



# The UNIVERSITY OF TORONTO QUARTERLY



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THE

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TORONTO, MAY, 1895.

No. 2.

## MATHEMATICS A MEANS OF CULTURE.

BY ALFRED BAKER, M.A.

[An address delivered before the Mathematical and Physical Society.]

I do not think that we who labor in the Department of Mathematics should lose our tempers when one who is ignorant of our subject ventures to attack it, or to comment adversely on its usefulness; for, from the very character of our subject, we are more exempt from such causes of irritation than are the laborers in other departments. A part of knowledge that for upwards of two thousand years has been most intimately identified with all that is most valuable in human progress needs no defenders, and can be indifferent to attack. But sometimes a statement is made that exhibits an ignorance not merely of the details of mathematics, which is pardonable, but even of the general character of the subject and of its relations to other departments of knowledge, with which general character and relations every cultivated man should enjoy an acquaintance. Thus it is not infrequently said that mathematics is most valuable as a discipline, but of little value as a means of culture. I wish to reply to such views to-night; I wish to offer instruction to those who entertain such views.

I take it for granted that I am speaking to an audience composed not necessarily of mathematicians. You will accordingly recognize that I am restricted in the means of presenting the case. Numberless illustrations which I could offer to a company

of mathematicians would be out of place here. Yet, such illustrations would be esteemed by many the most valuable part of the argument. I have therefore to ask you generously to recognize that the case can be made much stronger, not only if the speaker be changed, but also if he be granted a different audience.

The error of our critics arises from their taking a narrow view of culture, and from imagining that a kind of antithesis exists between culture and discipline. Culture includes discipline; discipline is a part of culture—possibly its most important part. Discipline concerns itself with the moral part of our nature, and with the higher part of our intellectual being, and hence the somewhat stern associations surrounding the word Culture and discipline may even be regarded as co-extensive, in which case discipline suggests thoroughness, depth, scientific method. Hence the word discipline lends itself especially to those subjects that are capable of a thorough, profound and scientific treatment. There is a part of culture, usually regarded as outside of discipline, which occupies itself with our æsthetic faculties, with our perception and appreciation of beauty; but even with this, as I shall shew, mathematics has to do.

My position is that not only does mathematics supply culture in the broadest and deepest sense of the word, but that even in the narrowest application of that much abused word "culture," our subject is not found wanting. My plea for culture as being resident in mathematical studies really applies to all science.

My claim is that all science not only disciplines the faculties but also cultivates the sense of beauty—the æsthetic faculties—provided always, of course, that science is properly presented.

I have no sympathy with the crude and narrow view of culture that sees it only in the study of poetry, and of the lighter forms of literature (without philosophy or science), or sees it only in the painter's or sculptor's arts, in architecture or in music. Our University, every university, is a protest against so circumscribed a view. It is not a little remarkable that men can be found who say that a science which deals with the most positive kind of knowledge is to be viewed merely as a discipline, but that *belles lettres* which may deal in things most fanciful and

absolutely removed from fact, are in themselves an end, or, at least, a nearer approach to finality. What a curious topsy-turvy view of education it reveals. The study of the poetry that deals with man's oppression of his fellow-man is a lofty culture; but the study of the political science that would devise means to relieve that oppression is, forsooth, only a discipline.

Beauty is far more wide-spread than most people suspect. It exists in its highest aspects in all fields to which man has devoted his energies. But beauty can never be seen in regions of thought where the mental operations are difficult. When a man or woman is wanting in the peculiar intellectual strength needed to comprehend the elements of mathematics, the pursuit of the subject becomes laborious, and the beauty is never seen, or rather the regions are never reached where the beauty exists.

Thus it comes to pass that educated men are to be found who think that science, mathematical science at any rate, does not make for culture. To such too often it is culture to understand a play of Shakespeare, but not culture to understand Newton's great discoveries; it is culture to read Dante's *Divine Comedy* and to seek to understand his curious and utterly false explanation of the cosmos, but not culture to understand the true explanation which Copernicus gives. I am sure Dante himself if placed in modern times would have entertained no such views. He incorporated his cosmos in his great work because he thought it was true, and his genius was in consequence enabled to give it poetic interpretation. To the people of whom I speak it is culture to be able, when standing before a painting, to talk intelligently of fore-shortening, middle distance, high lights, values, tones, half-tones, feeling, warmth, breadth, the painter's method, but a lower form of culture to understand the system of the universe as one looks out on a starry night; and if one has enough mathematical knowledge to understand, for example, why we understand the law of gravitation holds in those remote regions, it ceases to be culture at all. To such too often it is culture to talk glibly of the planets circling in their vast orbits about the sun, but not culture to possess enough mathematical knowledge to know that they do not "circle" at all, and to see clearly that, the law of gravitation being such as it is, the planets must move in ellipses. To such it is often culture to interpret the myths of

ancient Greece, but not culture to understand her marvellous system of geometry.

It has been said that "the ideas with which the mind of the mathematician is busied are of so uniform and limited a character that they do not of necessity impart any large amount of culture." I am here quoting, but I do not wish to give the quotation any personal reference. I merely quote so as to give in specific form a notion sometimes entertained. Yet this view is not entertained by any one with sufficient knowledge to give weight to his views. How can the subject present the difficulties it admittedly does if the ideas are "uniform and limited"? If the ideas were "uniform and limited," in conquering one part of the science we would be disposing of all. But this is certainly not the case; difficulties beset the student at every step, and hence there is no Department in the University in which such rational grading can be arranged from first year to fourth. The fact is, there is no subject in which the ideas are so varied and profound. Some one may ask—"Is there not but one idea in your subject, that of quantity?" I reply, there is the idea of quantity, and ideas of space and time. If my hypothetical enquirer still urges that, there being but these three notions, the ideas with which the subject is occupied are "uniform and limited," I beg to remind him that many scientists believe there is but one original substance in the universe, protyle, and of course there are space and time, motion being a relation between space and time. Possibly some day when the protyle question is settled this gentleman may explain to a body of auditors—"Gentlemen, I find there are but three things in the physical universe—protyle, space and time. The ideas, therefore, which occupy the mind of the student of physical science are of so uniform and limited a character that they do not of necessity impart any large amount of culture," and he may declare his intention of confining himself in the future to the poetry of his favorite author. The error into which such people fall comes from their not realizing the infinite, eternal, unbounded variety of which the ideas, space and quantity are capable.

But, possibly, an even more grievous error consists in thinking that a given subject is wanting in culture value by reason of its being uniform and limited. The most valuable quality in a

subject from a culture standpoint is its beauty or its suggestions of beauty. I find beauty everywhere in mathematics. The illustrations of the law of symmetry we so often meet with appeal to our sense of beauty; so does the constant presence of law. There is something very exquisite in the way in which we so constantly ascend from several particulars to the general; as, for example, in proceeding from exponential, binomial or trigonometrical expansions to Taylor's series. Even in elementary geometry we receive suggestions of man's intellectual progress, of the processes by which a higher geometry was slowly but surely revealing itself, and of the means by which other forms of mathematical thought were forcing themselves upon the attention of mankind. The technical nature of the subject prevents me from offering further illustrations of a like nature. Mathematics-like music, requires prolonged study to properly appreciate its greatest triumphs.

Astronomy can never be realized, nor its beauty properly comprehended, except by those who possess a knowledge of mathematics. For the science of which I speak—mathematics—furnishes the reasons for all the results and conclusions that are reached in astronomy, and the beauty of any fact in the spiritual, moral or physical universe can only be properly perceived where there is perfect understanding.

There is beauty intrinsically in the process of understanding anything perfectly, in seeing back to the first elements of anything, irrespective almost of what that thing may be. I mean there is a beauty in seeing from the beginning, through and through anything, clearly and with absolute certainty, *for this is as the Deity himself sees*. Well, such knowledge is, perhaps, attainable in mathematics only, for in it we realize our propositions from the result back to the beginning, where we are arrested only when we reach the question of the structure of our mental being, and then only mystery stops our further progress. In this sense it may be maintained that there is beauty even in the most elementary propositions. It has been well said that to an infinite mind all truths are axioms. It is exquisite to note how clearly in mathematics are set forth the steps by which we pass from our axioms to other truths. We seem to obtain so accurate a measure of our own finiteness.

I have spoken of mathematics in astronomy. It is possible that some may be so unfair as to say—"We admit the mathematicians have achieved grand results, but the results lose their beauty in the laborious and intricate processes by which they were achieved, or the results do not belong to the mathematician but to the physicist"—or perhaps to the poet! How grossly unfair such a contention, and what stupendous ignorance it reveals as to the character of all scientific research. No great result was ever reached without great labor, and only the laborer fully appreciates the beauty of the result. I believe our great Milton had no emotion so sublime as that which filled the soul of our greater Newton when foreseeing the result of his work, his trembling hands refused to complete the calculations that were to confirm his great discovery of the law of gravitation.

One of the most splendid passages in Shakespeare is that beginning

"Our revels now are ended," etc.

Is it possible that anyone can see beauty in this, and yet none in the science that enquires into the permanence of our solar system, in the science that seeks to know whether "the great globe itself shall dissolve"? It is science that furnishes a solid ground, a substantial basis from which the imagination may begin its flight.

There is a star in the constellation Perseus, known as  $\beta$  Persei, in the head of Medusa, and otherwise called Algol. Algol is described by astrologers as the most important, violent and dangerous star in the heavens. Possibly the interest the star has for astrologers may commend its observation and study as a branch of culture, as no one contends the study or practice of astrology is a discipline, unless it be such to those who are led into error by its predictions.

The peculiarity about Algol is its variable brightness, going through its changes in intensity in about two days, twenty hours. The hypothesis was that a dark body, revolving about it, eclipsed it. This hypothesis has been confirmed. We have now some remarkable facts about this almost infinitely remote star, and they have reached us *necessarily* in about the order in which I state them. We know the rate at which it moves, the radius of its orbit, the relative dimensions of Algol and its dark com-



panion, probably their relative weights, even the velocity of the dark body, and the size of the dark body, as well as the size of the bright one, the dark one having never been even seen. In the beginning, recollect, there was only the varying brightness of the star to distinguish it from millions of others in the heavens. Its orbit is too small to permit one to see, even through the most powerful telescope, that it moves at all. I wonder is it necessary to label such knowledge "A Fairy Tale of Science," to use a great man's feeble words, that people may appreciate its wonder and beauty. Yet that wonder and beauty are only fully known to him who could restore the knowledge were it lost. Do not tell me such is but the dry light of science, with no relation to our humanity. In the presence of such knowledge one has emotions such as humble him when surrounded by lofty mountains, and it is as full of suggestiveness as the tumbling sea waves on a coast.

It has surely occurred to many in how poetic a form scientific truth presented itself to Tennyson. When he thinks it would be a glorious thing to live in the distant future it is that he might

"Wake on Science grown to more  
On secrets of the brain the stars,  
As wild as aught of fairy lore."

The most beautiful, because the most perfect, work of the old Greeks was their geometry. Its purity and ideality as a science are incomparable. Starting from principles the most abstract and most universal, which with infinite delicacy mark the boundaries of self-evident truth, it proceeds to establish most varied truths by processes the most irrefragable. The existence of law amidst variation is its constant theme; and I doubt not it first suggested the existence of law in the Universe though obscured by the confusion of natural phenomena. It may thus have been the parent, as it certainly is the model, of all other science. The struggle of mankind for centuries has been to make possible in other branches of knowledge the methods that hold in geometry.

I have said that the most perfect thing the Greeks created was their geometry. Greek art was an idealization of nature. Neglecting all attributes that interfered with beauty and perfec-

tion, they sought perfection by a process of eclecticism. The same method was followed in their geometry, but with greater success. There are in nature lines with the quality of straightness, forms with the quality of roundness, surfaces with the quality of levelness. The Greeks abstracted these qualities and created those purely ideal things the straight line, the circle, the plane, of their geometry. The subject, in a quasi-scientific form, had been handed to them by the Egyptians with the imperfections and crudenesses inseparable from a department of knowledge so recently suggested by experience. The Greeks idealized it, perceiving that it could be made to depend on conceptions the most abstract and general; and from such conceptions built up the science. I direct your attention then to the fact that the quality in the Greek mind which created their art—namely, their idealization, their power of abstraction, their disposition to struggle up to perfection, their love, indeed, of beauty—created also their geometry; but that in their geometry that mental quality was more clearly and more successfully illustrated than in their art.

Culture, in the restricted sense to which I have often referred to-night, has its origin in Greek civilization, or, rather, in the failure of moderns, to appreciate the scientific part of that civilization. Had the Greeks made more advance in science than they did, had science played the important part with them which it does with us, their genius would have diffused through its study the spirit of beauty, and we should have had a broader conception of culture to-day. Or, rather, there would have been a broader conception in those dull spirits who see poetry only in verse, beauty only in art, ice-cold, unsympathetic, mechanical truth only in science; in other words, who see in a subject only what some stupid label tells them they are to find there.

The mathematical faculty, or rather the philosophical faculty of which the mathematical is an illustration, has such intimate relations with art that I venture to claim no great work of art can be produced without its presence. Mathematics, especially, trains one to look for relation and cause; to think of nothing as isolated; to expect that every part of a theme is to have its full and true significance, its bearing on the whole, on the result: in consequence to expect harmony or agreement and therefore

symmetry in the *tout ensemble*. Surely it is a training such as this that adds to one's power of criticising justly any work in art or literature. Consider how enormous is the aid which scientific methods and even scientific phraseology have given to other departments of human interest. The enunciation of the doctrine of evolution has made it necessary almost to re-write history, and to reconstruct criticism in literature and art.

A tree is known by its fruits. Many of the most distinguished mathematicians have been men of the widest possible learning and culture. Sir William Rowan Hamilton, the distinguished inventor of Quaternions, is a striking illustration of this fact. The historical and biographical argument which may be thus made out is exceedingly interesting, and I suggest that some of our mathematical students take it up and develop it.

And now I desire to refer to a phase of the subject I have been discussing, which if properly understood will do much towards clearing our mental vision in this regard: no literature, no art, no facts are necessarily sources of culture in themselves. Culture springs essentially from the mental attitude in which external phenomena are received. There are accordingly some minds which derive culture from no source, and there are others which derive culture from all things.

Thus the external facts correspond to inorganic nature, culture to the process by which they are assimilated into organic life, or to the results of that assimilation. I repeat, then, that whether becoming acquainted with a particular fact contributes to a man's culture, depends not on the fact so much as on the man himself. If his perceptions be acute, so that he can perceive the essential qualities of the fact, and if his knowledge of general principles be broad so that he can recognize the relations of the fact to other facts, his perceptions and his grasp of general principles will receive culture; and if he have the sense of beauty, his æsthetic faculties will receive culture in the perception of relations and in the recognition of the operation of general laws.

Do you ask me, then, if I consider mathematics imparts the highest culture? I have not claimed this. For no subject can such a claim be made. The best subject for such a purpose must vary with each man's intellectual and moral make-up. But mathematics is as frequently suited to fulfil this function as any

other department of knowledge ; possibly more frequently from the highly intellectual qualities it develops. It is each man's duty to devote himself primarily to that branch of learning for which he has special aptitude, that he may ably perform the duties for which nature has intended him. But in doing so he should guard against abnormal development in one direction and consequent sacrifice in another. Emerson says "Culture invokes the aid of other powers against the dominant talent ;" and again, "Culture is the suggestion from certain best thoughts that a man has a range of affinities through which he can modulate the violence of any master-tones that have a droning preponderance in his scale, and which can succor him against himself."

## CHARLES DARWIN.

BY DANIEL A. CAMPBELL, '95.

[Paper read before the Natural Science Association.]

It has been said that to be great, a man should have the choosing of his ancestors; he should also have the choice of the time in the world's thought in which to live. Charles Darwin may be said to have had both these opportunities of choice. He came upon the world when his presence became a necessity. A great man was needed. The world was ripe for a great "organizing and directing intelligence," and this it found in Charles Darwin. Looking back at the period prior to his appearance one can almost see the worried looks of the workers and thinkers of that day, dissatisfied with the views prevalent and struggling to reach the light which earlier and contemporary investigators saw but dimly.

It would be following too closely the popular notion to say that the evolution hypothesis was an invention by Darwin. This idea is entirely erroneous. Moreover, he was not the first great man to publicly announce that there had been an evolution. The foundations of the theory were already well laid. Men saw or thought there had been an evolution; none knew the cause of it. It was Darwin's glory that he made this known to the world.

Up to the time of the famous biologist Buffon, a period including Linnæus, who is called the great father of modern scientific biology, and who candidly and inconsiderately gave in his allegiance to the then current opinions on biological questions, from time immemorial the almost universal dogma of all men, educated and unlearned alike, was that every species of plant and animal now existing was brought forth by a mandate of the Creator and that it retained unchanged its original form. This opinion was not derived by exact observation, but depended for its authority, it was said, on the first chapter of our sacred

volume. Men thought and still think that the Creator by his word gave life to a pair of each kind and that this pair reproduced the type unaltered to the present day. They believed that no change occurred in the form of the original of any account. This doctrine held men's minds completely chained till the time of Buffon, 1749-1788.

Two causes may be assigned for the existence of this dogma of the fixity and immutability of species, so universally held till the end of the 18th century. One, a strong one indeed, was the reverent unquestioning attitude of all men to the sacred account as contained in Genesis and the danger which men underwent who assumed any sceptical position towards it. Even Buffon, who if he dared would have boldly denied that account, does so always in a hesitating and tentative way, continually employing a saving clause. Thus, after repeating again and again that the forms of plants and animals are not unchangeably fixed and that the whole of the existing species are derived by direct descent from others by small variations, he saves himself from the fate of such boldness in that disturbed country, France, under Louis 15th and 16th by the concession, "But no! it is certain from revelation that every species was directly created by a separate fiat."

Huxley says that even in his young days the Geologist "had one eye upon fact and the other on Genesis."

The second cause for this popular dogma being abroad was the inaccurate observation of the investigators concerning variations. Men, who passed along not observing carefully and minutely, did not see the differences now known to exist among similar species of plants and animals. Minor variations were unnoticed except by the curiously scientific. Even Linneus failed utterly to see these small but important differences, so important indeed, that special chapters are devoted to them by the leading investigators of our own times.

The suggestions thrown out by Buffon that species were derived from species, struck root deeply in the minds of biologists of every country about the close of last century. In France, St. Hilaire, in Germany, Goethe, and in England, Dr. Erasmus Darwin all became followers of the new evolutionary principle. The latter is important because of his influence chiefly upon

Lamarek, and through him upon Lyell and our modern biologists, Chas. Darwin, Spencer, Huxley and so forth.

Lamarek's theory that animals largely developed themselves through the use or disuse of their organs had no immediate effect, but the work he did produced an upheaval in the next generation. Indeed, as Grant Allan says, "from the beginning of the present century a ferment of enquiry on the subject of creation and evolution was everywhere obvious among speculative thinkers. The profound interest which Gœthe took in the dispute on this very subject, . . . between Cuvier and St. Hilaire amid the thundering guns of a threatened European convulsion, was but a solitary symptom of the general stir which preceded the gestation and birth of the Darwinian hypothesis." Every man's mind was troubled by the new thought. Everywhere the evolutionary dogma was profoundly agitating the scientific world. Some one was needed to strike a decisive blow.

On the other hand much had been done to prepare the world to accept the theory yet to come. Geology was enforcing the truth that nature's processes were slow and gradual, and that the countless myriads of organic forms, living and extinct, succeeded one another in ascending series of complexity and in a definite unchangeable order, thus hinting at the possibility of their descent from one another.

Malthus, too, in 1798 had published his work, showing that as population increases at so rapid a rate, in a geometrical ratio, a struggle for existence must follow. Afterwards, the struggle was shown to exist in the whole realm of biology.

So that all the fundamental postulates of his theory were ready for Darwin. This does not mean that his theory was "in the air," but simply as Darwin himself says in his usual candid manner, "innumerable well-observed facts were stored in the minds of naturalists, ready to take their proper places as soon as any theory which would receive them was sufficiently explained."

From this somewhat rapid review of the thinkers and workers who preceded Darwin, and who ripened and prepared the world for his coming, let us turn to the subject of this sketch.

And first a word or two about his ancestors.

Chas. Darwin sprung from a Lincolnshire family, with re-

ords dating from the year 1500 at least, but the first progenitor with an intellectual stamp similar to his own, was his grandfather, Erasmus Darwin. His great grandfather is also described as "a person of curiosity," with "a taste for literature and science," which taste is made known to us in documents of a scientific character published during his lifetime and in which he is mentioned on account of his describing a human fossil or impression in stone.

The literary and scientific tastes of his grandfather, Erasmus Darwin, are known to all students of the literature and science of the last century. He is regarded by some as the herald who ushered in the dawn of the Descent system. His views on variation and heredity were merely expanded by his grandson. In fact, on account of his not having the discovery of Malthus, he just missed being the author of the modern view of evolution by Descent of which Natural Selection is an explanation.

It is a debated question whether Chas. Darwin inherited most his father's or his grandfather's intellectual nature. He himself paid an extraordinarily high respect to his father's abilities. He constantly employed the superlative quality in describing him; thus he says of him that he was "by far the best judge whom I ever knew," or "the most acute observer whom I ever knew," etc. It is certain that he did not inherit his grandfather's love of language, but the same love of exercise and of field sports was strongly prominent in the young days of Chas. Darwin. Both possessed the same "indomitable love of hard mental work," the same fellow sympathy, benevolence and great charm of person.

His father, Robert Waring Darwin, like his grandfather, was a Doctor of Medicine, so quiet and retired in manner that as in the case of most men he did not display to the world his greatness, which was marked enough however to gain him admittance as a Fellow to the Royal Society.

The Darwins altogether were of noble stock, with high and varied intellectual endowments, who attained envious distinction in many fields, botany, zoology, medicine, philology and in general philosophical biology.

From his mother's side much of the dogged patience and



painstaking persistence, so lacking in Erasmus Darwin, so characteristic of Chas. Darwin may have come.

From both sides he derived a remarkably abundant amount of indomitable energy and a zeal which enabled him to surmount in after years, and while yet a young man, the dragging effects of ill-health.

Chas. Darwin was born Feb. 12th, 1809, at Shrewsbury. In passing it may be noted that in this same year Oliver Wendell Holmes, Abraham Lincoln, Alfred Tennyson and William Ewart Gladstone were also given to the world. Charles Darwin was the second son in a family of six—two boys and four girls. His mother died when he was only eight years old, so that he was left with but few remembrances of her. He attended day school at Shrewsbury at this time for a year. He was not observed to be a clever boy. But even at this early age of eight or nine the bent for Natural History subjects was pronounced enough to inspire him to name plants and to collect all sorts of things, shells, seals, franks, coins and minerals. This passion for miserly hoarding collections was not common to the rest of his family.

The simple character of the boy is shown by the following amusing story of his school boy life at Shrewsbury. A boy named Garnett took him into a cake shop one day and bought some cakes without paying for them, as the shopman trusted him. When he came out of the shop, young Charles asked him why he did not pay for them, and he answered, "Why! do you not know that my uncle left a great sum of money to the town, on condition that every tradesman should give whatever was wanted without payment, to any one who wore his old hat and moved it in a particular manner," and he then showed Charles how to move it. He then went into another shop where he was also trusted and asked for some small article, moving his hat in the proper manner and of course obtained it without payment. When they came out he said to young Darwin, "Now if you like to go by yourself into that cake shop (Darwin ever afterwards remembered its exact position) I will lend you my hat and you can get whatever you like if you move the hat on your head properly." The generous offer was gladly accepted and in young Darwin went, asked for some cakes, moved the old hat and was

walking out of the shop when the shopman made a rush at him, so "he dropped the cakes and ran for dear life and was astonished by being greeted with shouts of laughter by his false friend (Garnett.)"

As a boy he was humane, spent any number of hours at angling and had a passionate love of dogs; this love was reciprocated by dogs in general, as he was often in the company of dogs, not his own previously.

During the seven years from 1818 till 1825 he attended Dr. Butler's school at Shrewsbury, about one mile from his home, to which he used often to go during recesses, always trying to be back in time, and as he was a fleet runner was generally successful, but when in doubt of success he "prayed earnestly for help" and "attributed his success to the prayers."

At Dr. Butler's school, a classical one, he learned little, as he was singularly incapable of mastering any language. At this school he was considered an ordinary boy, rather below the common standard in intellect. His father mortified him at the time by telling him he would yet be a disgrace to himself and to the whole family, because he "cared for nothing but shooting, dogs, and rat catching." Without doubt the key to his life at this time is found in the uncongenial character of the curriculum of Dr. Butler's school.

He liked Euclid, read Thomson's "Seasons," Byron and Scott, was passionately fond of Shakespeare; in later life he lost all pleasure in poetry; even Shakespeare "nauseated" him to his great regret. Shooting, another of his youthful pleasures, was given over in after life, but one of the permanent pleasures of his life was his great delight in scenery; this one remained with him, doubtless because of the splendid opportunity he had in his travels of indulging his taste for it.

He still continued to collect minerals and insects, and observed birds so zealously that he wondered why every "gentleman" did not become an ornithologist.

He worked in a laboratory with his brother on chemistry, and got for it from his schoolmates the nickname of "Gas." To Darwin this simple work in a rudely constructed laboratory was highly educative; as he found out practically the meaning of Experimental Science.

For learning nothing, he was taken away from Dr. Butler's school and sent to Edinburgh University (1825) to study medicine. He remained here for two years but did not study medicine, because he learned that his father intended to leave him sufficient to live on, and because he found the study of medicine very dull. Dissection disgusted him so much that he never overcame this feeling.

While at Edinburgh he formed the acquaintance of young men fond of Natural Science; Ainsworth a geologist and writer of travels, Dr. Coldstream a young zoologist, Hardie a botanist, and Dr. Grant a zoologist. These men all quickened his zeal for Natural History studies. In 1826 he did some investigation in marine zoology and made a little interesting discovery, and read a paper on it before the Plinian Society of the University. This discovery was afterwards noticed by Dr. Grant in his memoir on the same subject.

In his second year he attended some very dull lectures on Geology; so unattractive were these lectures that he concluded Geology was an uninteresting subject and vowed never to read a book on it. This vow was afterwards broken much to the advantage of that subject.

He spent his holidays in amusement, the chief one being shooting of course, and to indulge this passion he was accustomed to walk about thirty miles a day.

In order that he might not become an "idle sporting man," his indignant father took him away from Edinburgh and sent him to Cambridge in 1828, suggesting at the same time that he become a clergyman. He scrupled somewhat about accepting the dogmas of the Church of England, although he did not "in the least doubt the strict and literal truth of every word in the Bible." After some examination he persuaded himself that the creed of the Church of England was all right. This intention to enter the Church died a natural death when, on leaving Cambridge, he joined the *Beagle* as Naturalist. He would have made an excellent clergyman if the phrenologists are to be trusted, as they averred that he had the "bump of reverence" developed enormously.

His time at Cambridge was lost as completely as at Edinburgh, so far as work on the curriculum was concerned. He

hated mathematics, nominally attended the lectures on classics, and did only about a month's compulsory work in his second and fourth year. He devoted himself to shooting, hunting and riding, took an active part in sports, did some card-playing and even some drinking, and, horrible to relate, associated at times with dissipated, low-minded young men. To offset the evil of associating with such sporting men, he always reckoned as companions young men of clever stamp with musical and other better tastes.

Nothing at Cambridge was undertaken with so much pleasure and zest as collecting beetles. So anxious was he not to lose one which he laid eyes on, that, on one occasion, he tells of catching two beetles, one in each hand, and on seeing a third, put one into his mouth in order to catch the third one. He was a clever collector and so ardent was his love for this recreation that he literally worked from morning till night catching beetles. In one of his letters to his relative W. D. Fox, he asks Heaven to protect the beetles for "we" won't leave a pair in the country.

At Cambridge he became acquainted with Prof. Henslow, a man of great knowledge in botany, entomology, chemistry, mineralogy and geology. There is much that is common in the character of these two men. Both were well endowed with reverence, benevolence, humanity and good judgment.

On returning from a short geological tour in North Wales, Darwin received a letter from Henslow telling him that he had the offer to become Naturalist to the voyage of the *Beagle*. Darwin's father objected to his going on this voyage, but told him he would consent if any person of common sense would advise the undertaking. Young Darwin appealed to his uncle and finally through him gained his father's approval.

Then he ran a very close risk of being rejected by Captain Fitz Roy, the commander of the voyage, who doubted if any one with a nose the shape of Darwin's, could possess sufficient energy and determination for such a voyage.

Too much importance cannot be laid upon this voyage, which lasted about five years. To it, Grant Allen says, we owe the "Origin of Species" and its great fellow the "Descent of Man," and a survey of the enormous change in thought wrought

by these books tells us in some measure how important that voyage was.

The *Beagle* sailed from Plymouth to "complete the survey of Patagonia and Tierra del Fuego, to survey the shores of Chili, Peru and some Pacific Islands and to carry a chain of chronometrical measurements round the world."

The voyage is outlined briefly as follows: On December 27th, 1831, the ship left England for the Cape de Verd Islands, touching the Canaries in January and leaving the Cape de Verd in February, 1832. Darwin's acuteness of observation is shown by his examination of the fine dust gathered from the deck of the vessel in her passage along the coast of Africa. This dust contained spores and seeds of 67 distinct organic forms, and Darwin saw at once one method at least whereby oceanic islands of volcano origin might be stocked with life. On examining these insular faunas and floras, he observed strong resemblances to the adjacent mainland forms with sufficient variations to make them distinctly peculiar. The similarities and differences aroused his curiosity enormously.

During February the *Beagle* crossed the Atlantic to Bahia, Brazil, where Darwin spent eighteen days (in March) observing and admiring the strangling luxuriance of tropical growth, which, in its marvelously rich and overstocked state, must have driven home to Darwin's mind the fierceness of the struggle for existence.

From April till July, 1832, Darwin was at Rio Janeiro, busied chiefly with insects but observing everything.

During the period from August, 1832, until the autumn of 1833, nearly two years, Darwin, with headquarters at Montevideo, spent his time in studying the geology of the adjoining regions. Here the resemblances and differences between the living forms and the fossils of that region struck Darwin forcibly, and speculation to derive the living from the extinct began in earnest. It was in South America that Darwin gathered the facts upon which in later years he based his solution of the problem of the Origin of Species. Enormous collections of fossils and of plant and animal life were sent home to Prof. Henslow in England.

In March, 1834, he was at the Falkland Islands, and during

1835 he was on the west coast at Peru and at the Galapagos Islands (in autumn). Here he saw more plainly than elsewhere the relationship of the inhabitants of these oceanic islands to those on the mainland; the variations moreover were so marked that the forms might be regarded as new—as separate creations.

He left the Galapagos to cross the Pacific, touching at Tahiti in November, and at New Zealand in December. From this place he sailed across the Indian Ocean to the Mauritius Islands, across the Atlantic again to Bahia, up to Pernambuco, across to the Azores, and landed at England on October 2nd, 1836. The latter part of the voyage contained nothing of importance to interest Darwin, who was longing now to get home to his friends and to get away from sea-sickness, his constant companion.

From his landing in England till his death his life was an unusually quiet and busy one.

His first work was the preparation of his "Journal of Travels," finished in about two years, during which period he read several papers before the Geological Society. In July, 1837, he opened his first note book for facts in relation to the Origin of Species, about which he had long reflected, and on this subject he never ceased working for the next twenty years.

In January, 1839, he married and soon afterwards settled at Down.

After twenty months of hard work, during which he read every work on the islands of the Pacific and consulted many charts, he corrected the last proof sheet of his work on Coral Islands, published May 6th, 1842. Several more papers were read at societies, one in 1838 on the formation of mould by the agency of earth worms, which, developed, was his last work.

While in London he saw much of distinguished men—chiefly Lyell—but his continued ill-health caused him to retire to his quiet country home at Down in Sept., 1842, where he remained till his death.

In 1844 he published his Observations on the Volcanic Islands visited during the voyage of the *Beagle*.

In 1845 appeared a new edition of his Journal of Researches, originally published in 1839. He was always tickled over the success of this his first literary child.

In 1846 his Geological Observations of South America appeared in three books, which required four and a half years steady work.

In 1854 came his elaborate memoir on the Cirrepedia. This work occupied him eight years, but two years illness must come out of that time.

Then came the great work of his life, "The Origin of Species." This problem had occupied him during the greater part of his voyage. He observed, he collected, he reflected, without any theory. From enquiry and conversation with skilful breeders and gardeners and by extensive reading he soon perceived that *selection* was the "key stone of man's success in making useful races of animals and plants." But how selection could be applied to organisms in a state of nature remained for some time a mystery to him.

In October, 1838, for *amusement* he read "Malthus on Population," and appreciated the struggle for existence. It then flashed upon his mind that this struggle would cause selection of the favorable variations which would thus be preserved, while the unfavorable variations would be weeded out.

In June, 1842, he first made a brief summary of his theory in 35 pages; during the summer of 1844 this was enlarged into 230 pages.

In 1856 Lyell advised him to make a full treatment of his theory; it is only an abstract of this intended work which we now possess. His plans for the large volume were overthrown, by the appearance on the scene of another Naturalist, Mr. A. R. Wallace, who had made an independent discovery of Darwin's yet-unpublished theory. Mr. Wallace, then in the Malay Archipelago, sent Darwin an essay in 1858, which contained almost exactly Darwin's idea, and asked him to forward it to Lyell for perusal. This Darwin did. Lyell and Hooker, great friends of Darwin's and his first great converts, requested him to allow an abstract from his MS., together with a letter sent to Asa Gray, dated Sept. 5th, 1857, to be published at the same time with Wallace's Essay. He was at first unwilling, but finally consented.

In September, 1858, Lyell and Hooker advised him to prepare a volume for publication, and acting upon this advice he

began an abstract of his great work in 1858 and finished it after thirteen months and ten days of hard labor, and published it in 1859. This is the book which has run through six editions, considerably corrected and added to, but substantially unaltered. The first edition, comprising 1,250 copies, was sold on the day of publication. The book itself has been translated into almost every European tongue, even into Spanish, Russian, Polish, Bohemian and Hebrew. The Marquis of Salisbury in his Inaugural Address at Oxford, during the recent holidays, in speaking of the publication of Mr. Darwin's work on the Origin of Species, says he considers it the "most conspicuous event in the scientific annals of the last half century."

It is not necessary to enumerate the various works and papers which came from the pen of Darwin from 1859, until his death. No essential change occurred in his opinions in the remaining thirty years of his life, and all the work done in that time was for the purpose of applying and enforcing his doctrine, which he believed would be aided most by special work in various departments.

A few words may now be said in conclusion, concerning this quiet methodical life of indefatigable industry. To few men is it given to see the fruits of their labor, but Darwin lived long enough to see the misunderstood, misrepresented and reviled speculation of his younger days become the universally accepted doctrine of not only scientific thinkers and workers, but also of the general public. So well was his work done that Salisbury says: "With the honored name of Agassiz has disappeared the last defender of the doctrine of the immutability of species who could claim the attention of the world."

So varied were his attainments, so thorough his methods and so profound his thought, that leading authorities in the different fields of geology, zoology, botany and psychology acknowledged that in these departments his influence was supreme.

Honors poured thick upon Darwin in his later life. Societies at home and abroad seemingly vied with each other in honoring this noble and gifted son of Science, while in doing so they added lustre to a name pre-eminent in Science and which shed a reflected lustre upon themselves. So universal was this homage that on his death in 1882, it was the unanimous wish of his



fellow countrymen of all classes and opinions that he should be buried in Westminster Abbey.

His death, so quiet was his life, was not known in London for two days, but when the news spread the whole world forgot its antagonism for his views and in unusual magnanimity manifested its deep affection for this ardent student, this patient, laborious and successful interpreter of nature's handicraft, this whole-souled, truth-loving and kind-hearted man.

## THE FRESH WATER CLADOCERA.

BY J. B. MACCALLUM, '96.

[Read before the Natural Science Association.]

THE paper which I have ventured to read before you to-day is based mainly on some studies I made during the past summer of some fresh-water Cladocera. The material was obtained in an unused limestone quarry, near Dunnville, Ont., and although the collection I made is by no means a complete one, the few forms which I have preserved will serve in a way to illustrate the anatomy of the different animals contained in this group. When I began, my intentions were to work up the fauna of the body of water which filled the quarry, and make a general study of all the forms living there; but there was such a large number belonging to nearly every branch of the animal kingdom, that I found that, if I wished to accomplish anything at all, I should have to confine my attention to a very limited area. I accordingly chose the Entomostraca, the lower branch of the Crustacea, as they seemed to me to be the most interesting group I had met. These I studied as well as the literature, which I had at my disposal, enabled me, and, thinking that the results of even such modest investigations as this might be of interest to some members of the Association, I have set them down in this paper, along with certain facts gleaned from books obtained through the kindness of Professor Wright and Mr. Jeffrey.

The members of the order Cladocera, as you know, are among the most primitive of the Crustaceans, and are also the most minute, very seldom exceeding three millimeters in length. The Crustacea are divided into two large groups, the higher forms being called the Malacostraca, and the lower, the Ento-

mostraca. The fresh water representatives of the latter group are classified by Zacharias as follows:—

ENTOMOSTRACA.

Order I.—Copepoda.

- (1) Gnathostomata.
  - (a) Cyclopidae.
  - (b) Harpactidae.
  - (c) Calanidae.
- (2) Siphonostomata.
  - (a) Branchiura.

Order II — Phyllopoda.

- (a) Cladocera.
- (b) Branchiopoda.

Order III — Ostracoda.

I found representatives of all these families, more or less, abundant in the water I examined, and generally most numerous near the top of the water. The only genus in the Cyclopidae was *Cyclops*, of which I obtained several species, distinguished mainly by such characters as the relative size of the segments and number of joints in the appendages. The genus *Diaptomus* is the principal one belonging to the Calanidae, and is quite a conspicuous figure among these small animals. The genera of the Cladocera, of which I found species, were *Ceriodaphnia*, *Daphnella*, *Pleuroxus*, and *Alona*; and of the Ostracoda several species of *Cypris* occurred. The number of these animals which may be found in pond water is enormous, when we consider how widely they are distributed. A calculation has been made, in a rough way, of the number of Entomostraca contained in a quart of ordinary pond water taken from some part of Minnesota. The figures, which are equally true for other localities, are as follows:—

Daphnia .....	6
Ceriodaphnia .....	1,400
Simocephalus .....	36
Cypris .....	50
Cyclops .....	30
	1,522

This is certainly a very large number when we think how large the animals are, all of them being visible to the naked eye. The general anatomy of the Cladocera, which, no doubt, is familiar to all of you, is very simple. The whole animal, with

the exception of the head, is covered by a laterally compressed bivalve shell. This shell consists of a simple undivided anterior part called the cephalostegite, and a posterior bivalve part called the ormostegite. They have two pairs of antennæ, the anterior pair being short, while the posterior ones are long, biramous swimming organs, covered with large setæ. There are besides these from four to six pairs of legs, which are leaf-like, biramous, swimming structures, with in most cases a branchial appendage near the base. The abdomen is bent towards the ventral surface, and has on its dorsal side several structures, which are used to close the brood-pouch. The anus is situated in the large hooked posterior end of the abdomen, the moving of which aids greatly in the ejection of feces from the intestine.

The internal anatomy is equally primitive, the eye being an unpaired or paired structure, consisting of a mass of pigment, surrounded by lenses. A second smaller eye, generally without lenses, may also be present. The eye is connected by a large optic nerve with the brain, which is a simple bilobed ganglion above the œsophagus, with a smaller ganglion below it. There is generally a ventral cord with seven swellings, of which the first supplies the mandibles and maxillæ, and the other six the six pairs of legs. The heart is a muscular sac beating rhythmically, and sending out the blood in definite tracts throughout the body. Excretory organs, called shell-glands, are always present in the anterior part of the body. The sexual organs are seen as dark tubes by the side of the alimentary canal, the ovaries opening by means of the oviducts into the brood-pouch, and the testes opening at the posterior end of the body by means of the vasa deferentiâ. Two kinds of eggs are produced, the summer eggs, which develop without fertilization, and the winter eggs, which are only formed when the males are present to fertilize them.

The most commonly occurring genus of the Cladocera is *Ceriodaphnia*. These may be found in great numbers in any pond-water, but it is exceedingly difficult to determine the species, because of the small differences on which the classification is based. There have been twelve species found, but I was able to distinguish only two, partly on account of an entire lack of literature on the subject. These were *Ceriodaphnia laticau-*

data and *C. consors*, the latter being very much smaller than the former, and having a larger head in proportion to the size of the body. In other respects they are very similar, and might easily be taken for the same animal. The shell is thick, and reticulated with large meshes, and in a great many cases is completely covered with *Vorticellae*, so that the internal structure cannot be made out. The head is small, rounded at the end, and separated from the body by quite a deep hollow. There are four pairs of swimming legs which are branched, the outer part being a leaf-shaped structure, serving as a gill, and the inner part in many cases a prehensile organ. The alimentary canal is a simple tube bent towards the ventral surface at the mouth and anus, so that it may be divided into an œsophagus, a mid-gut, and a rectum. The wall of the rectum is very thick and muscular, and narrows down abruptly just before it opens to the outside. Near the anus are nine or ten small spines, and one very large one, which curves back over the anus. The walls of alimentary canal are thick and more or less muscular, and are covered with hepatic cells in the blind canal, which extends forward from the anterior end of the midgut.

The eye is not a very delicate organ of sight, although it must be much better than that of the Copepoda, because of its greater complexity. The number of lenses, seen in section, on the mass of pigment, varies in different individuals, but it generally exceeds five, and may be as great as twelve or more. The muscles of the eye, which cause the characteristic trembling, are delicate thread-like bands, with a swelling near the centre, to which nerves run from the brain. There are three of these muscles on each side of the eye, having their origin near the mouth-parts.

The brain is belobed, the anterior part, or optic lobe, being slightly smaller than the posterior part, which is the supra-œsophageal ganglion. There is a nerve ring around the œsophagus, the two parts meeting to form an infra-œsophageal ganglion. The nerves running from this are very hard to make out, but a ventral cord can be seen, and also nerves proceeding to the antennæ.

The heart is supported in the pericardium by thin membranes, which in optical section look like threads. It is a more

or less round sac, with its walls thickened by bands of muscles running from the top to the bottom. These cause the quick, regular contractions which send the blood with great rapidity all over the body. The nutritive fluid consists of a colourless liquid, with a great many corpuscles floating in it, and flows in definite areas marked out by membranous walls of connective tissue. When it is forced toward the head the pressure in the pericardial chamber is diminished, and the blood from the posterior end of the body rushes into the two lateral openings of the heart. This is a superficial current, but a deeper one also exists. The blood which is forced towards the eye returns beneath the stomach, and dividing there into several branches, supplies the feet and antennæ, after which it flows back to the heart through the sinus venosus posterior, entering by the posterior opening.

The generative apparatus consists of paired tubes on the side of the intestine. In the female the ovaries are long oval bodies, having a coarsely granular appearance. They are connected with the brood-pouch by oviducts which open at the posterior end of the body. The brood-pouch is closed by two projections on the dorsal side of the abdomen, and contains in *Ceriodaphnia* generally two large eggs. These sometimes remain in the brood-pouch until they have developed into animals large enough to swim about. Reproduction without the aid of males may go on for as many as six generations. The male generative organs are somewhat similar in appearance to the female, the oval testes being prolonged into vasa deferentia, which open to the outside, near the anus.

*Daphnella* is an interesting form belonging to the family Sididae, and similar in many respects to *Ceriodaphnia* and *Daphnia*. There are only two species of this genus, and one of these is a very doubtful one. The species which I found was *Daphnella branchyura*, which is probably the only one in this part of the country, another form called *Daphnella brandtiana* being very likely a variety of this species. *Daphnella* is easily recognized in the water, on account of its T-shaped body, formed by the shell, and the antennæ which are usually spread out. The shell is a great deal longer in proportion to its width, than it is in *Ceriodaphnia*, and also more transparent. It is therefore much easier to make out the internal structure of these animals, than it is

in such forms as that first described. There are six pairs of biramous swimming legs, not so broad nor so long as in *Ceriodaphnia*. The abdomen extends beyond the shell, and ends in two large hooks, but there are no small teeth as in the first form. The alimentary canal is almost straight, except at the anterior extremity where it sends out an hepatic blind tube covered with large cells filled with granular substances.

The eye is very much like that of *Ceriodaphnia*, but its relation to the brain can be seen much more clearly. The large optic nerve enters the back of the eye, and smaller nerve-threads run from the brain to the muscles of the eye. Nerves also proceed to papillæ on the ventral surface near the mouth.

The heart on the other hand is quite differently formed from that of *Ceriodaphnia*, being very much elongated into a cylinder. The muscles seem to run quite around the whole structure, giving it a striped or banded appearance. The anterior and posterior openings can be distinguished quite clearly, and the blood can be seen to flow through them at each contraction of the muscles. The blood vascular system is very much like that of *Ceriodaphnia*, but the blood corpuscles are larger, and their movements can be made out more easily.

As in all Crustaceæ there are shell glands present, as coiled, flattened tubes in close connection with the shell.

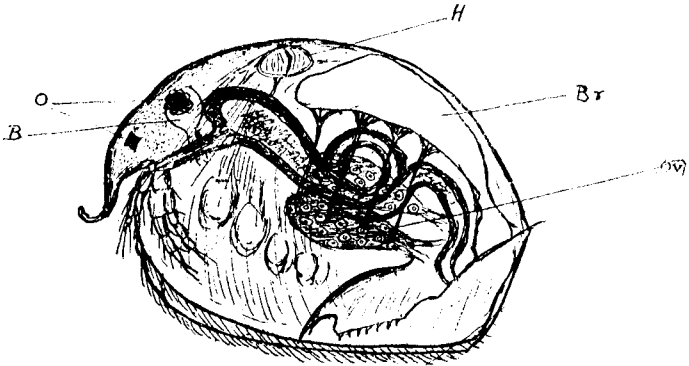
The generative apparatus is quite similar to that of the form before described, the oviducts opening into the brood-pouch, and the vasa deferentia opening just behind the last pair of swimming appendages.

*Pleuroxus* is a genus of small crustaceans, well defined by the presence of a long beak formed by the extension of the chitinous material which covers the head. Of this genus I found two species: *Pleuroxus procurvatus* (see fig.), in which the beak is bent sharply forward, and *Pleuroxus hastatus* which has a long, straight beak. The swimming appendages are like those of *Ceriodaphnia*, but the antennæ are shorter and not at all conspicuous. The intestine is a simple tube, as in the others, but is coiled once in the middle as represented in fig. The spines on the post abdomen are large and strong. There are also ten or eleven small teeth behind these two spines, and behind these teeth is the anal opening.

There are two eyes in this form, one a large mass of pigment covered with lenses, and the other a small pigment fleck entirely without lenses. The brain is a small structure partly surrounding the back of the larger eye.

The heart is like that of *Ceriodaphnia*, but is relatively slightly smaller. The generative organs also are very similar to those already described.

*Pleuroxus* is the smallest of these three forms, being 0.5<sup>mm</sup> long, while *Ceriodaphnia* is 0.7<sup>mm</sup>, and *Daphnella* 0.6<sup>mm</sup> in length. I also found a species of the genus *Alona* in some water obtained near Toronto, but I have not preserved it. This



form is very much like *Pleuroxus*, except that it has not a long beak. They are generally about 0.4<sup>mm</sup> in length, are almost spherical in shape, slightly compressed however laterally.

Another very interesting family is the *Polyphemidæ*, containing four genera, namely: (1) *Bythotrephes*, (2) *Polyphemus*, (3) *Evadne*, (4) *Leptodora*. All these have a short round head, with a very large eye and long swimming antennæ. The shell serves only as a brood-pouch, and is not very large. *Polyphemus* is a genus of peculiarly shaped animals, having a long thin hind body, which ends in two very movable claws of considerable length. The females are about 1<sup>mm</sup> long, and the males slightly smaller.

*Leptodora* is a somewhat similar genus, but often reaches a comparatively great length, sometimes being as much as 8 or 9<sup>mm</sup> long. It has a very small head and a small eye, with the central nervous system surrounding it, and extending in a ner-



vous cord back through the body. The abdomen ends in two large claws, with the arms situated between them. The shell is very small, and covers but little of the body.

The sub-order Branchiopoda contains a few interesting forms. They are all distinctly segmented animals, with from ten to thirty pairs of swimming feet. The heart is a dorsal vessel with paired lateral slits through which the blood is driven out or received. Parthenogenesis is the most general mode of reproduction, the males being very seldom seen. The most common genera are *Apus*, which has a rounded body with two long tail-like structures, and *Branchipus*, which is very plainly segmented, and is almost destitute of a shell. This latter form consists of about twenty segments, all but the last four or five of which have swimming legs attached to them.

The Entomostraca, in spite of their insignificance and inoffensive character, have a great many enemies. Every kind of fish, whether carnivorous or not, at some stage in its life, feeds on these animals themselves or on their eggs. Young carp live almost exclusively on the eggs, and would fare very badly if they had not such food. Similarly a great many sea fish are dependent on them for nourishment, and even the whale devours an enormous number. Another very dangerous enemy which these minute animals have to elude is the "Spectre animalcule," or *Corethra*, a gnat-like insect belonging to the Diptera. They are also attacked in an unfair way by the *Hydra*, which touching them with its poison-carrying tentacles paralyzes them immediately. Further, if they endeavor to escape from their pursuers they are more than likely to be caught by some carnivorous plant, and thus meet with an equally ignoble death. The common *Utricularia* is especially efficient in stopping such runaways. Besides these enemies the Entomostraca have certain parasites living on them, chiefly immature forms of parasites infesting higher animals. Endoparasites, however, are very rare, only one or two being known. For example, embryos of a nematoid worm called *Cucullanus* are found in the body cavity of *Cyclops*, from which they are conveyed to the alimentary canal of certain fishes. Another endoparasite of *Cyclops* is a species of *Filaria*. Only the Copepoda are infested with Endoparantes, the Cladocera never being found with them. The external parasites,

however, are more generally found, but are less dangerous. Many of the Ceriodaphnias which I saw were covered with colonies of Vorticellæ, but these were probably not parasitically attached. Many cetoparasites belonging to the Protozoa are of more or less common occurrence.

Thus it may be seen that with all these enemies preying on them the Entomostraca live under very unfavorable circumstances, and are exposed to almost constant danger of being destroyed. However, their loss is the gain of the fishes, and as this is the fate of everything that lives, they are not exceptionally ill-treated. As they are necessary for the welfare of the fish, they are indirectly of benefit to man, and we should therefore be thankful for their existence; for without them such fish as our common white fish, the mackerel, the sardine, and many others of our most valuable food-fish would be lost to us. This loss would certainly be felt all over the world, and would make us miss the insignificant Entomostraca very much—at least indirectly.

THE WOMEN OF THE HOMERIC POEMS.

BY F. B. R. HELLEMS, B.A.

[Read before the Classical Association.]

WHEREFORE I tell thee and do thou mark and listen unto me. Of all the creatures that breathe and move upon the face of the earth, there is nought that is feebler than man. So while the gods give him happiness, and his limbs move freely, he thinks that he shall never suffer evil in time to come. But when again the blessed gods have wrought for him sorrow, he bears it as he must with steadfast heart; for as the days God sends him, so a man's mind is. Yea, and I too once was like to have been prosperous among men, and mine heart was glad, for the time of assembling the classicists was almost over, and nought of evil for myself had I heard. But one day, about the time when the sun was wending downward to the loosing of cattle, a young man, a Greek in the likeness of a Canadian, even Megan, stood by me and spake unto me winged words. "Come now," said he, "it is our desire that thou shouldst tell us a tale of the days of old." "Nay," said I, "the gods have not granted unto me a ready tongue, and a wise mind, and little were it meet for a young man to speak in the presence of his elders, and moreover nothing know I whereof to tell." "That thou hast not a wise mind," did his lordly spirit impel him to reply, "I know, and that thy speech is uncouth I know, but even Thersites would speak among the hosts of the long-haired Achæans, albeit altogether void of understanding, and so mayst thou speak in our Assembly. And as for the tale thou shalt tell let it be of the women of the days of Homer, even of wise Penelope and hateful Clytemnestra, and, above all, of white-armed Nausicaa." Then did I make reply again, and say: "Nothing wot I of women, either of the days of Homer or of any other day, for the place of my dwelling is with the ill-starred residents, grim men, who never speak of mild-eyed women, much

less have knowledge of their thoughts and ways." But not even thus was it pleasing to Zeus, who sendeth to mortals blessing and bane, that I should escape utter destruction, for that other thought a thought and forth he spake it. "Therefore," quoth he, "may thy speech be sooth, for thy mind will be turned neither one way nor the other; and of somewhat wilt thou bethink thee in thine own breast, and somewhat the goddess will give thee to say." And so did I in an evil day assent thereto, but nothing hath the goddess, grey-eyed Athene, given me to say, and of very little have I bethought me in my own breast. Howbeit from the olden songs some fragments have I gathered together, even as a little child plucketh flowers in the sweet meadows and mountain dells, turning hither and thither and not knowing which flower to take, albeit the flowers are many and fair, and so, when the sun is sinking to the west, he cometh home all wearied with but a sorry lot in his tiny hands.

The feelings of the student as he closes his copies of the Iliad and Odyssey must be very strange. He has been living in a world removed from our own by a journey of approximately three thousand years and has not found himself altogether an alien, for the world which these poems depict is not so widely different from our own. Different it certainly is in many phases but not in all. The men of that world had not harnessed steam, nor bridled electricity, but they had brought under the yoke the great element of fire, just as wonderful, just as potent, and perhaps more wonderful and more potent, than these two marvels of our modern civilization. The shivering cave dweller, crawling into the side of a hill, his fireless home, is incalculably lower in the scale of civilization, when contrasted with the Homeric man, than is the Homeric man when compared with ourselves. Prometheus, or whoever it may have been, was as great as Newton or Edison. In the material and mechanical aspects of life we easily see the gap of three thousand years. In the intellectual aspects our vision is not so clear, for we have to look across that wonderful Periclean period when men loved wisdom without becoming effeminate and art without becoming extravagant and affected, and when the culture of a whole people soared whither we can only aspire. But even with this disturbing vista we can perceive the breadth of the gap twixt now and then. For they

had no universities, and no kindergartens except in the original meaning of the term, no education, except such as natural wants and natural emotions must always produce. No fifteen year old boy could have explained, as our examinations now demand, why the metre of Tinturn Abbey was peculiarly appropriate for the expression of the poet's thoughts. And yet one can conceive that they had caught some lyric of the flowers, some epic of human life which we have missed; and they at least without affectation enjoyed the God-given poesy of the minstrel's song as it fell bright and sparkling from his untutored lips. But in the world of the emotions they are very near akin to the nineteenth century Caucasian, although the latter may be a little played out. That great mystery, so holy, so tender, so absolutely insoluble, a mother's love, was the same then as now. The same, too, was that equally insoluble mystery, the love of a wife for her husband. The cry of Hector's babe for food, or its cooing of delight, was probably in a not perceptibly different note from the voice of the babe of a Professor of Philosophy; but the Homeric babe was probably more blessed in this, that it escaped being observed for psychological purposes, and could reach for its little toy without being burdened by the thought that it might be responsible for the settlement of the question whether red or blue is naturally more attractive to the human animal.

This mention of the world of the emotions brings us naturally to the subject assigned us, the women of the Homeric poems, for in those benighted times the emotions were woman's world, certain elevating and ennobling tendencies of later ages, such as the woman's suffrage movement having unfortunately not been as yet developed. Accordingly we may leave these vague generalities and try to find something more definite about the life and activity of women.

Perhaps the first phase that would suggest itself is the actual position of the wife in the family circle. The lady of the house commonly had her apartments in the upper story of the dwelling where she passed the greatest part of the day with her slaves in household duties, and where she slept at night. These apartments were sometimes changed for the thalamus, which is a general term, but is also used specially for the chamber of husband and wife where they seem to have spent part of the day together; at

least we find Paris, after the struggle with Menelaus, resting in the thalamus and polishing his arms while Helen and her maidens are employed on fancy work. But we must not imagine that there was any seclusion enforced upon the wife. Thus Arcte, the wife of Alcinous, king of the Phæacians, sat up until a late hour with her husband and the other proud Phæacians listening to the tales of Odysseus; and when she appears in the streets they honor her as a goddess. Penelope even appears among the unruly suitors, although she insists on having a chaperone. And apparently the wife ate with the husband even when there were heroes assembled within the halls.

The protection of the house, and the providing therefor, belonged to the husband; but the domestic management was in the hands of the wife, and the life of the women is so exclusively limited to her house and family, that we commonly only find them in domestic scenes. Hector bids his wife care for her affairs, to wit, the broom and distaff and the supervision of the servants; and Telemachus, in another place, makes the same suggestion rather pointedly to his mother. The business of the wife was to keep a watchful eye on the daily affairs of the house, to apportion their daily tasks to the servants and direct them in their work, particularly in the weaving and spinning, and to look after the cooking and sweeping, or what corresponded thereto. She herself was busied for the most part in preparing clothing, and working artistic weaving, and embroidery.

But the life of the woman was not limited to the household. She found recreation in the song and dance and even the game of ball on occasions of merrymaking and festivity. Religious services were open to her, even when the congregations were mixed, and, indeed, in special crises, when the men were otherwise employed, religious affairs seem to have been trusted entirely to the women. Thus Hector bids his mother and the other Trojan matrons to carry an offering to Pallas Athene, while the warriors strive in conflict. Again we see them abroad in the third book of the Iliad, where we find that when Hector entered Troy, the women who had been waiting at the gate crowded round him asking about their sons, their brothers, and their husbands; and when Priam returns with the body of his son the women flock to see the corpse.

The marriage relations of the Homeric poems, and the ques-

tions of what men call love, have been the subject of a wide literature, advocating most diverse opinions. Some critics maintain that these relations betray all the coarseness of savage tribes, others find in them all that is pure and elevated, but the later critics seem to be more inclined to speak favorably of the Homeric customs. We are beginning to perceive that Homer spoke plainly of what we conceal under specious euphemisms. There is, of course, primitive freedom in many ways; but the Homeric Greeks, who had arrived definitely at monogamy, were capable of very high and warm affection. And I cannot resist quoting a pertinent sentence from the great Gibbon who says: "The refinements of life corrupt while they polish the intercourse of the sexes. The gross appetite of love becomes most dangerous when it is elevated, or rather disguised by sentimental passion." This sentimental passion may not have existed to any high degree but there is true and noble love between man and wife.

The preliminary wooing seems to have been for the most part of a rather mercenary nature. The eager suitor presented gifts of gold or cattle or some other form of primitive wealth, and as a rule the aspirant who could come down most handsomely was the one accepted. This as poor students we may concede was deplorable, but if report be true, it is not altogether unknown to-day. Frequently, however, there were other considerations. Valor and manliness were often more persuasive than wealth. Odysseus in one of his characteristic fictions relates how although illegitimate and poor, he had won a wife of noble lineage through love, for that he was no weakling nor a coward. Sometimes, again, rich fathers actually gave dowers to their daughters to ensure a desirable parti. It is true that the maiden had theoretically little choice, but I am told that even yet in uncivilized tribes where this is true that practically she has much to say, and at any rate the fathers frequently chose for their sons as well, so that there is no striking disparity of privilege. The day of the wedding was celebrated by a banquet, for which the bridegroom sometimes contributed the substantial. Music and the dance were natural concomitants. The bride and her friends were decked in their finest raiment and would probably have often won a very neat paragraph in *Saturday Night*. The young people either remained in the ancestral house, in which case the differ-

ent generations made one large family, or entered an abode of their own. In the latter case their was a special ceremony. The bride was covered with a veil and conducted with torches to the house of the bridegroom to the accompaniment of a special song and dance.

The wife thus installed, although sometimes practically purchased, was no slave, but the peer of her husband. In fact in one or two cases the wife seems to have been rather in a place to dictate. Thus Nausicaa advises Odysseus in his need to supplicate her mother rather than her father, saying that if he win the good will of Arete he will be sent home in happiness to his dear native land. In fact, the same good lady had actually the power of settling disputes 'twixt man and man.

The marriage tie and the fortune thereof are under the special care of the gods. The gods give the bride to the young man, and bless the bed of the man to whom they wish well. They give children to the wife, and determine the number of offspring. Marriage is regarded as an honorable and happy estate. "There is nothing mightier and nobler," says Odysseus, "than when wife and husband are of one heart and mind within a house." The fierce Achilles says, "Do then the sons of Atreus alone of mortal men love their wives?" Surely whatsoever man is good and sound of mind loveth his own and cherisheth her, even as I, too, loved mine with all my heart, though but the captive of my spear." Agememnon, leader of the host, says that in the absence of one short month man comes to long for his absent wife. The thought of the women in distant lands waiting anxiously their return animates the Greeks as the thought of the women to be protected within the walls inspires the Trojans. The loss of their wives is the uttermost punishment that the Grecian host can invoke for violation of the truce. To Odysseus and Hector their wives, the mothers of their children, are the highest good on earth. Although Hector's conjugal affection cannot make him love honor less and sacrifice his duty, yet the fell day of Ilion's destruction is dreaded by him, not so much for the sake of his royal parents, his brothers and his people, as for the sake of his wife beloved. Odysseus prefers his spouse to the eternal youth and the immortality promised by the goddess Kalypso. This concord, this harmony of spirit, between the married twain, and the



happiness thereby produced, existing in too great a measure was, according to Penelope, the cause of the misfortune sent upon her and her husband. "The gods gave us sorrow, for too great would have been our happiness, if we could have lived our whole life through together in love and concord."

The crown of marriage was avowedly won in the possession of healthy happy children. Perhaps the best expression of this sentiment is in the myth of Niobe. "A woman, she dared to make herself the peer of the rosy-checked goddess Latona, who, she boastfully proclaimed, had borne but two children while she herself had brought forth many. The taunt rouses Latona's wrath and Niobe's six sons were slain by Apollo, and her six daughters by Artemis. "And so she ever wasteth away in tears for the children that perished within her halls." Motherhood in itself was respected, as we see from the regular epithet applied to a mother. It is equivalent to lady or "revered lady" and is used even of the mother of the village beggar. Thus it was through the rearing of their children that they were influential. In later days it is reported that a stranger said to the wife of the Spartan Leonidas: "How is it that the Spartan women are the only ones that rule over men?" and that the wife answered: "We are the only ones who are the mothers of men." The Homeric women were mothers of men. The child was recognized as the sacred mystic tie binding together husband and wife, and linking them in heart and soul and sympathy. "I count it no blame in thee to weep for thy absent lord, for many a woman weeps who has lost her gentle lord, to whom she has born children in her love."

The love of the mother for her child is so inevitable that it would seem not to admit of anything more than exemplification: but I question whether any writer has brought out this divine affection with more force than the writer of our poems. Take one example only, the mother of Odysseus. When the wanderer was having his interview with the shades from below, the ghost of his mother appeared among the rest, and the son asks: "What doom overcame thee of death that lays men at their length? Was it a slow disease, or did Artemis, the archer, slay thee with the visitations of her gentle shafts?" And then the mother made answer in words that will endure as long as there be men that live upon the earth and eat Demeter's grain: "It

was not the archer goddess of the keen sight who slew me in my halls with the visitation of her gentle shafts, nor did any sickness come upon me, such as chiefly with a sad wasting draws the spirit from the limbs; nay, it was my sore longing for thee and for thy counsels, great Odysseus, and for thy loving-kindness that rest me of sweet life."

On the whole the family life is kept pure. Polygamy is a rare exception. It is true that a concubinage is practiced, especially in time of war, but it is not of the coarser Eastern type. In fact, the captive in war, like Briseis, often became the honored and loving wife of her captor. The errors of the maidservants of Odysseus are often pointed out as showing the depravity of all subordinates, but we must remember after all that those erring were few in number and that they paid the last penalty for their fault. Perhaps no stronger evidence of the feeling against such error could be found than the severity of the punishment meted out to them by Odysseus. I am not attempting to state that the age was entirely free from the taint of natural sin, but there can be no doubt that the marital ties were much more sacred than in later Greece and declining Rome, and I am compelled to believe that the occasional complacent condemnation of Homeric morals is due to misinterpretation.

Perhaps in view of the increasing number of ladies interesting themselves in classical studies—and it is to be hoped that this tendency will have a rapid and uninterrupted development—a mention of the dress of the Homeric women may be pardoned. It was very simple, as indeed it always was in Greece. During the Homeric age we find the dress nearly the same as was in vogue in the time of Pericles; and the cultured Aspasia was probably not much more elaborately attired than the wise Penelope. The mildness of the climate, and the natural good taste of the Greeks prevented them from going to those extremes that have marked some of our later developments. They seemed to have an instinctive feeling that it was not necessary to disfigure nature beyond degree, and that modesty might exist without the aid of elaborate toilets.

The women wore a chiton, in all respects like that of the men, except that it was longer, reaching clear to the ground. It was looped round the waist, and much care and attention seem

to have been devoted to the symmetry of its folds and to its ornamentation. Hence some of the epithets, deep girdled, with deep folds, gracefully girdled, with beautiful girdles, etc., by which women are characterised. A peplos was worn over the chiton. It was a large garment of transparent linen, supported upon the breast by a clasp of gold. It too fell in graceful folds and reached almost to the ground, and it seems to have been often elaborately ornamented. "She drew near to Helen in the palace, weaving there an ample web, a shining double robe, whereon were many conflicts fairly wrought, endured by the horse-taming sons of Troy, and brazen-mailed Achæans for her sake upon the field of Mars."

The greatest possible attention was paid in Hellas, especially during the Homeric period, to the beauty of the hair. Wherever mention is made of the Achæans, they are nearly always called the long-haired Achæans. Even among men baldness was deemed an ugly and unsightly defect, and so was attributed to Thersites, the blockhead of the host. Homer it is who perpetrates the first bon mot at the expense of the bald-headed man, who is regarded as a sort of portent. One of the suitors of Penelope says to the great amusement of his fellows: "Not without the god's will has this man come to the house of Odysseus; methinks at least that the torchlight flares forth from that head of his, for there are on it no hairs, nay never so thin." The hair, in which a fair shade was preferred, appears to have been twisted or plaited or left gracefully flowing. Nets and veils and beautiful pins seem to have been frequently employed.

It is scarcely necessary to say that the desire to be admired, and the unfounded idea that beautifying oneself was not a poor way of attracting this admiration, is not limited to later generations, and that the Homeric women employed a multitude of objects known under the general appellation of ornaments. There were in use ear-rings made of costly materials, or precious stones; necklaces, wrought of metal and amber; bracelets of exquisite workmanship, and other devices that might fill an ancient jewel casket.

An important indication of the Homeric feeling about women is to be found in the similes of the poems. Shelley has said that all Homeric similes are unrivalled; but none of them, it may be

claimed, are more beautiful than those drawn from womanhood. A few of these I take the liberty of reading to you. "And as a woman throws herself wailing about her dear lord, who hath fallen before his city, and the host, warding from his town and his children the pitiless day, and she holds him dying and drawing difficult breath, and embracing his body wails aloud, while the foemen smite her with spears on back and shoulders and lead her up into bondage, to bear labor and trouble, and with the most pitiful grief her cheeks are wasted; even so pitifully fell the tears beneath the brows of Odysseus." Another runs: "But even so they could not put the Argives to rout but they held their ground, as an honest woman that laboreth with her hands holds the balance, raises the weight and wool together, balancing them, that she may win scant wages for her children; so evenly was strained their war and battle." A third is the following: "And close behind him came the noble Odysseus, as close as is a weaving rod to a fair-girdled woman's breast when she pulleth it deftly with her hands drawing the spool along the warp, and holding the rod nigh her breast." It grieveth me to say, however, that one unpleasant possibility of life is also brought out in one of these similes. It is perhaps the one that suggests the greatest difference between the women of then and now. It is this: "But what help that we should bandy strife and wrangling against each other, like women, who when they wax wroth for some heart-wasting quarrel go forth into the mid-street and wrangle each against each with words true and false for these too, anger bids them speak." We may close our list of similes with the famous one from the sixteenth Iliad: "Wherefore weepest thou, Patroklos, like a fond little maid, that runs by her mother's side, and bids her mother take her up, snatching at her gown, and hinders her in her going, and tearfully looks at her, till the mother takes her up? Like her, Patroklos, dost thou let fall soft tears."

After this rather disconnected view of woman's position we may look even more disconnectedly at some of the better known individual women. The only difficulty is that they really imply the whole of the poems. Argive Helen was the cause of the Trojan war from its beginning. Briseis is the origin of the wrath of Achilles, the avowed theme of the Iliad, while Pene-

lope is hardly less than Odysseus the central feature of the Odyssey, and she is certainly much more attractive than her far-wandering, much-enduring, crafty-minded husband. Perhaps, however, the foremost familiar names are Helen, Andromache, Penelope, Clytemnestra and Nausicaa.

The story of the judgment by Paris on Mount Ida and the bribe-inspired decision in favor of Aphrodite need not be rehearsed, nor need it be recalled that the bribe promised was the most beautiful woman in the world for his wife. Now the most beautiful woman in the world was Argive Helen. So fair that all men loved her, and to her beauty were utter thralls. "Small blame is it that Trojans and well-greaved Greeks should on her account suffer hardships, for marvellously like to the immortal goddesses is she to look upon." So fair was she that she has become the type of woman's loveliness and is called the world's desire. Mystically, it is said, she represents that beauty which men seek in all women and do not always find, the beauty which is the cause of eternal war between man and man, the greatest war of the world. "Her face men seek in every face; her eyes in yours they see." Helen was the wife of Menelaus, won by him from all the princes of the Achæans, but she was won from him by Paris and hence the Trojan war. The offence of Helen has given rise to much discussion, of which the summary is this. In both the Iliad and Odyssey, Homer makes his characters attribute the tripping of Helen to the impulse of a god, but it is impossible now to understand how far he considered her a voluntary agent. Notable passages are Priam's speech: "No whit art thou blamable in my sight, the gods are to blame"; and Penelope's utterance: "Even Argive Helen, daughter of Zeus, would not have taken a stranger for her lover, had she known the warlike sons of the Achæans would bring her home again. However it was the god that set her upon that shameless deed." For an acute discussion of the question reference may be made to Mr. Gladstone's great work on Homer. This much is clear that she bitterly repented her offence. She says to Priam: "Would that sore death had been my pleasure when I followed thy son hither, and left my home and my kinsfolk and my daughter in her girlhood and the lovely company of mine age fellows. But this was not so, wherefore I pine with weeping." She reproaches Paris:

“Thou comest back from battle; would thou had'st perished there, vanquished of that great warrior, that was my former husband.” Again: “This is now the twentieth year that I am gone from my dear native land, would I had died ere then.” Let her repentance suffice and let us be glad that in the *Odyssey* we see her peaceful if not happy in the home of Menelaus, the loving lady of a loving lord.

To know *Andromache* it is only needful to read the famous passage in the sixth *Iliad*, one of the most beautiful in all Homer. Hector is about issuing to the fray. “Then came his dear wife running to meet him; and with her went the handmaid bearing in her bosom the tender boy, the little child, Hector's loved son, like unto a beautiful star. So now he smiled and gazed at the boy silently, and *Andromache* stood by his side weeping, and clasped her hand in his, and spoke and called upon his name: ‘Dear my lord this thy hardihood will undo thee, neither hast thou any pity for thine infant boy, nor for hapless me that soon shall be thy widow, for soon will the Achæans all set upon thee and slay thee. But it were better for me to go down to the grave if I lose thee; for never more will any comfort be mine, when once thou, even thou, hast met thy fate, but only sorrow. Moreover, I have no father nor lady mother; and the seven brothers that were mine within the halls, all these on the selfsame day went within the house of Hades. Nay, Hector, thou art to me father and lady mother, yea, and brother, even as thou art my goodly husband. Come now, have pity and abide here upon the tower, lest thou make thy child an orphan and thy wife a widow.’ “This and Hector's reply do not seem to be the words of a loveless and unlovely age. He answers: “Yet doth the anguish of the Trojans hereafter not so much trouble me, neither *Hekabe's* own, neither King *Priam's*, neither my brethren's, the many and brave that shall fall in the dust before their foemen, as doth thine anguish in the day that some mail-clad Achæan shall lead thee weeping and rob thee of the light of freedom. But me in death may the heaped up earth be covering, ere I hear thy crying and thy carrying into captivity.” And even so was it fated to be.

*Penelope* is the type of faithful wifehood and affectionate motherhood. Twenty years before the opening of the poem she had been left a young wife with a baby at her breast, and those

twenty years had been spent in longing for her absent lord, and praying that she might see her son, the sweet light of her eyes, with a beard upon his chin. We may catch an *entrevu* that discloses much: "But as for her, she never refuseth the hated bridal, nor hath she heart to make an end, she gives hope to all, and makes promises to every man, and sends them messages, but her mind is set on other things." The same tact with those she loves not, the same fidelity for him she loves, that ever marketh womankind, the first proof of Goethe's

"Denn das Naturel der Frauen  
Ist so nah mit Kunst verwandt."

Her artifice of the web to put off the suitors is known the world over and need not be repeated; but I am constrained to hazard the thought of what she might have acquired in culture during those years, if she had only lived in the days of higher education. She could have framed just as effective an artifice by telling the suitors she could not wed until after her graduation, and by then starring herself in logic at each second year examination. But I have spoken lightly where I should not for the fame of the wise Penelope is sacred. Her love for Odysseus and Telemachus, her graciousness to whom graciousness was due, and her long tried fidelity have left her impress on the ages never to be effaced. In the words of Homer himself: "The fame of her virtue will never perish but the immortals will make a gracious song in the ears of men on earth to the fame of constant Penelope."

In gloomy contrast to Penelope stands Clytemnestra, the type of the woman who is fair but false. Her tale is less inviting but perhaps not less true to nature. It is possible she has been too sweepingly condemned, and the rarity of Christian charity may have been as strongly marked in Achaë as in Canada. For a long time she was faithful and true, notwithstanding all the wiles of Ægistheus, but at last she tripped, and after the first stray slip there could be only a tragic end, and it came in the murder of her husband, and the long tale of blood. Her fate, too, has been summed up by Homer, who contrasts her with Penelope: "Far otherwise did the daughter of Tyndareus devise ill deeds, and slay her gentle lord, and hateful shall be the song of her among men, and an evil repute hath she brought upon all

womankind even upon the upright." It is Clytemnestra's infidelity that provokes the words spoken to Odysseus by Agamemnon's shade, words so often lightly misquoted and misunderstood in these latter days: "Wherefore do thou, too, never hence be soft even to thy wife, neither show her all the counsel thou knowest, but a part declare and let part be hid."

We may close our gallery with the refreshing picture of Nausicaa. We see her first when she has been told by Athene in a dream that the time of her wedding is at hand, and that it were meet for her to have her apparel duly laundered. She accordingly goes to her father the King, with a happy feminine subterfuge and tells him that he needs a boiled shirt for the assembly, and her bachelor brothers one not less for the ball. She and her maids next morning drive away to the river and attend to the laundry, after the washing comes the dance and ball game, and here I believe is an immortal touch of the olden bard for he makes much turn on the circumstance of Nausicaa's throwing the ball amiss. What could be more artistic, or truer to woman's nature in every clime and time, for what mortal man hath ever heard of a girl, however bright and cultured, that could throw a ball with any more accuracy than the white-armed Nausicaa? Her fear of gossip and of her parents displeasure, is not more womanly than the graceful way in which she undergoes the embarrassing encounter with Odysseus. The love she conceives for this stranger reminds us of all the cases of "it might have been" from the Princess Nausicaa to the peasant Maud Muller. We can only echo the wish of Odysseus, a wish if the traditions of love be true, which his very coming denied forever: "May the gods grant thee all thy heart's desire; a husband and a home, and a mind at one with his may they give, a good gift, for there is nothing mightier and nobler than when a man and wife are of one heart and mind in a house, a grief to their foes, and to their friends a joy, but their own hearts know it best." To-day how different would be his prayer. For Odysseus of many wiles read her face, and knowing that such a wish could bring upon his head only something after the fashion of "How like a man!" and the reproach of being impolite and behind the times, he would change his words and wish her a vote and an emancipated intellect; whereat she would rejoice in her heart and admire him above all men, for wisdom and understanding.



Such be a few of the things sung by the men of old; more I fain would tell, but I know how weary you all must be of hearing the sus presuming to discourse upon Minerva, and weary too you must be even physically albeit I have left much untold. You must ever be looking for the end of my tale as Odysseus turned his head toward the sun, being fain to hasten his setting, for verily he was most eager to get him up and away. "As when a man longs for his supper, for whom all day long two dark oxen drag through the fallow field the jointed plough, yea, and welcome to such an one the sunlight sinketh, that so he may get him to supper, for his knees were faint by the way, even so welcome was the sinking of the sunlight to Odysseus." Even so welcome, I ween, will be the end of my tale to its much-enduring hearers.

## HANS SACHS: THE COBBLER-POET OF NÜREMBERG.

BY W. H. VANDER SMISSEN, M.A.

[Read before the Modern Language Club on, the 4th of November, 1894, the 400th Anniversary of the Poet's birth.]

Four hundred years ago this day there was born in the quaint old city of Nüremberg, the home of German art and commerce, Hans Sachs, son of a well-to-do master tailor. A pestilence was raging at the time, which attacked both his



HANS SACHS.

*After an engraving by Jost Amman, 1576*

parents, and alone of the household spared the little babe, destined to add one more to the great names which adorn the honor roll of his native city.

The boy was sent early to one of the best schools of the town, where he was educated in the current branches of knowledge, including a fair share of Latin (of the mediæval sort) and

perhaps a little Greek, Grammar, Rhetoric, Music, Logic, Arithmetic, Astronomy, Astrology, Poetry, Philosophy, Natural History—all of which he confesses to have promptly forgotten, except Music, which was then the foundation of poetry, especially of that form of poetry which was most accessible to him as an artisan, and to which he owed his first introduction to the Muses. I mean the "*Meistergesang*," as cultivated by the schools of "Mastersingers" since the thirteenth century in all the great cities of Germany, especially in Mainz, Strassburg, Munich, Augsburg, and in the poet's own native city of Nuremberg. The poetry of these schools was mostly mechanical rhyming, well calculated to smother all outbursts of any but the most powerful genius. For our poet, whose genius could not be suppressed, the elaborate and intricate artistic structure of the "bars" and "tones" of the *Meisterschule* afforded a not unwholesome training in matters of form, and taught him to confine his exuberant fertility within reasonable limits.

In 1509, having attained his fifteenth year, Hans Sachs left school, and was apprenticed to that trade on which he was destined to shed such lustre—the trade of a shoemaker. His *Lehrjahre* having lasted two years, his *Wanderjahre*—the years of travel which are exacted of every apprentice to a trade in Germany—began in 1511, when for the first time he left the walls of his native town. For five years these wanderings continued, taking the young journeyman over the length and breadth of Germany, from Lübeck to Innsbruck, and from the Netherlands to Austria. These years of travel were invaluable to the future poet, even more than to the future shoemaker, widening and deepening his experience, and bringing him acquainted with all sorts and conditions of his fellow-countrymen—the staid and peevish burgher, proud of the power and wealth of his native town, to which his narrow patriotism was for the most part confined—the stolid peasant, sunk in boorish ignorance and brutality—the vagabond stroller, student or actor, making his living by his wits, chiefly at the expense of the ignorant and simple peasant-women—the parish priest and the monk, the artisan of the towns, great and small, and the fraternities of guildsmen—all these contributed to extend his intellectual horizon and to furnish him with an inexhaustible and varied

assortment of characters wherewith to lend living interest to his plays, his tales and his jests. Even the life of the noble and the courtier was not to remain unknown to him, for we find him in 1513 attached to the brilliant court of the Emperor Maximilian I. at Innsbruck in the Tyrol, and at Wels in Lower Austria, in the capacity of huntsman. That this temporary change of occupation was due to a desire to see a new side of human life, and not to disgust at the humble trade to which he had devoted himself, is evident from his poem "Gesprech der neun gab der Musen," a dialogue on the nine gifts of the Muses, in which he describes, in the favorite guise of a vision, his self-consecration to the "lovely art" of poetry. His mind, he says, was torn hither and thither by distracting thoughts as to the "pastime" to which he should devote his young life "besides his handicraft," which he recognizes as "useful and honorable," but insufficient to satisfy the cravings of the intellectual side of his nature. Love, wine, gaming and athletic prowess he had found productive of bitter disappointment. In this frame of mind he fell asleep in the imperial park, when there appeared to him in a vision the Muses, the "Goddesses of Art," nine women fair and noble. To them he reveals his desire for some pastime which should bring him "profit and honor." Clio desires to enlist him in the "service of German Poetry," particularly the "*Meistergesang*," by which the "glory of God" is advanced, and which will "shield him from much trouble" and bring him great honor. The various classes of poetry are then specified, as: historical poetry, tragedy, comedy, dialogue, and last, but not least, "fables and jests (Schwenk)."

In reply to the youth's modest doubts as to his own capacity, Clio informs him that she and her sister Muses will bestow on him their nine gifts, which the poem proceeds to enumerate. These are interesting as showing the poet's clear conception of the qualifications necessary for a true son of the Muses. They are as follows: 1st, a perfect will; 2nd, pleasure and delight in this noble art; 3rd, cheerful industry; 4th, the needful sense of form; 5th, a keen wit and the sense of order; 6th, the power of discriminating, "to prove all things thoroughly"; 7th, heavenly wisdom to distinguish good from evil, profitable from unprofitable things, and lastly, a pleasing style and power of expression,

“without stammering.” In conclusion, Clio demands a vow from her newly-initiated servant “that all his poems shall be devoted to the honor of God, the castigation of vice, the praise of virtue, to the instruction of blooming youth and the delectation of sorrowful spirits,” and promises to crown him with imperishable glory.

The technical training necessary for a “*Meistersänger*,” and all but indispensable to make a respectable tradesman in those days, he had received before this time, his first instructor being the “Mastersinger” Leonard Nunnenbeck, of Nuremberg. During his wanderings, particularly in the Rhine cities, he assiduously visited the singing schools of the various cities and towns in which he sojourned, perfecting himself in the knowledge of the various “bars” and “tones” known to the poetic art of the handicraftsman. In 1513, however, the year of the vision just described, he composed his first poem, a farewell love-song, and in the following, at Munich, his first “mastersong” in the strict sense of the word, “The Mystery of the Godhead.”

Two years later, in 1516, Hans Sachs returned to his native town, enriched by a wide and varied experience, and set up as a master of his chosen trade. In spite of the demands which his avocation made on his time, he found leisure to bring about the restoration of the Nuremberg “singing school,” *i.e.*, the poetic school of “*Meistergesang*,” to more than its former glory. To the sweet passion of love he had, taught by bitter disappointments, bid a sad farewell, and determined to seek a substitute in devotion to the divine art of poetry, and in domestic happiness. Under the pressure of an exacting avocation, and the establishment of his trade, the stream of his productivity flowed for the first years but sparingly; but he seems to have prospered rapidly in worldly affairs, and perhaps acquired a further competence by his marriage, at the age of twenty-five, with Kunigund Kreuzer, an only child, and probably an heiress in a modest way.

His earliest poems, which in the first three or four years of his career amounted to but thirty-nine, a very small number when compared with his astonishing fertility in subsequent years, were chiefly of the usual “Master” type, for the most part scriptural and religious subjects, such as the Trinity, the Virgin, the Sacrament, etc. Of the non-religious poems, it is interesting to

note that he owed the subject of the only narrative ones, "Lisa-beta and Lorenzo," and "Guiscardo and Gismonda," to Boccaccio, the greatest of tale-writers, with the German translation of whose Decameron and other works by Steinhöwel, Hans was evidently familiar, for he returns again and again to this source for the materials of his tales.

A year after Hans' return to Nüremberg, Germany, and indeed all Christendom, was shaken to the centre by the bold words of an Augustinian monk at Wittenberg; and the good burghers of Nüremberg in particular, one of the great centres of the book-trade, where the average intelligence was of a very high order, were not long in taking a prominent part in the discussions that arose on the new doctrines. For three whole years, 1520 to 1523, Hans Sachs' muse was silent; these the thoughtful poet devoted to the earnest study of Luther's writings. In 1523 he poured forth his soul in song for the first time again in his song of "The Nightingale of Wittenberg." Any sketch of this evangelical and eminently Protestant poet would be incomplete which failed to give some account of this poem. It is an elaborate allegory (then considered the highest form of poetry) in which the flock of Christ (denoting of course the Christian Church) is represented as having for ages gone astray in the dense forest of ignorance, trusting to the borrowed light of the moon (the traditions of men). But now the nightingale (Luther) pours forth her strong voice, heralding the approach of the Sun, the Word of God, the Daystar from on high, which is to enlighten the flock and teach them to know and avoid their enemies. In vain do the lion (the Pope), the wolves and serpents, and other wild beasts (typifying the prelates and ecclesiastics of all sorts), rage against the melodious bird, whose song prevails, and is followed by the radiant Sun (the unadulterated Word of God).

After this song of triumph our poet devoted himself assiduously to the defence of the cause of evangelical liberty, and to the spread of the doctrines he had adopted as his own, in numerous poems, dealing partly with doctrinal matters, *e.g.*, the Ten Commandments, the Creed, the doctrine of Justification by Faith, the futility of Works, and partly with Biblical subjects, as the Parables of Our Saviour, and some very fine versions of the Psalms, as well as evangelical versions of some of the old Church

Hymns, *e.g.*, one in honor of the Virgin. Here spoke a man of the people, and the people understood him as they understood no one else but Luther himself. Here was practical piety, unadulterated by acrimonious theological disquisitions. In the same cause he published his only prose works, seven dialogues, full of dramatic power, witty and convincing, while free from bitter admixture. Of these, one addresses a note of warning and admonition to friend and foe alike. The theologians, in their zeal for pure doctrine, had neglected to inculcate with sufficient emphasis the necessity for a pure life, and the result was but too evident in many cases in the conduct and lives of not a few even of the prominent adherents of the new Church, and gave an effective handle to the enemy. The harm and scandal caused by this state of affairs are powerfully dealt with by the poet, and one point on which he dwells has not lost its interest even in the present day. He inveighs in no measured terms against the greed of selfish capitalists who grind the faces of the poor, buying up the necessaries of life to sell them at exorbitant prices. "Furthermore," says our author, "greed prevaieth mightily among the merchants and middlemen, who oppress the journey-men and workers by the piece; when these bring them their work, then do they bitterly depreciate it; then standeth the poor workman trembling at the door, with hands clasped, silent, that he may not lose the merchant's favor. He hath perchance obtained a loan on his work in advance, then doth the merchant reckon with him as he will." This picture shows that the sweating system was known at Nürnberg then, as it is in London and New York in our own days. And as in doctrinal matters he was no bitter partisan, so in matters political we find him on the side of a united Germany, lamenting those divisions and that disregard of the central authority, in which, with a clearness of vision vouchsafed to few of his contemporaries, he saw foreshadowed the impending decay and ruin of the German Empire.

For nearly ten years did Hans Sachs thus devote himself to the cause of religion, but when, about 1532, the distribution of Luther's writings, and particularly of his translation of the Bible, had made the Sacred Writings accessible to rich and poor alike, he once more turned the stream of his song into secular channels; for, with the insight of genius, he saw the danger of a

one-sided and exclusive devotion to Biblical and religious subjects. Henceforth he was free to devote himself to his Muse, walking with her in the pleasant gardens of allegory, in the shady groves of fable, didactic poetry and romance, in the dark wood of tragedy, and on the sunlit fields of comedy, holding his sides with merry laughter at human folly, or wielding with vigorous and unsparing hand the lash of indignant satire against vice.

His Muse was, above all, didactic, comic and dramatic; never did he lose sight of Clio's admonition in his early "Vision of the Nine Muses": to devote his talents to the glory of God, the castigation of vice, the praise of virtue, the *instruction* of blooming youth, and the delectation of sorrowful spirits. In summing up, at the age of 73, his poetic career, he could honestly say that he had "excluded all lewdness," and that his merriest "fables and jests" had been "not too coarse and shameless," but such as would "give delight and amusement, and yet see the good in them and be free of all evil." For, if he is coarse to our ears, we must judge him by the standard of an age as coarse and frequently as unclean as it was vigorous. His constant effort, particularly in his "Fastnachtspiele," or carnival plays, was to do away with the shameless license which had hitherto always attended these exhibitions.

His productivity was enormous: in the rhyming catalogue of his works he gives the total number of his poems as over 6,000, including more than 200 dramas, comic and serious.

One word as to the character of his versification. His lyric poems, constructed on the model of the "*Meistergesang*," are most elaborate in structure, frequently with a most complicated rhyme-scheme, containing sometimes as many as eleven distinct rhymes in a stanza of nineteen lines of varying lengths; but the great body of his poetry, his "*Spruchgedichte*," dialogues, *Schwänke*, or jests, his histories, and all his dramatic works, serious and comic alike, are written in rhyming couplets of eight or (with disyllabic rhyme) nine syllables, in fact the despised metre known as doggerel in English, or "*Knittelvers*" in German, a metre restored to honor in the "*Faust*" of Goethe, who both in early and late life loved and admired Hans Sachs, and wrote an "apotheosis" of him, called "*Hans Sachs' Poetic Mission*," showing a loving appreciation of his poetic genius.



This metre he handled with great freedom, shortening or lengthening words to suit the exigencies of the line, disregarding the accents, and treating the rhymes with similar license. I am disposed to think that the facility with which this verse could be handled partly accounts for his fertility, as a similar cause may also account for the still more astounding productivity of the Spaniard Lope de Vega. I have compared one or two of his lyric pieces, with their strict formula, with others in this metre dealing with the same subjects, and the advantage seems to me to be always on the side of the former, where the form is a check on diffuseness.

The copious stream of Hans Sachs' verse flowed on with but one interruption to the end of his long life. In 1560, the same year in which he lost his first wife (all their seven children had preceded her to the grave), he complains of the waning of his powers, and concludes to bid farewell to poetry. But in the following year Hans, who, like Oliver Wendell Holmes, might be said to be sixty-six years *young*, married a beautiful girl of seventeen, and the rejuvenated poet 'began a new course of poetic activity. He died in 1576, in his 82nd year.

To complete this account of the foremost poetic genius of Germany in the 16th century (one might even add the 15th and 17th), I shall give an outline, with translated extracts in the metre of the original, of one of his best known and favorite *Fasnachtspiele*, "The Unlike Children of Eve."

The *dramatis persone* of this play are : The First Person of the Trinity ; Adam, Eve, Abel, Seth, Jared, Enoch, Methusalah and Lamech, the six good and obedient children of Eve ; the angels Gabriel and Raphael ; then Cain and his villainous brethren, Dathan the Rebel, Achan the Thief, Nabal the Drunkard, Esau the Voluptuary, and Nimrod the Tyrant, with Satan as their guide, philosopher and friend ; and lastly, the inevitable Herald, as Prologue and Epilogue.

The slight anachronism of making Esau and Dathan, Achan and Nabal, contemporary with each other, and sons of Adam and Eve does not seem to have troubled the dramatist's mind for an instant. And, above all, we must be careful not to impute to a man of Hans Sachs' sincere and fervent piety any idea of irreverence in introducing and treating freely the *Herr Gott*, God the Father, as a personage in his drama. The poet, I repeat,

must be judged by his age; and not only his own, but previous ages had long been familiar with the appearance of all three Persons of the Trinity on the stage in the Mysteries and Miracle Plays; a practice continued by other Protestant dramatists after Hans Sachs.

To proceed then with our sketch of this "Comedy," which is in five Acts. After the herald has in the prologue outlined the action of the piece, Eve appears, uttering a bitter lament of sorrow and penitence for her sin in yielding to the "hellish satanic serpent." Enter to her Adam from his hard labor of earning his bread "in the sweat of his brow," and with gentle words consoles his dejected spouse, reminding her of the promise of salvation through the "woman's seed." He then announces the glad tidings that the Lord is coming to visit them, to see how they keep house, and particularly how they manage their children:

To see how we teach them their creed,  
And if they honor God indeed:  
So have them washed and combed and drest  
Right neatly in their Sunday best.

Eve promises this gladly, but both parents express a fear, which turns out to be only too well grounded, that there will be trouble with Cain, the naughty boy of the family. Abel is sent to call him in, and the trouble soon begins, for Cain cries: Who calls?

Is't you, you mother's babe? Indeed,  
I'd like to punch the milk-sop's head.

In this occupation Cain has just been engaged with the guttersnipes in the street, from whose vengeance he is fleeing when Abel finds him. His brother's admonitions are in vain, nor has his father any better success:

*Adam.* For the Lord's coming it were best  
You should be bathed and combed and drest.  
Prepare, it is the Lord's desire,  
For Sermon, Sacrifice and Prayer.

But wicked Cain replies that he wishes these things had never been invented, and would much prefer to play and fight with the boys. To being washed, he has also an insuperable objection, so that Eve in despair is forced to be satisfied with

making Abel and the other good boys presentable for the great occasion; Cain and his crew will, she fears, be "filthy, like swine from wallowing in the mire."

Eve's worst fears are fulfilled, when Cain receives the Lord with his left hand, and his bad brothers neglect to remove their hats, and they are banished in disgrace, while Abel and the other good boys pass a most satisfactory examination on the five principal articles of religion: the Ten Commandments, the Creed, the Lord's Prayer, and the Sacraments of Baptism and the Eucharist, the exposition of which is taken almost verbatim from that master-piece of exegetic logic, Luther's Smaller Catechism. This examination in fact closely resembles that of candidates for confirmation in any Lutheran church of the present time, on the great day when they have to testify before the congregation the reason of the faith that is (or ought to be) in them.

Delighted with the proficiency shown by Abel and his good brothers, the Lord assures them of the aid of His Spirit to keep the Word they know so well, and promises to bestow on them temporal blessings also, that "ye may be the great men of the earth,"

As kings, princes and potentates,  
Scholars, and preachers and prelates.

The Fourth Act opens with a consultation between Cain and his crew of tatterdemalions (Satan being also present) as to how they shall answer the questions to be put to them in the approaching cross-examination by the Lord—for their respite from the dreaded ordeal is only a temporary one. Cain expresses his apprehensions to his brethren thus:

O what shall we poor duffers say?  
The Lord examines us to-day.  
On faith and prayer, on heaven and hell:  
What to reply, I cannot tell.

Dathan the rebellious replies that he has no intention of bothering his head with faith or creed, but means to stick to cards and dice. Nabal, the drunkard, declares that he will not run after preachers and preaching, but would rather "make a wet night of it" any time; Achan, the thief, however, gives more specious reasons for rejecting the Scripture, from which we

see that at least he is no good Lutheran. Scripture, he declares, is not for the common man; it is dangerous:

Dathan hath chosen poker and euchre; \*  
 For my part, give me wealth and lucre.  
 'Tis better far than Holy Writ,  
 Which for a layman is not fit,  
 For 'tis a source of many a schism,  
 Gross errors and fanaticism.

Satan, who has been a delighted listener, exclaims that they are all his true followers, and encourages them to neglect God and despise His Word and Law, promising to each what he most desires, power, or gold, or fleshly pleasures, "for I will be your benefactor," he says.

Satan having hidden himself, the Lord re-enters with Adam and Eve, and proceeds to examine the naughty boys thus:

*The Lord.* Come, Cain, with thy motley crew and say  
 With what words to the Lord ye pray?

*Cain.* I have forgotten that, O Lord.

*The Lord.* Cans't thou remember not one word?

*Cain.* Well, perhaps I can remember some.

And then follows Cain's version of the Lord's Prayer, which may, perhaps, remind Sunday School teachers of occasional similar fruits of their labors:

O knock us into kingdom come,  
 O Father our in Heaven O,  
 In Heaven and on earth also;  
 Give us debts and lots of daily bread,  
 Battle, murder and sudden death Amen.

After Eve has disclaimed all responsibility for this dreadful exhibition, the Lord turns to Dathan, and bids him recite his Creed, which is equally brief and wrong-headed:

*The Lord.* Is this all the creed you can afford?

*Dathan.* So much to remember I found hard.

Nabal, asked to recite the Ten Commandments, bluntly declares his total ignorance. The Lord then turns to Achan, and

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\* I have modernized here with a vengeance, partly for the sake of the rhyme; but the anachronism would not have troubled my author for an instant, who would not have hesitated to introduce these games by name, had they been invented in his day.

asks: "Dost thou think to be saved?" In his reply, Achan now develops another heresy, displaying himself this time as a fatalist:

If God me thereto should ordain  
Unending life and bliss to attain,  
Then I'll be saved, do what I will.

Esau declares for salvation by works alone, at least if there be such a thing as eternal life at all; and Nimrod says:

What mine eyes see, my heart believes.

The Lord, justly indignant at such a state of things, turns to the mutinous crew in anger:

*The Lord.* O what a faithless, godless lot,  
That nothing know or care for God;  
Heedless alike of faith and prayer,  
Of the earth, earthy, they desire  
But what doth please their blood and flesh,  
Entangled deep in Satan's mesh.

He assigns to them as a punishment the lowest and most laborious occupations allotted to men, such as peasants, cottars, shepherds and knackers, hewers of wood and drawers of water, broom-makers, day-laborers, beadles and policemen, carters, wagners, vagabonds, beggars, soldiers and—shoemakers: they are to remain coarse and awkward, and wander about ragged and tattered throughout the land, a mockery to all men, and, unless they turn to God and learn commandment, faith and prayer, fare still worse in the other world. Abel is made their "bishop," as Cain afterwards angrily says, to teach them better things.

This curious way of accounting for the inequalities of human occupations, rank and condition of life, is, of course, not scriptural. It is a part, and a very ancient part, of German folklore, and is traceable, in fact, to the ancient heathen mythology of Germany. The subject was a very favorite one with our poet, for he has treated it in four or five different forms. The act closes with a hymn sung by a chorus of angels; and the Fifth Act of this "mournful comedy" represents the murder of Abel by Cain, with the latter's condemnation and banishment; the usual epilogue by the Herald closing the piece.

## THE POEMS OF WILLIAM WILFRED CAMPBELL.

BY JAMES A. TUCKER, '95.

[Read before the Modern Language Club, 1895.]

It seems to be known to comparatively few that the students of the University of Toronto have a right to take any special interest and pride in the literary successes achieved by William Wilfred Campbell, whose name, as we all know, has been for the past six years in the mouths of men of letters from one end of this continent to the other. Yet we have such a right: and if there has been indifference on our part in the past, it is but another instance of an eminent man being neglected and ignored by those upon whom he has shed a measure of reflected glory. Mr. Campbell is an undergraduate of this University, having been admitted in 1881. He never graduated, however, but entered the ministry of the Church of England, which he has since deserted, presumably on account of a change in his religious beliefs. He is now employed as a clerk in the Post Office Department at Ottawa, where his brother poets, Lampman and Scott, also find employment in the civil service.

The chief successes of Mr. Campbell have been scored in the American magazines and periodicals of the day. But he has collected his verse in two volumes issued from Canadian presses. The first, "Lake Lyrics and Other Poems," made its appearance in 1889; the second, "The Dread Voyage and Other Poems," in 1893. Of these two volumes, the first is decidedly inferior to the second. It is therefore a matter for regret that we have in the University Library only the first, as anyone desiring to become acquainted with Mr. Campbell's work, and applying himself to "Lake Lyrics" with this end in view, would certainly be misled as to the scope and character of the poet's genius. Grave defects that mar the earlier volume must, in the light of Mr. Campbell's later and better work, be regarded as the clinging imperfections of youth. They are entirely absent from his second volume.

which anyone must read who would see the poet developed, matured, and in complete command of his talents.

It is not surprising that Mr. Campbell should have first won attention as a nature poet, and particularly as an interpreter of the Great Lakes, the glories of which were as yet unsung, but which, as Mr. Walter Blackburn Harte long since pointed out, offer a boundless, and as yet almost virgin field for poetry and romance. Spending his youth as he did in Wiarton, a small town beautifully situated on the shores of the Georgian Bay, he could not fail to receive early and lasting impressions from the picturesque and rugged scenery of that region. Anyone who has sailed up Wiarton Bay will long remember the glory of the mighty limestone cliffs, beetling hundreds of feet above the gloomy waters, and fringed with forests of tawny green. It is from this scenery that Mr. Campbell seems to have drawn his first inspirations, and his earlier work consists almost entirely of nature-poetry, much of it having to do with the region where

“Out in the world of death, far to the northward lying,  
Under the sun and the moon, under the dusk and the day :  
Under the glimmer of stars and the purple of sunsets dying,  
Wan and waste and white, stretch the great lakes away.”

Mr. Campbell's love of nature is very much in evidence. His appreciation of her smallest beauties, and the consolations which he derives from her manifold music, are very sweetly and adequately expressed in his “Lyric of Weariness,” from which a couple of verses may be quoted :—

“Forgetting the jibe and the sneering,  
The pettiness, rancor and fray,  
Of a world whose birth and appearing,  
Whose jealousies, struggles and jeering  
And curses are but for a day ;  
Close brother to bud and to blossom,  
Low-cradled in Summer's warm bosom,  
I drink the sweet peace of the day.

“O Brothers, what matter, what reason,  
To struggle a few weary hours ?  
Better be one of the bees in  
The blossoms one sweet little season,  
To gather the honey of flowers ;  
To gather the sunshine and sweetness,  
And round out life's little completeness,  
Passing away with the hours.”

In his nature-poetry he sometimes shows great power as a word-painter. Some of the lines of "In the River Bay" strike one as being worthy of the descriptive faculty of Sir Walter Scott. In "To the Blackberry" we have a little passage that articulates the spirit of youth with a deftness which Robert Louis Stevenson has not surpassed in his child-verse:—

"Dark gypsy of the glowing year,  
Child of the sun and rain,  
While dreaming of thy tangled path  
There comes to me again

"The memory of a happy boy,  
Barefooted, freed from school,  
Who plucked your rich lip-staining fruit  
By roadways green and cool :

"And tossed in glee his ragged cap,  
With laughter, to the sky,  
Oblivious in the glow of youth  
How the mad world went by ;

"Nor cared in realms of summer time,  
By haunts of bough and vine,  
If Nicholas lost the Volga,  
Or Bismarck held the Rhine."

Other poems which illustrate Mr. Campbell's power as an interpreter of the world of visible nature, are "The Winter Lakes," "Lake Huron," "Autumn's Chant," and "The Flight of the Gulls," all of which, did time permit, might here be quoted with advantage.

But it is not as a nature-poet that Mr. Campbell has done his most effective work. Pœ contends in his "Poetic Principle" that he who merely gives expression to the impressions of pleasure or pain that the visible world brings to all God's creatures in common, though he express them never so adequately, has yet failed to prove his title to the name of poet ; and assuming that Poe is right, William Wilfred Campbell would not deserve to be called a poet, much less the greatest of Canadian poets, had he written nothing outside the descriptive verse which we have been considering. It is where distinctively human interests and currents of human tragedy come into play that he excels.

Some people see in him the successor to the muse of Longfellow, but Campbell is far too deep and sombre to bear much resemblance to that poet, who is so pre-eminently simple, calm



and joyful that even his saddest verses are like tears glistening with the light of hope. Occasionally, in his earlier work, Campbell bears a resemblance to Tennyson, and the lines

“ Politics, politics, politics ; ruin, confusion and rout,  
In chicanery, lying, model reformers when out ;  
Loud-mouthed babblings of honor, pratings of victories won,  
Maggots that crawl in the fulness of a carcass out under the sun,”

might be from “Locksley Hall Sixty Years After,” so far as sentiment is concerned. In fact Campbell, in his ode to Tennyson, distinctly acknowledges the influence of that poet, whom he addresses as “my master,” and in the same poem he incidentally expresses his admiration for Milton and Longfellow. Some of his work, such as “The Cloud Maiden” and “The Children of the Foam,” bears a certain indefinable resemblance to Shelley’s in its ethereal beauty. But beneath the surface and in its essence, Campbell’s work is totally unlike that of any of the poets above mentioned, and though I am not aware that the fact has ever been pointed out, it would seem quite clear that his genius is of almost precisely the same stamp as Edgar Alan Poe’s. His productions reveal the same love for the mystical and weird, they have the same wealth of melodious expression and the same facility of versification. “The Mother,” which *Scribner’s Magazine* pronounced the greatest poem since Longfellow’s “Psalm of Life,” and which the Chicago *Inter-Ocean* classed as the nearest approach to a great poem in current literature, illustrates what I have said. “Restless River,” “The Were-Wolves,” and “The Last Ride” remind one of Poe, and no less do “The Legend of Dead Man’s Lake” and “The Dread Voyage.” The latter I should like to quote in support of my contention. Besides having given its name to Mr. Campbell’s second volume, it is a poem of wonderful power and quite as fine an expression of the religious doubt of these *fin-de-siècle* days as may be found in literature :—

THE DREAD VOYAGE.

Trim the sails the weird stars under,  
Past the iron hail and thunder,  
Past the mystery and wonder  
    Sails our fated bark ;  
Past the myriad voices hailing,  
Past the moaning and the wailing,  
The far voices failing, failing,  
    Drift we to the dark.

Past the headlands grim and sombre,  
 Past the shores of mist and slumber,  
 Leagues on leagues no man may number,  
     Soundings none can mark ;  
 While the olden voices calling  
 One by one behind are falling ;  
 Into silence dread, appalling,  
     Drift we to the dark.

Far behind the sad eyes yearning,  
 Hands that wring for our returning,  
 Lamps of love yet dimly burning.  
     Past the headlands stark !  
 Thro' the wintry snows and sleeting  
 On our pallid faces beating,  
 Thro' the phantom-twilight fleeting,  
     Drift we to the dark.

Without knowledge, without warning,  
 Drive we to no lands of morning,  
 Far ahead no signals horning  
     Hail our nightward bark.  
 Hopeless, helpless, weird, outdriven,  
 Fateless, friendless, dread, unshrive,  
 For some race-doom unforgiven,  
     Drive we to the dark.

Not one craven or unseemly,  
 In the flare light gleaming dimly  
 Each ghost-face is watching grimly  
     Past the headlands stark !  
 Hearts wherein no hope may waken,  
 Like the clouds of night wind-shaken,  
 Chartless, anchorless, forsaken,  
     Drift we to the dark !

The poems I have mentioned, which are but samples of Mr. Campbell's most characteristic work, it seems to me bear out very strongly the comparison I have drawn between him and Poe. But Mr. Campbell has done some work in an entirely different spirit. Next to "The Mother," "Pan the Fallen" is probably his most popular piece. It cannot be said that the latter at all resembles the work of the great southern singer. We have in it, nevertheless, an exceedingly beautiful production, and one which should teach us to be less ready than we are to judge harshly the moral defects of such men as Burns, Byron and Shelley. It is to be regretted that the consideration of space forbids my quoting it.

There is only one more of Mr. Campbell's productions to be referred to—something entirely different from any of his other work, but quite as good in its way as his best. It is a poem called "Dan'l and Mat," and draws a striking picture of character from among the rough fishermen of Georgian Bay and Lake Huron. Everyone who has read it will bear me out in saying that as a piece of combined comedy and pathos it could not possibly be excelled. It proves that while the motive of nearly all the poet's work is so intensely serious, he has, nevertheless, a vein of humour as fine as James Whitcomb Riley's, even if less developed.

In concluding this necessarily brief paper, let me lay emphasis on the fact that Mr. Campbell is still a young man, and that while he has probably done as good work as he will ever do, yet on the other hand it is possible that he has greater things in store than any he has so far given us. But at any rate, whether his future work excels his past or not, one thing is certain—he has already done enough to show that even for Canada there are great literary potentialities.

## FREEDOM OF THE WILL.

BY A. H. MACGILLIVRAY, '96.

[Read before the Philosophical Society, March 15, 1895.]

THE question as to whether the Will is free is one that has occupied the minds of men and one which has been disputed by them ever since Socrates laid down the maxim "know thyself." It stands out prominently in Aristotle and the Stoic Philosophers, the influence of Christian teaching has also helped to bring it into prominence, and it is one of the great questions on which modern philosophers and psychologists are divided. The attempts of late years to reduce psychology to a natural science, and of evolutionists to show that by a process of development the higher grows out of the lower, has called forth the champions of Free Will to defend their cause: to endeavor to prove that there is a separate order of mental facts, and that the lower, if it is to be explained at all, must be explained by the higher.

It need hardly be said that it is a question of great importance. If man be not free in his actions, but if these are simply links in the chain of natural cause and effect, if they are determined by some thing or power or principle, over which he has no control, then plainly no philosophy of morals is possible; in other words, to extend natural cause into the region of mind is to annihilate all morality, and self-reform would be unintelligible. If there is no freedom one may say: "I am simply a machine, there is no use in me trying to be better, I have no control over the circumstances which govern me, I will let nature take her course, for after all I cannot do otherwise." It is not difficult to see what such a belief carried out would lead to.

But as a matter of fact we have to face the question. We act as if we were free, even those who say we are not free act thus. It appears to be an innate idea. Our voluntary actions appear to be subjective determinations and seem to be directed towards ends set up by the mind. We feel responsible for what we do

and it is this fact of responsibility that makes life so serious. We even feel responsible whether the ends toward which we direct our energies be attained or not. Should these facts go for nothing? Is consciousness not a competent witness to human freedom rightly conceived? Do we not know that it is the desire to be better on the part of anyone that constitutes the being better? In contrasting those two phases we see the problem in its practical bearings, and we also get a hint at the value of having a clear conception of it, seeing what the tendencies are, and the effects would be, if either were carried out.

Before entering into a fuller discussion of the question it will be well to guard against a misconception of what the problem at issue really is. Locke considered a man free or not free according as he had or had not the power to carry out what he willed. For example, a man is bound. If he wish to break the bands that bind him and can, he is free; if he cannot, he is not free. Locke here (as well as elsewhere) is astray as to the real question at issue. In contrast with this, and to see the question in its proper light, we cannot do better than quote Dr. Young's statement of the problem: "A man bound in chains is a free agent, as truly as if the fetters were removed. What matters the fact that he cannot break the fetters? You are merely asserting that certain external consequences would follow from the man's acting. That is not the question, but it is whether the subjective energies, which constitute our actions are the unconstrained forthputtings of a power inherent in self, *i. e.*, whether men are veritable, and not mere nominal agents." Or using Professor Hume's phraseology, the question of the freedom of the will is the question of choice, *i. e.*, "When alternatives are given, can we choose?" It is not the question of whether we can carry out what we will. Hence the solution of the problem rests on the question of the origin of choice, or in other words, how is choice, *i. e.*, motive, determined?

To help in the understanding of the question, let us consider three solutions, or attempted solutions.

#### I. DETERMINISM.

According to this theory, motives determine the choice; with this school, motive is an impelling force, an acting *from* some im-

pulse—the strongest motive determines the will, and the mind becomes simply a battle-ground for motives; the motives are, as it were, wrestling for supremacy in the arena of consciousness, and the strongest may say, “*veni, vidi, vici.*” But even on this theory we have to ask, what is the origin of these motives? Whence do they arise? The Determinists’ solution of this depends altogether on their view of the self. They do not recognize permanent self-conscious Ego, that can conjoin representations and knit together a world of experience, but self for them is simply the sum total of the feelings in consciousness at any one time. These feelings arise through the play of natural law—cause and effect—and thus man is simply a link in the chain that has been governing the course of nature through the ages. Therefore just as the law of cause and effect determines everything in nature, so it does in man. Choice is simply one stage in the process, and consequently man is not free.

#### CRITICISM.

1. Fundamentally we must object to the Determinists’ view of self. Far from admitting the self as the product of natural cause and effect, we claim that self is the condition of there being such a law. A series of events causally connected can only be known to some principle that is not one of the series. If the self were in the series it could never know it as a series. Instead of placing the self as an element in the course of events in time, we claim that it is the condition of there being such a flux of phenomena and that without it such a succession could never be known as a connected series of events at all. The series exists for the self or in relation to the self. All experience presupposes a self that is aware of *its* own experience.

2. We object to their idea of motive. A motive is not something coming behind and pushing you (as it were) on to action, not a force impelling, but in the language of Dr. Young “an end definitely in the mind’s view regarded as desirable or fitted to satisfy or realise the self.” We do not deny that motive as defined by the Determinists has a real existence, but in this sense we call it impulse, and no action done from impulse is moral at all. Mechanical, organic, sensitive, psychical (spontaneity) movements are such. The organism may perform

things that are not *mine*, in the strict sense. Without selection no will is exerted and consequently no act so done is moral. Motive is constituted when we perform or would perform an act, not *from* but *for* something; that is, having thought an end or line of conduct desirable we would carry it out.

3. Most of this school hold pleasure as determining action. Now if we act *from* pleasure it is impulsive, hence not moral; but if we act (if possible) *for* pleasure, pleasure becomes a motive and our action is accordingly moral. But if we can act *for pleasure* we can also act for other things. We see no reason why purposive action having once been admitted should be limited to one avenue of choice. If I can really choose pleasure, why may I not choose other ends which seem to me desirable?

4. Why do those of this school enjoin us to conform to rules and laws if we are the result of and determined by natural forces? Why lay down a code of rules for living, as most of the exponents of this theory do? It plainly implies that there is something in man independent of those forces which may determine the relation in which he shall stand to them. Why should we ridicule the misery of one and praise the prosperity of another, when they say the same law of nature brought one to misery and the other to happiness? It is simply because man has the power of improvement within himself, being determined by himself, and this is implied when we enjoin one to do better.

## II. INDETERMINISM OR LIBERTY OF INDIFFERENCE.

The supporters of this theory hold that motives are not impelling forces, but that a man is affected by various motives, non of which necessarily determines his act; and that between these he makes a choice which is not itself determined by any motive, *i. e.*, that there is unmotivated choice between motives. This is, we notice, the other extreme from Determinism. Let me again quote Dr. Young by way of criticism of this theory: "If we are not conscious of a liberty of indifference we can form no idea of what those mean who contend for it. Consciousness declares only what is. Regarding what may be, it is dumb. I am conscious of freedom in everything I do, *i. e.*, I am conscious of being the real, and not the mere nominal agent; but it is a contradiction in terms to speak of my being conscious of freedom in regard to

what is not being done or may never be done. Though I am convinced that the one result or the other shall take place according as certain subjective energies are or are not exerted (*e. g.*, moving a chair) the conviction is not a datum of consciousness: it is an inference from experience and one having nothing whatever to do with my free agency properly so called, but only with the outward results which experience teaches us to connect with particular exertions of free agency. Consciousness does not tell us what we may or may not do, but only what we do. Hence we are not conscious of *freedom to act*, but of *freedom in acting*." We add further, our action must be either Irrational or Rational. If it is irrational we are acting for no reason whatever, and this simply leads us back to Determinism, throwing us into the play of forces which though unknown, may be none the less real. Again, if it is rational, it is an act of reason, in which case the question of freedom is regarding the *reason for so acting*. This brings us back again to the true question, when alternatives are given *can we choose?*"

### III. FREEDOM, OR SELF-DETERMINISM.

We have found it necessary in discussing the two previous theories to assume throughout that the mental manifestations of which we are conscious are not the products of corporeal organization, but that united with the body there is an immaterial principle, the subject of thought and feeling, and the agent in volition. Hence the foundation of this, Green's theory, is the theory of self, and the above systems have been criticised in the light of this theory. In knowledge, a principle is implied which is not merely natural, that is, not the result of natural forces, and in action this same principle is implied in the ability to *present ends of conduct to itself*, which it strives to realize in action. This is the self. It is a principle which recognizes itself as a *knower* in knowledge and a *doer* in action. It not only, as intellect, comprehends the world as a system of relations, through experience, *i. e.*, makes the real the ideal, but as desire, strives to remove the opposition by giving reality in the world to an object which, as desired, is only ideal. That is to say, in knowing I am trying to incorporate into myself a world which is, and in action I am trying to thrust myself out to make a world which



I conceive ought to be. Green speaks of the self as a reproduction of the eternal self-consciousness to which the processes of animal life are organic; hence it has wants. We must not, however, confuse wants and wanted objects, *i. e.*, motives. A want is strictly natural, but the motive implies the action of self-consciousness on the want, and although the want (which is organic) may be a condition of the motive, yet it is not a part of it. In order for the motive to be a natural phenomenon, the self-consciousness must also be natural, but we have seen that if such were the case no theory of knowledge or of morals would be possible. We have to posit a self, something whose reality is not relative, a self that perceives when it has sensations, and forms motives when it has wants in the physical organism which it possesses, a self that is self-conscious and can present to itself also lines of action. We recall the distinction made in Pt. I. between impulse and motive. Motive, as distinguished from mere animal impulse, is constituted by re-action of the man's self upon all the ends (*i. e.*, alternatives) in consciousness, and his identifying himself with one of them as one in which he seeks satisfaction for the time, *i. e.*, is the act on its inner side. Impulses act upon a man. The man acts when he wills, *i. e.*, when he thinks an end desirable, and in so *thinking the end* he constitutes it a motive, and this *thinking the end desirable* is from one side the moral act, while from another standpoint we may say that the motive is the act. Thus we see that for Green motive determines the will, or, viewed in a certain way, motive is the choice. The next question is "Whence this motive?" It is, as we have seen above, constituted by the action of the self-conscious subject inasmuch as he has the power or *ability to think an end desirable for him*. Thus Green makes freedom to lie in *THOUGHT*. It does not consist, as Locke says it does, in whether we can do what we will, but in that we can *think an end desirable* or otherwise.

But does not this thought depend on character? Does not what I think desirable for me depend on what I am? Certainly. A man's actions must have a moral cause, they must be according to his nature. Shall we then conclude that man is not free, seeing that in the presence of given ends a man must choose as he does? Reflection on this leads us to see that this is just what shows him *to be free*. For the character *is* in a true sense the

man, self-consciousness has been active in making the man what he is, and he is not thus determined except as he determines himself being an object to himself. Hence we see that although an act is a necessary result of the character of an agent, it does not follow that the agent is a necessary agent; rather the fact of ascribing an action to character as its source is what shows it to be FREE from compulsion of any kind. Freedom is implied in obligation even, I OUGHT, MEANS I CAN. As far as one's future depends on one's past and present, it depends on this consciousness, depends on a direction of his inner life, in which he is self-determined and his own master, being his own object. Thus Green's theory is Determinism, but it is SELF-Determinism. We thus conclude that "man is a *veritable*, and not a mere nominal agent, that the subjective energies which constitute our actions ARE the unconstrained forthputtings of a power inherent in self."

## MONOMETALLISM.

BY A. M. CHISHOLM, '95.

[Read before the Political Science Club, December 5th, 1894.]

IN investigating the monetary history of nations, it will be found that silver was the first currency used. It was the best for early times because it was the cheapest, just as gold is the best metal for the present age with its enormous monetary transactions, because it is the dearest. In the beginning of nations, then, a high gold unit was not practicable, nor was it wanted. Gold was a mere article of dealing and traffic. People only wanted cheap things and a high standard of value was useless.

Gradually, with the growth of industry, the multiplication of transactions and increase of wants, grew up a demand for gold. There was a transition from silver to gold as a monetary basis, and not till the present century was the latter metal firmly established as the standard. It was, however, not possible to discard the metal of early times. Small transactions were more numerous than ever and the two metals had to be kept in use together. The necessity for this was seen, but it was long before the true system was perfected.

Under the English system, which is perhaps the most perfect of the present day, the dearer metal—gold—is the standard. Gold alone is used in large payments. For minor purposes, such as small payments, making change and the like, silver is used, but there is no real comparison of its value with the value of gold.

Twenty shillings do not necessarily make a pound. The values are arbitrary, and so is the quantity of silver coined. Gold coinage circulates at its true value, and an artificial silver coinage circulates at an abnormal value, because of its regulated quantity. Until this nice expedient was detected both metals circulated together at this equation or at that, with the result that one or the other was constantly disappearing, and entailing

endless trouble and expense on the government, besides producing widespread misery amongst the people. Now the English subsidiary coinage is limited in amount, and the sum for which it is legal tender is fixed by government. Silver is legal tender up to forty shillings, and copper up to 12 pence. The arbitrary value imposed by government upon this subsidiary coinage removes it from the ranks of the commodity in which it is in its raw state, and renders it independent of the fluctuations in value of that commodity.

Monometallism, as almost everyone knows, is simply a government measure rendering one metal, and one only, legal tender to any amount in payment of taxes and debts when stamped with the government stamp and turned by the government into coin, and the proof of the excellence of the system is that all Western nations are to-day practically monometallic, and show no desire for a change. And now to fully realize the excellence of the monometallic system, and to recognize the fact that it is the only sound one, and that all others are either impracticable, or, at any rate, do not hold out sufficient inducements to warrant a change, let us look at the bimetallic system and see what it really is and what its advocates claim for it.

The bimetallicists propose to establish by law a fixed ratio between gold and silver, say of 1:15½, and to make either metal legal tender to any amount in that fixed ratio. But can this be done? Certainly a government may declare one ounce of gold to be worth 15½ ounces of silver when coined, but will it be able so to regulate the market value of the two metals that that ratio will be maintained? Bullion, the raw material, is only a commodity, and if the government can regulate the price of this it can regulate the value of all other commodities, which was precisely what mediæval governments endeavored to do and without success. Success would be a paralysis of the laws of demand and supply.

In a pamphlet issued in England in 1696, it is stated: "When two sorts of coin are current in the same nation, of like value by denomination but not intrinsically (that is to say, in market value), that which has the least value will be current, and the other, as much as possible, will be hoarded," or, it may be added, melted down or exported. This great coinage law is

admittedly true and of universal application. Hence it has been recognized in all discussions on coinage. It applies in the following cases:—

I. If the coins consist of one metal only, and clipped, debased and degraded coins are allowed to circulate together with good coins, all the good coins disappear: they are either hoarded, melted down or exported, and in consequence the bad coin alone remains in circulation.

II. If coins of two metals, such as gold and silver, are allowed to circulate together in unlimited quantities, at a fixed legal ratio which differs from the market ratio of the metals, the coin which is underrated disappears from circulation, and the coin which is overrated alone remains current.

III. It follows that it is impossible to maintain a fixed par of exchange between countries which use different metals as their standard unit.

This law in its operation is not confined to single and separate states. It is absolutely universal, and it is as utterly impossible for a dozen states as for one to try and maintain coins of different metals in circulation together in unlimited quantities at a fixed legal ratio, which differs from the market value.

If coins of one metal—say dollars—are of different values, some worth more and some worth less, and each is legal tender to the amount of one dollar, everyone will pay his debts and make his purchases in those dollars which are worth the least, and keep those which are worth the most, just as a tenant who had to pay his rent in kind, would pick out the poorest portions of his produce for his landlord and keep the best for the competitive market. So, too, if dollars worth 100 cents have no more value than dollars worth 75 cents, every bullion dealer will collect as many of the heavy coins as possible and melt them down into bullion, in which form they have more value, or export them to some country where they will have their full value.

If the law allows debtors to pay their debts in coin of different metals, equally rated in law but of a different value in the market, they will naturally pay their debts in that coin which is overrated and keep that which is underrated, and from this circumstance creditors will inevitably lose, and no change can benefit them. Thus, too, the coin which is underrated disappears,

and leaves that which is overrated alone current. If this is true of a single and separate state it is true of the whole world. No international agreement or set of agreements can override the fact that when two coinages, a good and a bad, or an undervalued and an overvalued, come together in the arena of circulation, the good coinage and the undervalued one disappear, and the bad and the overvalued remain in circulation.

The contention of the bimetallists is that if a ratio between the two metals were established by international agreement their market value would conform to it. From this they draw the following conclusions:—

I. That by the fixation of such ratio the metals would circulate together in unlimited quantities at the fixed ratio, and so augment the currency or circulating medium of the world.

II. That everyone would bring his gold and silver to be coined.

III. That these might be used indifferently in the payment of debts, and that a stable ratio of exchange might be established between all nations.

But experience proves everyone of these contentions to be invalid. In the first place, it has been abundantly proven by financial history that a fixed legal ratio never had any effect on the market value of the metals.

As to the first corollary it is also proven that when the legal ratio and the market value have differed, the undervalued coinage simply disappeared and the overrated coin alone remained in circulation. Hence, as the market values changed, first one and then the other metal was displaced without any augmentation of the currency. It is perfectly clear that there may be as much gold and silver in use throughout the world as coin without bimetallism, as with it.

The sudden adoption by all nations of a single standard might diminish the quantity of money in use, but it is not a necessary consequence of monometallism. The bimetallists, by attaching such importance to an abundance of money, seem to imply that this is necessary, and thus tend to ally themselves to one of the most contemptible schools of currency theorists.

It is absolutely false that the quantity of money, apart from any sudden change, can affect industry or the real wealth of a

community. While it may be useful for some purposes that gold and silver should be readily obtainable, yet so far as their use as money is concerned they would serve the same purpose if only half as abundant. As a great increase in the quantity of currency means simply a rise in nominal price, so a decrease in currency means only a fall in nominal price. While it is true that money stringency affects industry so seriously as sometimes to paralyze it, it is equally true that the employments of the world—with a few exceptions—would not be affected were there but half the circulating medium there is at present. Half a dollar would buy then what a dollar buys now, farthings would take the place of cents, and the whole industrial fabric would adapt itself speedily to the changed monetary conditions.

In answer to the second corollary it is only necessary to say that when one metal is at a premium no one will bring that metal to be coined, because it would simply diminish its value and involve a loss to such person.

During the reign of Geo. III., only 64,500 lb. of silver were coined at the mint, and the reason is simply that during that entire period silver was at a premium.

Taking the last conclusion drawn by the bimetallicists, it is absurd to suppose that a metal, independent of its market value, can for any length of time be used indifferently in the payment of debts, or that, with or without international agreement, the economic forces, which regulate the rate of exchange, can be overcome or rendered inoperative.

It is said that if many countries adopted bimetallicism, the steadying effect on exchange would be greater than if only one or two adopted it. But if all countries had the same ratio, and the cheaper metal tended to become still cheaper, they would be as one country. If it were possible for all countries to be bimetallic, exchanges might possibly be steadier, but that would be the effect if all were monometallic upon the same basis. In any case, exchanges are likely to be fairly steady. Bimetallicism will only help to steady them in some instances and utterly fail in others, and the question which arises as to whether bimetallicism is worth adopting on the mere possibility of an increased steadiness of exchange must inevitably be answered in the negative.

The history of French currency is an example of the utter failure of bimetallism. From 1113 to 1874, France endeavoured to maintain a bimetallic system. During those years the mint price of the marc of gold has been changed 146 times, the mint price of the marc of silver 251 times, and the changes in the rating of the two metals were numberless. In 1726, the ratio of gold to silver was fixed at 1:14½. This rating was too high, and silver became the standard of France by the operation of the same law by which gold became the standard of England. In 1803 the ratio was fixed at 1:15½, at which it still nominally remains. In that ratio, gold and silver coins were made legal tender. During the career of conquest of France under Napoleon Bonaparte, great quantities of silver were taken from the sanctuaries of the different countries overrun by the invading armies. These were melted down and coined, and the market rating of silver to gold became 17:1.

From 1803-1850, gold was at a premium, and consequently during all that period there was hardly any gold in circulation.

About 1850, in consequence of the discovery of gold fields in California and Australia, the market ratio of silver to gold rose from 15¾:1 to 15¼:1, the legal ratio remaining 15½:1. That slight change in market value sufficed to displace 200 millions of silver and to substitute an equal quantity of gold for it. France was drained of silver, and it became necessary to coin five-franc gold pieces. The Latin Union was formed in 1865. In 1867 the value of silver began to fall. In 1868 the fall became more marked, and a commission appointed reported in favour of a single gold standard.

In 1871-73, Germany became monometallic on a gold basis. In 1874 France, in accordance with a resolution passed by a commission, closed her mints to the free coinage of silver, and became a gold monometallic country. It was the fall of silver which compelled the closing of the mint, and not, as bimetallicists assert, the closing of the mint which caused the fall of silver. This case itself disproves the assertion of the bimetallicists that two metals can circulate together in unlimited quantities at a legal ratio differing from the market ratio.

English monetary history before the adoption of a single standard, shows the intolerable nuisance of a constant readjust-



ment of legal and market ratios, and the monetary troubles in France, above alluded to, are a further proof of the impracticability of bimetallism.

The people were really deprived of the particular kind of money they wanted, so that bimetallism results in thwarting the natural choice of money by communities.

It may be said that under universal bimetallism, nations will be able to use what metal they wish and as much of it as they please. But so far as they use one metal to the neglect of another, bimetallism is inoperative, and they might as well be monometallic at once.

Moreover, bimetallic legislation may not always result in a corresponding practice. Merchants and mercantile communities, have preferences of their own and it is conceivable that they should refuse to accept the governmental fiat. The Californians rejected greenbacks; the New York banks declined to accept the silver coins issued by the Government as legal tender. Instances such as these are strong arguments against the bimetallic advocates.

The advantages of bimetallism then have been seen to be supplementary rather than primary. The whole onus of the proof of the superiority of their system is on the bimetallists, and until they bring forward incontrovertible proofs of such superiority, nations cannot be expected to try such a costly experiment.

The principal difficulties of coinage in times past have been, not in the choice between two metals, but in the endeavour to get a really sound metallic currency of any kind. The difficulties were the temptations of governments to make a profit for themselves by debasing the coin, and the difficulty of keeping the bullion contents of a bullion coinage up to the nominal value assigned to it.

England since 1696 has made no attempt at debasing the coin, and an effectual way of meeting the difficulty of wear and tear of coinage is of recent discovery.

Monometallism is now in possession, and has the merit of simplicity. It is almost universal among the great mercantile nations whose wealth demands a gold basis.

Bimetallism has been tried and found wanting in both England and France.

The monometallic preference is deeply rooted, and a change to bimetallicism can only be accomplished at great expense and against the wishes of a powerful section of the community. In view of the few positive and certain advantages held out, is it worth while? It would seem not, and until the bimetallicists can bring forward better arguments in favor of their system, nations will not change their habits and forsake their old gods to follow new.