

Ábrahám KOVÁCS¹ 

Personal Knowledge and Faith of a Scientist *Providence, Gratefulness, Sense of Vocation Sickness and Medicine, Education and the Belief in God and Mathematics*

Abstract.

This study intends to probe into the Christian faith of a well-known Hungarian scientist, István Hatvani (1718–1786). It does not claim to look at all of his writings by scrutinizing all of his statements about how science and Christian faith encountered in his life. However, it seeks to analyse his autobiography with a view to understanding how his personal life story, a *lived Christian faith*, had informed and influenced the perception of his own pursuit of science by the time he began to teach at one of the most prestigious Protestant centres of knowledge in Central Europe, at the Debrecen Reformed College in Hungary. The “confession” and reflection, as will be seen, is really informative about the basis of his faith and intention. This research paper focuses on three aspects typical of Calvinism such as providence, gratefulness, a call for vocation, a mandate and arrives at the beautiful confession of a scientist about God the Sustainer and Provider of all living creatures.

Keywords: providence, gratefulness, vocation, faith and science, Hungary

¹ Professor, János Selye University, Department of Historical Theology, Slovakia; Research Fellow, University of Pretoria, Department of Systematic and Historical Theology, Faculty of Theology and Religion, South Africa; e-mail: kovacsab@uj.sk.



István Hatvani (1718–1786) was a well-known Hungarian scientist and theologian. He taught at one of the most prestigious Protestant centres of knowledge in Central Europe, at the Debrecen Reformed College in Hungary.² His autobiography can be seen as a “confession” and reflection. It is really informative about the basis of his faith and intention which will be analysed. The current study focuses on three aspects typical of Calvinism such as providence, gratefulness, a call for vocation, a mandate and leading to a beautiful confession of a scientist about God the Sustainer and Provider of all living creatures. It is believed that these are tangible traits of Calvinist faith that are discernible in Hatvani’s autobiography.³ It will be pointed out that these three characteristics are based on a typical Calvinist realisation of the interrelatedness of knowing the Self and knowing God. At the end, the study depicts a scientist whose Calvinist faith rested on those faith tenets, and these were greatly influenced by his life story and personal encounter with Providence. It will be pointed out how he opted for Newtonian ideas instead of Wolffianism with a special concept of God that was in line with that of his contemporaries he preferred to learn from.⁴ It is argued that this aspect requires further research in terms of understanding the faith of one of the most famous Hungarian scientists of the 18th century.⁵ First, however, it is worth spelling out some of the special features of his autobiography. It is argued that it is unusual to have an autobiography written in the middle of a professor’s career. Another exciting feature of the handwritten work is that, surprisingly, it is highly self-critical, which is a rare trait of such a piece of writing. Flowing from this, the third trait unfolds itself to the reader because the author exhibits a reflective, contemplative, and philosophical attitude that he aligns to the pro and contra of the story, an action or a motivation of his own self. Finally, the autobiography

² VARGA, Zsigmond (1936): Hatvani István a természettudós, mint hívő keresztyén. In: *Vasárnap* 23, 30. 248–249; 23, 31. 257; 23, 32. 265–266.

³ LÓSY-SCHMIDT, Ede (1931): *Hatvani István élete és művei (1718–1786). I. rész* [The Life and Works of István Hatvani (1718–1786). Part I]. Debrecen, Studium Könyvkiadó. The translation of all originally non-English quotations belongs to the author of the present article unless otherwise stated.

⁴ GAÁL, Botond (2012): *Teaching and Cultivating Natural Sciences in the Reformed College of Debrecen*. Debrecen, DRHE-HITEK. See also: HORKAY, László (2018): *A magyar nyelvű filozófia történet a XVII. század közepétől a XIX. század végéig*. Debrecen, TTREK.

⁵ HATVANI, István (1750): *Oratio inauguralis de matheseos utilitate*. In: *Museum Helveticum*. XVII. Turici, Literis Conradi Orellii et Soc. 531–556.

is a treasure since Hungary experienced the devastating powers of the Ottoman Turks and the Catholic Habsburgs, which destroyed much of the archival materials; and this was unfortunately followed in the twentieth century by the German Nazi and then the Russian Soviet occupation of the Hungarian lands.

1. The Autobiography. Its Origin, Language, and Length

Professor Hatvani was only 34 years old in 1752 when he wrote his autobiography, finishing it by 1757. As for the latter date, one reference confirms that it was about that time that Hatvani finished writing his autobiography. Having an overview of his works written by the time of the autobiography, the 10th item lists a book entitled *A fűűi és leányi iskolákban tanuló gyermekek számára irattatott rövid könyörgések a tanítókhöz és szülőkhez való intéssel*.⁶ The small piece of work was bound together into one book with the Heidelberg Catechism in Hungarian. It aimed at educating young boys and girls in prayer. The booklet was eventually printed by a certain Mr Imhof in Basel. “Mr. Imhof printed 3,000 copies on my behalf, of which 2,900 were sent to me on October 10, 1757, all of which reached me with care. Glory to God.”⁷ Thus, this latest insertion of the date indicates for the reader the approximate time of publishing.

What is remarkable is that Hatvani was still a young professor when he deemed it vital to write an autobiography. He reached a relatively advanced age. He was about 68 years old when he died. This shows us that about halfway through his life, Hatvani, as a scientist and theologian, exhibited a contemplative character since the style in which he wrote his autobiography seems to have been that of a *paraenesis*.⁸

1.1. The Genre of His Autobiography – Paraenesis

⁶ *Short Prayers for Pupils Studying in Boys' and Girls' Schools, with Exhortations to Teachers and Parents*

⁷ HATVANI, István (1757): *Autobiography (in Latin)*. Budapest, Magyar Tudományos Akadémia, Manuscript Archive, Ms 10.378/a. The Hungarian translation of István Hatvani's autobiography will be cited as Manuscript. 29.

⁸ MCDONALD, I. H. James (1980): *Kerygma and Didache: The Articulation and Structure of the Earliest Christian Message* (SNTSMS 37). London – New York – New Rochelle, Cambridge University. 247. See also: GAFFNEY, James (1983): On Parenesis and Fundamental Moral Theology. In: *The Journal of Religious Ethics*. 11, 1(Spring). 23–34; BECKER, H. Adam (2006): *Fear of God and the Beginning of Wisdom: The School of Nisibis and the Development of Scholastic Culture in Late Antique Mesopotamia*. Philadelphia, University of Pennsylvania Press.

We may be wondering whether the work sits in the tradition of the Early Church Fathers such as Clement of Alexandria who wrote his *Paedagogus*.⁹ In this great work, he made a distinction between *protrepsis* and *paraenesis*. The latter is defined as moral exhortation in which a person is advised to pursue or abstain from something that is reckoned good or evil. Although Hatvani never mentioned the word *paraneisis* in his autobiography, the genre of his opus clearly points in this direction, as will be demonstrated.

Scholars argue that other ancient authors, such as Pseudo Justin in his work *Paraenetic Address to the Greeks*¹⁰ as well as Magnus Felix Ennodius's writing entitled *Paraneisis didascalica*,¹¹ is written in the style of *protrepsis* rather than *paraenesis*. However, for our study, it is enough to state that Hatvani intended to warn, teach, and educate his future readers to cultivate a humble, God-fearing, grateful heart in which science and faith live in peace with one another in the life of a Christian scientist.

Havas László,¹² who studied a similar work attributed to the first king of Hungary, King Saint Stephen (975–1038), highlights that in the genre of *paraenesis* the emphasis is naturally on God the Father, whose divine order prescribes the strict separation of cardinal sins and good deeds. Havas remarks that this is tantamount to putting *pietas* and *iustitia* on a pedestal.¹³ Thus, it is a virtue of a Christian to seek godly piety and search for justice and truth in his life and in any forms of inquiry.

⁹ PÁSZTORI-KUPÁN, István (2009): *Követvén a szent atyákat. Az ógyház dogmatörténete 381-ig.* Kolozsvár, Napoca Star – PTI. 65–66.

¹⁰ THOMAS, B. (transl.) (1948): Pseudo-Justin, "Exhortation to the Greeks". In: Falls, Saint Justin Martyr: *The First Apology, The Second Apology, Dialogue with Trypho, Exhortation to the Greeks, Discourse to the Greeks, The Monarchy of the Rule of God.* Volume 6 of *The Fathers of the Church: A New Translation* (Patristic series) Catholics University of America.

¹¹ KENNEL, Stefanie A. H. (2000): *Magnus Felix Ennodius: A Gentleman of the Church.* Ann Arbor, University of Michigan Press; See also: "Ennodius, Magnus Felix". *Encyclopaedia Britannica*. Vol. 9 (11th ed.). Cambridge University Press. 649.

¹² HAVAS, László (2012): A szent istváni intelmek mint a teokratikus keresztény monarchia eszményének úttörő jelentőségű metaforikus műfaji megszólaltatása. In: *Irodalomtörténeti közlemények*. CXVI, 4. 363–379.

¹³ Ibid.

In line with this “compass” set by Havas, it is clearly visible that Hatvani’s chief aim was to persuade his readers to be self-reflective, critical about themselves and to learn from their mistakes. Therefore, self-knowledge was regarded as a vital, indispensable, and praised virtue of a Christian scholar. A task that he tried to exercise by revealing very personal issues from his life. His very first statements declare: “...I have laboured long and hard to know myself better. Some know many things: but they know not themselves. Most who know themselves, when they have resolved to record their life’s journey and to preserve it for posterity, are not ashamed to confess their errors and faults, and praise only those things which please others.”¹⁴ His paraenesis, as a genre fits into the biblical tradition, rather than that of classical antiquity, the atmosphere of Greek and Roman, that is, of Hellenistic civilisation. This could be attested from the following: “.... But, as I see it, the Holy Spirit did not record without some intention even the seemingly minor stumbles of otherwise holy men. At least in my judgment, those who faithfully record everything, act more correctly, so as to write not only to those who seem to be born to perform heroic deeds and are called solely to the practice of virtue but also to those who, after having experienced long wanderings, follow the most holy examples of virtue.”¹⁵ Relying on the Bible as an inspired source of knowledge, Hatvani tried to underline the fallible nature of human beings indirectly. The young professor articulates four pieces of advice to adhere to: “There may be things that you will imitate, but there will be more things that you will rightly criticize in us and avoid. However, it is wiser to learn [imitation]¹⁶ from the misfortunes of others than from our own. Use our example [observation] in your own affairs, but learn the examples [learning] of virtues not from here, but from the Holy Gospel! By the way, think about it [contemplation], that life is a fairy tale that we live in different persons!”

Imitation, observation, learning, and contemplative thinking are the major virtues that may lead any human being to true self-knowledge bearing the fruits of humility and to open-mindedness regarding religion (tolerance) and science (the usefulness of mathematics for Christian religion). Hatvani strongly believed that such a perception

¹⁴ HATVANI 1757, 1.

¹⁵ Ibid.

¹⁶ Own insertions.

enables a person to recognise God's providence in his or her life and urged them to be thankful to God by expressing gratitude for his salvific will revealed in their own life. This is in line with the core teaching of the Heidelberg Catechism, which laid a very important emphasis on the aspect of gratitude, the third large constituent part of the message of Opus.¹⁷

Clearly enough, Hatvani thinks it is essential not to paint a heroic picture – therefore, he is against hagiographies. However, he considers it important to speak plainly about the mistakes, wrongdoings, and of individuals who may become exemplary figures for the public in general. It is rather telling that the former statements are not *conclusions* per se but show a higher road to be learned from the Holy Scripture. Careful attention needs to be paid to the fact that he is not reciting the proverb from Janus Pannonius that “Happy is he who can learn wisdom at the expense of others.” or a general Hungarian proverb that “Wise men learn from other persons' mistakes.” as the core of his paraenesis.¹⁸ His Christian belief tells him to place the wisdom of the Scriptures in a highly elevated place. God's revealed word contains the virtues that persons may learn from. Before dropping the first lines of details about himself in his autobiography, there are two other quite interesting, very mature statements made by Hatvani. The concluding thoughts are articulated as follows: “By the way, think about it: life is a story that we live in different persons! Therefore, just as it is your job to judge others and their actions, at the end of the fairy tale, it is the inalienable right of others to judge you: will they, won't they, they will.”

The story – rather similar to the tale-like aspects of our lives which Hatvani experienced as an encounter with other often different persons in his life – throws light on the psychological aspect of one's life that all of us must be aware. Furthermore, he repeated one of the crucial problems of writing a narrative of the personal past, such as a memoir or diary, to avoid hagiographies of any people, especially great religious people, or professors, by exposing them to judgement requiring all aspects to be taken into account, including the ones that are not pleasant or beautifying. Hatvani strongly underlines a core

¹⁷ BARNES, Craig (2017): *Életre szóló: A Heidelbergi Káté újrafelfedezése*. Transl. by Balázs Ódor. Budapest, Kálvin Kiadó.

¹⁸ CSAPODI, Csaba (1981): *A Janus Pannonius-szöveghagyomány*. Budapest, Akadémiai Kiadó.

wisdom that our life story as a tale will be judged by the inalienable right of our fiercest critic. Therefore, the utmost scrutiny is exercised not by our followers but by our most harsh academic or personal “competitors”, if not enemies.

2. Knowing God through Self-knowledge

All of these cautions, guidance, and admonitions may cultivate a virtue that leads to the true self-knowledge that was vital for Calvin too. It is rather interesting that Hatvani did not make any allusion to either Calvin or any author from antiquity. Nevertheless, it is a virtue that Calvin also underlined, as did Hatvani. To see a remarkable similarity in the argumentation, it is enough to cite Calvin’s *Institutes*.

Our wisdom, in so far as it ought to be deemed true and solid Wisdom, consists almost entirely of two parts: the knowledge of God and of ourselves. But as these are connected together by many ties, it is not easy to determine which of the two precedes and gives birth to the other. For, in the first place, no man can survey himself without forthwith turning his thoughts towards the God in whom he lives and moves; because it is perfectly obvious, that the endowments which we possess cannot possibly be from ourselves; nay, that our very being is nothing else than subsistence in God alone. In the second place, those blessings which unceasingly distil to us from heaven, are like streams conducting us to the fountain.¹⁹

Upon the further studying of the text of Hatvani’s autobiography, it becomes possible to discern some of the main traits of Calvinism. These key aspects will show clearly the faith of a Christian scientist who uniquely combined his personal belief with the emerging modern scientific discoveries of maths, physics, medicine, chemistry, astronomy, and the like.

¹⁹ CALVIN, John (1559): *Institutes*. Chapter 1. The Knowledge of God and of Ourselves Mutually Connected. – Nature of the Connection. 1. The sum of true wisdom—viz. the knowledge of God and of ourselves. Effects of the latter. Available at: <https://www.ccel.org/ccel/calvin/institutes.iii.ii.html> (last accessed: 18.10.2024).

3. Providence

Hatvani adhered to the faith tenet that first and foremost all knowledge comes from God. Therefore, all that we gain, the “endowments,” that is, knowledge gained by learning, implanted in us by God, via parents, teachers, and experience, do not derive from themselves, but *all* point to God the Creator and Provider. “Although I was not given a weak spiritual talent by God, which my father had tested by showing me the basics of spelling before he sent me to school, yet the cruelty and excessive severity of the teachers, the frequent beatings, which most often took their toll on the head, meant that in a year and a half I barely learned to read both languages correctly.”²⁰

Here comes a very personal aspect of God for Hatvani, as it will be crystal clear that one of the main motives of this young man, who managed to get to the top of educated society, is to see God as *Providence*. *God is seen like a Father who takes special care of his child*, Hatvani. One of the most profound life experiences was when the young Hatvani fell into the well in his parents’ courtyard and was miraculously saved. He began this really interesting and exciting story with the following line: “However, there is something that very clearly shows the miraculous Providence of the Supreme Divine will in preserving my life.”²¹

3.1. God’s Saving Providence – Falling into a Sweep-Well

It is really edifying to learn from his personal story.

But behold, a wonderful thing and the most indubitable proof of divine providence! Right at the surface of the water, in a gap between two stones, was driven a hazelnut stake, which was part of the wooden ring from which buckets and barrels are usually made among us. Thus, when I fell headlong into the depths under my own weight, the very strong hand of God raised me back to the surface of the water and held out to me the stake from the wooden ring. I grabbed it with both hands, and my weak childish body and especially my life hung on it. Meanwhile, my feet were floundering in the water. Who would have thought that an eight-year-old boy in such a cruel situation, in such

²⁰ HATVANI 1757, 3.

²¹ Op. cit. 4.

great confusion and restlessness of soul, could look for something to hold on to! Who does not see that God himself, as it were, has pulled me out of the abyss with his hands and has placed the support of my life in my hands, and has lifted and strengthened my hands to grasp and hold it!²²

3.2. God's Gracious Providing Care. Escaping the Lure of a Malicious and Charming Woman

There is another story when the young Hatvani was exposed to the enchantment of a beautiful noble lady from Komárom. A trap was laid down for him, and he barely escaped the situation. Not spelling out the story which shows somewhat similar traits to that of the biblical story of Potiphar's wife, it suffices to say he concludes his personal story with the following sentence: "...But although that wicked woman seduced the young man into love, the Lord God delivered me from her net; and did not allow the matter to turn into the greatest trouble and sin. I rank this manifestation of His divine providence and grace as extraordinary among the graces."²³

3.3. A Manifestation of Divine Providence. Pest and Poverty as an Obstacle to Study for a Number of Years

Hatvani also mentioned God's providential act in his life when he was not able to enter the most prestigious Debrecen Reformed College in 1738 for his studies. Poverty and plague impeded him from enrolling for some years. The city of Debrecen saw its last but extremely serious loss of population due to plague during 1739–1742.²⁴ More than one third of the people fell victim to the deadly disease.²⁵

²² Ibid.

²³ Op. cit. 13.

²⁴ RÁNKI, György (ed.) (1981): *Debrecen története*. Vol. 2. Debrecen, Csokonai Kiadó. 34–36; SZ. KRISTÓF, Ildikó (1990): Pestis pestise: Járvány és lázadás Debrecenben 1739-40-ben. In: *Rubicon*. 6, 6. 20–23.

²⁵ KUN, Enikő (2003): „Mutogattya Isten haragját” – Adalékok az 1739-40-es debreceni pestis történetéhez (”God Is Showing His Rage” – Details of the History of the Plague of 1739/40 in Debrecen). In: *Hajdú-Bihar megyei Levéltár évkönyve*. XXIX. 69–84.

Divine providence showed itself in many ways during this difficult time. For in 1738 I was so poor that I had barely more than six Rhineland forints when I entered the college in Debrecen, although I would have had the opportunity to stay there, I lacked so much that I should have known how to provide for myself and at least have clothes made according to custom: these would have prevented it. This was also contributed by the fact that I could hardly have contributed anything from my historical and geographical knowledge even if I had been able to start over because of the plague, the Reverend Mr Maróthi should have broken this ice first in his classes at the college.²⁶

Hatvani saw God's special intervention as a proof of Providence in his life. He also highlighted that it was God's hand that kept him alive. Here Hatvani provides abundantly evidence of his Christian belief. Moreover, the young professor also finds it very important to express gratitude for those "saving acts" of God in his life. Therefore, he arrives at a very Calvinist attitude that is articulated in the Heidelberg Catechism, being grateful to God the Creator and Provider of all things. He finishes his story in this vein: "Of all whom the earth bears, I should be the most ungrateful if I were to forget this very great deliverance and divine protection, and not endeavour to render to my Redeemer the gratitude due to Him, while this weak little heart shall breathe, and this feeble hand shall move. That stake was scarcely half a foot long, perhaps an inch wide, and three lines thick."²⁷

4. Gratefulness

Although he was accepted in 1738, he was not able to start his studies: "After arriving in Debrecen before the feast of St Gregory and passing the public examination, my name was listed among the top candidates, and I was admitted to the ranks of the students on 23 April 1738. However, since there were absolutely no free places in the college, each of us, more than seventy of us, were given the opportunity to continue our studies wherever we liked during the year."²⁸

²⁶ HATVANI 1757, 5.

²⁷ Ibid.

²⁸ Op. cit. 13.

Debrecen saw a plague in 1739. A year later in Losonc, where he resided, another plague broke out. It was only in 1742 that Hatvani managed to return to Debrecen after 3 years. However, he was a diligent student and used the time for increasing his knowledge during these years. The disadvantage of not being able to commence his studies in Debrecen proved to be extremely fruitful. He attributed the good turnout of these events to God and thanked him for the opportunity to study at Losonc under Professor András Kármán. "I also learned universal history and geography well; in addition to moral philosophy, I studied logic, then ethics, and natural law, and I also studied theology diligently in the public lectures and private lessons of the Reverend András Kármán. However, it was my special good fortune that the venerable Mr Pál Rádai used to pay Reverend Mr Kármán 150 Rhineland forints to teach him moral philosophy and theology in private lessons. I also had access to these lessons."²⁹ Another providential act also helped his studies. He wrote about it as follows: "Another thing also contributed that helped me wonderfully. For when the vice-comes, Mr Gyürki, was in office, rarely a day passed without various court cases being discussed at the table; and my soul did not shrink from studying political law. When the respectable gentleman noticed this, he used to practise it with me whenever he had time."³⁰ Although he was not able to start his studies for a year, those years were used for his academic preparation very well. When contemplating that time period, he wrote in his autobiography, "Divine providence was manifested in many ways during this difficult time."³¹

5. Vocation – Sickness as a Motivation to Gain More Knowledge about Natural Sciences

Early in his autobiography, Hatvani lists several diseases that are typical childhood illnesses. However, at the time that he lived, these could have been fateful and, unlike today, even deadly. Therefore, it is no wonder that these life-threatening

²⁹ Op. cit. 14.

³⁰ Ibid.

³¹ Op. cit. 15.

diseases are mentioned as a profound experience that stayed in his memory as deeply engraved traumas. It is amazing how many serious diseases he survived. At the beginning of the work, he articulated his thoughts in this vein:

I had a severe attack of smallpox³² when I was barely two years old, and measles³³ first attacked me when I was about six, and then again when I was ten. In the latter case, this disease was accompanied by inflammation of the diaphragm.³⁴ I had three bouts of the three-day fever³⁵, if my memory serves me right, the last of which lasted more than sixteen weeks after I was twelve. My nasal passages were frequently filled with thick discharge, and my head was often covered with ulcers until I was almost twenty. There is, however, something that very clearly shows the wonderful providence of the supreme divine will in preserving my life.³⁶

Although he continued with the well story already mentioned, it is clear that his diseases made an indelible imprint on his soul.

I was staying in Losonc, when, in the dark without lighting, my father and I hurried to our overnight accommodation from a relative, I hit the lower part of my right leg so badly on a stake that the ulcerated wound, which had covered the middle of my leg for almost a year, flowed so profusely that it flooded my boots, and it was difficult to stop its flow. This ulcer broke out by itself when I was in the poetry class, and although it finally healed, it burst open again. But it only healed after a year and a half with the help of a surgeon.³⁷

His deep spirituality is revealed in an amusing manner when the young lad's natural physical desire is connected with sickness. It is quite interesting to see how he perceived as a Christian the nature of an event that happened while he was still in his "primary school" years in Losonc.

³² Variola.

³³ Morbilli.

³⁴ Phrenitis.

³⁵ Febris tertiana.

³⁶ Op. cit. 4.

³⁷ Op. cit. 7.

Once during this time, I was infected with scabies, which, no matter how they were driven away, soon returned. An ulcer on my leg was also cured by a surgeon, in whose house I had to stay until the wound healed. However, in this place, the misfortune happened to me that, in addition to my studies, I began to love something else. The surgeon had a pretty, unmarried daughter who was in the sales line, who tried to incite me to love with various tricks, which, however, only reached the point of impure kisses. It was then that I first began to experience the temptations of the world and the wiles of Satan. Lord, my God, you have seen fit to grant me these transgressions of my youth, among other things; and you do not remember the sins and transgressions of my childhood; but you remember mine, in addition to your suffering, for your goodness's sake (Ps. 25:7).

It is revealing how sickness and temptation are portrayed as interrelated issues. The typical Old Testament way of thinking made its way into the life of Hatvani. Such a view presupposed that sickness and sin are strongly interrelated. This is to what Jesus alluded with his question of curing the blind (John 9:1–7). However, it is not the various theological and religious interpretations which are of interest to us here as to whether sin and sickness are interrelated or not, but *how Hatvani himself* saw it. To him, the two were strongly interconnected.

An expression of divine will, predestining, guiding him towards one of his main professions, becoming a doctor, Hatvani continued in this manner:

But as soon as I returned to my studies after two months, the love of science and faith easily extinguished the false fire.³⁸ Thus, I was freed from the ulcer on my body, while my unfortunate soul, which had not yet experienced these foolish fires, was wounded. The treatment of my leg itself was so difficult that I was very afraid that my leg would have to be amputated. And when I was so tired of the torments, I came to the decision that unless the ulcer was healed, I would abandon my studies and finally work on a thorough study of wound healing. The goodness of God and His merciful spirit forgave the foolishness of my youth and covered the ulcer with a scar.³⁹

³⁸ The Latin adjective *spurious* may be a play on words with the noun *spurium*, which can also mean the female genitalia, and thus refer to the fire of sexual desire. Special thanks for the translator of the document from Latin.

³⁹ HATVANI 1757, 8.

Again, his gratitude for the healing, as well as God's saving act can be easily identified here. Moreover, he reveals the cause of his interest and why he made the decision to become a doctor.

This was further strengthened by the experience of his repeated suffering from scabies when he took up his studies in Kecskemét: "Meanwhile, scabies flared up again in my body, unfortunately, or rather fortunately, when I met a pious old woman who used to cure those who had fallen ill with this disease, so she surrounded me with such love that she provided me with abundant food and accommodation for an entire month." ⁴⁰

These kinds of personal experience strongly urged him to move beyond obtaining the usual theological doctorate abroad. Having studied at the primary school level in Losonc, in Kecskemét at the secondary school level – if one could state that comparing it to today's schooling system –, and finally completing his basic ("university") training at the Debrecen Reformed College (1741–1745), ⁴¹ Hatvani travelled to Basel, Switzerland, to receive further education (1746–1747).

Having received his master's degree in theology on 1 July 1747, he submitted his theological doctoral dissertation on the topic of religious philosophy, entitled *Animadversiones theologico-criticae*. ⁴² This industrious, diligent, and talented young man did not satisfy himself with theology. Owing to the diseases mentioned, he devoted himself to the study of medicine.

In November 1746, he also enrolled in the medical faculty of the university, where he had excellent teachers such as Emanuel König, who taught him medical botany, Daniel Bernoulli, who lectured on physiology and medical mechanics, and J. R. Zwinger, an expert in practical medicine. After 15 months of study, in March 1748, he presented his

⁴⁰ Op. cit. 10.

⁴¹ ZOVÁNYI, Jenő (1977): *Magyar protestáns egyháztörténeti lexikon*. Ed. by Sándor Ladányi. Budapest, MRE Zsinati Iroda. 243.

⁴² FEHÉR, Katalin (2002): *Hatvani István tanítványai*. Budapest: Országos Pedagógiai Könyvtár és Múzeum. 1.

already printed medical thesis entitled *De aestimatione morborum cum facie*, that is, knowing diseases from the expression of the face.⁴³

As a stern Calvinist, he felt the need to help his people as an act of gratefulness towards God and his immediate community, the city of Debrecen and the college. This also comes to the fore at the end of his inaugural speech:

But I, the venerable and venerable leaders of the Church, greatly appreciate the favour you have shown me, and the fact that you have considered my less than average studies so well and have deemed me worthy and suitable for the management of this field of science, as is fitting, and I thank you with the most solemn words, and I am constantly afraid that I will not meet your expectations. Almost from my earliest childhood, many years of work are needed to accomplish something worthy and worthy of a man in philosophy and mathematics and physics. However, the time that I have been able to devote to these noble sciences is very small. For I have set a different goal for my work, and you have set a different goal. Moreover, I hope that just as I have not applied other sciences and knowledge against the will of Minerva, so she will not want to appear inaccessible to me in these either. If this is so, neither you will ever be dissatisfied with your resolution, nor will I regret my attempts and labours. It is no small proof of your good will and love for me, the venerable, learned, and wise professors of all the faculties, that you have judged me not unworthy to be included in your ranks.⁴⁴

As a Christian, Hatvani felt it his obligation to set up medical care for students in various manners when he had the opportunity to do so as a professor at Debrecen Reformed College. Béla Tóth wrote that first “in the middle of the century, in 1752, at the initiative of István Hatvani, a separate fund (*cassa infirmorum*) was established for the

⁴³ G. SZABÓ, Botond (1996): Hatvani István levele az Egyházkerületi Bizottsághoz. 1781. december 6. Közli G. Szabó Botond: A Debreceni Református Kollégium a „pedagógia századában”. Debrecen. 386. See also: TÓTH, Béla (1988): A kollégium története a XVIII században. In: Barcza, József (ed.): *A Debreceni Református Kollégium története* [The History of the Debrecen Reformed College]. Budapest, MRE Zsinati Iroda. 135.

⁴⁴ HATHVANI, Stephanus (1751): Oratio inauguralis de matheseos utilitate, in qua ostenditur. In: *Museum Helveticum. Particula. XX*. Turici. 531–557. The citations are from the Hungarian translation. Manuscript. 15.

medical care of sick students. From this, for example, Hatvani allocated 48 denarii for the medicines of Sámuel Diószegi, a servant student, on 18 April 1760, and 2 frt. 40 krajcárs every two weeks for the labour of his nurse.”⁴⁵ Second, it is worth pointing out that “Hatvani also treated the students injured in the fire of 1769. Several prescriptions of the great professor have survived, which he issued to sick students.”⁴⁶ Another researcher, György Elekes Diósadai analysed Hatvani’s receipts and claimed that:

Hathvani, like his contemporary: van Swieten, was mostly a follower of the eclectic Boerhaave, sober and free from extremes, although he also used certain medicines that were based on the superstitions and erroneous beliefs of his time, often taken over from the Middle Ages without criticism or investigation. The 198 recipes mentioned are currently in the archives of the Ref. College marked as A. 53.27⁴⁷ – according to the date, one from 1777, 118 from 1779, and 79 from 1780. They were written at the peak of Hathvani’s activity. Some of the recipes were written by surgeon József Csokonai, the poet’s father; some are from unknown sources.⁴⁸

Third, “Hatvani also established a separate hospital fund in 1775 with 85 Rhineland forints, which, in addition to the former, which operated until 1778, existed until 1792. At that time, according to the new organization of the College (it became a parish institution), it merged into the common property of the school and passed into the hands of the treasurer, the official who took over the management of the senior’s finances.”⁴⁹

⁴⁵ BALOGH, Ferenc (1904): *A Debreceni Református Kollégium története adattári rendszerben.* Debrecen, Hoffmann és Kronovitz. 158. The history of the hospital was written by Professor of Theology Ferenc Balogh.

⁴⁶ DIÓSADAI ELEKES, György (1941): *Professzor Hatvani receptjei a debreceni diákok részére.* Debrecen; DIÓSADAI ELEKES, György (1939): *Professzor Hatvani receptjei.* In: *Theológiai Szemle.* XV. 239–242.

⁴⁷ Ibid.

⁴⁸ Ibid.

⁴⁹ TÓTH 1988, 135.

In sum, it could be stated that the sicknesses Hatvani experienced left a deep imprint on his spirituality and strongly motivated the young person to turn his attention not only to curing himself but also to training himself for treating diseases. Although the autobiography does not relate to any study of medicine until his time in Basel, it may have been possible that he had consciously gathered knowledge about methods of healing either through autodidactic methods or at Debrecen Reformed College before he entered his medical studies abroad.⁵⁰ From the texts, it is clear that Hatvani's personal experience led him to serve his community. Therefore, he was one of the first professors to initiate medical care, hospitalizing in an organized manner at Debrecen College, which was further developed by his student. Thus, Hatvani was an innovative and "responsible" Calvinist who lived his life before "God's holy presence." This exhibits a deeply religious spirituality.

6. A Sense of Strong Vocation to Serve God the Provider and Sustainer

Another notable trait of Calvinism next to the sense of responsibility was his strong sense of vocation. It is conspicuous that the two are profoundly intertwined. While he was forced to spend 3 years with further studies due to the plague in Debrecen between 1739 and 1742, Hatvani worked for an aristocrat, Ferenc Forgáts, the *comes* of Zemplén County. The aristocrat was so pleased with the young Hatvani that on one occasion he offered him an attractive public service position in his county. Nonetheless, he felt he was called by God to teach and cure people in the church. He spelled this out in this manner: "However, since the ultimate goal of my efforts was not the forum and the auditorium but the church, I decided to continue with firm steps wherever I set out."⁵¹

This call was changed since Hatvani received an invitation from the famous Debrecen Reformed College to teach mathematics, philosophy, and experimental physics in July 1747 while he was in Basel pursuing further studies. It was a decisive point in his life. The life-changing experience is thus noted in his autobiography:

⁵⁰ Further research is needed to see whether Hatvani had any medical training at the Debrecen Reformed College, or what kind of knowledge he was exposed to in Debrecen.

⁵¹ HATVANI 1757, 14.

For a long time, I hesitated in anguish, unwilling to accept this distinguished office, until I was persuaded to accept it by the great Sámuel Szilágyi and, above all, by Professor Beck, and others. In any case, I was especially reluctant to accept this obligation because I had greater desire to teach the church and to devote myself entirely to the service of the divine word. However, when I considered my weakened health more carefully, I finally allowed myself to be persuaded by the advice and opinions of others.⁵²

The excellent opportunity to teach at Debrecen Reformed College provided Hatvani with a fine opportunity to initiate subjects and experiments that showed the progressive attitude of the Reformed city of Debrecen during the Enlightenment era. This is a fascinating fact, especially if one considers that the Counter-Reformation might have shaped the religious faith of the Debrecen Protestants into a conservative stance in many ways while struggling for survival as a religious community. On the contrary, Hatvani's employment indicates how open the leaders of the city and the professors at the College were to the most recent Western knowledge, which in Hatvani's case related to the emerging natural sciences. The knowledge that Hatvani conveyed to Hungary had a lot of practical use for the religious community, shaping its social, political, economic, and intellectual life.

6.1. Revelation and Science. A perception of God the Sustainer

In his inaugural speech, God is depicted as “the Most Perfect Being” and “the wisest Being”. Notably, he refers to God using a philosophical theological language – rather than an ecclesiastical usage of speaking of God as Father, ruler, creator, and so on. While making a point of the knowledge about God, a Christian truth different from the truth of experiments, he referred to God in this manner: “If the most perfect Being were capable of the things that are most imperfect and were capable of doing to the wisest Being what is most unreasonable: that would be the supreme imperfection and a wisdom unworthy of the most perfect Being.”⁵³ On another occasion, he used more church-like

⁵² Op. cit. 22.

⁵³ Op. cit. 7.

language and referred to God as “our Keeper/Sustainer”.⁵⁴ It is rather interesting that nowhere does Hatvani allude to any Christological statement of the Godhead.⁵⁵

6.2. The Benefit of Mathematics for Theology

Hatvani strongly separated the two realms of knowing the truth. To do so, he attempted to distinguish between two different kinds of truth, so to say proper, correct, and reliable/trustworthy knowledge. In his inaugural lecture, first he talked about truth as it is evidenced and proved by mathematics. Second, he also spoke of truth as revealed in the Scripture, the Bible.

One of the main theses in his inaugural speech had three aspects. First, he underlined that the use of mathematics extends to all sciences, and therefore it is practical for the religious-social community. Second, the study of mathematics is “quite useful for the theologian”. Third, he emphasized that it was “downright indispensable for the physicist”.⁵⁶ This statement may well be perceived as a sort of “confession of faith” by an excellent scientist. Being a scholar of his era, Hatvani was enchanted by the discoveries of maths, physics, chemistry, astronomy, and the other sciences. Nonetheless, he insisted on the separation of the two realms of knowing the truth. Although the great scientific discoveries that the fast-developing knowledge of mathematics made possible placed maths on a “throne” of sciences, this did not replace God’s primacy in his spiritual life.

Rather soberly, he warned the staunchly fundamentalist scientist, the sceptic of the Enlightenment in this manner: “And those who demand mathematical proofs for everything and refuse to accept things themselves until they are proven by the scientific method, never really understand clearly how moral proofs differ from mathematical proofs. Such people, believe me, cannot even last a very small number of days.”⁵⁷

⁵⁴ Op. cit. 8

⁵⁵ This observation also calls for further research to delineate his theology from the comments and remarks of his works. By trying to grasp his theological conceptualization about God, his belief, it might be possible to paint a more detailed picture of his Christian belief.

⁵⁶ Inaugural speech, 9.

⁵⁷ Op. cit. 7.

Carving out a place for moral truth not only enabled him to relegate the truth claims of the Christian faith into a different realm of “knowledge” but also assisted him in harmonizing his deeply held faith in God and God’s providence, which he experienced throughout his life. He consistently reiterated, “Now, from all that we have discussed so far, my dear listeners, unless I am mistaken, you will understand very clearly from the little that we have explained that we have destroyed the foundations of the entire philosophy, or rather of the foolish wisdom, of the sceptics. For we have not only mathematical but also moral certainty.”⁵⁸ Then, Hatvani goes to great lengths to argue that they are not in the realm of science but in that of “religious” (my terminology) faith. He arrives at proclaiming, “Thus does mathematics bind the reasoning and inquisitive sophists, thus does it bring into the greatest confusion those who only want to believe the mysteries of faith when they clearly grasp them with their minds and understand everything about them most definitely, and thus, as it were, know it from their souls.”⁵⁹

To achieve different kinds of certainties, that is, those based on experimenting, use of emerging science, and those of accepting the tenets of the Bible based on witnesses’ accounts that he accepted without questioning, was a special blend of how faith and science sought to be harmonized in his life. Needless to say, the kind of biblical truth that was accepted by Hatvani and that was not requires further research. In his inaugural speech, he does not refer to any Christological faith claims. He aptly avoids any references, and therefore one cannot infer much about these aspects of faith and truth claims. However, it could be said that he distanced himself from the deists, sceptics, and agnostics and presented himself as a devout traditional Christian who adhered to God the almighty whom he referred to as “the most perfect Being”, “the wisest Being”, (p. 7) and “the most perfect Mind” (p. 6).

These philosophical-theological categories enabled him to speak of God the Father as the Creator of all things on earth, a truth claim of the Christian faith. Moreover, Hatvani often spoke of God as the Provider and Sustainer of all things. This latter ecclesiastical-theological use of language also enabled him to anchor firmly in the accepted form of God talk that was acceptable for the Calvinist Church of Hungary. However,

⁵⁸ Op. cit. 9.

⁵⁹ Op. cit. 12.

as already noted, he, perhaps consciously, refrained from any Christological statement – although conspicuous, it is difficult to “decipher” the reason why from the two texts under scrutiny (autobiography and inaugural speech). What can be inferred is that no allusion is made to Christ except the vague reference “our Sustainer” (p. 8) that could be applied to God the father, as well as to Christ the Saviour who “keeps”, preserves us for eternal life.

Although Hatvani maintained *without going into details* that the tenets of Christian faith, biblical truth, and the mysteries of faith cannot be comprehended by mathematics and natural science, one may surmise that Hatvani accepted Christian faith without reflection and did not appreciate mathematics. On the contrary, Hatvani maintains that mathematics may be used in *understanding other aspects of the Bible*. This is indicated clearly, as seen from the following remark:

I will not mention now how ugly it is for a theologian not to know the places where sacred things happened. I will also be silent about how wrongly he claims the name of a theologian who does not take the trouble to know the fullness of times, the events that correspond to the things predicted (Eph. 10:1). But one of these can be understood from geography, the other from chronology, which are parts of mathematics. He will not understand the sacred and civil solar and lunar years of the Jews, nor will he who lacks the rudiments of astronomy compare the Jewish eras with ours. And I will not even mention here that chronology also relies on the rudiments of astronomy. And, finally, what else does God himself do but measure [geometry] forever?⁶⁰

Therefore, it can be seen that Hatvani seeks to maintain a healthy balance between the emerging natural sciences and the basic tenets of Christian faith. This was an existential issue for him who repeatedly declared God’s saving act in his life when he experienced fatal accidents (the sweep-well story, the temptation case of the rich man’s wife), as well as cures from serious illnesses.

In sum, Hatvani believed that mathematics is very useful in three distinct ways: First, the proper use of mathematics is widely applicable to “all sciences”.⁶¹ This meant geology, hydrology, astronomy, chemistry, physics, and medicine alike. Secondly, it is

⁶⁰ Ibid.

⁶¹ Op. cit. 1, 9.

useful for theologians to study mathematics. Here he referred to themes in the Bible that related to astronomy, customs, stories of the Old Testament, but not to the God concept or divine revelation embodied in Jesus Christ. In other words, he kept those issues on the table for research that modern biblical studies also investigated but left Christological and other divinely issues intact. (Either it was not of interest to him, or he was extremely careful!) Third, Hatvani repeatedly argued that the emerging and fascinating science of physics must use mathematics as they are entirely indispensable for scientific investigation.⁶² To bolster his thesis, he concluded: “I have presented very clearly in which sciences, or in which parts of them, this strict form of proof can be applied, and, on the other hand, I have also explained which sciences, according to our teaching, are those in which mathematical proofs are only hypothetically true, namely, if those things exist, if the thing claimed is truly so, if these or those laws have been proven, and, finally, if the Supreme God has revealed this or that.”⁶³

Expressing his faith conviction, the young professor claimed in his opening speech that “theologians are also led by the application of the methods of mathematicians to *develop* a correct concept of God and religion”.⁶⁴ In other words, theologians may also benefit greatly from the methods and science of mathematics should they become proficient in them. Referring to what today would be called biblical studies, he asserted, “the theologian must also be proficient in geography and the elements of astronomy. These disciplines also belong to mathematics, and the theologian who is inexperienced in them and does not know, for example, the location of the Holy Land, solar and lunar years, cannot even claim the title of theologian.”⁶⁵

This was a strong and very bold claim from Hatvani in Debrecen during the middle of the 18th century. He even dared to go further in his critique. According to the professor: “Both atheists and deists can be persuaded to see their mistakes with the help of mathematics, as it can be used to prove that there are things in nature that we cannot

⁶² Ibid.

⁶³ Op. cit. 9.

⁶⁴ FEHÉR, Katalin (2002): *Hatvani István és tanítványai* [István Hatvani and His Students]. Budapest, Országos Pedagógiai Könyvtár és Múzeum. 56–60.

⁶⁵ FEHÉR 2002, 57.

understand with reason but whose existence and truth it would be a mistake to deny or doubt.”⁶⁶

It is enough to allude to his magnum opus, *Introductio*, where he repeated his ideas of maintaining the two realms of knowing. His scientific belief and Christian faith based on two different kinds of epistemology. Béla Tóth accurately observed: “The text of the book was most likely composed of the second group of his lectures (*Explanation of the Principles of Philosophy*), but his main ideas were already included in the content of his inaugural dissertation. As he writes in the introduction to the book, his aim is to ‘expose the foundations and principles of human cognition’, that is, to provide an epistemology. Right from the start, he strongly refutes the two cardinal tenets of Wolff’s philosophy, the principle of contradiction (*principium contradictionis*) and the principle of sufficient reason (*princ. rationis sufficientis*).”⁶⁷

Here he also rejects the efforts of those who want to bring everything into the sphere of mathematical proof. This, he writes, is not possible, because the object of philosophy is the knowledge of the whole universe (*pan seu universum*), and there are two paths leading to this, the path of *Evidentia Mathematica (Certitudo)* and the path of *Evidentia Moralis*. The former, as we would say today, provides methods for knowing nature, the physical world, the latter – and here we come closer to his expression – the moral world, to which religion primarily belongs.⁶⁸

In so doing, Hatvani argues in *Evidentia Mathematica* for the compelling irrefutable truth in the realm of emerging natural science. However, this is not the case in the field of *Evidentia Moralis*, where a different kind of faith and formation of truth prevails. There, in addition to perception, the truth evidence of faith governing moral action can be obtained through testimony and analogy in a world that is beyond our understanding such as things, the origin of the world, the functioning of the heart, and alike. Therefore, the explanation of these phenomena cannot be traced back to *Evidentia Simplex*.⁶⁹

⁶⁶ Ibid.

⁶⁷ TÓTH 1988, 104.

⁶⁸ Ibid.

⁶⁹ Ibid.

Tóth grasped well the essence in his summary, stating: “Hatvani’s work, by proclaiming two fundamental ways of approaching truth (*Ev. mathematica*, *Ev. moralis*), embodies one of the typical phenomena of the eighteenth century. On the one hand, natural sciences and the philosophy based on them shake the pillars of faith, and, on the other hand, there was the claim and expectation that the tenets of Christian religion need to be defended. Hatvani defended his convictions for himself and for his students and readers in the manner described in his inaugural lecture bolstered by the further evidence of his later work, *Introduction*. Hatvani as a Christian scientist exhibits a character that is of a rationalist natural scientist, who believes in experience and common sense (*sensus communis*) in science. Nonetheless, he has another side, that is, of a believing theologian. Béla Tóth was right to aptly observe that Hatvani may have confessed together with Hamlet, “There are more things in heaven and earth than wisdom can think of.”⁷⁰ In so doing, Hatvani maintained a healthy balance of endeavouring for a scientific approach and acknowledging the limitations of scientific enquiry.

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⁷⁰ TÓTH 1988, 105.

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