The Australian New Church College

The Life of Swedenborg

Readings from, *Swedenborg: Life and Teaching* by George Trobridge

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Assignment 1.

As a guide, aim *for a response of around 300 words for each answer to the following questions...*

1. Identify what you think were the two greatest influences that impacted on Swedenborg in his early travels and studies and say something about how these may have affected his outlook and attitude to life.

2. Discuss how he wished to apply his studies in a way that could improve the economic, intellectual or political situation of Sweden.

3. Take some time to reflect on your own life journey and respond to **one** of the following…

Either

a) Write out a brief outline highlighting 3 or 4 aspects of experience and learning you have had in your life and comment on how they have ended up being of use in unexpected ways "down the track"?

Or

b) Write about how you see the hand of providence in your life journey thus far, what has led you to this course for example – where might it lead in the future?

Background and Beginning

IN ONE OF HIS MYTHS Plato tells of people on their way to being born

into the earth -life. They pass
swiftly along a dim corridor which ends in a room bill of lights. Each passing soul takes a taper to guide it in the dim country of this world. But some souls are detained longer than others in the room of light; they grasp a handful of tapers and weave them into a torch. They are the light-bringers and the way-showers of humanity. This is as good an explanation of genius as any, for outstanding greatness is always a mystery.

It has been humorously said that when Emanuel Swedenborg was born his father gazed up at the stars and said, "We shall call him Emanuel," which means God-is-with-us, while his mother looked at the scales to see how much the baby weighed. This is one way of telling us that the scientific mind and the spiritual mind met in him, mingled, and were finally fused by the insight of profound inner

experience. His mother's side of the family had long been prominent in the mining industry. His father was a devout clergyman of intelligence and zeal. Into such a household, marked by the harmonious blending of the secular and the sacred, Emanuel Swedenborg (or more properly at this time, Swedberg) was born on the twenty-ninth of January, 1688, in the city of Stockholm. We know very little about his mother, as she died when Emanuel was eight years old. But certainly, her quiet and practical spirit was influential in molding his character.

Fortunately we have a very good picture of his father, who in significant ways foreshadows the son. It would be difficult indeed to understand the issues which Emanuel faced if we knew nothing of this forceful figure.

Jesper Swedberg (the family name until it was changed to Swedenborg in 1719, when the family was ennobled) was ordained and made Court Chaplain in 1682, became a professor at Uppsala University in 1692 and Bishop of Skara in 1702, which office he held for thirty-five years. He was always close to the throne, enjoying royal favor and the intimate friendship of his sovereigns. He was by all reports an upright and pious man, an indefatigable worker and an enthusiastic reformer. His exemplary conduct and untiring zeal made him conspicuous among his less earnest and less dedicated brethren. "If he had lived a few hundred years earlier," wrote one of his contemporaries, "he might have increased the number of Swedish saints. . . . His learning, industry, exemplary life, good intentions and zeal for God's glory deserve to be venerated even more by an enlightened century." He was active in the cause of education, whether as army chaplain (where he offered a bonus to every soldier who learned to read), or later as professor of theology and rector of Uppsala University. He worked to reform the teaching in the public schools, composing and editing many textbooks, and in every way possible promoted the advance-ment of learning.

Although Sweden was a Protestant country, the study of the Bible was given a low priority. Bibles were in fact expensive: privileged publishers set luxury prices for them. Swedberg attempted to remedy this by provid-ing an inexpensive edition. Although he obtained official permission and expended a considerable amount of money himself, vested interests were so strong that the project failed. His efforts to revise the Swedish transla-tion of the Bible likewise came to naught, while his attempt to improve the Swedish hymn and psalm book brought upon him a charge of heresy which led to the suppression of the work. In every direction he seems to have been thwarted by the jealously, apathy, and stolid conservatism of those who should have been his supporters. Nevertheless he persevered in these laudable efforts to the end of his long life.

The bishop's religion was of a most practical nature. In the Lutheran Church of the times, as in other Protestant bodies, "faith" (in the sense of assent to creedal formulations) had been elevated to such preeminence that good works were disparaged, and morality suffered as a consequence. He held that true faith could not be separated from a life of service and active usefulness. He complained that "many contented themselves with the first and second paragraphs of the Great Faith but that they would have nothing to do with the third paragraph, with Sanctification and a Holy Life." "Faith of the head" and "devil's faith" to him were synonymous. He was a fearless preacher, denouncing the shortcomings of those in high places as well as the sins of the humbler. He was especially severe against the neglect of religious duties by the former, and against their scandalous abuse in granting church patronage.

His spirit of ecumenicity was remarkable considering the age in which he lived. He was ready to see what was good in all churches. During a visit to England he eagerly discussed the question of Christian unity with the bishop of Oxford. In Roman Catholic countries he admired the care given to the poor, and the devotion of high-born persons to the sick and destitute. He complimented the earnestness of the Pietists, although hr did not agree with all their tenets and practices. The bishop was described by Counselor Sandels as "a man full of zeal but without bigotry."

It is not surprising that to such an earnest and devout man as the bishop the spiritual world should have seemed very real and near. He had an unwavering faith in the presence of angels and in their function as "ministering spirits." He lived in the company of his "guardian angel," with whom he declared he was able to speak at times. He believed that he had had spiritual experiences on several different occasions, and seems to have possessed a gift of psychic healing. Jesper Swedberg tells us that not long after his ordination he and the rest of the villagers heard loud voices singing in the church one evening. This convinced him of the presence of angelic visitors, and caused him to feel more strongly than ever the sacredness of his calling. All of this has a bearing on the still more extraordinary experiences of his son.

Strangely little is known about Emanuel Swedenborg's childhood. We know the date of his birth, and we know that he was the third child and second son. For further information, we are largely dependent on a letter he wrote to a friend, Dr. Beyer of Gothenburg, relatively late in his life. In this he says:

> From my fourth to my tenth year I was constantly engaged in thought about God, salvation and the spiritual life. Several times I resealed things at which my father and mother wondered, saying that angels must be speaking through me. From my sixth to my twelfth year I used to delight In talking with clergymen about faith, saying that the life of faith is love, and that the love which imparts that life is love to the neighbor; also that God gives faith to everyone, but that those only receive it who practice that love. I knew, no other at that time than that God is the creator and preserver of nature, and that he imparts understanding and a good disposition to us.... I knew nothing at that time of that termed faith which teaches that God the Father imputes the righteousness of his Son to whomsoever and at such times as he chooses, even to those who have not repented and have not reformed their lives. And had I heard of such a faith it would have been then, as it is now, above my comprehen-sion.

Since direct information is lacking, we may fill in some of the blanks by inference from what we know about the family. At the time of his birth, Emanuel's father was the court chaplain in Stockholm. The first three or four years of his childhood were spent here. Doubtless, he carried away impressions of the busy city—its lofty buildings, its rushing flood of deep green waters coming down from Lake Malaren, its shipping, its military displays, and the coming and going of royalty and nobility in their summer carriages and winter sleighs. Then, by contrast, the family moved to a quiet rural home at Vingåker, where his father served for a year as dean and pastor. Here he reveled, as all children do, in the flowery fields and delightful farmyard, being "adopted" by the good people of the parish, who were overwhelmingly kind to his father.

The next ten years were passed in Uppsala, the family residing in the cathedral square. Here is where his formal education began. His tutor was Johannes Moraeus, a cousin on his mother's side.

We hear little about his studies. Counselor Sandels speaks of "the thoughtful care which was bestowed on his education," and that he speaks the truth we cannot doubt, knowing what we do of his father's dedication to learning.

Uppsala, where the free, happy days of his boyhood were passed, was at that time a city of some five thousand with a cathedral which was reckoned the finest Gothic building in northern Europe. Within its walls many monarchs had been crowned and here many were buried. We can picture the boy Swedenborg wandering through the aisles and meditating on vanished greatness, or listening with other members of the family to the daily service in which is father often took part. This service was not so cold and lifeless as Protestant services generally were at this period, for the Swedish Lutheran Church retained many of the beautiful and impressive features of the Catholic liturgy. A portrait of Dean Swedberg shows him sitting at a table with a Bible in his hands, opened at a doubtless favorite text, I Corinthians 16:22.

We can imagine the interest with which young Emanuel watched the building of his father's large new stone house in the square, and the impression made upon his youthful mind by the terrible fire which, shortly after it was finished, destroyed not only the new house but many other buildings, including the grand cathedral itself.

An account of the building of the house given in the Swedish Biographiskt Lexicon throws a very pleasing light on Swedenborg's father. The writer says, "It is interesting to hear him speak about the building of his new house, saying . . . 'I know and can testify, for I was always present, that not the least work was done, that not a stone was raised, with sighs or a troubled mind, but all was done cheerfully and gladly. No complaint, no hard or disagreeable word was heard; there were no scoldings and no curses were uttered.' “When the house was finished in the autumn of 1698, Jesper Swedberg dedicated it by inviting all the poor of the town to dinner. The family waited upon them, and this feast of charity was concluded with singing, prayer, thanksgiving, and mutual blessing. We can assume that young Emanuel, who was then ten years old, took part in this lovely celebration.

Another event that must have left its mark was the death of his mother in 1696. This sad event was followed by the loss of his older brother a few weeks later. Of the remaining children, seven besides himself, his sister Anna (sixteen months his senior) was his favorite. At seventeen she married Dr. Erik Benzelius, librarian of the University of Uppsala, but she remained close to her fond brother. He had entered the college himself in 1699, and lived with Anna and Erik from 1703, when his father moved to Skara, until he completed his studies in 1709.

Those were thrilling times to be alive, particularly for a talented young man. The renaissance, late in reaching Sweden, was stirring the University with its fresh spirit, sweeping out the old and ushering in the new. It has been likened to opening a window in a long stagnant room, letting in the refreshing breezes. Scholars no longer pored over dusty tomes to learn what the ancients, such as the indisputable Aristotle, had laid down as to the nature of things, not to be challenged by findings to the contrary. Now they were bent over microscopes and were gazing into telescopes to discover the secrets of nature for themselves. Those were heady times, in which nothing seemed impossible. We can easily imagine how Swedenborg eagerly soaked up this atmosphere and thrilled to the spirit of the new.

But we do not hear anything of this from young Swedenborg himself: doubtless he was too absorbed with the new learning to write about it. We do, however, learn of another side of him which augurs potently for the future. Counselor Sandels says that he made "the best use of advantages enjoyed by comparatively few," and describes the disputation which he published on leaving his alma mater as "a clever work for a youth." After leaving the university he published some of his Latin verses which mani-fested, says Sandels, "a remarkable readiness of wit, and showed that he had made good use of his time." He continued to exercise this talent for some years, and was looked upon in his family circle as something of a poet.

His university education behind him, young Swedenborg rejoined his father, who had been made bishop of Skara, in Brunsbo, the Episcopal residence near Skara. He began to make plans for an extended foreign tour which was the custom upon graduation, and which would expose him to the more advanced centers of learning in England and on the Continent. This was not to be a "Wanderjahr," an occasion for casual sightseeing, but a work year. Under the date of July 13, 1709, he wrote to his brother-in- law Erik Benzelius, asking his help in carrying out his plans. He also desired his recommendation to some English university where he might improve himself in mathematics, physics and natural history. He told him that he was preparing a summary of the principal discoveries in mathemat-ics, to which he would add anything new that he might discover in his travels.

In this same letter he tells his brother-in-law that he has acquired the art of bookbinding from a man who had been working for his father. This evidences a characteristic interest which could be followed throughout his life, a fascination with craftsmanship. Wherever he went in his later travels, he used every opportunity to gain a working knowledge of useful trades. For instance, writing from London in 1711 he says, "I turn my lodgings to some use, and change them often. At first I was with a watchmaker, afterwards with a cabinetmaker, and now I am with a maker of mathemat-ical instruments; from them I pick up their trades which some day will be of use to me." He learned to make brass instruments and to grind lenses so that he might furnish himself with equipment which he could not afford to buy. Benzelius had commissioned him to buy some globes in England for the university library. These proved too expensive to send safely, so he was instructed to obtain the printed sheets which could afterwards be mounted in Sweden. The makers, however, refused to supply these, so Swedenborg learned the art of engraving and produced the sheets himself.

It was a full year after he had asked Benzelius for help that he was able to begin his travels, a year of disappointments and impatient waiting. As he wrote to Benzelius, "I have little desire to remain here much longer for I am wasting almost my whole time. Still, I have made such progress in music that I have several times been able to take the place of our organist. But for all my other studies this place affords me very little opportunity, and they are not at all appreciated by those who ought to encourage me in them."

Some relief was found in a short visit to the great Swedish engineer and inventor, Christopher Polhammer (also spelled Polhem or Polhammar). With him the young man was in his element. He writes to his brother-in-law,

> "We were pleased and satisfied with one another, especially when I found him able to assist me in the mechanical experi-ments I have in hand I value more highly a quick and intelligent

> person with whom I can enjoy the discussions of subjects on which I possess some little knowledge than I do a few weeks' board and lodging."

The autumn of 1710 finds Emanuel Swedenborg finally in London, and his occasional letters to Benzelius give us brief but revealing accounts of his activities during the next five years. His journey had not been without perils, his life being in danger four different times. The ship in which he sailed was nearly wrecked; then they were boarded by pirates; then they were fired on by a British warship, being mistaken for those same pirates; and finally, having arrived safely in the Thames, he narrowly escaped hanging for breaking the quarantine regulations set up because of the existence of the plague in Sweden.

His first letter reveals not only his "immoderate desire" for study but also the range of his interests.

> I study Newton daily and am very anxious to meet him. I have provided myself with a small stock of books for studying mathematics, and also with a number of instruments which are both a help and an ornament in the study of science; an astronomical tube, quadrants of various kinds, prisms, microscopes, artificial scales and a camera obscura. This latter I admire, and you will too. I hope that after settling my accounts I will have sufficient money left to buy an air pump.

It does not appear that his desire to meet Newton was ever fulfilled, but he made the acquaintance of many notables, including Flamsteed, Halley, and Woodward, who introduced him to various members of the Royal Society and to other scientists.

Among the items of information contained in this letter, dated October 13, 1710, he notes that the magnificent St. Paul's Cathedral was finished a few days ago in all its parts. But he was more impressed by Westminster. He writes, "I happened to see the tomb of Casaubon, when I was inspired with such a love for this literary hero that I kissed his tomb and dedicated to his manes under the marble some Latin verses." But mathematics and astronomy seem to have absorbed most of his interest. "I daily visit the best mathematicians here in town." He also speaks enthusi-astically about his growing knowledge and hopes of attainment.

> I have made such progress in astronomy as to have discovered much which I think will be useful in its study. Although in the beginning it made my brain ache, long speculations are no longer difficult for me. I have examined closely all schemes for finding the terrestrial longitude, but could not find a single one. I have therefore originated a method by means of the moon which is unerring, and I am certain that it is the best that has yet been advanced. In a short time I will inform the Royal Society that I have a proposition to make on this subject, stating my points. If it is favorably received I shall publish it here; If not, in France. I have also discovered many new methods for observing the planets, the moon and the stars. I will publish those concerning the moon and its parallaxes, diameter, and inequality whenever an opportunity arises. I am now busy working my way through algebra and the higher geometry, and I intend to make such progress as to be able in time to continue Polhammer's discoveries.

Swedenborg's scientific and literary friends in Sweden often availed themselves of his assistance while he was abroad. At one time it was to buy some scarce books for the university's library; at

another, to purchase scientific instruments, or to find out the most approved way of using these. The Literary Society of Uppsala also gave him a number of commissions. He good-naturedly fulfilled these requests and added suggestions of his own. He advised the purchasing of the Philosophical Transactions of the Royal Society, Harris' Lexicon of the Sciences and Arts, several of Newton's works and other books. He mentions the publication of Grabe's Septuagint and one or two books on theology, but this is almost the only indication that he took any interest in religion at this time. As a relief from his more demanding studies, he continued to write poetry, noting English models. He mentions as eminent poets, well worth reading for the sake of their imagination alone, Dryden, Spenser, Waller, Milton, Cowley, Beaumont and Fletcher, Shakespeare, Ben Johnson, Oldham and Benham. For a foreigner he had gained a considerable acquaintance with English literature.

Swedenborg spent nearly two years in London and Oxford, losing no opportunity to acquire knowledge. His travels and studies must have involved appreciable expense, for which his father seems to have been slow to provide; in fact the latter was spending all available money on his own projects. From time to time Emanuel raises a mild protest. He writes to Benzelius in August of 1712:

> I have longed to see the Bodleian Library but I ant kept back here by "want of money." I wonder that my father does not show greater care of me than to let me live now for more that sixteen months on 250 rixdalers, well knowing that I promised in a letter not to embarrass him by drawing on credit; and yet no money has been forthcoming for the last three or four months. It is hard to live without food or drink like the wench of Skåne. Your great kindness and favor, of which I have had so many proofs, make me believe that your advice and your letters will induce my father to be so favorable towards me as to send on the funds which are so necessary for a young man, and which will infuse into me new spirit for the prosecution of my studies. Believe me, I desire and strive to be an honor to my father's house and yours, much more strongly than you yourself can wish and endeavor.

From England he went to Holland, but unfortunately his few letters from there are missing. All that we hear of his stay in that country is from a letter from Paris in August of 1713.

> During my stay in Holland I was most of the time in Utrecht where the Diet met and where I was in great favor with Ambassador Palmqvist, who had one every day at his house; I also had daily discussions with him on algebra. He is a good mathematician and a great algebraist. He did not want me to go away and therefore I intend to return to Leyden next year. They have a splendid observatory and the finest quadrant I have ever seen, costing 2,000 guilders. They are continually making new observations. I will ask permission from the university to take observa-tions there for two or three months.

Of his stay in Paris we have also only a very meager record. There he met De la Hire, Varrignon, and the Abbe Bignon, a member of the French Academy and royal librarian, besides other notables. He observes,

Between the mathematicians here and the English there is great rivalry and jealously. Halley, of Oxford, told me that he was the first to examine the variation of the pendulum at the equator, but

they keep silence about that here. The astronomers here also maintain that Cassini's paper was written before Halley made his expedition to St. Helena, and so forth.

After having spent nearly a year in France, he went to Hamburg and from there into Pomerania, then a Swedish province on the northern coast of the Continent. We hear from his next letter that he is in Rostock; from there he sends his brother-in-law a long list of inventions whose designs he has either completed or projected. The first of these was for a certain ship which was to go under the surface of the sea wherever it chose and do great damage to an enemy's fleet. Another was a device for raising ships by means of sluices where there was no fall of water. Yet another was for setting mill wheels in motion where there was likewise no falling water available—the wheel would revolve by means of fire which would put the water in motion. A magazine air gun, discharging sixty or seventy shots without reloading, and a flying machine were further projects of his active mind.

He was to return to the plan of a flying machine later. Almost two centuries later, it would be recognized as "the first rational design for an aircraft," but at the time Polhammer responded negatively, expressing his opinion that "with respect to flying by artificial means there is perhaps the same difficulty as in making a perpetual motion machine or in producing gold from base metals." There is now a model of Swedenborg's design in the Early Flight Room of the Smithsonian Aerospace museum, and during the observance of the tricentennial of Swedenborg's birth, a larger model was on display in the museum of the Massachusetts Institute of Technol-ogy.

Swedenborg regarded his method of finding longitude by the moon as the most important of his early discoveries. Though it was not taken up sympathetically by his contemporaries, he always insisted that it was the easiest and in fact the only right one. His confidence in it was so great that he published it in pamphlet form several times between 1718 and 1766. It was very favorably reviewed in the Acta Literaria Sueciae for 1720, the editor stating that it was superior to all other solutions of the problem hitherto proposed. The Acta Eruditorum for 1792, published in Leipzig, also spoke highly of this little work.

In a letter from Rostock he expresses a great desire to return home to Sweden, but he remained in Pomerania for another nine months. It is hard to say what kept him there unless it was the presence of the king at nearby Stralsund and a hope that he might attract the favorable attention of the court. It was presumably to further such hopes that he composed a highly literate Latin celebration of the king's escape from captivity in Turkey and dramatic return to his own land.

But in fact, his first trip abroad was drawing to a close. What finally put an end to it was the arrival before Stralsund of troops hostile to Sweden. Swedenborg had no wish to be caught in the fighting. He tells us, "When the siege was about to begin I succeeded, under Divine Providence, in obtaining passage home."

CHAPTER 2

Seeking a Career

SWEDENBORG RETURNED TO SWEDEN full of ideas and ambition, eager to put his knowledge and talents to work. He was confident that he would not have to wait long. But the Sweden he returned to was bankrupt and bled white by Charles XII's wars of conquest. Its industries were in shambles. Everywhere he turned he met with lethargy, conservatism, indifference and lack of funds. It was not a propitious time to come home.

His first effort was toward the setting up of an observatory, as there was none in Sweden. He wrote to his brother-in-law, Benzelius, on August 9, 1715:

> The day after tomorrow I will go to Mt. Kinnchulle to select a site for a small observatory where I intend toward winter to make observations about our horizon, and to lay a foundation for those calculations by which my method of finding longitude may be confirmed.

Learning that Benzelius was trying to get an astronomical observatory built at Uppsala and was meeting with nothing but opposition, he aban-doned his own project and gave his brother-in-law his warm support, writing:

> I wonder at your friends, the mathematicians, who have lost all energy and desire to follow up such a clever plan which you suggested to them about building an observatory. It is a fatal flaw of mathematicians that they remain mostly in theory. I have thought that it would be a profitable thing if to every ten mathematicians there were assigned one thoroughly practical man by whom the others could be led to market. In that case this one man would gain more renown and be of more use than all the ten together.

He visited the Board of Mines and observed that its models "are going to ruin as time advances. After six or ten years they will be good for only firewood, unless I choose to reverse that fate by means of a little brass, a little ink and some paper." Ten years later, when he shared the responsi-bility for the property of the board, he obtained an appropriation for the repair of these models, showing that this was not just a peevish criticism by one who found his talents unappreciated.

Having traveled at length in the more technologically advanced coun-tries of Europe, he was more impressed than ever by the backwardness of his own, and was all the more determined to devote himself to bringing Sweden up to date. He had two suggestions of how to begin to do this. One was forming a "Society for Learning and Science," a kind of Swedish Royal Society, and the other was establishing a Chair of Mechanics at the University of Uppsala. He hammered away at this latter idea for years, but without success.

While waiting for a position to turn up in the job market, he started a scientific and technical journal with the title Daedalus Hyperboreus, "The Northern Daedalus." This dealt not merely with scientific theory, but contained practical ideas and suggestions for industry. On the advice of Benzelius he

dedicated it to King Charles XII, who professed much interest in the project. First, however, the means of publishing it had to be found, and he appealed to his brother-in-law to intercede with his father for assistance. He was always reluctant to approach the latter for money and, as he was now twenty-eight, the bishop might well think that it was time he fended for himself. He wrote to Benzelius:

> A single word from you to my father will be worth more than twenty thousand remonstrances from me. You can without comment inform him of my project, and of my zeal in my studies; and that he need not imagine that in the future I shall waste my time and his money. One word from another is worth more than a thousand from me. He knows very well that you have the kindness to interest yourself in my behalf, but he knows also that I am still more interested in my own behalf. For this reason he will distrust me more than you, my dear brother.

Swedenborg's father was using his influence with the king and court to find employment for his son. But King Charles was too busy with other matters, and it was not until the end of 1716 that Swedenborg was appointed "Extraordinary Assessor" (that is, an extra member) of the Board of Mines, the department of state responsible for supervising the mining industries of Sweden. This position entailed far more than attend-ing a directors' meeting once a month around a table. The Board ruled in mining disputes, kept abreast of developments in metallurgy, suggested more efficient methods of mining and processing ore, conducted safety checks of mines and appointed inspectors—all of which was in line with Swedenborg's interests. His fitness for this post was attested to by Polhem in a letter to Benzelius dated December 10, 1715. "I find," the famous inventor wrote, "that young Swedenborg is a ready mathematician, and possesses much aptitude for the mechanical sciences. If he continues as he has begun, he will in course of time be able to be a greater use to the king and to his country in this than in anything else."

It seems that the king offered Swedenborg three positions to choose from before he was finally assigned to the Board of Mines. Although no salary was attached to the post until he attained membership (and this was delayed, since the board resisted this irregular appointment), he was to find the work congenial. Two years later he refused the offer of a professor-ship of astronomy at Uppsala University. In a letter to Benzelius he gave the following reasons:

> 1. I already have an honorable post.
>
> 2. In this post I can be of use to my country, and indeed of more practical use than in any other.
>
> 3. I thus decline an appointment which does not agree with my tastes and turn of mind, by both of which I am led to mechanics and will be in the future to chemistry. Our Board is noted for having members who know little on these subjects. For this reason I will try to supply this deficiency, and I hope that my work in this direction will be as profitable to them as their own may be in another.

There were also ulterior reasons which we leans about from a later letter to his brother-in-law.

> I hope I shall be able to be as useful in the post which has been entrusted to me and also to secure to myself as many advantages. My present position is only a step to a higher one, while at Uppsala, I would have nothing more to expect; moreover I do not believe that the king would like me to give up my present position. With regard to the board, I will try most diligently to make myself at home in mechanics, physics and chemistry and, at all events, to lay a proper foundation for everything, when I hope no one will have any longer a desire to charge me with having entered the board as one entirely unworthy.

During the early part of his career at the Board of Mines he was detached at times for special services with his friend and patron Christo-pher Polhem. One of the most dramatic of these was connected with the siege of Frederikshald in 1718. Two galleys, five large boats and one sloop were transported overland from Strömstad to Iddefjord, a distance of fourteen English miles, under Swedenborg's direction. Other projects were the construction of the great dock at Karlskrona and a plan for connecting the North Sea and the Baltic by canal. This latter undertaking, however, was never completed, the king's death ending the funding.

The relationship of Swedenborg and Polhem was a very friendly one, so much so that the latter on the recommendation of the king promised his eldest daughter in marriage. It is not clear that they were formally engaged, and in the end she married someone else. There was a younger sister, however, to whom the young man was strongly attracted and who was in due course engaged to him. The girl, it seems, had not been consulted, or at any rate the match was arranged for her, and was not to her liking. Discovering this, he renounced his claim; and while we have no direct word from him on his feelings, there are indications that this was a painful decision. In a letter to Benzelius, Polhem speaks of the interruption of his correspondence with his protégé, and mentions the fact that three of his letters had been returned to him unopened. "I must beg of you," he says, "to offer Emanuel my greeting, and also to ask him to favor me with one of his welcomed letters, which are all the more acceptable in our house seeing as he has given us sufficient cause to love him as our own son."

Swedenborg's own correspondence took on a pessimistic cast. He wrote to Benzelius in October of 1718:

> Among all my brothers and relatives there is not one who has entertained a kind feeling towards me except you. In this I was confirmed by a letter which my brother wrote to my father about my journey abroad. If I can in any way show a due sense of gratitude I will always do so. Brother [in-law] Unge does not withhold his hands from anyone. At least he has estranged me from my dear father's and my dear mother's affection for the last four years; still this will not probably be to his advantage .

Even his scientific pursuits were giving him no satisfaction. He is discouraged "to find that his mathematical discoveries were considered as novelties which the country could not stand." He adds, "I wish I had some more of these novelties; yes, a novelty for every day in the year, so that the world might find pleasure in them. There are enough in one century who plod on in the old beaten track, while there are scarcely six or ten who are able to create novelties which are based on argument and reason."

Among the novelties which his lethargic countrymen were slow to adopt were his plans for the extensive manufacturing of salt in Sweden; a new slow combustion stove, a new method of discovering mineral veins, and a decimal system of coinage and measures. "Projects like these," he complains, "are left to starve in Sweden, where they are looked upon by a set of political blockheads as scholastic matters which must remain in the background, while their own supposed refined ideas and intrigues occupy the foreground." In another letter he writes:

> It seems to me there is little reward for the pains taken in advancing the cause of science, partly on account of the lack of funds which prevents our going as far as we ought, and partly also on account of jealousy which is excited against those who busy themselves more than others with a given subject. Whenever a country leans towards barbarism it is vain for one or two persons to try to keep it upright.

In sending Benzelius his treatise on the decimal system on December 1, 1719, he renews his complaint of neglect and lack of appreciation.

> This is the last that I will publish myself because I have already worked myself poor. I have been singing long enough; let us see whether anyone will come forward and hand me some bread in return. For he is nothing short of a fool who is independent and at liberty to do as he pleases, and who sees an opportunity for himself abroad, and yet remains at home in darkness and cold, where the Furies, Envy and Pluto have taken up their abode, and assign the rewards, and where labors such as I have per-formed are rewarded with misery. The only thing I would desire until that time is to find a sequestered place where I can live secluded from the world. I think I may find such a corner in the end, either at Starbo or at Skin(Skatte)berg.

If it was honor he sought, he might have been satisfied with the distinguished favor shown him by Sweden's famous king, Charles XII. Through Polhem, he had gained frequent and intimate contact with his majesty, who condescended to read his Daedalus, to discuss mathematics with him and to accept his personal assistance in various ways. Swedenborg wrote from Wenerborg on September 14, 1718:

> Every day I had some mathematical matters for his majesty, who deigned to be pleased with all of them. When the eclipse took place, I went out with him to see it, and talked much to him about it. This, however, is a mere beginning. I hope in time to be able to do something in this quarter for the advancement of science, but I do not wish to bring anything forward now except what is of immediate use. His majesty found considerable fault with me for not having continued my Daedalus [which ceased with the sixth number], but I pleaded lack of means, which he does not like to hear. I expect some assistance for it very soon.

These fond hopes were never realized. The king was busy with warlike undertakings, which were brought to a sudden end by his death at the siege of Frederikshald the following November.

Despite the loss of his royal patron, the failure of his hopes for marriage, his estrangement from his family and his sense of being sur-rounded by indifference, he did not go abroad to live. He left Sweden in the summer of 1721 not to stay, but on an extensive foreign tour for the purpose of researching mining and manufacturing, to strengthen his credentials for service on the Board of

Mines. His original plan was to visit Holland, England, France, Italy, Hungary and Germany, but the tour was mainly confined to Holland and Germany. He visited all the mines in Saxony and the Harm mountains, and was entertained in a princely manner by Duke Ludwig Rudolf von Brunswick-Luneburg. The Duke not only paid all his expenses but presented him on parting with a gold medal and a large silver coffee pot, besides bestowing on him other marks of favor.

At Amsterdam he published several scientific and speculative works: Prodromus Principiorum Rerun Naturalium, a treatise on chemistry and physics; Nova Observata et Inventa circa Ferrum et Ignem, new observations on iron and fire; and a second edition of his New Method of Finding the Longitude. At Leipzig, Miscellaneous Observations on Geology and Mineralogy was seen through the press. It is indicative of the backward state of things in Sweden that he found it necessary to publish most of his books abroad. This was partly on account of expense, partly that they might be better printed and partly to escape the criticism of the press censor whose views were apt to be narrow. When he published his Rules of Algebra (the first in the Swedish language) he questioned his brother as to whether there was anyone in Uppsala who knew enough of the subject to read his proofs for him.

In July, 1719, Swedenborg was home again; full of new projects for furthering the material prosperity of his native land—projects to be met as before with scanty encouragement and not a little opposition from self- interested parties, easygoing conservatives and jealous officials. Among the latter was Urban Hjärne, vice-president of the Board of Mines, who had an old quarrel with Swedenborg's father and made his son uncomfortable at times as a consequence.

As a result of his investigations abroad, Swedenborg laid before the board, and also before King Frederic, proposals for increasing the yield of copper, for improvements in the manufacture of steel and for giving encouragement to the production of iron "the interest of copper being protected at the expense of the iron interest." On these, as on other such matters, he held broad and liberal views, as witness his opinion about trade secrets. Referring to the difficulty he sometimes had in gathering information abroad, he wrote, "According to my simple notions, there ought to be no secrets at all in metallurgy, for without such knowledge it is impossible for anyone to investigate nature."

On July 15, 1724, Swedenborg, being then thirty-six years old, was appointed a regular member of the Board of Mines with a yearly salary of 800 silver dalers. It was not until 1739 that he received the full salary of 1200 dalers. He was, indeed, poorly paid for his unique services. From the records of the board he appears to have been assiduous in his duties, and the value of his work was recognized on several occasions by his colleagues. But he occupied himself with a great deal more than his official duties. He was constantly gathering material for further publications, and by the beginning of 1733 he had the manuscripts of several important scientific and philosophical works ready for the press. He petitioned for nine months' leave of absence so that he might get them printed at Dresden and Leipzig. The leave was granted by royal decree.

The books in question were his philosophical and mineralogical works, three heavy folio volumes with numerous copper plates, and The Infinite and the Final Cause of Creation. The expense of publishing the former, which must have been very great, was borne by his former patron, the Duke of Brunswick-Lüneburg. The work was very favorably received and portions of the second part, dealing with the production of iron and steel, were reprinted separately and translated into French. The publication of these works won for Swedenborg a European reputation and brought him into

correspondence with some of the leading scientists and philoso-phers of the day. The Academy of Sciences of St. Petersburg invited him to become a corresponding member in 1734, and he was one of the first elected members of the Royal Academy of Sciences in his own country.

Swedenborg has left us a somewhat detailed account of his travels at this time, a matter-of-fact document presenting many points of interest. It proves the truth of what Counselor Sandels said, that "nothing ever escaped him that merited the attention of a traveler." "It would be prolix," Swedenborg noted, "to mention all the learned men I visited and with whom I became acquainted during these journeys, since I never missed an opportunity of doing so." His observation ranged from such important matters as the fortifications of a town to the method of constructing fences in Schonen. Wherever he went he visited the libraries, museums, picture galleries, churches, monasteries, asylums, theaters and especially factories. He made comments on mining and blast furnaces; vitriol, arsenic and sulphur works; naval architecture; copper and tin production; paper mills; plate glass and mirrors; as well as on anatomy, astronomy, magnetism, hydrostatics, literature and the social conditions of the people among whom he found himself

His experience under Charles XII had taught him how culture and science languish under a military regime. The condition of the Royal Library in Berlin, therefore, could have given him no surprise. "The books," he says, "are mostly old, not many being purchased at the present time, for no money is available for this purpose." He remarks that most of the books are old in the Ambrosian Library at Milan, in the Vatican and in the library of San Lorenzo, Florence, but without the same explanation. He was essentially a modern man whose stature was to look forward rather than backward, and so he took little interest in things from an antiquarian point of view. He was inspired by his newborn love of science and progress, and was eager to study all the latest developments. Hence he cared little for missals and breviaries and rare editions. The Ambrosian Library, he said, "is of little value as it contains only old books." He made one exception, however, in favor of Bible codices which he examined with interest.

In matters of religion he was naturally observant. He visited churches, both Catholic and Protestant, orthodox and unorthodox, and conversed with monks and laymen about religious developments and movements. He frequently remarked on the impressiveness of the Catholic ritual, at the same time noting its sensuous nature. He was fully alive to the evils of forced religious sentiment. "The city of Copenhagen," he remarks, "is infected with pietism or Quakerism, and they are crazed enough to believe that it is well pleasing to God to do away with oneself and other, of which many instances are on record."

In many ways Swedenborg showed a broader and more open mind than his father. The latter looked with little favor on the stage, and complained to the king on one occasion that money was being paid to actors which might have been devoted to the restoration of his ruined cathedral. His son, on the other hand, continually visited the theaters and opera houses, and discussed the performances. He even goes into such details as to tell us that the best harlequins come from Bergamo. Still he was in no sense a hedonist. Wherever he went he had humanity in view and, in a sense, the theater was as much a proper object of study to him as the church.

In all his comments, we do not find the marks of a connoisseur of art. His remarks on painting and sculpture reveal an ignorance of the great artists and of the fundamental principles of art criticism.

This ignorance he shared with most of his contemporaries, or rather derived from them, for his judgment was chiefly formed by reading.

He was also a man of his time in that he showed little appreciation of natural scenery. He tells of the hidden wealth of the mountains but not of their outward beauty and majesty. He describes his journeys by sea and river, but never a word of the dancing waves and the ever changing light. He carefully notes the construction of the fence, but does not see the flowers of the field they enclose. He is struck by "an extraordinary fine illumination of fireworks" at Leghorn, but is oblivious to the rising and setting of the sun. His thoughts were engaged with the nature and origin of things rather than with their appearance. He was full of awe and reverence for the wonders of creation, but his aesthetic faculty was dormant or untrained. He was at this period essentially a man of science and practical affairs, though new faculties were rapidly developing within him.
