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THE CANADA EDUCATIONAL MONTHLY.

OCTOBER, 1902.

THE PLACE OF LATIN IN THE STUDY OF LANGUAGES.

Prof. Dr. MacGillivray, Queen's University, Kingston.

The relative value of subjects of study in secondary and higher institutions of learning will probably always be more or less a matter of dispute. Knowledge subjects and culture subjects, as they are sometimes classified, will continue for some time to come to have their respective advocates. The relation of the terms to each other should perhaps be clearly understood, and that might go far to settle the question. What, in the first place, is culture? Then how far is the acquisition of knowledge culture, or how far is culture possible without knowledge?

The term culture is used with a broad and a narrow meaning. It is in this narrower sense that it will be used here, that sense in which it means the peculiar quality of mind acquired from the study of certain subjects, viz., languages with their literatures in general, and the ancient classics in particular, to which is also often added philosophy.

Since the importance of English, as the open sesame to much knowledge and the vehicle to one of the richest of literatures, is now generally admitted, even if the treatment of it is not always

adequate, it may be dismissed from this discussion without further consideration. The modern languages, French and German, while not claiming the same status as English, demand at least the same rights as Greek and Latin. As Greek has at last been relegated to this position, it too will be passed by.

In its own place there is perhaps little to be said against Latin as a proper subject of study in a high school or university course. It is because it has been unduly magnified and given a fictitious value altogether out of proportion to its intrinsic worth, and this at the expense of more important subjects, that a protest is necessary. This has doubtless long been felt, but such is the force of tradition, even in presumably intellectual circles, that such a protest even now will no doubt seem a sacrilege.

In the place given language studies on our high school and university curricula, Latin ranks next to English, if, in some cases, it does not even equal or surpass it. It is at present practically compulsory on the majority of students during their high school course, just like

English; while, speaking generally, French and German are studied for a considerably shorter time, and are, during this time, given relatively fewer recitation periods. German, in the time usually allotted it, comes as far behind French as French is in many cases behind Latin. If this difference in the time allotted is on account of the relative difficulties of the three languages, then German should clearly rank second. But it is more probably a matter of tradition and seniority, or of "culture," a matter which none the less requires reforming.

Considered from this standpoint, the reality is the opposite of the traditional view, at least to judge from results. More practical knowledge and mental and moral training, and consequently more culture, are obtained from the study of French and German than from that of Latin, and more from German than from French.

Statistics show that of all students entering the secondary schools, only ten per cent. pass on to the universities, where the study of Latin is supposed to be further prosecuted, while of the remaining ninety per cent. studying Latin, more or less drop out at different stages of their course.

The first year of this course seems usually to be devoted to a formal study of the Latin grammar as far, in some cases, as the declension of the adjectives, in others as far as the regular verbs. The second year is devoted to further formal grammar, supplemented by the reader. The third to a couple of books of Cæsar, and the fourth to a book of Virgil, or some chapters of Cornelius Nepos, or equivalents, and, be it added, these au-

thors are in most cases prepared by means of those ready-made translations, called "cribs" or "ponies."

The study of grammar, *per se*, and scraps of it at that, is a useless study from any point of view. Translating bits of reader literature is not much better, if it stops there. The last stage, viz., author reading, if properly, that is, independently, done, is doubtless of value, but prepared in the manner referred to the results are worse than useless.

Accordingly, those students who leave school after one or two or three years, and very many do so, may be said to have wasted the time thus devoted to the study of Latin, while those who take the full course have at best but a sorry grasp of the language. This also is the status of the matriculant.

Of the foreign modern languages of the course, neither one is compulsory, and when they are studied, it is generally for a shorter period of time. Nevertheless valuable results are obtained. Owing to difference in aims and methods of teaching, as well as to the fact that they are spoken by peoples, our contemporaries and our equals in civilization, they appeal to the student with a force lacking in a language dead for nearly 2,000 years. It would therefore seem that the least concession in the matter, that should be made to common sense, would be to putting, and make them all optional to the extent of requiring any two for these languages on an equal foot-matriculation—for special matriculation courses, at least.

For in view of the recent regulation of the Department of Education, abolishing after a stated time, of foreign languages for the Junior Leaving examination, it is perhaps

a question whether the universities should not follow suit and establish a matriculation course without foreign languages. The mere possibility seems a heresy, but better than the sham knowledge of languages, represented by thirty-three, or even forty per cent. If a natural science or mathematical course, to which such a matriculation would only lead, should desire to add a language, the necessary knowledge could be obtained after matriculation.

This brings us to the universities where traditional and antiquated views, combined with prejudice or vanity, still bear sway to such an extent that scarcely any course of study, general or special, seems possible without a substratum of Latin. This substratum is in the majority of cases as devoid of solidity or real value as in the secondary schools, and for the same reasons. It may be different in the honor or voluntary classical course, where, owing to more extended study, it is possible that valuable knowledge, real mental effort, and consequently some culture, are obtained. Yet the value of the study is here, too, no doubt diminished by the use of ready-made translations, as well as by the frequent practice on the part of some instructors of delivering "lectures," that is, of reading a translation to their classes, and so freeing them from any independent work.

Latin then has no special culture value all its own. It is not the indispensable basis of scholarship; nor is it along with Greek and philosophy scholarship itself, as some belated pedants pretend. At its best it gives results inferior to those obtained from modern languages.

The study of Latin was originally carried on entirely for its practical value. When the Roman Empire fell, and before the new languages of the rising nationalities had time to produce literatures of their own, or even to develop fixed linguistic forms, Latin was used, in the first place, by the church, as a universal medium of communication, as well as to give it prestige in the eyes of the multitude, and then by the so-called scholars of the middle ages for the same reasons, and was consequently the language of the schools of the period. The study of it was, therefore, at that time, most practical and necessary. The general effect of its use was to retard the growth of the vernaculars and the development of their literatures; in other words, it suppressed general intellectual growth. That is also its effect now, even if the delusion that has followed in its wake produces no little conceit and arrogance. Yet, in spite of its early repressive influence, the native literatures developed, and as they did, the Latin authors were published and translated, as well as imitated, so that in process of time their best thought became incorporated in the modern literatures, while they themselves became available in translations. Herewith the practical need of Latin ceased; but, its study was continued, and its present fictitious value established, with the results noted.

But, apart from this mythical culture value, it is claimed that English cannot be properly appreciated without a knowledge of Latin. We have seen what this knowledge usually amounts to. English, although influenced by Latin through the French, is essentially a Germanic language,

highly developed and consequently analytical, the very reverse of a synthetic language like the Latin. It would therefore seem, if a profounder historical knowledge of our mother-tongue were needed, that it should be obtained from the study of Anglo-Saxon in the first place instead of Latin, and in the second place of French, or rather the earlier phase of it known as Old French, and then, perhaps, only of Latin.

A general historical knowledge of all these facts ought to be taken for granted in connection with the leaving class of the public schools, where also a knowledge of the principal classical roots might be imparted, which should serve as a sufficient classical substratum for the ordinary citizen.

Instead of pushing back the fingers on the dial-plate of time and making all languages compulsory for matriculation, some of them even in the public schools, as has been proposed with a loud flourish of trumpets, a readjustment of language work leading to graduation along the lines already suggested for matriculation, seems imperatively necessary.

When that is done in the case of Latin, and a similar treatment is meted out to all other subjects, that is, when no special subjects are given imaginary values and made compulsory on all comers, then an incubus will be removed, the effect of which will be that universities will become more what they ought to be, leaders in real literary activity and in scientific and industrial progress.

BIOLOGICAL ANALOGIES.

W. T. Harris, Ph.D., LL.D.

1. Mental digestion or apperception.

It is a common habit to describe things and processes by figures of speech. Many of the results of education are described in terms of biology. I have myself often used a biological figure of speech to explain the Herbartian doctrine of apperception. The Pestalozzian, or sense-perception, standpoint believes in observation and the memorizing, but the Herbartian believes rather in explaining and understanding what is seen or memorized. It believes not so much in eating as in digesting what one eats. Not what we eat but what we digest nourishes and strengthens us. This figure of speech is of great aid to start one on the road

to insight into the merits of two very different theories of education. But the usefulness of the trope is soon exhausted. There are very few symbolic or figurative expressions which remain useful beyond the first steps of inquiry.

The digestion of food, for example, ends with assimilation of foreign matter introduced as food and the selection and distribution of the assimilated particles to the parts of the body to which they are to perform the office of restoration. They supply the place of worn out organic matter and these new particles will pass through the process of waste incident on fulfilling their bodily functions and then they must be removed and replaced by newly assimilated food. But this

is not the case with the spiritual process of learning. The waste process and the restoration process do not belong to the spiritual process. The biological analogy does not hold good except so far as to indicate that the raw material of knowledge is assimilated to the body of knowledge already in possession. What is new is explained by what is old and the old store receives an accession or supplement from the newly assimilated knowledge.

In the case of new knowledge the old knowledge is not destroyed. But there is an assent on the part of the mind to a new unity or aggregate which contains the old explained in part by the new and the new explained in part by the old. The explanation is clearer and gives us more insight. When we study this carefully we see that the including totality which contains the old and the new reveals a deeper principle of causality than the principle which organized the old knowledge. Hence the new principle is better able to explain what we already knew before by reason of the fact that we explain with this principle both the old and the new. Hence instead of a waste of matter which needs the addition of new matter to restore the loss we have to admit that the matter of the old knowledge as well as the matter of the new knowledge is better explained than it was before the act of apperception. Hence there is less waste of the material of knowledge. There were some phases of the old knowledge which were not so well explained or understood before as after the act of apperception, hence in apperception considered as mental digestion there is not only no

waste but a considerable change of what was superfluous and unorganized matter of knowledge into more thoroughly organized and digested matter. The spiritual digests without waste and hence it is not a process of restoration like the biological process.

All figurative language may stimulate the first stages of apprehension but it retards the final stages of apprehension. The symbolic knowing has always in it this defect. Starting with the idea that sense-perception has its analogy in the seizing of facts and following up the analogy with the supposition that apperception has an analogy to digestion, this biological view may go on to assume further steps of analogy which do not aid psychology, but on the contrary, mislead the student. For example, the particles of food that have been converted into animal or vegetable cells by the plant or animal are preserved in the organism for a time as occupying space and as mutually excluding. This affords a materialistic conception of stored up facts in the mind. But the act of mental assimilation does not leave the fact as a space occupying cell; it explains it as an act of causality which has produced it, and a million products of a causality would not occupy any more space than a single fact. The mind in the apperception process slips over to the thought of the producing energy and drops out all of the dead results as summed up in one class-word, a common noun or general name. The process is capable of producing an infinite number of dead results.

The student who is beginning his study of botany takes some particular plant and commences its

analysis, inquiring into the use and function of each particular which he inventories. The roots, the trunk, the branches, the leaves, the flowers, the fruit—all of them dead results in his first inventory—are to become vital or living by having their causal relations unfolded; each must be seen in its process as causing a new result and being itself the result of a cause lying back of it.

At first the dead results are separate items without unity. But when they have been interpreted by placing them in the causal process they get a unity through that process and the mind thinks them all in one inclusive thought. When we think things in their causes we think multiplicity into unity—many into one. Therefore in what we have called mental digestion, each fact is enlarged into a process and not any of the fact gets wasted but all of it is preserved and elevated into a higher form of reality.

2. Should pedagogy include medical and surgical pathology?

There is a movement in cities towards the appointment of examining or supervising physicians who are to inspect the schools periodically with a view to prevent the spread of contagious diseases. This movement is undoubtedly in the interest of public health and every city should consider its adoption. But there is another movement which looks towards the conversion of the teacher into a practicing physician or surgeon, and this is not to be commended. It is not well for the influence of the teacher that he become a specialist in diagnosing diseases. There is a psychological reaction upon the

mind in the study of pathology. The successful physician trains his powers of observation into the narrow field of morbid bodily condition. He trains himself to see symptoms of disease. And so nature and man come to be looked upon by a pathologist teacher as objects in a hospital or sick room. It is evident that no such habit can be formed in the mind of a teacher or a clergyman without diminishing his power in the school or the church. To cultivate one's observation in the question of pathology is to withdraw by so much one's power to notice defects in habits of study and to give the proper instruction required by the pupil in the mastery of lessons in mathematics or history or literature. It is not desirable to have the teacher's mind on the constant lookout for bodily abnormalities. Hence it is not best to require teachers to make a daily physical inspection of pupils in order to ascertain what diseases are incipient or chronic. Such inspection is perhaps desirable from time to time in city school systems but it should be performed by regular physicians.

What is said here of habits of observation directed upon disease may be repeated with more or less force against anthropological study when it goes so far as to become a hobby of the teacher. It may distract the teacher's attention from the proper instruction of the pupil in the course of study and in the matters of his behavior or deportment, and such a distraction will distinctly lower the capacity of the teacher for his proper work.

THE DEVELOPMENT OF THE SAULT STE. MARIE CANAL.

By William Gilbert Irwin.

Few save those directly or indirectly interested in the commerce of the Great Lakes fully realize the import upon the various lines of industrial endeavor of the traffic of our great inland seas. In no other way is the magnitude of this internal shipping so fittingly exemplified as in the immense tonnage which annually passes through the Sault Ste. Marie canal, which forms that important artificial waterway which obviates the natural barrier between Lake Huron and Lake Superior, and thus opens up to interlake shipping the greatest link in the world's greatest chain of unsalted seas.

Aside from establishing Duluth as a most important point of shipping, this great canal has been responsible for the marvelous agricultural, commercial, industrial and mineral development of the great Northwest through providing cheap water transportation facilities to the Atlantic. Through the wonderful development of the iron ores the canal has been a factor in establishing the industrial prestige of Pittsburg and other iron and steel manufacturing centres. In fact, no similar expenditure of capital by any state or any nation has conferred such vast benefits to a wide area and to so extensive a population.

The time has come when the accomplishments of the human race in the wide domain of commerce and industry are no longer subordinated to the enactments of war and conquest, and for some time important events in the peaceful fields of industry have been marked

by exhibitions of work along these lines. The observance of the beginning of the work which resulted in the construction of this great canal is to be appropriately observed, and although it has not yet been decided just when this event is to be celebrated, there is at this time a bill before Congress for an appropriation for this purpose.

So far as concerns the American canal, the idea was first originated by Gov. Mason, of Michigan, in his message to the Legislature in 1837, the year after Michigan was admitted to the Union. On March 21, 1837, the Legislature of that State passed an act authorizing a survey and appropriating \$25,000 for the work. This original survey, made under the direction of John Almy, recommended a canal 75 feet wide and 10 feet deep, with two locks, each 100 feet long, 32 feet wide, and 10 feet deep, the estimated cost of the work being \$112,544. On September 7, 1838, the State of Michigan entered into a contract for the construction of the canal with Messrs. Smith & Driggs, of Buffalo. Work was not begun until May, 1839, and was soon suspended owing to a clash between the United States military authorities and the contractors, which resulted in the ejection of the latter, and thus ended the first attempt at canal-making at this point.

On March 27, 1840, the Michigan Legislature passed a joint resolution protesting against Federal interference with the work, and three days later a memorial on the subject was forwarded to Congress.

in which body a bill granting 100,000 acres of land to aid the work of constructing the canal was introduced. The matter rested until 1843, when the Michigan Legislature asked Congress for an appropriation, similar resolutions being passed by that body in 1844 and 1848. In the meantime the copper industry of the Lake Superior region had assumed great importance. In 1849 the State Legislature asked Congress for a cash appropriation of \$500,000 for the canal, and finally a bill was passed by Congress and approved by President Pierce on August 26, 1852, by which a grant of 750,000 acres of land was made to assist in constructing the canal. Whether this event or the actual beginning of work on the canal will form the date of the celebration is a matter not yet decided by those in charge of the matter.

Immediately upon the passage of the Act of Congress relative to the land grant for the canal, G. V. McClelland, of Michigan, secured the services of Capt. Canfield, of the United States Topographical Survey, to make a survey for the proposed canal. An Act of the Michigan Legislature, approved by the Governor on February 12, 1853, provided for a canal commission, to which Chauncey Joslin, Henry Ledyard, John P. Barry, Shubael Conant, and Alfred Williamson were appointed. On April 5, 1853, the commissioners entered into a contract with Joseph Fairbanks, J. W. Brooks, Erastus Corning, August Belmont, H. Dwight, Jr., and Thomas Ryer as principals, and Franklin Moore, George F. Potter, John Owen, James F. Joy, and Henry P. Baldwin as sureties, for the construction of the canal, the

contractors agreeing to build the canal and defray all expenses for the 750,000 acres of land appropriated by the Federal government.

As the Constitution of the State of Michigan contained a provision which forbade all special charters, the St. Mary's Falls Ship Canal Company, with a capital of \$1,000,000, was chartered under the laws of New York, the company organizing with Erastus Corning as president, James W. Brooks vice-president, J. V. L. Prior secretary and treasurer, and Erastus Corning, J. W. Brooks, J. V. L. Prior, Joseph Fairbanks, John F. Seymour, and James F. Joy directors. While the original contract was not assigned to this company until August 25, 1853, ground was broken on the canal on June 4, 1853, by Charles T. Harvey, under whose supervision was constructed the original "Soo" canal, a work which has resulted in opening a vast domain and conferred untold wealth upon a wide section of our country.

Work upon this original canal was conducted with vigor, and on May 21, 1855, a certificate of the completion of the work was signed by Kingsley S. Bingham, then Governor of Michigan, and the members of the canal commission. A certificate to the same effect was made on May 21, 1855, by James T. Clark, engineer, and these two certificates were filed with the Commissioner of the State Land Office on May 24, 1855, and the following day the land appropriated by the general government for the canal work was patented to the St. Mary's Falls Ship Canal Co. This canal was 5,750 feet long, 64 feet wide at the bottom and 100 feet at the water surface, and 13 feet deep.

There were two tandem locks of masonry, each 350 feet by 70 feet by 11 1-2 feet on the miter sills, with a lift of about 9 feet each, and the entire cost was \$999,802.46.

Water was first let into the canal on April 19, 1855, and on June 18 following, the first boat passed through the canal, and thus was inaugurated intercommunication between Lake Superior and the others of the Great Lakes. Upon the completion of the canal it passed into control of the State of Michigan, the Governor, Auditor-General and State Treasurer constituting a Board of Control, John Burt being appointed the first superintendent of the canal. The canal remained under State control until 1872; and the old locks, which were built of Ohio limestone, remained in use until 1888, when they were destroyed by the excavating for the Poe lock in 1888.

Upon the transfer of the canal to the Federal government, Gen. O. M. Poe, then in charge of that district, assumed control of the waterway, being relieved by Gen. Godfrey C. Weitzel on May 1, 1873. Under Gen. Weitzel's supervision was built the lock which bears his name. This lock is 515 feet long, 80 feet wide in chamber, narrowing to 60 feet at the gates, with 17 feet of water over the miter-sills, and it was built between the years 1873 and 1881 at a cost of approximately \$3,000,000, including the deepening and widening of the canal. Plans now being formulated by the Federal authorities will increase the Weitzel lock so that it will have a length of 1,600 feet, a width of 100 feet and a depth over miter-sills of 30 feet, these improvements to cost nearly \$25,000,000.

The Poe lock, which was originally surveyed by Gen. O. M. Poe, is 800 feet long, 100 feet wide, and 22 feet over miter-sills. It was built between 1887 and 1896 at a cost of a little over \$4,000,000. The canal has been deepened to 25 feet, and the entrance piers extended so that its total present length is 8,448 feet. The channel through the St. Mary's River is now 20 feet deep at the mean stage of water and 300 feet wide, and the whole improvements on the American side up to date aggregate something over \$15,000,000.

While electricity is used for operating the Canadian lock, both the Poe and Weitzel locks use hydraulic power, a pressure of 400 pounds per square inch being used for the former lock and 115 pounds for the latter. The Poe lock can be filled and emptied in about 7 minutes, and an up-lockage of a boat 350 feet long can be made in 11 minutes, the gates being opened or closed in 2 1-4 minutes.

Canal work on the Canadian side began some time between the years 1796 and 1798, when the Hudson Bay Fur Company built a lock 38 feet long, 8 feet 9 inches wide, with a lift of 9 feet. A towpath was made along the shore for oxen to pull the bateaux and canoes through the upper part of the rapids. This old lock was demolished in 1814 by United States troops from Mackinaw Island under command of Major Holmes. The present Canadian canal is 5,920 feet long, 150 feet wide and 22 feet deep, with a lock 900 feet long, 60 feet wide and 22 feet of water on the miter-sills. It was built between the years 1888 and 1895, the work being in charge of W. G. McNeil; Thompson,

Ryan & Hayney being the contractors. The canal cost, \$4,000,000.

During the first season of the original American canal a registered tonnage of 106,296 tons passed through the canal. Until 1864 no record was kept of the number of vessels passing through the canal, but in that year there were 1,411 lockages, with an aggregate tonnage of 571,438 tons. In 1870, 1,828 vessels passed through the canal, and their aggregate cargo was 690,826 tons, while in 1875, 2,033 vessels passed through the canal, and they carried 1,260,000 tons of cargo. The traffic of the canal in 1880 amounted to 3,503 lockages and 1,735,000 registered tons.

The development of the shipping on the Great Lakes was so rapid during the next few years that in 1884 but 11 per cent. of the vessels passing through the Weitzel lock could have used the old canal. In 1885, 5,380 vessels passed through the canal, carrying more than 3,000,000 tons of freight; and in 1890 this had increased to 10,557 vessels, carrying 8,500,000 tons. In 1895, during part of which season the Poe lock was open, 17,956 vessels, carrying 16,806,781 tons of freight, passed through the canal. In 1900, during which year the American canal was open to navigation 231 days, a total of 19,432 vessels, carrying a registered ton-

nage of 22,315,834 and a net freight tonnage of 25,643,073 tons, passed through the American and Canadian canals, of which traffic fully 90 per cent. passed through the American canal. The traffic for both canals for 1901 amounted to 20,041 vessels, with a registered tonnage of 24,626,976 and a net freight tonnage of 28,403,065. The value of this freight was \$289,906,865. Navigation for the present year on the American canal opened on April 5, and for April 1,303 vessels carrying a registered tonnage of 2,067,046 tons, passed through the canal, while the Canadian canal, which opened April 1, shows a traffic for April of 376 vessels, with a registered tonnage of 255,833 tons.

The American "Soo" canal, which is open to navigation only about eight months in the year, has more than four times the annual traffic of the Suez canal. During the past few years the vessels passing through the "Soo" canal have averaged one for every fifteen minutes day and night. Few works of man portray more fittingly the spirit of this age of industrialism, and of great achievements in production and distribution as does this, the world's greatest canal, which has about completed the first fifty years of its existence.—*Scientific American*.

THE BLUE-COAT BOY.

By a Former Master.

Now that this particular specimen of boy is about to disappear, it may be well to put on paper some of the features that have helped to distinguish him from other boys. He who is now writing knows quite well that a school which means to

call itself Christ's Hospital is to start soon on its career at Horsham, and it is quite possible that the familiar dress may be worn in those "fresh woods," and that the mantle blue may be twitched in "pastures new"; but no one who

knows anything about the old conditions of existence and the plans which have been laid down for the school that is to be, can imagine for a moment that the Blue boy of the future will be the same as the Blue boy of the past. He may be something far superior—that is not the point—but he will not be the same, and, therefore, as has been remarked before, it may be no bad thing to put on record some of the salient features of the creature who has been known (and liked) by many as "the Blue-coat boy."

Of boys in general it is not necessary to say much. A boy is a queer, attractive person, as full of surprises as "a surprise packet," idle, affectionate, with a strong sense of justice—even for assistant masters—as full of rules of "taboo" as a savage, and with some odd notions as to right and wrong. So much for the general; now for the particular. To begin with, up to recent days, the Blue has not been rich; indeed, it used to be a *sine qua non* of his "presentation" that his parents, if they yet existed, should be poor. One result of this was that he was not difficult to please; he was not *blase*. A day in the country was delightful; a theatrical matinee was a revelation—even tea at an assistant master's home was not despised. To find boys so easily amused and pleased was a pleasant change to one who had been an usher at a school intended to prepare the boys for Eton. The boys were nice enough, as boys usually are; out, as they came from lordly or luxurious homes, as they began the day with made-up dishes, such as curries, devilled kidneys, omelettes, and continued until night "according to that beginning," and as they could

criticize every play and entertainment, it was not easy to give those young gentlemen a treat. Mr. Peter Magnus' friends were easily amused. Blue-coat boys were easily amused—and pleased.

Another striking feature about Blues arose from the conditions of their life in London. For reasons of economy, they had no servants waiting on them. The ward servant attended on the matron and helped to keep the ward clean; but each boy made his own bed, blacked his own boots, laid the cloth for dinner, carried in the joints, did all the "waiting" in the hall, and so on; consequently the Blue was a most handy, helpful creature—not only able, but anxious, to help a friend—even a master, in any detail of practical affairs, such as serving out books, addressing magazines connected with the school, etc., and it is possible that such experience, such habits of order and of methods were found useful in the business-life to which many were to go.

Perhaps even the lack of games was not an unmitigated evil. A school which organizes games as thoroughly as it organizes work must have a tendency to turn out machines rather than living, thinking creatures. The present writer knows the use and good of games as well as most folk; but, at the present moment, he is thinking of one special aspect of the question. A Blue had leisure to think out his own tastes and methods. Some "loafed," no doubt, but many developed their own tastes and used their leisure in wise ways. The masters, being practically daily tutors, could not be always worrying and drilling, as is the tendency of some conscientious creatures

who are serious and "earnest." If a Blue-coat boy wanted advice, wanted a quiet talk, wanted, in a word, a friend, he generally knew where to find one, and few notions can have had a slighter base of fact to rest upon, for the last twenty or thirty years, at all events, than the one that Christ's Hospital contained two camps: some masters who heard lessons and used canes, some boys who got the thrashings and who howled—"Iugentes campi" of the City, in a word. The next characteristic of the Blue-coat boy seems to be connected with his dress. There can be little doubt that the quaint garb came to him as the local and spiritual successor of the monk—*i.e.*, of the Grey Friars who lived upon the City site long before Christ's Hospital was founded. Doubtless it is true that "cucullus non facit monachum"; but it does not follow that a certain garb may not, without the wearer's consciousness, carry with it something of the spirit of the friars. Be that as it may, it is on record that, in Charles Lamb's day, the little Blue was marked by a certain reserve, aloofness, dignity, and that these marks have survived till recent times. If some members of the school, in the last year or so, have not exhibited these traits, it must be borne in mind that, for the last ten years, some boys have got in, not by presentation, but by competition: have missed the startling newness of the Board School, have gone without the valuable training of the nursery at Hertford, have had no fancy for a boarding school, and, in a word, have felt no love for, or pride in, the old school. But, speaking generally, the Blue was civil, courteous, yet reserved. Two instances may

prove this fact more clearly than a series of general remarks.

About a quarter of a century ago a tragedy, occurred among the Blues that may occur at any school (especially one that lays, or has laid, itself out to catch the failures and the oddities): a boy destroyed himself. A certain master warned his boys when they were going home that they would be much pestered by inquiries about the matter, chiefly on the part of strangers, and that for their own sake and the school's sake the less they said the better it would be. One boy bettered his instructions; for on being asked by a stranger: "Well, now, what about the boy who hanged himself?" the little Blue replied, with the angelic air that most boys can at will assume: "Oh, he's dead!"

An old clergyman to whom the writer told this anecdote produced from his own experience a confirmation of this tendency to reticence: he was one day travelling by train and came across a company of little Blue-coat boys (he had in his boyhood had the offer of a "presentation" to Christ's Hospital, but, for some cause or other, he had gone to Marlborough): anxious to hear something of Christ's Hospital from inside, the clergyman left his carriage, bought a store of buns and oranges, and joined the little Blues. They munched and sucked like children at a school treat, but were silent as Trappists.

Now the whirligig of time is bringing these two schools together. What has been Christ's Hospital is to reappear at Horsham as a sort of Marlborough with its hostel system and unmarried masters. It may be a copy; it may be a carica-

ture; it may be a great improvement on its old self and its model; but, for divers reasons known to many, the school will not be what

it has been, and the Blue-coat boy that has been will be seen and known no more.—*Journal of Education.*

ADDRESS IN PRAISE OF THE FOUNDERS.

By Professor Davidson, University of New Brunswick.

It has not always been an easy matter to determine who the founders of this institution were; but in the present cycle of Encoenial Addresses in their praise, it has been customary to single out for honor the members of the New Brunswick Legislature, whose names were so eloquently enumerated by the Chancellor from this place some years ago, and to attribute to them an almost uncanny foresight regarding the intellectual requirements of a time half a century later than their day. In the last clauses of the statute, in which this foresight is exhibited, there is an outline of a course, leading to a diploma, in Commerce which is in general harmony with the proposals made, in these latter days, for giving commercial education as part of a college course; and in this matter, at least as fully as in others, the founders may claim, or be allowed, the great merit of anticipating future needs. One of the demands now being made on the universities is that some provision shall be made for technical instruction in commerce. We have as yet heard but little of this demand in this province; but when the demand does arise, and the public is prepared to pay for what it asks, the University of New Brunswick will probably be found ready to discuss the question of organization intelligently. But it is not the function of the college to anticipate

such a demand by showing the commercial advantages of commercial education. For the enthusiasm which makes the demand is not always intelligent and ridiculous claims are sometimes made regarding its necessity and its value. Not long since in a leading Review the English people were adjured to follow the example of Germany and establish a Training College for Colonial administrators, presumably that we may repeat Germany's success with her trained Colonial administrators.

But whatever the excesses of some enthusiasts, there can be no doubt of the reality of the demand. The Universities have not yet made up their minds how to meet the demand; and there is, moreover, a disposition in some parts of the University circle to be at least backward in welcoming such a new development. There is a certain fear that the introduction of commercial education means an intrusion of the commercial spirit and a qualification, if not a degradation, of those ideals for which universities were founded and ought to continue to exist. It is felt that the efforts which the universities have made in the last half century to accommodate themselves to the spirit of the age have resulted in the degradation of the University and in the degradation of professional office; and many feel that the spirit of commerce is antagon-

istic to the University spirit.

Whatever one may think regarding the protest thus raised against commercial education, there is some justification for the apprehension regarding the deterioration of the University spirit. Not only is the University apparently a factor of decreasing importance in national life; but it is open to question whether the University is as worthy as it was of high place among social institutions. How far this decline is due to increasing and unbalanced specialization within the University, or to the increasing materialization of the public mind, or to other causes, we are not immediately concerned to determine. But the fact remains that there has been a decline relatively at least; and neither the increasing attendance nor the increasing benefactions are evidence to the contrary and may, under circumstances, be deterioration. To put the matter briefly, the universities have lost touch with the life for which their students are being trained and in consequence have apparently to a certain extent lost confidence in themselves. They seem no longer to dare to impress themselves on the student; and while giving perhaps a better technical preparation for the struggle for life, do not succeed so well as in the past in placing their unmistakable stamp upon their graduates. It has always been a complaint against the universities that they are not practical; but in the past they were generally effectual; and in endeavoring to become more practical they seem to have become less effectual. It may be that the old fashioned course, however restricted, was more logical; and it may also be that the old type of professor, who was not a specialist, was

more fitted for the task of impressing the university spirit upon the students. But whatever the cause there has been a change for the worse; and university people have to deplore that in these days the University does not exert so abiding an influence over its graduates. The ideals are quickly forgotten: the graduate finds that to 'live he must readjust himself; and in the process he sheds, like an outworn garment, much of the University spirit. He may retain an affection for his alma mater but it is not always because he believes in the work which she has to do. In some cases this readjustment works itself out into what we may call spiritual bankruptcy; but the spectacle of a University graduate, without ideals either of public or private life, is so disheartening that some dislike to contemplate it.

The fault is not altogether in the graduate. It lies partly in the institution; and I speak of the best of them. There is no need to refer to teachers who are themselves the cause of the disillusionment, for there are unworthy men in every calling; but the same difficulty exists even in institutions where the teachers are filled with enthusiasm for knowledge, for the making of knowledge and the imparting of knowledge, and are at the same time men of character and ideals. The University, as an institution, has lost its grip. Living in a world where knowledge is paramount, University teachers have, in all ages, been apt to lose their sense of value or proportion; and in this age the danger is peculiarly great. For specialization almost surely leads to disproportion. I am not depreciating the specialist. I am one myself; and in the modern University life there is nothing

more hopeless than the man who is not a specialist, who without any sense of responsibility drifts from one subject to another, as a grocer may turn from selling tea to selling butter. Specialization we must have apparently in the Universities; but it brings with it an increased danger, for very often the specialist has specialized prematurely and lacks even that sense of proportion which a general training gives. The specialist is an enthusiast, and often can communicate his enthusiasm to his students; and then they go out into the world to find the world has a totally different and, it turns out, a very much better set of values. There may be, indeed, small room in the world's system for pure knowledge, but by its values a man must live, and the readjustment is not always a safe process.

The share of the fault which is due to the University arises from the fact that the University has not adjusted itself properly to the increased complexity of life. Half a century ago life was relatively simpler; and the old orthodox course was not an inadequate preparation for that life. Classical and English literature, mathematics and natural philosophy, mental and moral philosophy, constituted a logical course and met fairly the old demands. The new demands of the last half century have been met by adding new courses of study, which was right; but the University has not readjusted its proportions, and the modern curriculum is not a logical preparation for life. The chief defect is the neglect of philosophy; and as things now are in many places many a student graduates without ever having studied philosophy, even in the shape of

that modern apology for philosophy called psychology. And in this neglect of philosophy lies the explanation of the failure of the University to retain its place as a social factor; and in the restoration of philosophy, which is the study of man, to its proper place in a University curriculum lies the hope of the University regaining its proper position.

I do not for one moment contemplate the restoration of the old curriculum and those who hope for such a return are either visionaries or reactionaries. A University is a social institution from which social service is required. It is to be judged, not by its past services or its own traditions, but by its present capacity for service. It must therefore recognize new studies as they arise and continuously adjust itself to new conditions. It may determine the form of the service it renders but the real character is determined by present social needs. Each generation is entitled to demand that the University shall justify itself by training its graduates to cope with the conditions of life that will meet them. It is worse than useless to seek to return to the idealism of the old curriculum. That was real idealism then because it was in vital relation to life then; now it would be an unreal and abstract idealism. The problem for the University is how to keep its idealism a reality; and it is to be solved only by continuous adjustment to social needs.

We may not hope for the restoration of philosophy, *qua* philosophy, to its old position as the crowning study of the University course; but we must have in some way or other the study of man and especially the study of man's activities if the

University is to regain its old position as a social institution. Therefore because commercial education is, in its University aspects, a study of one of man's most important activities, I see in its introduction the possibility of a new life for the institution. With that view, which would make the University a superior or inferior sort of business college where typewriting and the casting of accounts may take their place alongside of Latin and physics, I have no sympathy: nor has any one seriously proposed such a system for the universities. But the study of the conditions of business is a study of man and therefore a kind of concrete philosophy; and combined with the study of man in his other chief activities in his religion and his politics, it may, properly conceived, be a not inadequate substitute for the older philosophy and may lead up to the study of man in his ultimate relations. The Trust and the Church, the University and the Banking system, the Organization of trade and Parliament, are all of them means which man has found necessary for the realization of self and the achievement of his ends. These are not all of one rank or importance, but they all have some rank because they are vitally related to man. Even as isolated studies they are not unworthy of attention; as part of a more concrete philosophy they may reinvigorate the Universities. As such a study of man, commercial education is to be welcomed, not rejected. Indeed, taught merely as a short and easy method to success, business cannot be either in the University or elsewhere. But regarded as human activity, the means and methods by which man has made and is making sure his

dominion over nature, the conditions and limitations which nature imposes upon that activity, and the measure of success which man has achieved: these are subjects which may not be philosophy in the narrower sense but are yet essentially philosophical in character. It is in this sense, as understanding and appreciation of the dignity of my subject have come to me with experience, that I have endeavored to teach economics; not merely as a subject but as an activity; and it is in this sense that commercial education may prove a great gain to the Universities themselves.

The demand for commercial education is really an opportunity for restoring that sense of proportion to the curriculum which has been lost and overwhelmed in the multitude of new studies. So far as the University can meet the demand it must deal with business as a human activity and it must impress upon its graduates the fact that in these concrete activities the ideal of man may be found, that morality, in short does not exist merely in man's aspirations but has a more valuable and more concrete expression in the institutions of actual life. The remarkable growth of the commercial spirit, which so many deplore and which has given rise to the demand for commercial education, means, in its last analysis, a demand that business shall be regarded as an occupation on a footing of equality in social service with any of the professions. This is in itself a distinct moral advance for the community; and the University must realize the importance of the fact. Merely to preach a barren and formal idealism, resenting the intrusion of the study of commerce, leads nowhere. Life, even for University graduates, is lived

among concrete realities, and not in the heights above; and the University must prepare its students for life. The University is not an end in itself but a stage through which men pass, and its ideals must not be so conceived and enforced that the interpretation of the real life which men must live becomes more difficult.

No traveller ever forgets the impression made by his first vision of the Rockies, a hundred miles and more away; the mountains, clear cut, snow-clad and cloud-piercing, but apparently baseless and having no connection with the earth, arising out of nothing and reaching to the infinite; while the traveller sits spell-bound. But he is carried quickly on; and soon the low, rounded green foothills come between him and the heavenly vision and shut him down to the commonplace. Yes, it is among the foothills that men live and work; and there they may even forget the glory of the early vision. But some day a man leaves the busy haunts of men and comes to a spot whence he can see, near at hand, no longer baseless but resting on the solid earth, and almost within hand reach, the mountains he had "lost awhile;" and they still have the overwhelming grandeur of the early vision with an added sense of immediate reality. Then, too, he may realize that in the eternal hills the foothills have their origin and

are nearer the ideal than the spirit compelling vision of earlier days.

Ladies and gentlemen of the graduating class, this University has given you, I hope, some opportunity of the earlier vision; but if it has presented the ideal to you in such a form that with it the realities of life seem to have nothing in common, it has done you a great wrong. For you are now entering the foothills of life where men live and work and do not see daily visions. But if this University has in any degree given a knowledge of the dignity and worth and practical idealism of ordinary life, it has rendered you a very great service indeed, and has performed in you a part of the social duty required of it. For to realize the ethical value of the common round of life, to realize that the ideal is better represented in achievement than in aspiration and that the ordinary institutions of life are not only capable of reconciliation with, but are actually derived from the ideal, is to know much of the wisdom of all ages. And if you are wise you will seek, not merely to retain the memory of the past, but also at times pass to some spot whence again you can see, but now clearly and not as in a vision, those eternal hills from which doth come, not only our aid and aspiration, but the very meaning and possibility of the ordinary life we have to lead. —*University Monthly, Frederickton.*

VARIABLE STARS.

W. Balfour Musson, Toronto.

To the casual observer of the heavens it is quite evident that *one star differeth from another star in glory*, but it is not so evident that one star differs in glory at different

times; yet such is the fact, and the waxing and waning of these distant suns offers striking evidence of the mighty forces ever at work in the depths of space.

Such stars, known to the astronomer as variables, exhibit in their light changes characteristics of the greatest diversity.

For the most part these changes in magnitude can only be detected by systematic and patient observation, assisted by greater or less optical power; yet in a few notable instances, such as those of *Algol*, "the demon star," and *Mira*, "the wonderful," they are easily discerned by the unaided eye.

In order to facilitate their observation Prof. Pickering divided variable stars into five classes; it is true that these classes may occasionally overlap, while some stars present features of so unique a combination as to preclude their assignment to any particular class, nevertheless their classification serves to emphasize the main points of difference.

For our present purpose, however, we may arrange them roughly into two divisions to distinguish stars of long period, and stars of short period, omitting temporary stars, which are scarcely to be described as true variables, and making a sub-division in favor of those of the *Algol* type—remarkable for the clock-like precision of their fluctuations.

Short period variables run the cycle of their changes in hours or days, show spectra of the *Sirian* or *Solar* types, and are predominantly white or yellow in color.

Long period variables, on the other hand, take months and years to complete their light curves, belong to the third spectral type and are strikingly red in color.

Prof. Chandler, after a careful study of the subject, reached the conclusion that "the redness of

variable stars is, in general, a function of the length of period of their light variation."

In *Algol* variables the change of light occurs in consequence of an interruption to the steadfast shining of the star, while in the opposite type the variability appears to depend upon a more or less sudden outburst of light.

Long period stars are, as a rule, characterized by greater amplitude and irregularity in their light curve. Their redness of color is significant when considered in relation to their spectrum, the third type of spectrum, as is well known, being identified with a red color as a probable effect of condensation resulting in a strongly absorbent atmosphere. Further, these stars almost invariably show bright hydrogen lines at maximum, thus appearing to justify the conclusion that the increase of light is due to a highly incandescent state of the star's atmosphere, which gradually subsides as the minimum is reached; thus completing a cycle of changes in from one to four years, which, under ordinary circumstances, would take unknown ages.

Regarding theories as to the cause of these remarkable phenomena perhaps, in the present state of our knowledge, the less said the better. Sir Norman Lockyer advanced the hypothesis of the periodic impact of two meteor swarms as an explanation, whilst the near approach of the components of a binary system—thus setting up enormous tides and disturbing the thermal equilibrium of the system—offers a plausible alternative. Neither of these theories, however, will meet the necessities of the case; the baffling

irregularity of change in many instances seeming to defy all attempts to bring the phenomenon under the sway of any one particular theory.

In the case of *Algol* variables, however, the cause of variation is placed beyond reasonable doubt. The great regularity of period, together with the facts that their light is interrupted, and that their spectra show no change between maximum and minimum, as well as the spectroscopic evidence of motion, lead to but one conclusion—that of the eclipse theory, or the regular passage of one member of a double star system between the observer and its companion.

As these eclipses occur at very short intervals we are forced to conclude that the bodies revolve about one another in very close orbits, and, indeed, in the case of the *Algol* system the components are known to be separated by a distance but half again that of the sum of their diameters, while even smaller orbits are known.

Upon the assumption of the bipartition of one original mass—in conformity with the investigations of Poincaré upon the behaviour of a rotating fluid ellipsoid—this should indicate an early stage in the life-history of the system and consequently a comparatively low density. Such is actually found to be the case; the color of these stars and the character of their spectrum are also in close accord with this conclusion.

Of short period variables *Algol* may be taken as the typical example. Its characteristics are an apparent continuance at a constant magnitude between eclipses, great loss of light at minimum, and a remarkable regularity in period.

This star is also of special interest as being the first to the examination of which the spectroscopic method was applied, as also the first system whose mass was determined. It is sensibly constant at 2.3 mag. for two and one-half days, when its light begins to decrease, at first gradually, but with increasing rapidity, until it reaches a mag. of 3.5—losing about two-thirds of its light in four and one-half hours; then without any pronounced pause the increase begins and the maximum is again reached in a similar manner in some nine hours from the time of first diminution, the total period being two days, twenty hours, forty-eight minutes and fifty-nine seconds.

In 1888-9 spectrographic observations of *Algol* were undertaken by Vogel at Potsdam which disclosed the fact that at one time it was approaching the earth and at another was receding from it, and further, that not only was this motion periodic but that it was directly associated with the star's variation in brightness. Thus was the true nature of its mysterious "winking" discovered,—it revolved in an orbit together with an invisible companion about their common centre of gravity. It had been suspected that a change was taking place in the light curve—the period gradually lessening—and about this time Prof. Chandler published in the *Astronomical Journal* the results of a large number of observations. He arrived at the conclusion that the irregularity comprised two inequalities, the first having a period of about 140 years, and the second of something over 37 years.

Subsequently, when making observations to determine alterations

in terrestrial latitude, among other stars he made use of *Algol*, and during the course of the investigations the suspicion was aroused that the star was subject to a change in position not to be accounted for by any variation in latitude on the earth. A closer examination convinced him that not only was this suspicion correct, but that *Algol's* change of place among the stars was closely related to the long irregularity in its period. His explanation was that the star and its dark companion together revolved about a third body, in an orbit nearly equal to that of *Uranus*; and he predicted a maximum of acceleration in the light period about the year 1900.

The *Astronomical Journal* of 15th October, 1901, contains the latest word from Prof. Chandler upon this subject. Summarizing an exhaustive series of observations he says: "It will be seen that the actual course of observation has satisfactorily verified the prediction that the protracted interval of gradual decrease, which began about 1830, and had continued up to the time of the publication of that paper (1888), would soon be followed by a long interval of increase. The beginning of this increase indeed set in immediately after, rather than earlier, than the elements indicated. It is manifest that the length of the principal inequality, which was then assumed as 18,000 periods, is considerably less than that. The new value now adopted, 15,000 periods, or 116 years, cannot be very far from the truth."

It will thus be seen that when we come to study carefully variables of this type we are in reality dealing with true binary or multiple sys-

tems, which fact lends additional interest to the subject, for we are brought face to face with the great problem of Stellar evolution.

In short period variables not of the *Algol* type we find, as in those of long period, considerable diversity in light curve. *Beta Lyrae*, for example, has two equal maxima and two unequal minima. At its greatest light the mag. is 3.4 and at the least 4.5. The intervening minimum is usually about the fourth mag., but is subject to considerable variation. The entire period is 12 days, 21 hours and 47 minutes, having increased more than two and a half hours during the last century.

A noteworthy feature of this star is that it is one of the few of short period known to give a gaseous spectrum—if indeed it has a parallel. The hydrogen lines, however, do not brighten as in the case of long period variables, but on the contrary are weakened, perhaps by the effect of contrast, while the only instance of their showing traces of absorption was during the time of minimum.

An ingenious theory of its variability has been advanced, based upon the assumption of two bodies of low density revolving about one another, and being drawn into ellipsoids by the force of their mutual attraction.

We now come to a consideration of the class known as variables of long period, the most famous example of which is *Mira* in the Constellation *Cetus*. This star was first observed as variable in 1596, again in 1603, and its period of 333 days was determined in 1667. Once in eleven months it increases in some 110 days from the ninth to the second magnitude or even

higher, remains nearly stationary for two or three weeks and then drops in about 200 days to its former level.

A faint minimum in 1783 is said to have reduced it to less than the tenth mag., whilst Sir Wm. Herschell observed it when at its maximum in 1779 as little inferior to *Aldebaran*. The intensity of the maxima vary, but outbursts of exceptional brilliancy are isolated.

Deviations of the mean period sometimes occur, amounting to a fortnight, and the maximum of 1840 was a full month late.

The spectrum is of Secchi's third type, eleven bands of shadow—sharp towards the violet—dividing the brilliant zones. These are combined with lines of metallic absorption.

Eta Argus is a particularly interesting type of an irregular; a faint reddish star; it was first seen by Halley in 1677, and although it was observed in 1751, 1822, 1826 and 1832, its variability was not detected until a traveller named Burchell, who had been familiar with it as an object of the fourth magnitude, was astonished one night to see it shining with great brilliancy. A still greater outburst occurred in 1837, when it equalled *Alpha Centauri*; after a partial decline and many fluctuations it again blazed out, rivalling *Sirius* in splendor.

This position was maintained for nearly ten years when it began to decline, reaching the second mag. in 1858, and the third in 1859. It was invisible to the naked eye in 1868, and in 1886 was still below the seventh mag.; it has since exhibited, however, slight signs of revival.

With the exception of "temporary," or new stars, such a range of magnitude is unequalled. Photographs of its spectrum taken by Prof. Bailey, of Harvard College, showed bright hydrogen lines.

In the monthly notices of the Royal Astronomical Society for April, 1901, is a paper from Mr. F. McLean, in which he states that he received from Dr. Gill, of the Cape Observatory, a photograph of the spectrum of *Eta Argus*, and upon examination found a strong resemblance between the bright spectrum of this star and the dark line spectrum of *Nova Persei*. He further states that the absorption spectra of *Nova Norma*, and *Nova Aurigae* also correspond so closely as to lead him to infer a common origin for all these objects. *R Coronae* is an instance of a long period star owing its variability to an interruption instead of to an increase of light, thus proving an exception to the general rule. Of the sixth mag., when constant, it occasionally sinks to the thirteenth, and remaining stationary for several months slowly regains its light. *R Cephei* sank from the fifth to the tenth mag. in the course of thirty years, and has not risen above the eighth since 1840.

Gamma Cygni rose a whole mag. in six months and the gain appears to have been maintained.

As a general rule very red variables are characterized by great irregularity. Variable stars exhibit a tendency to cluster in the Milky Way in a zone of from 15 to 20 degrees of galactic latitude, and to form in groups in the constellations *Delphinus*, *Cygnus*, *Canis Minor*, *Libra*, and *Sagittarius*. It is also to be noted that new stars have almost invariably appeared in this

region of the heavens. Prof. Bailey has made an exhaustive study of variable clusters and has found over 500 variable stars so situated, thus doubling the hitherto known number of these objects.

All clusters, however, are not of this character, the great cluster in Hercules yielding only two out of 1,000 stars examined. On the other hand, in *M.* 3 15 per cent. of the stars proved to be variable, in *M.* 5 9 1-2 per cent., and in other clusters, from 4 to 6 per cent.

In all some twenty clusters, including upwards of 19,000 stars, have been submitted to scrutiny.

The great percentage of these stars found in clusters may have some bearing upon the fact of their affinity for the *via Lactea*.

According to Bailey's estimates the periods ranged from less than one to over 400 days, the cycle of light change being often marked by sudden increase, brief maximum and comparatively slow decline, with considerable interval at or near minimum. Sometimes, however, the period of increase was equal to or greater than that of decrease.

Some remarkably regular examples were found, in one instance 5,000 periods having been observed without noticeable change. Greatly condensed clusters are found to contain the largest percentage of variables.

Various methods have been devised for the detection of variable stars, the simplest being to select two comparison stars, one fainter and one brighter than the suspected star, and make a comparative estimate of magnitudes according to certain well-known methods. This

method may be used with very simple optical aid when the stars are not too faint. At Harvard College Observatory, where the work is being prosecuted with great energy, the photographic method is largely employed, both for an examination of the spectra and for an estimate of magnitudes, either from actual star images, or from the varying width of star trails. Photometric measurements are, of course, also made.

When near the maximum, as has been stated, the hydrogen lines in long period variables are bright, and with a single exception, every star having this peculiarity of spectrum has proved to be a variable.

Mrs. Fleming, of the Harvard staff, has by this means alone been enabled to discover over thirty examples (the suspicion of variability, of course, being afterwards confirmed by an actual measurement of the star's light).

In conclusion it may be said that no class of observation offers so great an opportunity for really useful work to the amateur as the careful and systematic study of variable stars. The true nature of these bodies is still involved in mystery, and if the mystery is ever to be solved it must be by the deductions drawn from the comparison of great numbers of observations. In the collecting of this material professional astronomers welcome, and are even asking for, the assistance of careful amateur work.

A fair knowledge of the star charts combined with patience and perseverance, are the chief essentials of success.

HUMAN INTEREST AND NATURE STUDY.

By Clifton F. Hodge, Ph.D. Assistant Professor of Physiology and Neurology in Clark University, Worcester, Mass.

"And why are these men revered? Because they humanized knowledge; because they broadened the basis of life and intelligence."—Matthew Arnold.

There is but one thing of deeper educational significance than interest, and this is, the cause or reason of interest itself. We must seek for this in the warp and woof, in the very web and tissue of life. Psychologists seem able to tell us absurdly little about the deeper rationale of interest; students of child study give us only superficial and fragmentary chips as to its genesis and scope; and the pedagogues, except some of our good Herbartians, have done little more than bury the subject under a mountain of misrepresentation.

Nature touches the organism at a thousand points. Why does the life respond, warm, glow, and fuse with one point of contact and not with all the rest? There is but one answer to this question. The particular element of the environment which arouses interest—is responded to—stands in a vital relation to the life. This relation, or affinity, is no fictitious or arbitrary matter. It has been woven into the fabric of the species through the years of its past history. During this history, failure to respond has meant death; response has carried with it life.

The fact is seen most clearly in the new field of animal psychology, since here the problems are simplified by narrower lines of interest and by the absence of pretense and

all other fictitious elements. Watch for a moment the robin in the garden. He stands erect and looks about him.—his first interest his own safety. A cat skulking along the fence is seen and immediately absorbs his attention. He flies to a tree and watches the cat disappear across the street. Assured of safety, he drops to the ground, and now every sense is absorbed in the search for food. His hunger appeased, he secures food and carries it to the nest. A note of alarm or distress from a neighboring garden, and off he flies with a loud cackle to render what assistance he is able to his species. With peace restored, he perches on the topmost spray of the elm tree, and his being overflows in his song of good cheer.

Here we have in epitome the fundamental psychology of life. Herbert Spencer has classified the ideas basal to human education as follows: (1) ideas centering about direct preservation of self; (2) ideas connected with self-preservation indirectly *i.e.*, food and external necessities of life; (3) ideas relating to preservation of the family; (4) ideas pertaining to the state; (5) ideas associated with one's pleasures, or the gratifications of his tastes,—art, science, recreation, play, and the like. If any fake exception to Spencer on the ground of utilitarianism, certainly these charges cannot be lodged against Ruskin, and he says: "And sure good is first in feeding people, then in dressing people, then in lodging people, and lastly in rightly pleasing people, with arts or sciences,

or any other subject of thought."

"Making a subject interesting" is apt to be fraught with insincerity. A subject is interesting or it is not interesting according to the nature of the human mind and the unchangeable constitution of nature. All human beings who are not actual or potential suicides, mental or physical,—all who are not inherently addled or "spoiled,"—must find universally and perennially interesting the elements in their natural environment which stand related to these ideas which are fundamental to life. "Making a topic interesting" may be legitimate, if by this we mean showing its relation to life. With most of the topics of elementary nature study however, this relation is, or should be, if we select the proper materials, so immediate and direct that we shall need to divert little effort to this end.

A brief reference to commonly accepted definitions of "interest" may place us upon a better mutual understanding in preparation for the points which follow.

A common dictionary definition of "interest" is: "Attention with a sense of the special importance of a thing to oneself." John Dewey has constructed a more technically pedagogical definition as follows:

"Genuine interest in education is the accompaniment of the identification, through action, of the self with some object or idea, because of the necessity of that object or idea for the maintenance of self-expression.

In further explanation he says: "Self-expression, in which the psychical energy assimilates material because of the recognized value of this material in aiding the self to reach its end, does not find it

necessary to oppose interest to effort. Effort is the result of interest, and indicates the persistent outgo of activities in attaining an end felt as valuable; while interest is the consciousness of the value of this end, and of the means necessary to realize it."

We owe much to the Herbartians for proving that there is no real antagonism between education of interest and education of discipline. Such supposed antagonism, as is so often the case in disagreements of this kind, results from partial views of the facts. It is the old controversy of the two sides of the same shield. We must love them both, and the best discipline and the highest effort are obtained when the interest is deepest and most whole-souled.

In the light of what has been said we may frame a definition of "interest," not specially related to technical pedagogy, but of universal application to life, in the following terms: Interest is the affinity or relation of the organism to those elements in the environment that are of importance to its life.

In dealing with the problem of human education these elements are numerous and their relations are extremely complex. Our chief concern should be to select for elementary instruction those that are fundamental and universal, and relegate to later and more special education all those interests that are differentiated, or technical,—interests related to special trades, occupations, or professions.

"How could youths better learn to live than by at once trying the experiment of living? Methinks this would exercise their minds as much as mathematics." (Thoreau.) We have been studying things in

such artificial and superficial ways that we have well-nigh gone blind to the larger and deeper human interests involved. And in this connection do not misunderstand me to mean material values or interests alone. I would combine every scrap of human interest,—economic, aesthetic, mental, moral, and spiritual,—using each or all combined to yield the strongest possible motive or appeal to induce the child to study aright the nature about him.

Characteristic lines of interest have developed along with the life of the human species, and I see no better way to distinguish between special and universal interests than by studying through the history of the race the development of relations toward nature. Not to go back to the lowest savagery, where men lived solely by hunting, fishing, and gathering what wild products of the soil the region happened to yield, the points of greatest educational significance concern the steps by which man worked his way upward into civilized life. These steps, as I have stated at length elsewhere, have to do mainly with man's relations to animal and plant life. Worked out, as they were in great part, before even myth or legend—not to say history—began, they are the very deepest and most fundamental lines of human nature study. Chief among man's relations to nature in the historic epoch, and destined to retain a foremost position among those perennially close to his life, these relations must remain not only the deepest but the most universal human interests of the race. Instead of wasting time and effort in

trying to make interesting to the children things that are apart from their lives and hence essentially uninteresting, the problem of elementary nature study becomes the much easier one of finding those things in nature that possess intrinsic human interest. While this standpoint may seem theoretical and far-fetched, it has come to me wholly from the side of practical experience. Any one may test this for himself. Let him but watch a child in his effort to tame and gain the confidence of some wild bird about his home, and he will see how the heart is touched. Or let the child try to rear a flower, and he may observe how the mind unfolds, with his growing plant, into living sympathy with nature. I think one who does this will agree with me that such lessons lie deeper and closer to life than anything he can find in technical zoology or botany.

The public schools are not fancy-work circles or art clubs; they are not scientific academies or even natural history societies. In their relation to nature study their function is deeper than any and all of these combined. The school course in nature study should aim to bring the children into fundamentally civilized relations to nature. "To learn what is true in order to do what is right" is the fundamental purpose, or, as Spencer words it, "To prepare us for complete living is the function which education has to discharge;" and life is response to the order of nature. The more perfect the response, the higher and more complete will be the life.

THE AMENDMENTS TO REGULATIONS FOR 1903.

J. H. Knight, P. S. Inspector, Lindsay.

The Public School Leaving Examination is dead, a thing of the past. The idea of dividing pupils into two classes, those who intended to go to a High School, and those who did not, was a good one. The former were to be fitted to enter the High School, for the latter a course was laid down, so that instead of beginning a number of subjects which might be of very little use, they would carry every subject begun to a definite and approved stage.

The Public School Leaving Examination as at first established, served its purpose fairly well. It had its weak points which might have been corrected, as is the case with all our examinations. One of its weak points was that the examiners were poorly paid for their work.

The first real blow this examination received was when it was proposed that those who had passed it should be admitted to the second form of the High Schools. The intention was good, but the effect was bad. From that moment it became a High School examination, and the next step was to have it held with the July examinations instead of with the Entrance. But here a difficulty occurred. The examination that had been conducted by the local examiners at a dollar a candidate would cost \$5 a candidate if the papers were read at Toronto. But those who wished to kill the examination and ruin our rural schools had a remedy at hand, "Examine five subjects and let the teacher certify that the other seven subjects have been properly taught, and make the fee two dol-

lars." It is very flattering to a young teacher to tell him that he knows more about his pupils than any examination can reveal, but every teacher of experience knows that an examination ahead is a great stimulus to work.

And where are we now? Many rural schools that twenty years ago were taught by an experienced male teacher are now taught by a third class female teacher. Very few boys and girls who have passed the Entrance examination will go to them, and there is little inducement for parents to urge them to do so. There never was a time when education was so much needed for the sons and daughters of farmers as now. Men in commerce and manufacturers are looking for educated employees and they get them from the High Schools and Commercial Colleges. Our farmers might make two dollars where they make one now were they better educated than at present. Our continuation classes may be an advantage to the villages, but without a Leaving Examination are not likely to benefit the rural schools.

The regulation that a candidate may take Chemistry instead of Latin will not make him a better teacher even if he takes 60 per cent. on the total instead of 50. The object of this change may be to have Junior Leaving work done in continuation classes. But the cost of apparatus stands in the way of efficient work. Then if a school spends \$500 for apparatus, the regulation may be changed in two years.

The regulation speaks of "the lowest grades" and "the higher

grades" as if there were several grades of non-professional certificates, whereas there are only two. Surely some teachers who elect to take the lower grade will decide at some time to try to obtain a higher. But what if they have lost six or seven years by not beginning Latin at first. Many persons would like the standard of the Entrance lower in order that languages might be begun earlier. If a second language should be begun at ten years of age, what chance will there be for those who begin at twenty-one?

The next regulation authorizes High School Principals and Public School Inspectors to certify that the holder of a Part II. Junior Leaving Certificate has taken the required course in geography, history, drawing, book-keeping, reading, etc. In a High School with two teachers, the principal may be able to certify this; but if there are more than two he can only certify that somebody else says so. It is difficult to see how an inspector

can certify to this without a laborious examination, yet he may satisfy himself in five minutes that the course has not been completed.

The next regulation provides for a report from the High School staff to take the place of the examination of the five subjects which is now abolished. It is to be hoped that the report made by the High School teachers of the five subjects will be more satisfactory than the report by Public School teachers of the seven subjects has been.

The reason assigned for the changes is "the widespread opinion that a higher standard should be exacted at the non-professional examinations for Public School Teachers' Certificates." If so, why not raise the standard to 40 per cent. in each subject and 60 per cent. on the total. This would shut out only those who did not know their work. Then let every candidate take Latin and either French or German.

FLOWER AND FLAME.

Between the flowering and the flaming woods,
 All greening in the rain
 The fields unfold,
 The sun upon the grain
 Outpours its gold,
 And sweet with bloom and dew are nature's moods
 Between the flowering and the flaming woods.

Between the flaming and the flowering woods
 The wind bemoans a host
 Of withered leaves
 The winter is a ghost
 That grieves and grieves
 Around a ruined house where none intrudes,
 Between the flaming and the flowering woods.

O woods that break in flower or in flame,
 My winged days and hours
 Shall meet their doom
 Like to your leaves and flowers;
 Let not your bloom
 And brightness put my flying years to shame,
 O woods that break in flower or in flame.

ETHELWYN WETHERELD.

EDITORIAL NOTES.

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

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

The School Reports of Messrs. Inspectors MacIntosh and Johnston have been kindly sent us. We thank these gentlemen for sending us a copy. On the teaching staff in these Public Schools the women are five to one—this is about the proportion for the whole province. These Inspectors seem to imply that it was a mistake to abolish the Third Class Non-professional Certificate, and set forth the same statement made by many others that it is difficult to find qualified teachers for all these schools, which we venture to think is a good sign of a new improvement for the well-being of our schools. In these inspectorates the salaries of teachers are less than they were nine years ago. "Many children leave school before reaching the Senior Third Book Class!" says the Inspector. "Our teaching is too bookish and, especially in the Secondary Schools, seems to have a tendency to give our young people a distaste for mechanical and agricultural pursuits" is another statement found in these reports.

TEACHERS WANTED.

We have reports to the effect that there is a scarcity of qualified teachers both in the Provinces of Ontario and Quebec. To secure the services of qualified teachers is expensive. It is expensive to qualify so as to obtain any grade of certificate authorizing a person to teach a school in Canada and

not every one who tries can succeed in the attempt. Therefore, it pays better to turn the attention to some other occupation; the various commercial pursuits pay more money to ordinary people than teaching; a domestic—a servant-girl, not subjected to any worry, carrying no responsibility, receives far more money for her time and work than hundreds, yea thousands, of teachers in Quebec and Ontario.

Trustees now, we are informed, are engaging unqualified teachers, taking the risk of losing the Government grant. As regards Quebec, this is vouched for on the highest authority, the case is not so clear as regards Ontario, but of the lack of teachers in both provinces there is no doubt.

Trustees can get some teachers for a "piece of bread." The important question is what kind of teachers? It is a universal truth that the poor workman is the dearest, the most expensive. The country pays toll for such teachers in many ways, and for many generations. The low wages paid to teachers for years past has been a crying evil. We are glad that our talented sons and daughters are refusing to enter on the onerous and responsible work of teaching; they cannot live decently on the wages offered; they ought to be given such remuneration as would enable them to lead strong and happy lives for the sake of the well-

being of those whom they undertake to teach. This they cannot do on starvation wages.

One of the resolutions adopted by the National Educational Association U.S.A. at Minneapolis last July was as follows:

"It is apparent that familiarity with the English Bible as a masterpiece of literature is rapidly decreasing among the pupils in our schools. This is the direct result of a conception which regards the Bible as a theological book merely and thereby leads to its exclusion from the schools of some States as a subject of reading and study. We hope and ask for such a change of public sentiment in this regard as will permit and encourage the English Bible, now honored by name in many school laws and State Constitutions, to be read and studied as a literary work of the highest and purest type, side by side with the poetry and prose which it has inspired and in large part formed."

The complaint is an old one, and is well founded. Ignorance of the Bible, even among the educated classes, has reached a depth which is a sorry return to the self-denying and fixed determination of the British peoples in ages bygone to have the Holy Scriptures in the mother-tongue. The Canada Educational Monthly a few years ago gave reports of test examinations, chiefly from pupils at our High Schools, to ascertain their familiarity with the allusions to Bible incidents and character, compared with that with respect to heathen deities to be met with in a piece of ordinary English literature. The result of this was to make it quite clear that these scholars were better pre-

pared to give a common-sense explanation of references to heathen mythology than to statements found in their Bibles.

There is no doubt that the acquaintance with the Bible of the young in Canada and the United States of America whatever may be the truth as regards the young in Great Britain and Ireland, is very unsatisfactory indeed, and in comparison with that of their forefathers inferior in extent and quantity.

The best of all institutions for instruction, for education, is the family; the best of all books for the building of character is the Bible. Read, conned, laid up in the memory for use at all times, in childhood, in youth, manhood, and in the years of most mature judgment, the teaching of the Bible is unapproachable by any number of other books. The histories of the Bible, its biographical sketches, its literature and the literature it has inspired, together with its outlook on human existence, is the human races' most priceless possession. Therefore it is only the mark of common prudence to engage every agency in human society to permeate all communities with the contents of this matchless volume. Hence, we were glad when the resolution at the head of this article passed at its annual meeting by the National Educational Association of the United States of America, appeared in the public press. We felt that it was becoming well in the Christian Guardian of this city to publish its appreciation of the resolution and the spirit thereof. Let us have the Bible studied and taught in all the schools of the country: Public and High Schools, Normal Schools, Col-

leges and Universities, but most specially in all our families. "They that honour Me I shall honour, and they that despise Me shall be lightly esteemed."

The Minister of Education has announced that hereafter no text-book will be authorized for use in the schools of Ontario until after it has been published and in general circulation for at least six months. In this way there will be no difficulty in learning the opinions of teachers and experts concerning the books for which authorization is desired.

Publishing firms the world over are to-day more enterprising and progressive than at any previous time, and capable and learned authors find less difficulty in securing publication for their works. There has been marked advance and improvement, too, in the processes of bookmaking in recent years; especially is this the case in all illustrative work. When a new text-book appears the author can readily and conveniently circulate a few hundred copies of it, and those most competent to judge of its merits or demerits will have the opportunity leisurely and deliberately to form a careful opinion concerning it. The committee of experts, to whom each book for which application has been made for authorization will hereafter be referred, will be likewise greatly aided by the criticisms or notices, favorable or the reverse, which, on account of its previous circulation among the teachers, have appeared from time to time.

According to the new method, authors will be given a more open field, and there will be equal chances for all who choose to write educa-

tional works. At the same time, the usual conditions regarding the quality of paper, typography, binding, price, etc., which experience has proved to be safe and useful, will be maintained.—*Globe.*

Such is the last word from the Minister of Education to the province on the question of authorizing text-books for our schools.

THE CANADA EDUCATIONAL MONTHLY congratulates the Minister upon the conclusion he has come to on this long considered question. The decision was not arrived at any too soon. It is now more than a quarter of a century since the Council of Public Instruction was relieved of the onerous duty of authorizing text-books for the schools. To abolish the Council was a retrograde step in education; to appoint a political partizan head of the Education Department was a "blunder." The determination of the Minister in the matter is a partial recovery of lost ground, and we have no doubt will be beneficial to the country in many ways.

We hope there will be no interference on the part of the Government between writers and publishers. To write good text-books requires knowledge, skill, and imagination. Writers possessing these qualities are not any too abundant, and to entice them to enter the field of preparing school books, the financial returns must, to say the least, be sure and handsome. Therefore, let us have no cheeseparings with the artist in his effort to inspire our children in the schools by the valued results of his genius. No doubt the names of the members of the committee to pass the final judgment on such books as are to be used in the schools will shortly be given to the public.

Many of the text-books now in use in the schools are in great need of improvement, and no doubt the decision of the Department will be an active stimulus to capable writers to try their fortune to supply Ontario with the best possible books for her schools. There are several publishers in Canada fully prepared to give the highest satis-

faction in this class of work of the bookmakers' art.

This recent development in the school book question is gratifying to the CANADA EDUCATIONAL MONTHLY; because for more than twenty years it has constantly advocated what is now declared to be the policy of the Education Department in the matter of authorizing books for our schools.

COMMENTS.

Apropos of President Roosevelt's frequent use of quotations from the Bible to illustrate points in many of his recent speeches in New England, the Boston *Herald* says that it was not very long ago that "orators could make no point more certain of instant appreciation than one which turned on an illustration from the Bible, even from its least read portions. Nowadays it is hardly safe for a popular orator to venture on any allusion outside of the gospels and the Psalms."

The *Washington Post* admits the truth of the *Herald's* statement and expresses the opinion that "the waning of the good old habit of reading the Bible is regrettable on other than religious grounds. Ignorance of the Scriptures disqualifies one for appreciative reading of many of the best pages in general literature. To become a fairly well-educated man or woman, 'a boy or girl should become familiar with the Bible.'" "The decrease in Bible reading generally, if there has been a decrease, has been due to many causes," says the *Baltimore Sun*. "One of these is that the old custom of family prayers, where the children and servants gathered in the sitting-room night and morning to listen to a chapter from

the Bible and brief prayers appropriate to the beginning or the end of the day, is not generally observed. The so-called 'higher criticism' of the Bible is responsible, doubtless, for decrease in Bible study. The masses of the people do not differentiate very nicely. They argue that if the Bible is the word of God and its writers inspired by God, then it must be true. But if it is part true and part error, if it is not inspired, if things which are told as facts are not facts, but merely allegory or fables, then the Bible can not be the word of God and is not worth reading. The Bible is no longer the only book of the plain people as it once was, because so many books are now accessible to all classes."

During the last two years we have counted in the output of the publishing world, five editions of Dickens and Scott, four of Thackeray and Hawthorne, three of Irving, Eliot, Reade, Marryatt, Bronte, Victor Hugo, and Dumas, and two of Jane Austen, Ainsworth, Walter Pater, Barrie, Black, Wilkie Collins, Blackmore, and Trollope. One rather wonders what household is still lacking of a set of Scott, Dickens, Thackeray,

but the demand evidently continues, or the publishers would be chary of launching editions after editions upon the sea of popular favor. Indeed, when one thinks of the innumerable Bibles absorbed each year, computed at a million, there are evidently depths of which most of us are ignorant. These continual editions of books of standard authors which must be absorbed almost entirely by private individuals is a pleasing sign that the undercurrent of the reading world is much stronger and deeper than surface appearances indicate. The good we have always with us to fall back upon, to pick up again and again when we can find a cosy spot and quiet evening to ourselves. How Job, had he lived to the present day, would go about the streets on a broad grin at his fulfilled desire, "Would that my enemy would write a book." And it is pleasant to discover the strong undercurrent in favor of books whose popularity is not solely due to brass-band advertising.

Perhaps it is not altogether a disadvantage to be behind the rest of the world in some things—that position at least may not seldom prevent the necessity for retracing steps, or retreating from false and possibly dangerous positions. For thousands of years education was to all intents and purposes, as well as of purpose and intent, bi-sexual, and that certainly seems what Nature intended it should be. But in America, and in other countries, following her lead, co-education of the sexes was proclaimed as the ideal system, and adopted almost universally. A few years ago few and faint were the voices of those in America who had anything but good to say for co-education. Now what is the position? We are told by

Dr. Edmund J. James, one of the most eminent "educationists" of America, that a reaction has set in, a vague prejudice has arisen in the country at large, which has induced a new attitude of the public mind towards the whole problem. Curiously enough, this widespread loss of confidence in the system of teaching the sexes together, instead of separately, is not attributed to anticipated objections. "The notion," says Dr. James, "that women are capable of doing college work, so commonly urged a generation ago, has completely disappeared. The objection that young men and women cannot be trusted to observe proper relations in their social intercourse has lost its force in view of the plain fact that the moral tone of co-educational institutions is certainly not inferior to that of schools for one sex alone."

What, then, is the cause of this "marked reaction in the public mind?" One cause, for there are many, is that the "increasing number of women tends to feminise the institutions where they are, in some cases to such an extent as to discourage the attendance of men." Another practical objection is that, whereas the chief aim of education is to fit for a career, the broad difference in the future careers of the two sexes should find a more adequate recognition in the college curricula."

It must indeed be discouraging to the advocates of co-education to find that in the North-Western University, Chicago University, Cornell University, Columbia University, and Brown University the male graduates are manifesting their dislike of co-education "in ways that are more annoying than chivalrous."—*Publishers' Circular*, 16, 8, '02.

The most striking feature of recent Canadian literature has been the discovery and exploitation of the interesting and picturesque material which is afforded by habitant life in French Canada. It is in working this field that Dr. W. H. Drummond, of Montreal, has found his well-deserved fame. The Westminster for July introduces a new writer, J. É. Le Rossignol, who contributes a charming story of French-Canadian life, entitled, "An Anchor of the Soul." Mr. Le Rossignol is a graduate of Toronto University, and is now a professor in the University of Denver.

King Edward celebrated his coronation by making a gift of the Osborne estate, situated on the Isle of Wight, to the British nation. Osborne House was one of the favorite residences of Queen Victoria, but has not been so popular with the King. With the exception of the apartments personally used by the late Queen, Osborne will be converted into a convalescent home for army and navy officers whose health has been impaired through service for their country.

Any school board which provides for the scholars a library selected from the catalogue which is to be prepared by the Minister of Education shall be entitled to a share of whatever money is appropriated for the purpose. The grant is to be equivalent to half the money expended by the board, but will not exceed \$10 in any year. In case the Legislature does not vote enough money to justify the full grant a pro rata payment will be made. The trustees are still empowered

to buy such books as they deem expedient for the school library, but the grant they receive will depend solely on the amount expended on books catalogued by the Minister of Education in such departments as biography, history, geography, travel, mythology and fables, elementary science, citizenship, etc. The principal of the school will be librarian and the trustees are required to make arrangements for the care of the library. Applications for legislative aid must be made by the trustees upon the departmental form each year, after the books have been received, through the Inspector to the Minister of Education. All necessary information regarding the books must be given, together with such vouchers from the booksellers as may be required.

We commend the above scheme to the teachers, trustees, parents and young people, and hope and expect to see it generally taken advantage of, especially in rural schools. There is more leisure and quiet in the country for good wholesome reading than there is in cities and towns, and more genuine culture can be had from a few good, wholesome books well conned than from a large number hastily perused.

Would that our religious leaders were as prudent as our educational authorities! Then we might find in our Sunday school libraries nothing but books that are distinctively religious and moral in tone. The motto of those who have selected books for these seems to have been: Get books that will be read. It ought rather to be: Get books that ought to be read.

CURRENT EVENTS.

The assembling of nearly eight hundred of the school-teachers of the Transvaal and Orange River Colony at Johannesburg on July 2, for a ten days' conference, has great significance. In the opening address, Mr. Sargant, the Director of Education, stated that "colored children had just as much right as the children of other taxpayers to access to Government schools, and the Government recognized its duty to provide schools for them. It was impossible, however, to disregard the social usages of generations. Therefore, in spite of the extra expenditure involved, separate schools, just as well equipped, would be provided for the colored population."

Inspector Tilley, of Durham County, gave a very satisfactory report of the schools in his inspectorate, from which report we gather the following.—

(1) The Model School is doing excellent work, with Mr. Wood as principal.

(2) The Public Schools are doing better work than formerly in many instances.

(3) The Teachers' Association is in an efficient condition.

(4) Trustees are discharging the duties of their position in a satisfactory manner, all things considered.

(5) More attention is being given to procuring suitable supplies and appliances for the schools, as shown by an expenditure of \$394 in 1900, increasing to \$970 in 1901, in this department.

(6) Better salaries are being paid on the average. The average salary for males is \$360, females, \$267.

We also gather from Mr. Tilley's report:—

(1) That at an expenditure in 1901 of about \$35,000, the county employed 117 teachers, comprising 34 males and 83 females, with the latter increasing in number at the expense of the former.

(2) That he is not altogether in favor of the centralization system of which Mr. Odell seems to be a warm advocate.

Further in his report Mr. Tilley takes occasion to explain two special grants made by the government to certain public schools thus:—

(1) Rural schools winning diplomas for excellence of premises and supplies receive \$5 additional grant, which is taken from the whole Legislative Grant to the township before dividing the balance among the schools of the said township.

(2) Public Schools having at least three Public School Leaving pupils in attendance each month of the year receive \$15 from the Government and a like sum from the County grant.—*Independent, Newcastle.*

The Pacific cable to connect Canada with Australia and New Zealand will probably be completed before the end of the current year, the last portion of it having been shipped from London last month, via the Suez Canal. The longest section of the cable will be from the south coast of Vancouver Island to Fanning Island, about 3,500 miles; and the others, from Fanning Island to Fiji, 2,093 miles; from Fiji to Norfolk Island, 963 miles; from Norfolk to the northern part of New Zealand, 537

miles, and from Norfolk to Australia, at a point near Brisbane, 834 miles. The latter section has been completed and is now in operation.

Work will soon be commenced upon the new Trans-Canada railway, which is to touch James Bay and Lake Winnipeg, open up the valley of the Peace River, and run to Port Simpson, on the Pacific coast, following a route four or five hundred miles north of the Canadian Pacific route.

At the regular meeting of the Public School Board, Barrie, on Monday, 8th of September, the following resolution was passed with respect to the reprehensible conduct of Mr. Edward Moore, who failed to keep his promise to the School Board. We hope the Minister of Education will ask Mr. Moore to explain and, if possible, to defend his breach of promise with the Board. We agree with the trustee who stated in the dis-

cussion of the matter: "That a man who had no regard for his word, had no right to teach."

The failure of Mr. Moore to put in an appearance was the cause of considerable discussion, and the following motion was made by Trustee Smith, seconded by Trustee Rhinehart: "That the Secretary be instructed to report to the Minister of Education the fact that Mr. T. Edward Moore, having engaged with this Board to take the Fifth Form for Model Term disappointed us at the last moment."—*Barrie Advance*.

Among the nations of the earth, Canada stands eighth in respect to the registered tonnage of shipping. Great Britain, of course, heads the list, followed by the United States, Germany, Norway, France, Italy, Russia and Canada. The total number of Canadian vessels is nearly seven thousand, and their value about \$20,000,000.

SCHOOL HYGIENE.

Helen MacMurchy, M.D.

Food and Its Functions. By James Knight, M.A., B.Sc. London: Blackie & Son.

This work was first published in 1895 and the fact that it has already been three times re-printed proves its success. The author is Lecturer on Physiology and Hygiene in the High School of Glasgow and Lecturer in Dietetics to the Glasgow School of Cookery. The book is intended as a complete manual of the theoretical part of a course on Dietetics and contains much information in a brief compass. At the end of each chapter is a useful summary of its contents, and while

an occasional page may be found containing statements too dogmatic or somewhat out of date, the book is a good one on the whole.

The Imperial Health Manual. London: Bailliere, Tindall & Cox.

This is the authorized English edition of the Official Health Manual issued by the Imperial Health Department of Germany. It is divided into four parts, the first being devoted to the Structure and Functions of the Body, the second to the Necessaries of Life for the Individual Man, the

third to Man in His Social Relations, and the fourth to the Dangers to Health from External Influences. There is also a supplement on Nursing.

Household Economics. By Helen Campbell. New York and London: G. P. Putnam's Sons.

This book is a "find." We have not seen a dull page in it. It is a delightful companion, the reader is grateful for its wit as well as wisdom. A book on life and living, mainly intended for the home-makers, on whom we all depend; it should be read by everybody, if only because the ideas are so stimulating, especially when you do not entirely agree with them. We cordially commend it to our readers.

Rural Hygiene. By Geo. V. Poore, M.D., F.R.C.P. London: Longmans, Green & Co.

The Dwelling House. *Ibid.*

Dr. Poore's essays on Rural Hygiene are profitable to read, inasmuch as the author takes as his text sanitary methods in general and shakes his readers out of their ignorant confidence in the arrangements of city life. The style is fresh and interesting and the facts

are marshalled in a masterly manner. Those who are interested in country vs. city life, or, indeed, in sanitary questions at all, will find themselves at home with this book.

In "The Dwelling House" Dr. Poore takes up common defects in dwelling houses and briefly reviews sanitation from a social and scientific standpoint. This little book deals in an admirable manner with the many questions about soil, construction, overcrowding, etc., which meet us daily in one form or other.

Hygiene and Public Health. By B. Arthur Whitelegge, M.D., B. Sc. London, D.P.H. Cambridge. Ninth thousand. London, Paris, New York and Melbourne: Cassell & Co.

Of all the well-known students' manuals issued by this publishing house, none is more important and valuable than this. The author is one of the highest sanitary authorities in the world and his text-book, first issued in 1890, has been repeatedly revised and brought up-to-date. In the seventeen chapters of the book the reader will find in little space a wonderful amount of sanitary science. It should be placed in Teachers' Libraries as a book of reference.

CORRESPONDENCE.

Editor C. E. Monthly:

Dear Sir,—I was much interested in the contribution published in the May number of your valuable Journal of Education from the venerable historian of educational history of Upper Canada, Dr. George J. Hodgins. All who are fit to appreciate the work Dr. Hodgins is doing for the history of Education in Canada are grateful to him for his zeal and labor to

preserve the records of the past. Dr. Hodgins has shown conclusively that the Chief Superintendent, the late Rev. Dr. Ryerson, made provision for County Model Schools. Another evidence, if that were needed, of the clear foresight of that able and worthy son of Canada. For some reason the Model Schools of that day did not prosper. I recollect very well the animated discussions which took place

at the annual meetings of the Ontario Teachers' Association in the early history of that body in connection with the question of organizing County Model Schools. The Association passed, at several annual meetings, resolutions favoring the organization of Model Schools in the shape we now have them. In this way the attention of teachers and others were centred upon these schools and thus led to

the hearty recognition of them by the general public. Evidently we are soon to have further development of these useful schools in the improvement of the education of the Province. The attention of the Minister of Education has been for some years directed to the necessity of making these necessary changes.

Believe me, your friend,
ZIPH.

BOOKS AND MAGAZINES.

To accommodate readers who may wish it, the publishers of *THE CANADA EDUCATIONAL MONTHLY* will send, postpaid, on receipt of the price, any book reviewed in these columns.

The American Monthly Review of Reviews for September is a farmer's number. There are several articles on harvesting and the finance of farms, and C. Warman contributes an account of A Migration from the States to the Canadian North-West.

The Youth's Companion for September 11 publishes a short story by Jane Barlow, entitled Moriarty's Meadow. There is also a second instalment of a serial story by Mr. E. W. Thomson, once of the Staff of the Toronto Globe, who some months ago gave up an editorial position on The Companion in order to get more time for writing.

The September Atlantic contains short stories by Thomas Bailey Aldrich, Louise Lyndon Sibley and George Kilbe Turner. The Baroness Von Hutten's Our Lady of the Beeches continue to be charming, and a second serial, Memories of a Hospital Matron, is begun. The Atlantic is undertaking to give each month some really good work in reviewing, a benefit in these days of pervasive advertising.

The long story in the September St. Nicholas is one for girls, by Miss Carolyn Wells, entitled Hilarity Hall.

Mr. Arthur E. McFarlane, a young Canadian and a graduate of Toronto University, has a short story in the September Cosmopolitan which, it is claimed by the Editor, should rank with some of Edgar Allan Poe's work in the same line. It is a striking story, but some of Mr. McFarlane's readers will think that he has done better work in The Youth's Companion and in other periodicals in which his work has appeared.

Dr. Weir Mitchell's short novel, New Samaria, which was published in the August Lippincott, is followed in the September number by A Bit of Human Nature, by Ellen Olwey Kirke. The Lippincott's complete monthly novels are, as a rule, extremely successful; there two should certainly be no exception. The names of other contributors to the September number are: C. T. Brady, Josiah Flynt, and Alice M. Brown.

The Studio for August contains an interesting account of a Scottish painter, E. A. Walton, A.R.S.A., by James L. Caw, which gives, in explaining Mr. Walton's work, an excellent sketch of the rise of the School of Modern Scottish Painters. An article on Monotyping is followed by another on a Scotch artist, Miss Jessie King, whose work, judging by the beautiful reproductions which appear in the article, is curiously individual and decorative. She illustrated Kipling's first Jungle book. Each issue of *The Studio* is invariably beautiful.

The *Living Age* for September 6th reproduces from the *Church Quarterly Review* an excellent article on Some Aspects of the Modern Novel, dealing more particularly with the general absence of any treatment of spiritual life of the higher kind.

The September *Century* is a very good number of the magazine. Amongst the contributions of more than usual interest should be mentioned: A Ballad of Semmerwater, by William Watson; The Boyhood of Mark Twain, by Henry M. Wharton; On the Giving of Books, by the author of *Elizabeth and Her German Garden*; and William Watson, by George E. Woodberry.

Mr. Barrie's *Little White Bird* will mean almost the whole of Scribner's Magazine to many subscribers while it is being published. It is very charming, and very true, looking at life from a certain standpoint which seems to be Mr. Barrie's standpoint most of the time. Frank Brangwyn's illustrations for a Fisherman of Costla, by James Connolly, are very striking; his extraordinary richness of

coloring may be divined through the black and white. Mr. Connolly's story is good, as is usual with his work.

Browning as a Tree Lover, an appreciation, is one of the most interesting articles in the September *Book-Buyer*.

French Commercial Correspondence. By Messrs. Glauser and Poole. 4s. 6d. John Murray, London, England.

This course of French Commercial Correspondence, prepared by Prof. Glauser, is adapted to English schools of the highest grade by W. Maufield Poole, M.H. It is written entirely in French, the only English in it being translations of technical terms. A useful book, a further evidence of the activity of the British in educational affairs.

Elements of English Composition.

By Profs. J. H. Gardiner, G. L. Kittredge, and Sarah Louise Arnold. Cloth. Pages 431. Ginn & Co., Boston.

After a careful reading of this book on Composition we can say that for the teaching of the subject of Composition, either in the elementary or secondary schools, it is the best we have ever read. It connects the subject of Composition with the experiences of everyday life, as well as with the study and appreciation of literature. No teacher of Composition should be without a copy of this excellent book.

The following three books are from the well-known press of Messrs. Ginn and Company, Boston, U.S.A., and are good specimens of their beautiful workmanship:

The Lady of the Lake. Scott. In the Standard English Classics.

This edition is designed for children between nine and fifteen years old. It is safe to place copies of any of Scott's works in the hands of young children as well as in the hands of children of forty years.

Advanced First Reader. By Ellen M. Cyr. Towards the Rising Sun: The Youth's Companion Series.

Elements of the Theory of Newtonian Potential Function. By B. O. Peirce, Ph.D., Professor of Mathematics and Natural Philosophy in Harvard University.

The Abbey History Readers, Nos. I, II, III, IV and V, completing the series, 1s., 1s. 3d., 1s. 3d., 1s. 6d., 1s. 6d. respectively. Revised by the Rt. Rev. Francis Aidan Casquet, D.D. George Bell and Sons, London, England.

The old sad story, the old inspiring story, the present glorious story of how the British people have become to be the Crowned Republic. History can be very well taught by the aid of these Readers. Well worth the thoughtful attention of teachers.

The House That Jill Built. By E. C. Gardner. Springfield, Mass.: The W. F. Adams Co.

This is a pleasant and readable book on home architecture, first issued in 1882 (present edition 1895), containing many useful hints; not only for people who are building houses, but also for those who could and should understand and improve the houses they live in. It is not a book which foolishly aims at making "every man his

own architect," but rather helps people to think out sensibly what they need in a house and what they need to know about a house.

Arithmetic Made Easy, Mr. Murray's Text-books for Secondary Education. By Mabel A. Marsh. John Murray, London, England. 2s. 6d.

Miss Marsh is a teacher, thus she writes of her book: "Though primarily designed as a handbook for teachers, the writer hopes that it will be of use to their pupils as well, out of whose actual perplexities the lessons have really grown." From her book both teacher and pupils can obtain useful hints.

Electric Wiring, Murray's House and School Library. By W. C. Clinton, B.Sc., London. 1s. 6d.

This little book is intended as an introduction to the "Indoor" electric wiring as practised in the fitting up of private houses, shops, etc., with lamp and bell circuits, and for this purpose the science master will find it very helpful and likewise the students.

Animal Activities. By Nathaniel S. French, Ph.D., Roxbury High School, Boston. Longman, Green & Co., New York. Pp. 262; \$1.20.

In the introduction the author says that this first book on zoology is the outgrowth of fifteen years teaching of the subject to large classes in a High School. The book gives ample evidence of the truth of the above statement. One of these is the long list of books given which have been found useful by the pupils in their study of zoology. We commend the volume to our teachers in all our schools.

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ALBANY, April 17, 1902.

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