

Sir William Edmond Logan, FRSE FRS FGS (20 April - 22 June), was a Canadian-born geologist and the founder and first director of the Geological Survey of Canada.

Life[edit] William Edmond Logan was born into a well-to-do Montreal family in , the third son of William Logan, a baker and owner of real estate, and Janet Edmond, both originally from Scotland. Logan was sent to Edinburgh to receive an education. As was common at the time for young men of means, he learned languages French, Spanish, some Gaelic and German , music flute , and became an accomplished artist. In the s, Logan became fascinated with geology while managing a copper-smelting works near Swansea, Wales, on behalf of his uncle, Hart Logan. The need for an organization that could chart the mineral resources of the newly established Province of Canada following the merger of Upper and Lower Canada had been under discussion for over a decade. Government funds were allocated in and Logan took up his duties in He had also hired Scottish-born Alexander Murray , a former naval officer, as his assistant. The rapid industrial advances in England since the late 18th century had shown how essential coal was to economic expansion. Based on information gathered during the first two field seasons, Logan was able to report that no coal deposits were to be found in the Province of Canada. Logan also made many important discoveries in the early days of the Survey. For example, he identified several broad geological divisions: He also lobbied the government successfully for continued funding for the GSC, although he would use his own funds when necessary; he was an independently wealthy man, and to the despair of many parents hoping to snag him as a son-in-law, his response was always that he was "married to the rocks. A second similar opportunity came in with the Universal Exposition in Paris. That same year he was awarded the Wollaston Medal , the highest award of the Geological Society of London. Throughout his career, Logan was to receive dozens of prestigious awards. Logan was also an influential museum builder. In , he was authorized by the government to establish a Geological Museum open to the public " which he did at the GSC headquarters in Montreal. This museum was to grow through the years, and both the Canadian Museum of Nature and the Canadian Museum of History trace their roots to it. One of the most important accomplishments of the GSC under Logan was the publication in of the *Geology of Canada*. Representing all the work of the organization up to that date, this page book recorded everything known about Canadian geology. It received national and international acclaim for its content, style, and precision. On a scale of 1 inch to 25 miles, it showed the geology and geography of southeastern Canada as far west as Manitoba and as far north as lakes St. John, Timiskaming, Nipigon, and St. In , a smaller scale version of this same map 1 inch to miles had been printed in atlas form, making it the first comprehensive illustration of the geology of what is now the southern part of Ontario and Quebec. Logan retired in at the age of Russell of the U. The Geological Association of Canada awards the Logan Medal , established in , annually as its highest honour. Report of Progress from its Commencement to as one of the most important Canadian books. Gordon, William Edmond Logan

Chapter 2 : Canadian Personalities - William Logan

Sir William Edmond Logan: Sir William Edmond Logan, one of the foremost Canadian geologists of the 19th century. Logan was educated at the University of Edinburgh and began working for his uncle in London in

In he registered as a medical student at Edinburgh University where his subjects included logic, mathematics, and chemistry. Although he may not have been impressed at the time, his lectures in chemistry probably provided his first exposure to theories on the formation of rocks and minerals: Logan left the university at the end of his first year, even though his scholastic achievement was high, to enter the London business establishment of his uncle, Hart Logan, for whom he worked for over 20 years. After the management of the business was left to Logan, who devoted days and many evenings to his work. During this period he took lessons in art and languages, and continued the study of mathematics. In he went to Italy, possibly as a tourist, for his diary records descriptions of numerous churches, palaces, gates, bridges, and other buildings; he was also most diligent in recording the types of rock in columns and other parts of the great edifices. In Logan moved to Swansea, Wales, where he was appointed manager at the Forest Copper Works, Morriston, a copper smelting and coal mining establishment in which his uncle had invested a substantial sum of money. His prime task was to set up a proper system of accounts but Logan soon realized that a continuous supply of coal for the smelters had to be guaranteed, and that this could only be done with the help of accurate maps of coal seams from which reserves could be determined. Existing geological maps of Wales were highly generalized with too little detail to make them useful. Logan therefore set out to make field observations and to plot them on the available topographic maps of South Wales, recording the continuity of seams and the succession of rocks. A high degree of accuracy was obtained by using surveying instruments such as a compass, a theodolite, and probably barometers. His data included subsurface information from miners, and subsequently from drill cores. By these means he constructed, for the first time, true-scale horizontal cross-sections upon which the underground occurrence of the coal seams was mapped. The results allowed predictions about the depths of mines and the discovery of coal seams that were not exposed at the surface. Geology had become a popular science in the early decades of the century, with the formation of the Geological Society of London in , the publication of a geological map of England and Wales in by William Smith, and of a book on the geology of England and Wales by William Daniel Conybeare and John Phillips in . In , while on a business trip in France and Spain, Logan mentions in his diary the works of Charles Lyell who, at that time, was one of the principal authors in the field of geology. On such trips Logan carried painting supplies; some of his watercolours and sepias are held today in trust by the Geological Association of Canada. Logan helped to organize the Swansea Philosophical and Literary Institute in in order to encourage study of natural history and preservation of antiquities. He was elected to the Geological Society of London in , and in presented to it a paper outlining his concept of the origin of coal. The rock succession, including the coal seams, in South Wales suggested that coal had accumulated in situ: Logan was immediately interested in the position of provincial geologist and requested the support of several eminent British geologists in his application. Canadian friends, principally in the Montreal and Quebec societies, also placed his name before the governor of the province. Logan recognized that a proper geological survey of the vast wilderness of Canada would require a permanent institution. At the same time he realized that the politicians who would have to provide money for his organization would only be impressed by practical results and by indications of both actual and potential mineral occurrences from which the country would benefit economically. His task was going to be a difficult one, and capable assistants would be required. By the end of the year Logan was seeking continuance of the survey and urging government leaders to establish a more satisfactory and definite fiscal arrangement. He realized that if the results of his work were made obvious, they could have an influence on politicians and the public. He also took great care to talk and write to legislators and perform small tasks on their behalf. The act of experienced opposition, and to ensure its passage Logan had to spend time reluctantly in Toronto, then the seat of government, and away from his field work. After some delay, the same financial support was provided for an additional five years. In , however, the government created a select committee on the Geological

Survey. From to annual appropriations were made. During the spring the government changed, and a sympathetic legislature provided an annual grant for another five years. Geological mapping of the Canadian provinces, in which Logan himself participated actively, could be done in the mid-century only by a person with considerable physical strength and stamina, perseverance, unrelenting resourcefulness, and untiring enthusiasm. Travel around the provinces was difficult. There were steamships on the Great Lakes and the Rideau Canal had been built between Bytown Ottawa and Kingston; but in the early years of the survey travel from Montreal to Canada West was by stage coach through the United States. Geological traverses were made by walking, with distances determined by counting paces, establishing lines laid out by compass. The impression was heightened by his seemingly continuous mutterings, wanderings in a zig-zag fashion, and hammering on the rocks to obtain chips which he wrapped in paper with great care. In the field, Logan usually started at dawn and continued throughout the day and into the evening until he could no longer see distinctly. By the light of the campfire he would work until a late hour to ink-over the pencilled notes and figures made during the day and plot on field maps all the measurements and dimensions which had been recorded. His geological observations were authenticated by pen and ink sketches which clearly reveal his artistic talents. His note books, held by the Geological Survey, are exemplary models for recording field data. By the end of the field season of , Logan and Murray had established that the united Province of Canada could be divided into three well-defined geological areas. Between Montreal and the Detroit River were Paleozoic rocks, flat-lying but broken into two parts by a band of metamorphic gneisses and schists extending for several miles east of Lake Ontario. A northern division of complex metamorphic rocks would present a formidable task of understanding. In order to justify the continued existence of the survey, Logan immediately started a search for an obviously valuable mineral resource, coal. In the summer of he compiled for use in comparison a detailed section of the coal-bearing strata near Joggins, Nova Scotia. Subsequently he traversed the north and south shores of Chaleur Bay but he soon recognized that the exposed strata are geologically older than the Carboniferous strata, such as at Joggins, in which beds of coal occur. The expedition, which provided both topographic and geological information, established that coal would not be found in the area. In Logan made the first of several expeditions across the ancient rocks north of Montreal. He found evidence of glaciation in polished, scratched, and grooved rock surfaces. He commented on the numerous veins and dikes and especially the occurrences of metallic minerals which would provide an impetus for the development of a mining industry. His report included observations on iron, lead, and copper, and such building stones as marble and slate. The next year he examined the north shore of Lake Superior specifically for occurrences of copper, within a rock sequence he named the Upper Copper-bearing Series, a major discovery having been made on the south shore. In and additional occurrences, like that being mined at the Bruce Mines copper deposit, were sought along the north shore of Lake Huron. For each prospect he wrote a cautious report presenting factual observations in a carefully worded style. He pointed out that the high cost of transportation, machinery, and labour would make only the richest deposits suitable for economic development. His objective reports did not, of course, have a kind reception from mining promoters. On several occasions during his tenure as director of the survey he was called upon to evaluate mineral occurrences. Whenever evidence of fraud by citizens became obvious, his reaction was dismissal of the perpetrators from his office bluntly and swiftly. Apparently Logan did not observe any evidence of the deposits of silver near Cobalt, of nickel at Sudbury, and of uranium north of Blind River. Deposits of serpentine found in the area would have had commercial value as a decorative stone except that the occurrences of asbestos, then considered a mineralogical curiosity, made it unusable. In , near Quebec City, he recognized a major geological phenomenon when he realized, on the basis of fossils identified by Billings, that the folded rocks had been faulted and great masses had been thrust northward up and over younger formations. In he defined the Grenville Series as a succession of gneisses and crystalline limestones intruded by dikes and granites. The limestones contain distinctive layerings and internal tubular structures which he concluded were the remains of fossils, and to them his friend J. Dawson applied the name *Eozoon Canadense*. To Logan these structures provided a strong argument for the occurrence of life in these very ancient rocks. Subsequent study has demonstrated that similar features can be formed by inorganic processes but other evidence for abundant life

in the rocks of the Precambrian is now well established. To the generally flat-lying rocks north of Lake Huron, resting on the Grenville Series, Logan applied the name Huronian. In he applied the name Laurentian to the seemingly more ancient rocks north of the Ottawa River and in the Adirondack Mountains of New York; he considered them the oldest rocks in North America, perhaps influenced by the then accepted theory that granitic rocks formed the original crust of the earth. Modern scientific methods have proven his interpretation wrong but his names are still used though in a different sense. He found in distinctive trails of invertebrate animals in Cambrian rocks near Beauharnois, Quebec. Such failures still occur to this day. The government of Canada was asked to participate in the Exhibition of the Industries of All Nations in London in and Logan organized an extensive collection of Canadian minerals along with a geological map. In Logan was again called upon to display Canadian materials at the International Exhibition in London. Although the collection was of high quality, Logan, because of administrative and publication problems within the Geological Survey, and his participation as a juror at the exhibition, responded with less than his normal enthusiasm. He was now 64 years old. The culmination of his years as director of the survey was, however, the publication in of the *Geology of Canada*, a volume of pages with Murray, Hunt, and Billings as co-authors, which even to this day is a basic reference for geological work. The volume was followed in by an atlas of coloured geological maps covering the entire area from Newfoundland and Nova Scotia to the central United States and Canada. Upon his return to Canada after receiving these honours, McGill University conferred on him the degree of lld. The Canadian Institute, which had been founded in with Logan elected its first president, gave a public reception in Toronto and commissioned his portrait in oil. Starting a major career at the age of 44, he organized, directed, and contributed in a substantial way for more than a quarter of a century to the Geological Survey of Canada. Subsequent to he saw the development of a major copper-producing area in the Eastern Townships, where the Acton Mine was said to be the largest copper mine in the world in its time. During the middle part of the 19th century, the rigours of field work in the Canadian wilderness demanded exceptional physical strength and endurance, and the administrative problems of a government organization along with the arrangement of international exhibitions demanded political skill and a sense of dedication to profession and country. So determined was Logan to continue the Geological Survey that he was willing to provide financial support from his own funds when government money was not immediately available. With all this he seems to have been a shy person, even an introvert, and was most uncomfortable at social gatherings. The diligent and strenuous effort he made as director of the Geological Survey placed him in the limelight and he was apparently prepared to endure some personal discomfort in it because he drew satisfaction from acquiring national and international recognition for Canada. He returned to Canada several times, however, and for a few months in assumed temporary directorship of the survey while Selwyn was in British Columbia doing field work. During the summer of Logan spent several weeks in the Eastern Townships and made plans for some further subsurface drilling in order to demonstrate that his geological interpretation of the complex structure was correct. But in the spring of his health was failing noticeably. Report of progress for the year

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The region, particularly around Sarnia, continues to be a major centre for petrochemical research and refinery operations. George Mercer Dawson conducts numerous surveys of western Canada and its resources for the International Boundary Commission and the Geological Survey of Canada. In 1885, he reports oil seeps in the Waterton area, 100 km mi. It is the first producing oil well in western Canada. On May 14, 1891, the Dingman No. 1 well is drilled. Provincial Archives of Alberta, P A new discovery rekindles hope that large reservoirs of oil will be found beneath Alberta. Discovered by British Petroleum in 1914, the large Wainwright oil field revives hopes for the Alberta oil industry. Provincial Archives of Alberta, A Control of natural resources is transferred to the provincial government. The agreement transferring jurisdiction of natural resources from the federal to the provincial government is signed in Ottawa, December 14, 1905, and enacted the following year. Seated, starting second from left, are Hon. John Brownlee, Premier of Alberta. The transfer allows Alberta to realize the full economic potential of the oil and gas resources found within its borders. The discovery of the Leduc oil field, then the largest and most lucrative yet found, comes after decades of fruitless searching and drilling. Provincial Archives of Alberta, P Additional oil discoveries confirm Alberta as a major oil producer. Oil derricks dot the landscape, and smoke from a new oil well rises from the horizon beyond the hamlet of Redwater. On the heels of the Leduc discovery, Imperial Oil finds a second major oil field near Redwater, northeast of Edmonton. By 1925, the pipeline is expanded and extended to Sarnia, Ontario, and is transporting more than 100,000 barrels a day. A wellsite geologist stands in front of the Pembina No. 1 well. A joint venture of two oil companies, this well successfully strikes oil about 62 km mi. In 1913, the Banff Oil Company drills successful wells in this region. Fuel shortages become common, and the price of Alberta oil, one of the few remaining reliable and friendly sources of oil for industrialized nations, skyrockets. The National Energy Program is created by the federal government in 1974 to ensure a reliable and affordable supply of oil and gas for Canadian industry. Although a compromise is reached in 1982, bitter memories of the NEP continue to characterize Alberta-Central Canada relations. Although not directly related to the oil sector, this concept forms the basis for future anti-pollution and climate change strategies. The World Petroleum Congress, held for the first time in Canada, attracts industry and political leaders from around the world. A parallel counter-congress and protests occur in the city at the same time. Provincial Archives of Alberta, GR In his teens, he was sent to Edinburgh, Scotland, for his higher education. Logan continued his research and developed the in situ theory of the origin of coal. Based on the presence of fossilized tree trunks amidst coal seams deep underground, he hypothesized that coal was created by the accumulation of organic matter that was then submersed in salt water and buried under layers of sediment. His observations of similar phenomena in the coal beds of Nova Scotia and Pennsylvania added weight to this theory, which is still considered valid today. In 1880, Logan was appointed director of the newly formed Geological Survey of Canada. He actively sought the position, even though it entailed a fifty percent reduction from his previous earnings. Logan was faced with creating the survey from practically nothing, lacking even the adequate topographical base maps required for geological surveying. Logan was elected to the Royal Society of London in 1883. Following his retirement in 1891 he continued to serve as director on an occasional and temporary basis when called upon over the following years. Logan died in Pembroke, Ontario, on June 22, 1913.

Chapter 4 : William Edmond Logan | calendrierdelascience.com

LOGAN, Sir WILLIAM EDMOND, geologist and geological cartographer, founder and first director of the Geological Survey of Canada; b. 20 April at Montreal, L.C., third son of William Logan, a baker and owner of real estate, and of Janet Edmond, both from Scotland; d. 22 June at Cilgerran, Pembrokeshire, Wales.

After a good grounding at the school of one Skakel, the Canadian Busby, he was sent by his father in to the high school at Edinburgh, and thence to Edinburgh University, where he graduated with distinction in mathematics in . In the following year he entered the counting-house of his uncle, Hart Logan, in London, where he relieved the tedium of his evenings by taking lessons in geometry from Robert, eldest son of the poet Burns. While there his attention was attracted to the general structure of the Glamorganshire coal-field, and he became an enthusiastic student of geology. When Sir Henry de la Beche [q. In he was elected F. Before he left South Wales he had demonstrated the important fact, till then unrecognised or not understood, that the stratum of clay underlying coal-beds was the soil in which the coal-vegetation grew, thus refuting the drift theory, and establishing that of growth in situ Trans. In August Logan left Liverpool for Halifax, Nova Scotia, and during the following winter studied the phenomena connected with the annual freezing over of the St. Lawrence, the observations which he made proving of great value to Robert Stephenson when considering the best site for the Victoria bridge, Montreal see Quart. In he visited the coalfields of Pennsylvania and Nova Scotia, finding his discoveries in Wales as to stigmaria underclays everywhere confirmed, and making several valuable communications on the subject to the Geological Society. He also declared that the rocks forming the Laurentian and Adirondack mountains, previously regarded as unstratified, were in reality, in his opinion, disturbed and altered sedimentary deposits of vast thickness. The skilful manner in which he traced out the structure of these ancient formations was, according to Sir R. The work of the survey, which Logan steadily continued until by he had surveyed over one hundred thousand square miles of territory was rendered particularly arduous by the absence of any accurate map of the country, so that he was often obliged to make a topographical survey of the country pari passu with a geological one. In Logan represented Canada at the Great Exhibition of , forwarding a large collection of the economic minerals of Canada, which was commended as the most interesting and complete mineral exhibit in the exhibition. He was in this year elected F. In he was Canadian commissioner at the Paris Exhibition, and was presented by the Emperor Napoleon III with the cross of the Legion of Honour; while on a subsequent visit to England he was awarded the Wollaston medal of the Geological Society, and was, on 29 Jan. On his return to Canada an address was presented to him by the Canadian Institute of which he had been first president , and his portrait was hung in the meeting-hall of the society. He had previously been created LL. The volume may be described as a generalised summary of the progress of the survey during the first twenty years of its existence; it contains, says Sir A. Geikie Nature, , ii. Carpenter, made known the existence of what were then believed to be organismsâ€”the most ancient relics of life yet discoveredâ€”and was followed in by the award of one of the royal medals of the Royal Society. Logan resigned his directorship of the survey in , spent the winter of â€”5 with his sister in Wales, died at Castle Malgwin on 22 June , and was buried in Llechryd Church, Cardiganshire. His writings, however, although accurate and precise, are deficient in power of expression, and hardly convey an adequate impression of his vast stores of original information, the product of many years of keen and systematic observation. His distinguishing characteristic as a geologist lay in the power he possessed of grappling with the stratigraphy and structure of the most complicated regions. Survey of Great Brit. The proof of this article has been kindly revised by Sir Archibald Geikie.

Chapter 5 : Sir William Edmond Logan Facts

Sir William Edmond Logan () was a Canadian geologist who founded the Geological Survey of Canada and contributed many fruitful new ideas to the science of geology. William E. Logan was born on April 20, , in Montreal, where his father, a Scottish immigrant, was a prosperous businessman.

Click here to return to W. When he was knighted in , Montreal and Toronto held great soirees of celebration - he HAD to attend, and give a speech which he loathed. John Molson of Montreal was a good friend. Perhaps he just dropped it in the Atlantic on one of his many crossings. He was also the subject of six essays published in the CIM Bulletin in Citizens who make notable contributions to society are memorialized by applying their name to a major award - Nobel; a way of thinking - Cartesian; a scientific law - Charles [or general law - Murphy]; a unit of measure - Ampere; and most commonly a geographic feature - Hudson Bay, Vancouver Island, etc. William Edmond Logan made a monumental contribution to Canada between and His name is applied to not one mountain, but two - Mount Logan elev. His name is also applied to a range of mountains in central Yukon; a submarine canyon in the Atlantic continental shelf; two islands; a bay; a lake; an inlet; a township in Quebec; and a government park in Gaspé. Recognition during his lifetime is evident by one notable international award. At age 44 in April , Logan was appointed founder and director of the Geological Survey of Canada. Less than 14 years later, on January 29, , he was knighted by Queen Victoria, the first knighthood to have been accorded to someone born in Canada, and a rare honour for a scientist. William Logan was born in Montreal, April 20., in a family whose father had immigrated from Scotland, and who was a successful baker, a wealthy farmer, and a property owner. He had three brothers and four sisters. In William was sent to Scotland to finish high school, and won several prizes. In , he registered at Edinburgh University in medicine, and his classes, all large, were logic, mathematics, and chemistry. He achieved the highest class mark in mathematics, for which his award was a brass octant, with his name engraved in Latin. This instrument is like a sextant but only horizontal angles can be measured; it can be seen in the Logan Museum at the Geological Survey of Canada, Ottawa. Logan left the university at the end of the year, possibly upon hearing about surgery without benefit of anaesthetic. Within a week he was in London working for his uncle Hart Logan as bookkeeper and accountant. During his leisure hours, he took lessons in painting, languages, flute, and geometry. South Wales has broad river valleys with low rolling hills, on the sides of which were located numerous small coal mines operated by one or two men. The smelting operation required a continuous supply coal, which these small individual operations could not guarantee. Logan wrote his brother in London for old clothes, books on mineralogy, and a theodolite, and proceeded to construct precise geological maps. Whether he had any surveying instruction is unknown. The existing geological maps, by William Strata Smith, , and George Greenough, , were highly generalized. Whether Logan was even aware of these maps is unknown. Did Logan have any interest in geology before going to Swansea in ? At Edinburgh University, the chemistry professor was T. Hope, an ardent and vocal supporter of Wernerism. Another faculty member was Sir James Hall, an original investigator in experimental igneous petrology, who argued the case for vulcanism. Logan probably heard the rhetoric about these contrasting theories, but probably had little training in the basic principles of geology. In , Logan made a trip to Italy and his diary suggests that he went as a tourist. He recorded the rock types used as building stone - granite 11 ; porphyry 2 ; marble 8 ; travertine 5 ; jasper 2 ; lapis lazuli; alabaster; and pozzulana. Logan interest in geology may therefore have initially been a business interest, rather than a scientific interest, and his mapping of South Wales coal occurrences may have catalyzed his interest in geology as a science. In , the Swansea Philosophical and Literary Society was organized and Logan became the curator for geology. In , his uncle Hart died, and his employment was terminated. He nevertheless continued his geological mapping in Wales until In , when Logan was appointed as founding director of the Geological Survey of Canada, he was probably the best prepared candidate - physically, intellectually, scientifically, mentally, and by nationality. In April for ten days, he, his brother and two friends, went on a walking, climbing, riding, rowing, and sailing trip over miles in the western highlands of Scotland. One night after midnight by moonlight, they rode in a farm wagon which had been used that day to haul

manure. The next day they walked 14 miles from Ballychullish to Fort William, and up and down Ben Nevis, elevation feet. While living in London and Swansea, he walked to work each day, possibly four to six miles. His field measurements in the Canadian bush were made by counting steps using a compass, with a mercury barometer for elevation. One feature of the Survey office in Montreal was a row of his worn out field boots along the wall. His accuracy was evident because, in the Grenville area north of the Ottawa River, he discovered errors in the government land surveys. He won prizes at high school, and the octant for mathematics at university. He must have taught himself about rock types, and geological field mapping; he progressed from near relatively gently folded rocks in south Wales, to complexly folded and faulted rocks in the Appalachians, to the metamorphic terranes of the Grenville. With respect to personal relation, he was an eccentric. Every day he did talk to each of the four or five Survey employees about their problems - T. Sterry Hunt, the chemist; Elkanah Billings, the paleontologist; James Richardson, field mapper; and the map maker, and the handyman; but not Alexander Murray, his senior field man, because he lived in Woodstock about miles away. He expected his employees to work long hours, and they did, because they knew Logan worked even longer hours. Even at midnight a light could be seen in the Survey office, in which he worked and slept. Some wondered if he ever slept. Politicians always received special attention because they provided the funding. On a personal basis he usually wore field clothes every day. After his knighthood in , he was probably one of the best known individuals in Canada, but few were able to identify him. One visitor to the Survey office mistook him for the handyman, and the well dressed handyman for the director. And when the demands and frustrations as director became overwhelming, he would disappear into the bush for several weeks. That Logan was born in Canada probably was a factor in his appointment. In , he was offered the directorship for a Survey in India. In the Presbyterian Church, one teaching was predestination, which has the corollary that a career opportunity once evident, would indicate divine direction. Whether William Edmond Logan viewed his appointment as founder of the Geological Survey of Canada in this light is unknown. But his drive, determination, vigour, resolve, and focus, allow such speculation. Readers were invited to nominate individuals in ten fields - heroes, thinkers, nation builders, discoverers, artists, scientists, activists, characters, stars, and entrepreneurs. The above essay was sent to nominate Logan. References at the end of the above essay provide much more detailed information about Logan. Logan was born in Montreal and educated in Scotland, though he did not progress beyond the first year medical course he began. He then worked in England and Wales, and in his early 30s managed a Swansea coal mine and copper smelter in which his uncle was a major investor. He quickly realized that coal supply for the smelters had to be guaranteed and this could be done only with the help of accurate maps of the coal seams. This began his professional interest in geology, and he produced maps that were so precise that the British geological survey published them. Thereafter, Logan was a budding scholar. When he travelled, he kept records of the rock types he saw, and his interest and knowledge were such that in he became the first director of the Geological Survey of Canada. What else could explain someone who walked around mumbling to himself, taking note in leather-bound notebooks, peering at instruments, cracking rocks with a hammer, and wrapping the chips in paper, and carrying them off in a large wicker basket? Logan worked hard and expected his staff to emulate him. He dressed in field clothes and, even after he was knighted in , was occasionally mistaken for the office janitor. Logan also sketched superbly, augmenting his geological observations with pen and ink drawings His efforts laid out the geology of Canada East and Canada West. He sought fossils with eagerness, in finding invertebrate animals preserved in Cambrian rocks near Beauharnois. He noted how the ice pack on the St. Even so, there was never enough money, and Logan put up his own cash more than once when the government was slow. His work was invaluable, but as he explored north of Lake Superior and Lake Huron, finding the ore bodies that provided the foundation for the mineral wealth of Canada, he remained very cautious in his claims. That upset mining promoters, always on the lookout for a fast dollar. Oddly, for one so meticulous, he apparently missed the silver deposits at Cobalt and the nickel at Sudbury. His display of Canadian minerals at the Exhibition of the Industries of All Nations in in London was hailed, and he won medals from France in He published a huge volume on the geology of Canada in , and produced an atlas of eastern and central North America in , likely hand-colouring every map in each of the copies. His task, as he saw it, was "to ascertain the mineral resources

of the country," and the reports and maps that his Geological Survey produced, established the geological fundamentals of the Canadas. Report on the North Shore of Lake Huron. Esquisse Geologique du Canada; H. Bossange et Fils, Paris p. Montreal, Dawson Bros, p. Toronto, Macmillan Company of Canada, p. Other links to Logan:

Chapter 6 : Sir William Edmond Logan

William Edmond Logan was born at Montreal, in He was of Scottish parentage, and his father, after a residence of many years in Canada, returned to Scotland, and purchased an estate near Stirling, known as Clarkstone.

Logan was born on April 20, , in Montreal, where his father, a Scottish immigrant, was a prosperous businessman. William attended high school in Edinburgh, Scotland, and then entered the University of Edinburgh. After a year he left for London to join his uncle in business for the next 10 years. These were the years of highly touted processes for extracting previously unrecognized metals from slag heaps and mine tips. When everyone else was plunging however, Logan was cautious and avoided the grave losses which ensued in many of these fly-by-night enterprises. He purchased some simple instruments, a compass and a theodolite, to map the Glamorganshire coal field; the maps were so detailed and so accurate that they were eventually adopted in the government survey by De La Beche. His copper business took him through France and Spain, and he studied the geology of various regions en route. By Logan was elected a fellow of the Geological Society. He carried on in Wales, by now more immersed in geology than in business. In Nova Scotia, Logan visited quarries seeking fossil remains. At one quarry he found the tracks of a batrachian animal, evidence of animal life in the Lower Carboniferous rocks, but was not given credit for this discovery for some years. He carried out surveys of the then-settled part of Canada, rejecting over and over again the possibility of making a fortune from the knowledge thus acquired. He received numerous honors and was knighted by Queen Victoria at Windsor in and awarded the Woollaston Medal by the Geological Society of London. Logan, a confirmed bachelor, gradually attracted a core of dedicated and highly qualified workers about him, but he suffered the indignities of many pioneer scientists when it came to getting Parliament to finance his work. His great volume, *Geology of Canada* , was derided by the Canadian prime minister, who said "It ought to have been a school book to instruct the youth of the province in the elements of geology. This suggested that life existed in the Laurentian Shield before it existed in some of the oldest rocks in Europe. Logan was director of the Geological Survey until Hunt, is *Geology of Canada: A biography* is Bernard J. Harrington, *Life of Sir William E. Logan*. For a background work in which Logan is cited see Carl O. Dunbar, *Historical Geology* ; 3d ed. *Encyclopedia of World Biography*. Copyright The Gale Group, Inc.

Chapter 7 : Sir William Logan

Sir William Edmond Logan, , Canadian calendrierdelascience.comed in England, he managed () coal mines and a copper smelter in Wales. In addition to making studies of clays underlying coal seams, he made extensive geological maps and sections.

Montreal, Canada, 20 April ; d. Llechryd, Wales, 22 July geology. He soon found that chemistry and geology were essential to the success of the business and embarked upon a geological study of the local Glamorganshire coalfield—ultimately, in , producing a memoir, with maps and sections. From that time on, Logan devoted himself exclusively to geology, particularly to the coal formations. Lawrence River, soon established him as a geologist of note. In the appointment of a provincial geologist was approved by the Canadian government under Sir Charles Bagot , who set about finding a suitable candidate. As a consequence he was offered, and accepted, the directorship of the newly created Geological Survey of Canada, a post which he held until After more than a century, it is still a reservoir of important information. Logan was fortunate in the choice of his assistants for both fieldwork and office work. Alexander Murray was his first and most important field geologist until he resigned to become director of the Geological Survey of Newfoundland in Sterry Hunt, his chemist, was responsible for hundreds of analyses of minerals, rocks, and ores. Elkanah Billings, his paleontologist, examined all fossils collected by field geologists and provided Logan with information invaluable for the correct identification of the age and the stratigraphic position of rock formations. Vennor joined the Survey. A twelve-hour day in the field was the rule for Logan. If at the end of a day in the bush his plotting of his traverse showed an error of more than two chains, he was disappointed. In the evenings he wrote up his notes and completed his maps. He was equally tireless during the winters, composing his reports of progress, revising those of his assistants, and above all seeking adequate governmental financial support. Thousands of pounds of his own resources were poured into the early ill-supported organization. As a consequence, in that year he resigned as director and divided his time between an estate he had bought in Wales and exploration, at his own expense, in Canada, designed to settle certain vexatious problems which had been left unsolved at the time of his resignation. He was buried in the churchyard at Llechryd, Wales. Many of these reports, sixteen in all, he wrote in his own hand—some in quadruplicate. The most important, and nearly the last, was his report, which provided the first complete coverage, according to information then available, of the geology of Canada from the Great Lakes to the Atlantic seaboard. In this remarkable compilation Logan was ably assisted by Sterry Hunt, whose work as chemist provided the foundation on which much of the information concerning the rocks, minerals, and ores of Canada was based. Early articles on underclay, the Glamorganshire coalfield, and ice packing have been mentioned. The earliest use of that term is not known. The excellence of his display of Canadian rocks and minerals at the London exhibition of led to his election as fellow of the Royal Society ; he was sponsored by the most prominent contemporary British geologist, Sir Roderick Murchison. A similar exhibit at Paris in earned him the Grand Gold Medal of Honor from the Imperial Commission and an investiture as chevalier of the Legion of Honor in the same year. His bibliography also includes a dozen short reports and articles on various topics. London, , with portrait; J. Clark Pick a style below, and copy the text for your bibliography.

Chapter 8 : Sir William Edmond Logan - Conventional Oil - Alberta's Energy Heritage

William Edmond Logan was born in Montr al to a Scottish migrant. The family returned to Scotland where Logan attended Edinburgh High School and the University of Edinburgh. He spent the next 15 years working for his uncle, Hart Logan, in London and south Wales.

For several years his health had been failing, and he felt more and more the need of rest and change of climate. Accordingly, in August, , he crossed to the mother country, intending to pass the winter there, and then to return to his work in the spring. But rest and a more genial climate were unavailing, and nowâ€™kindest of friends, most indefatigable of workers for science and for his countryâ€™he is no more! William Edmond Logan was born at Montreal, in He was of Scottish parentage, and his father, after a residence of many years in Canada, returned to Scotland, and purchased an estate near Stirling, known as Clarkstone. His education was begun at Mr. On leaving college he betook himself to mercantile pursuits, and we find that in he entered the counting-house of his uncle, Mr. Hart Logan, of London. Here he remained for about ten years, and here, it is said, he first became fond of geology, making geological excursions into the country whenever opportunity offered. In he paid a visit to Canada; but, returning the same year, took up his residence at Swansea, in South Wales, where he was appointed manager of a copper-smelting establishment, and of coal mines, in which an uncle of his was interested. In , his uncle dying, Mr. Logan resigned his position at Swansea. But the nine years he spent here were well-spent years; for not only had he gained a practical knowledge of mining and metallurgy, which afterwards proved of the greatest value to him, but had done a large amount of very excellent geological workâ€™work which caused Dr. He was Honorary Secretary and Curator of the geological department, and the Institution is indebted to him for valuable collections of minerals and metallurgical products, besides books, drawings and laboratory apparatus. De la Beche afterwards wrote as follows: Logan had carefully investigated it, and at the meeting of the British Association for the Advancement of Science, held at Liverpool in , he exhibited a beautifully executed map of it. Logan most handsomely placed it at our disposal. Having verified this work with great care, we find it so excellent that we shall adopt it for that part of the country to which it relates, considering it but fair and proper that Mr. Logan should obtain that credit to which his labors so justly entitle him. Of the thick and thin coal-seams in the South Wales coal-field, he found that not a single one was without an underclay, and the inference appeared to be that there was some essential connection between the production of the one and the existence of the other. It was during his visit to Nova Scotia, in , that he discovered in the Lower Coal-measures of Horton Bluff the footprints of a reptilian animalâ€™a discovery which, perhaps, failed to attract as much attention as it deserved, although it was the first instance in which any trace of reptiles had been detected as low down in the geological scale as the Carboniferous. The winter of was also spent in Canada, and the facts were obtained for a paper on the packing of ice in the St. Lawrence, which was subsequently read before the Geological Society of London. Such, briefly, was the career of Logan previous to his appointment as Director of the Geological Survey of Canada. Already he had acquired a reputation in Britain as a geologist, and had given himself the best of trainings for the work upon which he was about to enter on this side of the Atlantic. But what was meantime passing in Canada? It was referred to a select committee consisting of Messrs. Holmes, Neilson, Quesnel, [p. Killaly, but it was not reported on. A similar petition was presented by Mr. Black, from the Literary and Historical Society of Quebec, which was read. The government took up the matter, and on the motion of the Hon. Logan in the spring of Logan was now thoroughly in love with geology, and seeing in Canada the grandest of fields for original research, at once accepted. Still he well understood the difficulties which lay before him, and shortly afterwards addressed the following words to De la Beche: The extent and nature of the territory will render the task a most laborious one; but I am fully prepared to spare no exertion of which I am capable to render the work, when it is completed, satisfactory to those who have instituted the examination and creditable to myself. To carry out the field-work with vigor, to reduce all the sections with the requisite degree of accuracy, and map the geographical distribution of the rocks, to collect minerals and fossils, and to analyze the one, and by laborious and extensive comparisons, to determine the geological age of the other, is quite impossible without

a proper division of labor. There is no arranged collection of fossils, and no such thing as a geological library to refer to. This was done entirely at his own expense. In December, he returned to England to fulfill engagements there, but came out again in the following spring. During his visit to the old country, he was so fortunate as to secure the services of Mr. Alexander Murray, a gentleman who afterwards proved himself an invaluable assistant and friend, and who has contributed largely to our knowledge of the geology of Canada, and, more recently, to that of Newfoundland. Shortly after his visit to the Joggins, he wrote to a friend as follows: The rocks along the coast are laid bare for thirty miles, and every stratum can be touched and examined in nearly the whole distance. A considerable portion has a high angle of inclination, and the geological thickness thus brought to view is very great. I measured and registered every bed occurring in a horizontal distance of ten miles, taking the angle of dip all the way along. It occupies fifty-four pages of foolscap, closely written, and you will be astonished at the details in it. Logan as the field for his first operations, as it was thought that outlying patches of the Carboniferous might be found to exist there, and the government was especially anxious to ascertain whether there was any truth in the reported occurrence of coal. Murray, who, in , again carried, on the work, while Mr. Logan was engaged in explorations on the Upper Ottawa and Mattawan. No coal was found, but many geological facts of importance were accumulated, and a large amount of topographical work accomplished in what was previously almost a terra incognita. From early dawn till dusk he paced or paddled, and yet [p. To give details of his work during the many remaining years of his life would be to write a book; and all that we can do here is to trace briefly what his movements were, at the same time calling special attention to those of his labors which have given him a world-wide fame. The summer of found him studying the copper-bearing rocks of Lake Superior. This older set of rocks, which he had already observed, in , on Lake Temiscamang, he had ample opportunity of studying in , when he devoted several months to an examination of the Canadian coast and islands of Lake Huron, where the formation attainsâ€™as shown by Murrayâ€™a thickness of 18, feet. The seasons of and , and a portion of that of , were employed in studying the rocks of the Eastern Townships. In also, a short time was spent in an examination of the rocks about Bay St. Paul and Murray Bay, where coal had been reported to exist. The member for Saguenay County had previously made application to the Legislature for means to carry on boring operations in the vicinity of Bay St. Paul, but before his request was granted it was deemed advisable to obtain the opinion of the Provincial Geologist. By this means the Government was saved a large and useless expenditure of money. Most of the year, however, was devoted to the collection of specimens for the London Exhibition of , at which Mr. Logan acted as Juror. His visit to England at this time must have been for him an agreeable change. After a lapse of eight years to meet again with men like De la Beche, Murchison and Lyell, to hear from their own lips of the strides which science had been making, and in turn to tell of all that he had himself seen and done: For him, however, there was little relaxation from labor, for he toiled early and late in order that the [p. And every one knows the resultâ€™the collection elicited universal admiration, and Mr. Logan received a highly complimentary letter of thanks from the Prince Consort, and was elected a Fellow of the Royal Society, his name having been proposed by Sir Roderick Murchison. During the winter he again visited England to attend to the distribution of a portion of the Exhibition collection which was to be left there, and to see to the return of the remainder. In an examination was made of a strip of country on the north side of the St. Lawrence, extending from Montreal to Cape Tourmente below Quebec. The following season was spent among the Laurentian hills of Grenville and the adjoining townships, a field which proved so attractive that he afterward returned to it in and Nearly the whole of was occupied in making preparations for the Exhibition which was to take place at Paris in the following year, and to which Mr. Logan was to go as one of the Canadian Commissioners. It was in the autumn of also, that a select committee was appointed by the Canadian Government to inquire into the best method of making the information acquired by the Geological Survey more readily accessible to the public. A lengthy report on the subjectâ€™indeed on the entire working of the Surveyâ€™was published, and the evidence which it contains is of a most flattering character, both as regards the Director and those associated with him. Then came the Paris Exhibition of , at which the representation of the economic minerals of Canada was so complete and the arrangement so admirable that the collection attracted universal attention. This in itself Logan would have regarded as amply repaying him for his trouble;

but greater honor was in store for him. The Imperial Commission presented him with [p. Early in the following year he was knighted by Queen Victoria, and received from the Geological Society of London the Wollaston Palladium Medal in recognition of his distinguished labors in geology. Long previous he had won the confidence and esteem of his fellow-countrymen in Canada, but this seemed to be a fitting time to testify to him their appreciation of his worth. Accordingly, on his return to Montreal, the citizens presented him with a testimonial on which were engraved the words: They also presented him with an address expressive of their affectionate esteem and respect. I can assure you with sincerity that the honor conferred upon me, when you elected me the first President of the Institute, was one highly prized, although the circumstances of a distant domicile, and the intent pursuit of the investigations with which I am charged, rendered it extremely difficult for me to be of much use in your proceedings. It is a fortunate circumstance for me that my name should be connected with an act of grace on the part of Her Majesty, which serves to confirm your feeling in regard to the fact that as Canadians we enjoy a full share in the honors and privileges of British subjects. And I am proud to think that it was perhaps more because I was a Canadian, in whom the inhabitants of the Province had reposed some trust, that the honor which has been conferred upon me by Her Majesty was so easily obtained. That I am proud of the honors which have been bestowed upon me by the Emperor of France, in respect to my geological labors, and also by my brother geologists in England, there can be no doubt. But I have striven for these honors because I have considered they would tend to promote the confidence which the inhabitants of the Province have [p. Owing largely to his untiring exertions, the meeting was a most successful one. Returning from this trip, he spent the autumn months among the Laurentian Rocks of Grenville. Here too, as already mentioned, he continued to work during the season of For several years after this, his time was much taken up with the preparation and publication of the Geology of Canada and its accompanying Atlas, the former of which appeared in , and the latter in Before these could be completed, however, many facts had to be added to the stock already obtained, and besides a large amount of geological work among the Laurentian rocks of Grenville and the rocks of the Eastern Townships, a personal examination of many parts of the country, as well as of portions of the New England States, was rendered necessary. In , Sir William was again present, in the capacity of Juror, at the London International Exhibition, and again displayed a large and interesting collection of economic minerals. Another opportunity of seeing his scientific friends in Britain was also afforded him in , when he went to London to superintend the engraving of the Atlas already mentioned. In , a geological collection was again prepared for the Paris Exhibition of , and Sir William worked so closely in getting up a geological map to accompany it that he is said to have nearly ruined his eyesight. In , he resigned his appointment to Mr. Selwyn, the present Director of the Survey. The few remaining years of his life were occupied chiefly with a study of the rocks of the Eastern Townships and portions of New England:

Chapter 9 : About: William Edmond Logan

Sir William Edmond Logan William Logan was born on April 20, , in Montreal, Lower Canada. In his teens, he was sent to Edinburgh, Scotland, for his higher education.