

THE SWAY OF ELECTRICITY.

Some Features of Electrical Engineering as a Profession.

The Course of Training - The Characteristics Required and the Possible Chances of Success Discussed in an Interesting Manner.

PROF. R. H. THURSTON of the Mechanical Engineering Department of the Cornell University, writing in the New York Post in regard to the progress achieved in the mechanic arts, says: -

Engineering schools are those professional schools in which the science of engineering and its art, as well, are both taught. Their curricula comprise the physical and mathematical sciences, the modern languages, the applications of the sciences to the arts, and the special manual and trade operations included in the vocations subsidiary to the profession.

Every student in a modern first-class school of engineering acquires, not only the elements of the more directly useful and needful learning of the older schools, thus securing their advantages of gymnastic and broadening training in some degree, but he also acquires practical familiarity with the arts of the wood and the iron worker, with carpentry and pattern making, with blacksmithing and tool-dressing, moulding and other work of the foundry, and the main divisions of the arts of the machinist and the draughtsman and machine designer.

A half dozen or more trades and a profession thus give the graduate of the engineering school or college a rare insurance against the accidents and betrayals of fortune. Further than this, even the young man thus inducted into a profession of peculiar attractiveness to him who is so fortunate as to possess the talent of the mechanic and the genius of invention, through the modern systems of instruction in shops and laboratories of chemistry and of physics, as well as of engineering, usually finds singular opportunities to acquire 'the noble contagion' of scientific investigation, of systematic research, out of which come so large a proportion of modern inventions and discoveries. This is the noblest opportunity of all.

Electrical engineering, that branch of the profession of engineering which has now come to attract more attention than any other, and which is illustrating more than any other the magnificent fruits of modern combination of modern learning, modern science, and modern art, is thus the offspring of our contemporary union of sciences and arts, giving intellectual training by a hardly less modern form of technical education. The extraordinary expansion of its work has marked the latter half of the nineteenth century as strongly and as wonderfully as did the outburst of the power of steam in its earlier half through the genius of Watt and his contemporaries and successors. Then the world of industry sprang up in new forms with a rapidity and brilliancy of expansion which has been a source of astonishment. In a generation the steam-engine revolutionized civilization in its every aspect, and started the nations upon careers of prosperity, material, intellectual, and moral, such as no prophet ever had previously dreamed of. This last generation has seen electricity as the right hand of steam power reaching out into a thousand new directions of industrial development, and stimulating scores of new vocations and industries into activity, while inconceivably broadening the fields of operation of many older departments.

In the practice of his vocation the electrical engineer finds application for mathematics for the sciences, for refined and elaborate construction, in greater degree than perhaps any other member of the profession of engineering, or even of any of the members of any constructive profession. He requires a broader and more severe professional education than most others, and he actually receives, it is admitted by unprejudiced and competent critics, instruction in stronger collegiate courses than ordinarily is given to the candidates for entrance into the older 'learned' professions. His usual and regular course of professional instruction in the professional school adds four years of unparalleled work in the most difficult of the sciences, in large part, to the training of the secondary schools, and supplements this by extended instruction and practice in the arts which constitute the basis of his own profession.

It is only necessary to study the curricula detailed in the catalogues and registers of the leading schools of engineering, and especially of electrical engineering, to discover that his days and his nights are more than fully occupied for the full four years of his college work; but if more testimony were needed it would be found in the fact that, on tracing the names of entering students in these institutions, it will be seen that it is not unusual for two-thirds of the members of the entering classes to fall out before the end of the course. The causes of this mortality are variously recorded; but it is easily discovered that, directly or indirectly, they are principally to be set down as due to the operation of an eliminating process always acting where strong meat is served to weak and strong alike, to the fit and to the unfit; the process resulting in the survival of the fittest to survive as members of the profession.

The work of the electrical engineer is as varied as it is interesting and important. It includes the construction of electric-light and power stations, of street railways, of both electro-dynamic and dynamic electric machinery, design and supervising the building of the most curious and mysterious of all known forms of energy production and transmission. It involves determining the size and forms of various prime-movers, steam or hydraulic, occasionally aerial, and has compelled the introduction of many new forms of steam engines

and machinery for its peculiar purposes. It has even revived the old steam turbine of Hero, of twenty centuries ago, and the steam wheel of Brunel, in perfected form, and has applied them to novel uses. It has compelled the perfection of the steam-engine, until the economy and nicety of regulation have become phenomenal.

Already it has relieved the streets of all our cities of the overworked car-horses, formerly threatening our lives by their insanitary presence, and demoralizing our people by their daily pictures of misery, abuse, and inefficiency, and has given us rapid, clean, healthful, cheap, and comfortable transportation. It has provided admirable systems of street and interior lighting. It discharges power to a thousand points of utilization from single central stations, and to this extent restores to us the more satisfactory industrial conditions attending the factory system. It gives us the power of driving tools and machinery, in any desired location and in any needed amount, throughout the largest and most widely distributed establishments. It is providing energy for our telegraph lines and supplying electric current for innumerable new chemical and physical apparatuses. All the aluminum in the world is now made by this latter method, and the reduction of its cost from several dollars a pound only a few years ago to thirty or fifty cents to-day, is to be attributed entirely to the readiness and the cheapness with which the electric current can now be secured in desirable quantity and at any intensity.

Our verdurous and treeless territories of the great inner deserts, and especially our mining districts are profiting by this new and comparatively limitless aid of the steam-engine, and of the water-power of those areas, securing from distant water-power, or from large centres where the power of steam may be even there developed to advantage, ample energy for local application.

The future of electrical engineering can hardly be as yet predicted. Only a century ago no one could have imagined the outcome of the introduction of cheap steam-power, and no one can today dream of the immense rôle to be played, in the industries, in politics, in economics, in civilization throughout the world, by this latest of the wonders of the modern world of mechanics, science, and invention. Of this, however, we may be entirely sure: that we have not yet seen the veriest beginnings of the new development. We may confidently expect it to go on, steadily expanding, for many years to come; its present uses finding constant growth, new fields opening for its application, and every industry profiting more and more by its continually increasing versatility and availability. Each decade in the future, as in the past, is likely to see a period of temporary subsidence of all industry; but each low tide will be followed, as always before, in a year, in two years at most, by a rising tide of still greater altitude than the preceding. All progress exhibits such pulsations, but progress continues nevertheless.

Like all professions the now peculiarly seductive vocation of electrical engineering will have its ups and downs, and will occasionally prove unremunerative to the less well fitted and less talented among its practitioners. But those who are naturally suited to its work, and who possess both the mechanic's intuitions and the needed scientific preparation, will always have their opportunities and will rise, whatever the state of the tide or the condition of business. The 'hard times' will, as always, simply work out the least competent, giving the survivors of the process still larger advantages. Like all the other professions, that of electrical engineering is sure to be always overstocked with the unfit; but there will never be an overplus of the fit. Good timber will surely float to the top, and he who hustles while he waits during the dull times, will reap the harvest during the periods of prosperity.

No young man should attempt to enter the profession because it seems to him the current fad. To succeed he must have natural talent for construction, natural ability in the fields of mathematical and physical science, and that vigor, pluck, endurance, and good sense without which no man can succeed in any profession, old or new. He must have a practical as well as a theoretical and imaginative side; he will need a good general education and a very complete and specialized professional training, including the arts as well as the sciences of his department. Above all, he must be a strong man, and a gentleman, if he would attain the highest success, gaining a reputation as a gentleman and a scholar, as an expert and a man of honor, as well as a curing a competence. A good mechanic's hand, a fine scholar's head, a soul above trickery, and a character that can bear the scrutiny of all men, reinforced by a good common-school education up to and including a strong high-school course, and a real engineer's novitiate in the professional school, in the office, and in the workshop, furnish the highest possible guarantee of a successful business life that can be today found in this world.

If your children are well but not robust, they need Scott's Emulsion of Cod-liver Oil.

We are constantly in receipt of reports from parents who give their children the emulsion every fall for a month or two. It keeps them well and strong all winter. It prevents their taking cold.

Your doctor will confirm this.

The oil combined with the hypophosphites is a splendid food tonic.

See and buy, all druggists. SCOTT & BOWNE, Chemists, Toronto.

NEW DIOCESE OF PEMROKE.

The Vicariate of Pontiac Raised to a Diocese.

Rt. Rev. N. Z. Lorrain, D.D., to be Installed as First Bishop on Thursday, Sept. 22nd.

PEMBROKE, Sept. 22nd.

The Vicariate of Pontiac will hereafter be known as the Diocese of Pembroke. At a Consistory held in Rome, May 4th, 1898, the Vicariate of Pontiac was erected into a Diocese, and the present worthy Vicar Apostolic, Rt. Rev. Narcisse Zephirin Lorrain, D.D., was appointed its first Bishop.

The official documents have been received from Rome and preparations are being made for the ceremony of the installation of the new Bishop in his See at Pembroke, on Thursday, September 22nd. On that day the public promulgation of the Apostolic Letters will be made and the solemn installing of Rt. Rev. Bishop Lorrain will take place. Rt. Rev. J. T. Duhamel, D.D., Archbishop of Ottawa, and Rt. Rev. P. Larocque, D.D., Bishop of Sherbrooke, will perform the ceremony of installing the new Bishop in his See.

Rt. Rev. J. M. Emard, D.D., Bishop of Valleyfield, will preach the French sermon, and Very Rev. J. J. McCann, V.G., and administrator of the Diocese of Toronto, will preach the English sermon.

A large number of Archbishops, Bishops and Priests of Canada and the United States are expected to be present, including Rt. Rev. J. T. Duhamel, D.D., Ottawa; Rt. Rev. P. N. Bruchesi, D.D., Montreal; Mgr. Gauthier, Archbishop-elect of Kingston; Rt. Rev. J. M. Emard, D.D., Valleyfield; Rt. Rev. P. Larocque, D.D., Sherbrooke; Rt. Rev. U. N. Blais, D.D., Rimouski; Rt. Rev. E. Gravel, D.D., Nicolet; Rt. Rev. H. Gabrielis, D.D., Odessa; Rt. Rev. S. Mgr. J. Roumier, V.G., Ottawa; Mgr. C. Marois, V.G., Quebec; Very Rev. J. J. McCann, V.G., and Administrator of the Diocese of Toronto; also delegates from other dioceses.

The Vicariate of Pontiac was erected July 11 and during the sixteen years of its existence has made rapid progress under the able management of Right Rev. N. Z. Lorrain, who has the honor of being elevated to the dignity of first Bishop of the New Diocese of Pembroke.

ECCLIASTICAL APPOINTMENTS.

His Grace Archbishop Bruchesi has made the following appointments: Abbe A. Coutu, almoner of the Carmelites; Abbe A. A. Brault, cure of St. Vincent de Paul; Abbe A. Provoost, cure of Hochelaga; Abbe H. Briest, cure of Cote St. Paul; Abbe H. Charpentier, cure of Pointe-aux-Trembles; Abbe V. Dupuis, cure of St. Paul, Isle aux Noix; Abbe E. Pepin, cure of St. Valentine; Abbe J. Demers, cure of St. Bernard de Lacolle; vicar of St. Gabriel de Brandon; Abbe H. Marsolais, cure of St. Theodore de Chertsey; Abbe J. E. Joly, vicar of St. Emile; Abbe A. Morin, vicar of Notre Dame du Rosaire; Abbe J. A. Ducharme, almoner of the Sisters of Charity; Abbe Z. Delinelle, almoner of the Sisters of the Good Shepherd; Abbe J. A. Bertrand, almoner of the Sisters of the Holy Cross; Abbe J. Forbes, almoner of the Sisters of the Holy Name; Abbe A. Desnoyers, almoner of the Asylum of the Sisters of Providence, Montreal.

ITEMS OF LOCAL INTEREST.

Rev. A. P. Cullinan, recently ordained, celebrated High Mass at St. Ann's Church on Sunday last. There was a large congregation present and Rev. Dr. Luke Callaghan, of the Archbishop's Palace, delivered a masterly discourse.

The Shamrocks will play for the last time this season with the Nationals this afternoon. The match, which will be played on the S.A.A. grounds, will be one of the best of the season.

The funeral of the late Mr. T. Clarke, which was held on Sunday last, was one of the largest held in Montreal for many years. Deceased was prominent in the circles of the A.O.H. and C.O.F., and both organizations turned out in large numbers. The employees of the M.S.R., where he had been employed, also assisted at the funeral. Division No. 1, A.O.H., had about eight hundred members out under leadership of Mr. J. Dandon. About two hundred employees of the M.S.R., composed of motormen and conductors, under the marshaling of Mr. F. McCarthy, attended.

About four hundred members of St. Ann's and St. Patrick's Courts of the C. O. F. also attended, with Mr. Furlong as Marshal. The Provincial Directory of the A. O. H. was represented by Mr. T. N. Smith, and the County Directory of the same organization by Mr. Hugh McMorrow, James McIver, County Secretary, and Patrick Scullion, County Treasurer. About two thousand citizens walked after the hearse. Amongst those noticed were: Mr. George Clarke, Past County President A. O. H.; Col. Feeney and Lieut. Sullivan, Hibernian Knights; C. McAleer, Vice President Div. No. 2 A. O. H.; D. McDonald, Superintendent M. S. R.; J. Ryan, L. Z. Boudreau, P. J. Kennedy, John Davis, D.H.G.R., Catholic Foresters; J. P. Jackson, C. R., St. Ann's Court; M. A. Daley, T. Heaney, John Lavell, J. Mangan, John Lamont and several other well known members of the Catholic fraternal or organizations. The pall bearers were three from the Foresters and three from the A. O. H.

The Minerve, in its issue of Tuesday, refers to the Catholic Schools. It says that among the leading questions which the Catholic School Commissioners have to deal with is that of the exceedingly congested state of some of the schools under their control. It believes that their rules and regulations require

MRS. L. H. BOURGUIGNON

Was Thin, Pale and Weak. She was Suffering From Female Weakness.

No Doctor, No Remedies, Could Cure Her. She Took Dr. Coderre's Red Pills and Now She Enjoys Perfect Health.

Dr. Coderre's Red Pills Purify and Make New Blood, Tone and Strengthen the Stomach, Regulate and Invigorate the Bowels, and Build Up the Entire System.

How often weak, tired, worn-out women, thoroughly exhausted by their sufferings caused by female weakness, with despairing voice exclaim, "We had better be dead!" Their cry is wrung from bitter disappointment in not getting well from sheer nervousness, and the growing fear that their cure, and that cure is Dr. Coderre's Red Pills remedy—that grand and wonderful remedy which has cured so many thousands of apparently hopeless cases.

That was a marvelous cure of Mrs. Bourguignon of Cohoes, N.Y., who says: "I was sick for years, very thin, pale and weak. I suffered most from backache, headache and female weakness. I was in very bad shape when I started to take Dr. Coderre's Red Pills. I am now cured; for six months I have not had any backache or headache, and I was never so strong since my marriage. My friends are surprised to see me in such good health. My appetite is good, and I sleep well. Dr. Coderre's Red Pills have done for me what my doctors could not do—cured me. I do not doubt that any woman troubled as I was can be cured by these pills." (Signed) Mrs. L. H. Bourguignon, 77 Mohawk street, Cohoes, N.Y.



MRS. L. H. BOURGUIGNON.

Such testimony as that offered above should be convincing to every woman who is suffering with the ailments peculiar to her sex. We have provided you the means—at a cost so small as hardly to be considered—whereby years of physical agony may be avoided. It is the same old story, which every woman understands, but alas, how few regard. Think of the restless nights you are enduring, the nervous headaches, the monthly sickness, aggravated by painful and irregular periods, dragging weight in the back and loins, leucorrhoea, dizziness, and all kinds of female weakness. Let any or all of these symptoms prevail, and Dr. Coderre's Red Pills will do more than help—THEY WILL CURE YOU. Think of it! This remedy was made for you, and for the ailments described. Can you afford to suffer longer in silence when the cure is yours almost for the asking?

REMEMBER that you can consult without any charge our successful physician specialists. We wish that you would give us a full description of your case. Tell them how you feel. Address your letter to "Medical Department, B. X. 2306, Montreal." Our physician himself will open your letter and keep it confidential. As soon as your letter is received they will give your case their best attention. In their answers they will tell you what you have to do and how to take Dr. Coderre's Red Pills in the best way most appropriate to your sickness. You can consult our specialists as often as you wish and ask as many questions as you desire about your case. They will always answer you with their best attention. If you take Dr. Coderre's Red Pills carefully, strictly following the directions, you will be cured. They have cured young and old women. They have cured after every thing else had failed. Dr. Coderre's Red Pills can be taken at all times and all places and under any conditions. Dr. Coderre's Red Pills will always be found a reliable remedy.

BE CAREFUL not to buy Red Pills by the dozen, the hundred, or at 25¢ a box. These red pills represented to you as being as good as our Dr. Coderre's Red Pills are only an imitation of them. You must refuse these cheap imitations because they always contain arsenic, strychnine or morphine, and are very dangerous to your health. Our Dr. Coderre's Red Pills are always in little round wooden boxes of 50 Red Pills each. If your druggist does not have them, send us 50 cents in stamps for one box or \$2.50 by registered letter or money order for six boxes. Remember that one box of Dr. Coderre's Red Pills has a larger quantity than any liquid remedy that you pay one dollar for. On receipt of the amount we send Dr. Coderre's Red Pills to any part of Canada and the United States—no extra charge. Always give your full name and address, to prevent all delay of shipment.

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Advertisement for Steinway pianos, featuring a large graphic of a piano and text: "\$25.00 Per Month... LINDSAY-NORDHEIMER CO. WAREROOMS: 2366 St. Catherine Street."

Advertisement for School Books, listing various titles and prices, including 'SADLIER'S DOMINION SERIES' and 'SADLIER'S BIBLE HISTORY'.

Advertisement for Coleman's Salt, featuring a graphic of a salt container and text: 'BUY Coleman's Salt THE BEST'.

Advertisement for Loyola College, 68 Drummond Street, Classical Course, Classes Open Sept. 13th.

Advertisement for International Business College, Place D'Armes, Montreal, offering courses in Accounting, Arithmetic, etc.

Advertisement for Boarding School and Academy, Congregation de Notre Dame, Kingston, Ontario.

Advertisement for Bourget College, Rigaud, P. Q., Classical Course and English Commercial Course.

Advertisement for American and European Tours, listing travel agencies and destinations like Europe, Bermuda, West Indies, Florida, etc.

Advertisement for Cook's Tours, W. H. Clancy, Agent, Grand Trunk Ticket Office, 137 St. James Street.

Advertisement for Specialties of Gray's Pharmacy, including Castor Fluid, Saponaceous Dentifrice, and White Rose Lanolin Cream.