the thread in a bunch over the pole of a strong magnet. Describe and explain their behavior.

BOTANY.

B.

1. Give a systematic description of the plant supplied.

2. Refer it to its Sub-Kingdom, Class, Sub-Class, Division and Order, with reasons in each case.

3. Make drawings to illustrate the structure and relations of the gynoecial and androecial whorls of the flower submitted.

4. Explain the terms, ovule, seed and fruit, illustrating your answer by reference to Canadian *Roaceæ*, *Cruciferæ*, and *Liliaceæ*.

5. Describe the microscopic structure of the stem of a herbaceous plant.

FRENCH AUTHORS.

Examiners: John Petch, MA., John Squair, B.A.; A. H. Young, B.A.

NOTE.—Candidates will take section A, and either section B or C.

A.—(Sight Translation.)

Translate:

Réintégré (re-established) dans son château de Palificat, le marquis de Sicard fit revenir sa fille de Turin où il l'avait laissée. Profitant d'un congé, François vint passer trois mois à Croix-Daurade où il fut reçu, comme bien on pense, à bras ouverts par M. de Sicard.

Remercie le capitaine, dit le marquis à sa fille, c'est à lui que tu dois d'avoir encore un père, et je lui dois, en outre de ma fortune, ce bonheur plus précieux, encore de pouvoir t'embrasser.

Qu'ajouterai-je de plus ?

Il advint (came to pass) ce qui devait arriver. Jeanne et François s'aimèrent, se le dirent ; le marquis consentit à leur mariage qui fut célébré en grande pompe dans l'église Croix-Daurade et l'histoire ajoute — comme dans les contes de fées — qu'ils eurent beaucoup d'enfants.

Le lendemain de leur noce (wedding), le deux époux visitèrent la petite maison où était morte la pauvre Margaridetto, et dans laquelle un violent orage (storm) avait obligé Jeanne et son père à se réfugier une nuit de Noël, au retour de la messe de minuit,

Jeanne, dit François à sa femme, ceci me rappelle combien vous avez été bonne et compatissante pour la mère du malheureux berger que j'étais et c'est ici que j'ai appris à vous aimer pour la première fois.

B.

Translate :

Oui, sans doute, ils le connaissaient bien, leur François, les braves gens ! Ils savaient combien ça l'amusait, le petit, d'aller saccager les haies le dimanche et de revenir à Paris, chargé d'aubépiânes, sur les épaules du père, ou encore aux Champs-Élysées d'entrevoir Guignol dans l'intérieur de la *fielle*, avec les petits riches

Jacques Legrand avait acheté à François des images, des soldats dorés, des ombres chinoises ; il les découpait, les mettait sur le lit de l'enfant, les faisait danser devant les yeux égarés du petit, et avec des envies de pleurer, il essayait de le faire rire.

“ Ça c'est un général ! Tu te rappelles, nous en avons vu un, un général, au bois de Boulogne, une fois ? Si tu prends bien ta tisane, je t'en achèterai un d'or Le veux-tu, dis, le général ?

Non, répondit l'enfant, de la voix sèche que donne la fièvre.

* * * * *

“ Comprends-tu cela, petite ? Nous mangeons du cheval ! ” “ Je crois bien qu'elle le comprenait. Depuis deux mois, elle ne mangeait pas autre chose. De jour en jour, cependant, à mesure que la convalescence approchait, notre tâche autour du

malade devenait plus difficile. Cet engourdissement de tous ses sens, de tous ses membres, qui nous avait si bien servis jusqu' alors, commençait à se dissiper. Deux ou trois fois déjà, les terribles bordées de la porte Maillot l'avaient fait bondir, l'oreille dressées comme un chien de chasse ; on fut obligé d'inventer une dernière victoire de Bazaine sous Berlin, et des salves tirées en cet honneur aux Invalides. Un autre jour qu'on avait poussé son lit près de la fenêtre — c'était, je crois, le jeudi de Buzenval, — il vit très bien des gardes nationaux qui se massaient sur l'avenue de la Grande-Armée.

“ Qu' est-ce que c'est donc que ces troupes-là ? ” demanda le bonhomme, et nous l'entendions grommeler entre ses dents : “ Mauvaise tenue ! Mauvaise tenue ! ”

“ Il n'en fut pas autre chose ; mais nous comprimes que doré-navant il fallait prendre de grandes précautions. Malheureusement on n'en prit pas assez.

1. Explain *Champs-Élysées* and *Invalides*.

2. *Tu te rappelles*. What difference would it make in sense if *vous vous rappelez* were used.

3. *Malheureusement on n'en prit pas assez*. Show how the latter part of the story justifies the use of this expression.

C.

Translate :

Plus Valentin apprenait, plus il brûlait du désir d'apprendre encore. Il eut bientôt, lu, relu et appris par cœur tous ses livres. Où en trouvera-t-il d'autres maintenant ? Il faudra donc qu'il cesse de s'instruire ? Soyez sans inquiétude ; Valentin saura bien encore vaincre cette difficulté. Le voilà qui déclare la guerre aux animaux de la forêt, dans le dessein de vendre leur fourrure pour acheter des livres ; sans cesse à l'affût, tantôt il prend un lapin, tantôt une belette ou quelque autre animal. Son ardeur était incroyable. Il eut un jour une lutte violente à soutenir contre un chat sauvage, qu'il ne put vaincre qu' au prix de son sang. Enfin, sa constance lui procura au bout de quelques mois, environ cent francs. Le cœur palpitant de joie, il court à Nancy, entre chez un libraire, choisit, paie, et retourne à sa solitude, le dos chargé

de livres, mais la bourse absolument vide d'argent.

* * * * *

Malgré tout ce que je pus lui dire, je le quittai au bout de dix minutes. paraissant très peu convaincu de mon existence. Je me rendis chez le général Sébastiani. Il était dans son cabinet de travail ; quatre ou cinq secrétaires écrivaient sous sa dictée ; chacun d'eux avait sur son bureau, outre sa plume, son papier et ses canifs, une tabatière d'or qu'il présentait tout ouverte au général, lorsqu'il s'arrêtait devant lui. Le général y introduisait délicatement l'index et le pouce, savourait voluptueusement la poudre d'Espagne, et se remettait à arpenter la chambre, tantôt en long, tantôt en large. Ma visite fut courte ; quelque considération que j'eusse pour le général, je me sentais peu de vocation à devenir porte-tabatière.—Je rentrai à mon hôtel un peu désappointé, mes rêves d'or étaient ternis.

4. In what connection does the first extract occur ?

5. *Qu'il ne put vaincre qu'au prix de son sang.* Rewrite this clause, using another word, but of similar meaning, for *ne . . . que*.

6. What is the title of the piece from which the second extract is taken ? Give a brief outline of it.

FRENCH GRAMMAR AND COMPOSITION.

A.—(Grammar,)

NOTE.—These extracts are given merely as a basis for the questions that follow, and are not to be translated.

Le grand veneur et le page ne doutèrent pas que Zadig n'eût volé le cheval du roi et le chien de la reine ; ils le firent conduire devant l'assemblée du grand Desterham, qui le condamna à passer le reste de ses jours en Sibérie. A peine le jugement fut-il rendu qu'on retrouva le cheval et le chien. Les juges furent dans la douloureuse nécessité de réformer leur arrêt ; mais ils condamnèrent Zadig à payer quatre cents onces d'or, pour avoir dit qu'il n'avait point vu *ce qu'* il avait vu : il fallut d'abord payer cette amende ; après quoi il fut permis à Zadig de plaider sa cause au conseil.

* * * * *

Puis il prit une grammaire et nous lut notre leçon. J'étais étonné de voir comme je comprenais. Tout *ce qu'* il me disait me semblaît facile. Je crois aussi que je n'avais jamais si bien écouté et que *lui* non plus n'avait jamais mis autant de patience à ses explications. On aurait dit qu'avant de *s'en* aller le pauvre homme voulait nous donner tout son savoir, nous le faire entrer dans la tête d'un seul coup.

1. Parse the words in italics.

2. *firent, conduire, dit, vu, prit.* Give the present indicative in full of each of these verbs.

3. Give the imperative in full of *s'en aller*.

4. *en Sibérie.* Give rules for the use of *en* with names of countries.

5. *quatre cents onces.* Write down the French for "four hundred and four."

6. Change *j'étais étonné de voir comme* to *j'étais étonné que* and complete the sentence.

7. *fut-il rendu* (1. 4). Account for the inversion of verb and subject.

8. Translate into French :

(a) He is permitted to go away.

(b) I wish to make it enter into his head.

B.—(Composition.)

9. Translate into French :

(a) Have you neither pens nor ink in your room ?

(b) Our friends have no apples, but they have pears.

(c) You have too much money, and we have not enough.

(d) Horses, cows and sheep are very useful animals.

(e) France and England are two countries in Europe.

10. Translate into French :

(a) Why have the children not gone to school to-day ?

(b) When are you going to depart for Switzerland ?

(c) Where did you find the little boy and girl ?

(d) What were they doing yesterday in the city ?

- (e) How many apples did your father give the beggar?
11. Translate into French :
- (a) Has the merchant given you money or cloth?
- (b) Where are the horses? I have not found them.
- (c) There are some fine apples. Give me some.
- (d) He is asking for money. Do not give him any.
- (e) If there are any in the house, I shall give you some.
12. Translate into French :
- (a) If we rise at five o'clock, we shall call you.
- (b) If we had friends in this country, we should visit them.
- (c) If I am there to-morrow, I shall speak to him.
- (d) If you had had any, you would have given them some.
- (e) If it be fine this evening, we shall go to church.
13. Translate into French :
- (a) Who was here? Nobody has been here.
- (b) I have never seen anybody with him at church.
- (c) What did you have in the box? I had nothing.
- (d) Had you done nothing before his arrival? No, sir, nothing.
- (e) I have no more money and I need some.
14. Translate into French :
- (a) This house is small and that one is large.
- (b) These horses are mine, but those are his.
- (c) My pens are not good, but my brother's are good.
- (d) This man and woman are my neighbours.
- (e) This is not so easy as that, but this is more useful.

LATIN GRAMMAR AND COMPOSITION.

Examiners: A. J. Bell, M.A., Ph.D.; W. Dale, M.A.; W. S. Milner, B.A.

1. Write down the ablative singular of *impetus difficilis*; put *magnus* into agreement with *vis*, and then write down the accusative plural of the two words; give the Latin for "of the same camp"; give the other degrees of comparison of *summus* and *acrius*.

2. (a) Write down the first person singular of all tenses of the subjunctive active of *video* and *venio* and mark the quantity of the first syllable in each case.

(b) Give the voice, mood, tense, number and person, of the following words: *exiret*, *auferet*. Give all the tenses of the infinitive active of each.

3. *Hoc cum voce magna dixisset se ex navi projecit*. Rewrite the independent clause of this sentence in four other constructions. Why is *cum* not placed first?

4. Explain the syntax of the words italicized (the sentences are not to be translated):

(a) *Quid fieri velit* ostendit.

(b) *His* praeerat Viridovix, ac summam imperii tenebat.

(c) *Ejus belli haec* fuit causa (i.e. why not *hoc* instead of *haec*?).

(d) In quos *gravius* Caesar *vindicandum* statuit. (In what different ways may the comparative *gravius* be translated?)

(e) *Rostro* eam *noceri* non posse cognoverunt.

(f) *Huic* permisit, si opus esse *arbitraretur*, uti in his locis *hiemandi* causa castra collocaret.

(g) Q. Titurium Sabinum in Venellos mittit qui eam manum *distinendam* curet.

5. Translate into Latin :

(a) He said that he was bringing with him all the troops he had.

(b) We persuaded him to cross to the enemy and I explain our wishes.

(c) After a short time had elapsed he returned to build more ships.

(d) As soon as the time of the year allowed he hastened thither in person.

CONTEMPORARY LITERATURE.

The fourth prize serial story, "Sam," is at present appearing in the *Youth's Companion*. The most notable feature of the issue of Oct. 19th is an account of an English public school, Haileybury, by Rudyard Kipling, who seems to be turning his attention to stories for the young at present. Charles G. D. Roberts contributes a story of adventure entitled "Labrador Woives." The whole tone of the *Companion* is upward and wholesome to a degree.

The October *Century* contains a most satisfactory conclusion of Bret Harte's two-part novelette. "The Heir of the McHulishes," which commends itself to the reader as containing more delicate humor and better artistic work than anything he has produced for some time. "Taking Napoleon to St. Helena," is perhaps the most striking feature of the number. The account is given from the diary of Mr. Glover, secretary to the Admiral in charge and will be continued in November. Mark Twain will contribute a novel called "Puddin'head Wilson" to the *Century* in the coming year.

One of the most attractive features promised by *Littell's Living Age* next year is "Mannette Andrey," a picture of life during the Reign of Terror. The story is said to be of thrilling interest.

The *Sunday School Times* is wisely turning its attention to the subject of S. S. libraries, more important than most people think. Those selecting books will find a useful list. This paper is of the greatest service to teachers, the treatment of the lesson being broad, scholarly and practical.

BOOKS RECEIVED.

Three of Shakespeare's plays are the latest numbers of *Macmillan's English Classics* (Toronto: The Copp, Clark Co.) These are "King Henry the Fourth," First and Second Parts and "Romeo and Juliet." Mr. K. Deighton is the editor of all three and has discharged his editorial duties with his accustomed industry and skill. The introduction prefixed to each play is clear and

well-written and the notes are accurate and scholarly, invariably supplying all that the student needs. 2s. 6d. each.

Public School Physiology and Temperance. Toronto: William Briggs. By William Nattress, M.D., M.R.C.S., Eng. (25c.) Dr. Nattress shall speak for himself. "The object of the author has been to put clearly before the teachers and pupils the leading facts concerning the structure and functions of the various organs of the body, and, at the same time, to associate with these facts the physiological action and effects of alcoholic stimulants and narcotics. The pupil is, in this way, at every turn confronted with the evil effects of alcohol and tobacco, the dangers accompanying their use and the tremendous risk of tampering with such powerful agents of destruction."

Practical Work in Heat. By W. G. Woolcombé, M.A. Oxford: At the Clarendon Press. (3s.) We have examined this work with pleasure, for something of the inspiration of a true worker always remains in his work. Inexpensive apparatus, carefully detailed instructions and simple experiments (most of them within the range of pupils fourteen years old) are described in the pages of this little book. In his own Laboratory Mr. Woolcombé arranges the pupils in pairs, gives each a sheet of MSS, instructions, requires them to set to work at once and to enter in a note-book, as soon as their work is finished, (1) The enunciation, (2) A description of the method, (3) A drawing of the apparatus (4) Properly tabulated results.

The Making of Virginia and the Middle Colonies. By Samuel A. Drake. New York: Charles Scribner's Sons. \$1.50. This is the third of a convenient series of brief histories, each dealing with some phase of the making of the United States. We think his book very suitable for the purpose for which it is designed. It is comprised in five parts. I. The English in Virginia. II. The English in Maryland. III. The Great Iroquois League. IV. The Dutch on Manhattan. V. The Dutch, Swedes and English on the Delaware.

We think these sentences will satisfy our temperance friends. It was necessary to authorize a primer, and Dr. Nattress's task was not an easy one, as the preface clearly shows.