THE IMPERIAL OIL REVIEW

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THE EMPIRE CONGRESS

WHEN we scan our morning paper and note in headlines that the Second (Triennial) Empire Mining and Metallurgical Congress is holding its sessions in Canada, we are apt to "take it as read" and hurriedly turn over to the sporting page or the Market columns for something less stodgy. But, concealed beneath that awe-inspiring title, there is a romance of Empire and of Industry, and one who reads between the lines can conjure up a vision of the ceaseless battle which mankind wages to wrest from Mother Earth the treasure hoards which lie secreted in her bosom.

Whether it be iron ore for our ship or bridge building, gold and silver for our currency, coal for our furnaces, precious stones for our personal adornment, the rarer minerals for their obscure scientific and commercial uses, or petroleum for its many-angled entrance into modern industry, the geologist, the engineer, the miner and the driller have conquered the uttermost parts of the earth so that our needs or whims may be catered to and nature made captive to the chariot wheels of modern civilisation.

International economics are built upon a veritable quicksand of mutual dependence so that no nation, as well as no man, "liveth to himself alone." The so-called rubber monopoly, the recurring over-production of petrol, the after-war slump in the demand for certain metals did not only affect those actively engaged in the recovery and distribution of these products but, as pebbles cast into a pool, spread ever-widening circles of disturbance into allied industries in every country, threw a monkey-wrench into the machinery of supply and demand, and per-\n
chance even threatened the peace of nations.

Our Empire, with its far-flung outposts, its multiplicity of interests, and its wealth of raw material is a vital factor in world economics and it behoves us, as custodians of the vast treasure with which nature has endowed the lands under our jurisdiction, to review our stewardship and determine whether we are developing our heritage for the glory of God and the good of mankind.

This Mining Congress is, therefore, a triennial stock-taking of the mineral resources of the Empire and it is fitting that Canada, which has probably a greater all-round mineral wealth than any other unit in our Commonwealth of Peoples, should be selected as the venue of this conference in her Diamond Jubilee year.

From every corner of the globe the delegates have gathered: from Jo'burg, Salisbury, Tanganyika and Nyasaland in Africa; Sydney, Melbourne and Kalgoorlie in Australia; Calcutta, Tatanagar, Khowa and Burdwan in India; from Tasmania, Egypt, Korea, Malay States, Czechoslovakia, Germany, France, Spain, Portugal, South America, U.S.A., and the Mother Land. Each one has come those Tubal Cains of the twentieth century that, by the interchange of opinions, experiences and ideas, the recovery and treatment of the Empire's mineral resources may be guided and aided along the most desirable scientific and economic channels.

Imperial Oil joins with Canadian industry and science in welcoming this Congress to its Dominion.

As the exploitation of our natural resources has progressed so has our Company expanded its facilities for the supply of the essential petroleum products to the mining, as to every other industry, and, perhaps most important of all, we have bent every effort towards placing Canada on a more assured basis as regards her domestic crude oil production.

It is, therefore, gratifying to see, whilst those scientific ambassadors traverse our Dominion from the Atlantic to the Pacific and see something of the immensity and potentiality of our mineral wealth, they should also find Canada's petro- lum industry on the verge of important developments which carry many indications of ultimate success.

Imperial Oil has taken an active part in preparing for this Empire Congress and expects to be represented at its sessions throughout the country.
WHETHER the recent encouragement extended to the seekers for oil in the Dominion of Canada will result in an influx of geological capital, and whether the more prominent world oil interests will now make haste to reap where others have sown, it remains a fact that, for the last decade, the search has been conducted by only two groups; first, the individuals with too few vision and little credit, and, secondly, Imperial Oil Limited with both vision and capital.

The never-say-die spirit of the former and the painstaking, scientific efforts of the latter are now bearing fruit, and Canada, in her Diamond Jubilee year, enjoys a phase of intensive oil development that has not been paralleled since the birth of the petroleum industry brought prosperity to Ontario in the “Sixties.”

It is roughly estimated that some nine million dollars have been spent on legitimate wild-casting in the Western provinces and, of this vast sum, Imperial Oil has expended at least two-thirds in comprehensive geological surveys, leasing and purchasing acreage, and drilling of test wells at widely separated locations, many of them

*This article was contributed to “The Petroleum Times” London, England.

Given some economic method of recovery and in view of the revolution in refinery practices which the introduction of cracking has brought about, one feels safe in assuming that the Tar Sands will yet yield their quota towards Canada’s needs.

The Foothills Belt has long been the Mecca of the Canadian wildcarder. The tremendous upheavals which brought the Rocky Mountains into being were equally responsible for a series of narrow parallel ridges to the eastward where rocks of bituminous antecedent were brought within reach of the drill.

supply would have on the industrial growth of the Dominion.

These endeavours have brought about recognition of the fact that Western Canada has probably five separate and distinct petroleum areas, each with its particular problem and promise, those being the Mackenzie River valley, the McMurray Tar Sands, the Foothills Belt, the Sweetgrass district and the Plains area of Alberta and Saskatchewan.

The operations of Imperial Oil have demonstrated that, in the Mackenzie region, there is at least a limited area where wells of moderate production may be counted on, and, whilst, under existing conditions, the field cannot be economically developed, the fact that successful drilling has been accomplished may have an ultimate bearing on the opening up of that vast area, and prove a valuable asset to posterity.

The McMurray Tar Sands have been widely advertised as one of Nature’s most lavish displays of bitumen and inventive genius has not been slow to accept the challenge which the extraction of the oil content from these sands presents.

Many wells were drilled before the “Calgary Petroleum Products” met with moderate success in the Black Diamond field and, unknowingly, laid the foundation for the more pretentious achievements of the present day.

Apart from some sporadic drilling at widely separated localities, the Sweetgrass area received little attention until brought into prominence by the development of the Kevin-Sunburst field in Montana.

The main Sweetgrass structure lies South of the 49th parallel but careful instrumental surveys have established more or less definitely the presence of localized domes on the Canadian extension of the arch. On some of these gas wells have been brought in, and the completion of the Deveyish well, near SKIB, as a producer of heavy gravity oil has given a distinct filip to further exploration.

The Plains area has long been noted for its prolific gas-fields, Medicine Hat, Bow Island, Foremost and Viking supplying numerous Albertan cities with that most desirable and economic medium of domestic and industrial light, heat and power.

So far, however, oil has not been recovered to any appreciable extent, although the Fabry-Wainwright area has yielded heavy crude and, on the Ribstone structure, the “Imperial Oil Refining and Scrubbing Plant at Turner Valley”

The Imperial Oil Refining and Scrubbing Plant at Turner Valley

Following on these preliminary investigations more detailed examinations were carried out in the succeeding years and numerous test wells were drilled where structural conditions seemed indicative of possible accumulation.

Many of these wells were negative in their findings or succeeded in obtaining dry gas only, as at Pouc Coop, Fabyan, Dead house Creek and Erickson Creek, where substantial “gassers” await what will probably be a long delayed demand for their product, as the first mentioned is situated in a sparsely populated area, whilst the others are in districts whose needs are already provided for.

The high lights of the “Imperial” programme, however, have been
confined to the far North and the extreme South, the Fort Norman advance was an achievement for a frontier company to rank among the most significant in the history of the oil-producing nations. Two wells, each with a capacity of almost 10,000 barrels per day, had been completed at Fort Norman, but the Imperial Oil Company, which owned the lease in the area, showed the productive area to be of considerable size and the calibre of the successful wells did not warrant the tremendous expenditures which would have been entailed in bringing their output to the market.

A great deal of planning and some little delay followed the Imperial’s success, but no work was accomplished and the bore derricks of “Discovery No. 1 and 2” stand remote in the Arctic s incentives as a monument to that initiative which is the prime essential of successful petroleum developments.

After several disappointments in the Foothills Belt Imperial oil has encountered success in the Turner Valley through their subsidiary, the Royalite Oil Company, which acquired a controlling interest in the “Caribou Petroleum Products”, the pioneer in that field.

An up-to-date and highly efficient absorption plant was built to handle the wet gas which was flowing at these existing wells, whilst steps were taken to commence “straddling” the Turner Valley when drilling. A ready market was found for the stripped gas with the commence of the franchise, the Foothills Belt and the drilling of a fourth well, which resulted in the discovery of the discovery well at the Turner Valley, having apparently drilled through a fault, and of the Turner Valley, are drilling at their “Highwood” location.

Imperial Oil is not yet engaged in the development of the Turner Valley, but through the use of the \"Highwood, Nova Scotia; Montreal, Quebec; Sarum, South Australia; Calgary, Alberta; and Isco, British Columbia, with their total

end-all of this and each succeeding generation should be to “seek peace with justice; for without justice, a truly prince and statesmanlike approach to the task of providing for the needs of the people will not be achieved. And now, through the tule and the shutoff, the Captains and the Kings depart” there remains this additional connecting link between the nations: a Way of Peace that will be traveled by all men, regardless of their race or creed. U.S. tourists annually as they come to Canada in ever increasing numbers to find rest and recreation and to learn something of the natural resources and industrial awakening.

Canada welcomes such an invitation, not only on its own behalf but on behalf of the people of this country, who have always been willing to extend a helping hand and a friendly word to all who seek its friendship. For our part, we welcome such opportunities for cooperation, based on mutual respect and understanding, to the fullest extent possible. For our part, we welcome such opportunities for cooperation, based on mutual respect and understanding, to the fullest extent possible.
The capital letter in Premier is 24 feet and the remainder of the word 8 feet, whilst "Everywhere in Canada" is comparatively modest with its 6 feet capitals.

The lettering is made of 26 gauge galvanized iron with channels 5" deep which carry "Neon Tubes" for illuminating purposes, and after dusk this sign will be a beacon-light for the motorist and a brilliant example of the enterprise of at least one Canadian industry.

Nor is our claim to Dominion wide service an idle boast, as this station is but a link in the Imperial chain which stretches from coast to coast and ensures for the motorist a confluence of the friendly interest and helpfulness which meet him at this new gateway to Canada.

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Teaching the Young Idea How to Shoot

There is no Royal road to learning," but this old saw has lost much of its application for certain of the youth of Nova Scotia, for, since October, 1919, there has been an "Imperial" route to knowledge for the olive branches of Imperial's employees on our eastern seaboard.

One of the first problems caused by the influx of workers to the site of our refinery in 1917 and 1918 was what to do, educationally, with our boys, to say nothing of the girls.

The nearest "little red schoolhouse" was a mile and a half distant, a long, long trail for the feet of tardy youth when summoned by a school bell, so, with a consideration that was perhaps not wholly appreciated by the youngsters, as distance in this instance probably lent encouragement and provided a "sure-fire" alibi for non-attendance, a temporary school was opened on the site of the construction camp, and ninety-six pupils sat down to master the three "Rs" under the guidance of Miss V. E. Lowderm.

The school thus formed was under the jurisdiction of "Eastern Passages School Section," but received financial assistance from our Company. It was unfortunate that the first scholastic year should be interrupted by an epidemic of "Spanish influenza," which not only interfered with the studies but resulted in the resignation of the teacher.

It was soon apparent that more pretentious educational facilities were necessary and on May 26th, 1920, the schoolhouse shown in our picture was opened.

It is a wooden structure supported on concrete walls 10' high, which affords ample playroom space in the well-lit basement.

The main building is 88' x 50' with a wing 44' x 15'. A 10' hallway extends the whole length of the building and from it open the various classrooms, teachers' room, chow-room and library.

The nucleus of the library fund was supplied by a gift of $100.00 from the Imperial Amateur Athletic Association, augmented by a donation of $70.00 from the pupils themselves.

As an indication of the public-spirited citizenship which is nurtured in Imperial School it is worthy of note that the scholars' contribution was part of a $500.00 prize won by themselves in a literary competition fostered by "The Evening Mail" and that, whilst their charity may have begun at home in rounding out their library, they had also a mind for the less
Moving In High Circles

I M P E R I A L Oil takes a personal interest and pride in the first lady to attempt to qualify as a licensed airmail pilot in Canada, because of the fact that Miss Eileen Vollick, the aspiring "pilotess," is a daughter of the chief engineer on our tanker, S.S. Imperial.

When approached by the "Review," Miss Vollick admitted that she had long had a craving to fly, not merely as a passenger safely ensconced in the cockpit, but with her hand on the "joy-stick" and the rudder plane answering to her slightest touch.

When Mr. Jack V. Elliot opened his letter to Miss Vollick's home in Hamilton it seemed like an answer to "The Maiden's Prayer," but there were certain formalities to be attended to, including an application to the Naval Air Board in Ottawa, before the fair novice could wing aloft.

Fearful of being bound to earth by Red Tape it was a pleasant surprise to learn that Miss Vollick, now officially a licensed airmail pilot, had been permitted to fly the "Brass Hat" that her application had been passed upon favourably, and that, when she reached the mature age of 19 years, she met the requirements for a pilot's license.

With this official benediction arranged, and her plans speedily completed, Miss Vollick became an ardent disciple of Mr. Elliot.

The Elliott planes have a dual control and, by means of specially constructed ear-phones on the helmet, the pilot gives his instructions to the student.

Apparantly Miss Vollick proved such an apt pupil, because, on her second trip, she reached an altitude of 4,500 feet and has already the ambition to attempt a coast-to-coast flight.

When asked to recount her first experiences in flying, for the benefit of the readers of the "Review," Miss Vollick disclaimed any claim to literary merit, naively remarking that she was an Aviatist, not a writer.

She informs us, however, that there is really nothing sensational in going aloft. She felt quite at home and would have liked to take the plane under her own control.

"There is a certain thrill," she continues, "when the earth recedes as the plane rises, and the familiar scenes below soon become a vast panorama of checker-board and "landing.""

"Any one can fly toward the horizon and keep straight, but rising from the ground and returning is a different matter. Then again, aviation has a fascination all its own, even the work around the hangars, either on the motor or plane, keeps the mind alert and interested, and together with the romance of travel over land and sea, makes the life of a flyer full and satisfying."

"If you have never sat in the cockpit of a plane and watched the earth swiftly slip away from the winged monster roars and soars skyward, then you can never imagine the pure joy of it, nor know the thrill of a first flight."

The "Review" congratulates Miss Vollick on her rapid rise to fame and its readers will follow her, metaphorically at least, as she wipes her way to further conquest.
John Ross Polley

The refining of crude oil

By C. D. Dean,
Technical Engineer on Processes, Imperial Oil, Ltd.

A mong the various substances made up of benzene, C6H6, + 2, while that of the asphalt base is C6H6, but the petroleum phenomenon of inorganic substances and mixture of two or more gases or vapors in a container each gas will exert the same pressure at the same temperature that it would exert if it were a pure substance.

The third physical law which we have to deal with is known as the law of osmotic pressure, which among other things states that where two or more substances come in contact under the same conditions of pressure, temperature, and the like, because of the only one given off, and the liquid from which it emanates rises with increasing viscosity of the liquid, which in turn seems to be related to increasing molecular cohesion.

These constitute the most important laws on which the theory of the fractional distillation rests and what follows is a description of the quantitative characteristics that emerge in the operation of the modern oil refinery.

A refining site, aside from the usual economic considerations such as markets, labor conditions, and taxes, its primary physical requirement is fresh water of relatively large quantities for boiler and condensing purposes. The water requirements are usually found to vary between 750,000 and 1,200 barrels of crude capacity daily, depending on the variety of process work and the pumping rate will be found to be quite uniform. For plants located on level ground the compressors counteracted by Dalton which states that the mixture of two or more gases or vapors in a container each gas will exert the same pressure as it would in a vacuum.

The general chemical formula for the asphalt base hydrocarbons is C6H6 + 2, while that of the asphalt base is C6H6, but the asphalt phenomenon of inorganic substances and mixture of two or more gases or vapors in a container each gas will exert the same pressure at the same temperature that it would exert if it were a pure substance.

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bined static and friction heads are rarely over 100 feet, and during the cold weather, steam vapor puffs for this purpose, operated by the R.P.M. has become general, due to the well known characteristic of the condenser.

Depending on the method of recovering and reusing the condensed water, it is the variety of products to be manufactured. The heat and condensate so produced will pass directly to the plant for use as steam. There are few areas where a large amount of steam is required, and the majority of these areas would be in the coal mining and steel industries. In these areas, steam is used directly for heating processes, and the condensate is sent to a steam generator for reuse.

Aside from the requirements for mechanical power and treating a great amount of steam is required in the distilling processes, and it is found that the steam requirement in our Canadian climate necessitates a year-round water temperature of 650 F.P.H. per 1000-33 Imperial gallon barrels per condenser capacity. This is a large amount of water, and there is sufficient over-capacity left to take care of the large variations encountered in the refinery work.

The design of the total refinery fuel requirements, which if liquid fuel, would vary between 20 and 30 per cent of the total power load, is quite important, and the installation of a water heater is necessary, and is generally provided with a condenser. The water heater is often a steam-heated heating system, and it is used to provide hot water for the distillation process. The hot water is then used to heat the steam, which is generated by the steam generator. This hot water is then sent to the distillation columns, where it is used to heat the crude oil, which is then distilled into the various products.

For the mechanical purposes three pump stations are supplied with steam at various points of consumption. Heating, when required, is done by steam heating, exhaust steam is used as advanced advantage as live steam and a complete network of exhaust live steam is duplicated live steam lines is provided. The steam pressures vary from 85 pounds per square inch, gauge, while the exhaust steam pressures are reduced to 4 to 8 pounds per square inch, gauge, and with efficient pipe covering and properly designed lines, the actual heat losses from the live and exhaust steam lines combined rarely exceed 5 per cent, and the maximum pressure drop to the large points of consumption are rarely greater than 3 per cent.

The requirements for mechanical power for pumping and other purposes up to a few years ago were all provided directly by steam apparatus. In pumping the duplex steam pump was used, while the throttling and occasionallly dampening the steam, the automatic control of the engine was dependent on the water in the general mechanical power was dependent on the system of the steam apparatus. The sub-station of the centrifugal pump for the duplex steam was, however, at the present time, the most popular and mechanical power in oil refinery work. It is the nearest approach to the duplex steam pump for the purpose of using oil for the purpose of using oil. The centrifugal pump is a simple, efficient, and reliable machine, and it is used in the oil refinery to pump the oil from the storage tanks to the crude distillation units. The centrifugal pump is a simple, efficient, and reliable machine, and it is used in the oil refinery to pump the oil from the storage tanks to the crude distillation units. The centrifugal pump is a simple, efficient, and reliable machine, and it is used in the oil refinery to pump the oil from the storage tanks to the crude distillation units. The centrifugal pump is a simple, efficient, and reliable machine, and it is used in the oil refinery to pump the oil from the storage tanks to the crude distillation units. The centrifugal pump is a simple, efficient, and reliable machine, and it is used in the oil refinery to pump the oil from the storage tanks to the crude distillation units. The centrifugal pump is a simple, efficient, and reliable machine, and it is used in the oil refinery to pump the oil from the storage tanks to the crude distillation units. The centrifugal pump is a simple, efficient, and reliable machine, and it is used in the oil refinery to pump the oil from the storage tanks to the crude distillation units.
operations is made in the cracking which produces the coke. In the continuous operations about 55 cubic feet of gas under standard conditions is produced per barrel run, while in cracking the total fixed gas produced is found to be from 50 to 120 cu. ft. per bbl. of crude, and it is found that a relation exists between the gas and coke produced. There is a distilling loss which probably averages around 5 per cent. for paraffine base crudes, but for asphaltic crudes goes as high as 15 per cent.

It will be appreciated that distilling to coke means very high temperatures and the fluie gases reach as high as 2000 degrees F. toward the end of the run. As a general thing the temperatures of operation are all very high and as a result the labor needed to effect current repairs is as great as that needed in the operations. All still equipment is designed to permit the making of repairs as cheaply as possible by arranging the fire sheets and brickwork so as to minimize the amount of tearing down in order to make the real repairs. For the same reason the worms are built of cast iron flanged pipe installed so that any section can be removed and replaced without disturbing the other parts.

(To be continued)

[IMPERIAL OIL REVIEW]

HEADQUARTERS HOLD HOLIDAY

ON THE assumption that "all work and no play makes Jack a dull boy" the Jacks and girls of the organization at Toronto staged a merry picnic on July 14th last. The books for the day were closed at noon and the many employees of the Marine Department, sailed off with first in the "under one year class", with Gordon Harrison, who claims a "Queen City" connection on his father's side, taking first in the "one to three year class."

An excellent programme, provided twenty-six strenuous athletic events, filled the afternoon and offered to every contestant an opportunity of demonstrating their speed or skill and proving the truth of the adage that the race is not always to the swift.

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[IMPERIAL OIL REVIEW]

SETTING THE PACE

THE world production of petroleum in the year of grace 1926 was approximately 1,093,000,000 barrels. Of this tremendous output the United States contributed 766,504,000 barrels or 70.13% of the total. It would be difficult to estimate how many separate individuals, companies and corporations participated in the States in the proud position of almost Universal Provider, but, in its own quiet way, Imperial Oil is also making a niche for itself in the Petroleum Hall of Fame.

In the three countries where Imperial subsidiaries are operating they have usurped the stellar role, and our diagram shows to what extent Peru, Colombia and Canada are indebted for their position in the annual production column to the efforts of our Company. The columns shown in illustration represent the total production of the countries indicated, whilst the solid portions show "Imperial production."

THEPEOPLE

ploled by their friends gathered together at Exhibition Park to take part in the celebrations. Rain-clouds that threatened to dampen the enthusiasm of the picknickers and make them run for shelter failed to materialize and the company proceeded to enjoy themselves with the abandon which is characteristic of all such outings. The Baby Show opened the programme when numerous entrants from proud Imperial homes made "the judgment of Paris" seem a sincere to Mr. Bacon, Mr. Sinclair and Miss Hurry, who were charged with the duty of selecting the prize winners. After due deliberation, strict examination and profound consultation little "Janet", daughter of Mr. Gum-
of every industrial endeavor—calm, patient, persevering and conscientious to an extraordinary degree. Mr. M. B. Green, who had that faculty of finding the right word to fit the occasion, years ago described Mr. Johnstone in the Freight Department as "a crackpenny." Many of the Calgary Division recall the sage advice which Mr. Johnstone gave when problems were referred to him, both in regard to questions arising in business and in particular concerning personal affairs, and gushed with that advice, the kindly Christian spirit of this courtly gentleman. Not only the office staff but a wide circle of personal friends and business associates will be left with one friend the less by his passing on, but we are glad to know he will be at peace. During the last year he was a martyr to intense internal pain borne with wonderful stoicism till he was forced to go to the hospital April 25th.

The sincerest sympathies of the organization are extended to Mrs. Johnstone, three daughters and one son.

MR. JAMES BOYD

A NOOTHER one of the Imperial Oil veterans has retired from active service. James Boyd, Construction Foreman, of the Hamilton Division, after 49 years service has decided to live a life of comparative ease. Mr. Boyd's retirement was the subject of the officers of the Company at which at the Annual Dinner of 1933, when he was one of the first to volunteer during the Riel Rebellion, and served throughout that entire campaign.

Returning from the Northwest, he again entered the service of Imperial Oil, and for years he manufactured all the Pulp Oil that was made for Ontario. While he is willing to admit that there have been many improvements in Oil Refining and Compounding during his 49 years' service, he still feels there is no Pulp Oil made quite as good as that put out during his time in charge of that particular product. Later, having offered repair work and a portion of the construction, and finally his whole time was given to the latter work. When the Hamilton Division was formed, Mr. Boyd was appointed foreman of the construction, and has carried on that work up until a few months before his retirement, when his first serious illness prevented him from carrying out his duties. The construction of some thirty or forty Stations in Western Ontario will stand as a monument to his good work. He delighted in hard work, and long hours were nothing in his young life.

All of his friends and everyone with whom he worked united in hoping that he will have many years to enjoy the comparative rest that he has so well earned, and the good wishes of the organization go with him into his retirement.

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The Ideal Product of Education

"The ideal product of education is a person, with a sound, strong, vigorous body, so trained as to be a perfect servant of the will; a will so disciplined as to choose uniformly in accordance with the highest good, under the guidance of intelligence; an intelligence thoroughly stored with knowledge, and so trained that it can expeditiously obtain more knowledge when occasion requires it, and at the same time discriminate between knowledge that is worth while and knowledge that is not worth while, so refined by contact with the great minds of the present and the past, as to be free from all petty bias and narrow prejudice; an emotional nature so nurtured and chastened that it always reinforces these true judgments and right choices by strong, pure feelings of approbation for them and aversion for their opposites, permitting neither self-interest, nor fear of consequences, nor personal ambitions to becloud these true judgments, or to impede these right choices, and withal habituated to interpret all experience, to test all doctrines and to guide all conduct, in constant reference to the Supreme Reality in whom he lives and moves and has his being."

—Professor Frederick Tracy,
Toronto University