

The illustrious Boerhaave.

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BY
WILLIAM T. LUSK, M. D., LL. D.

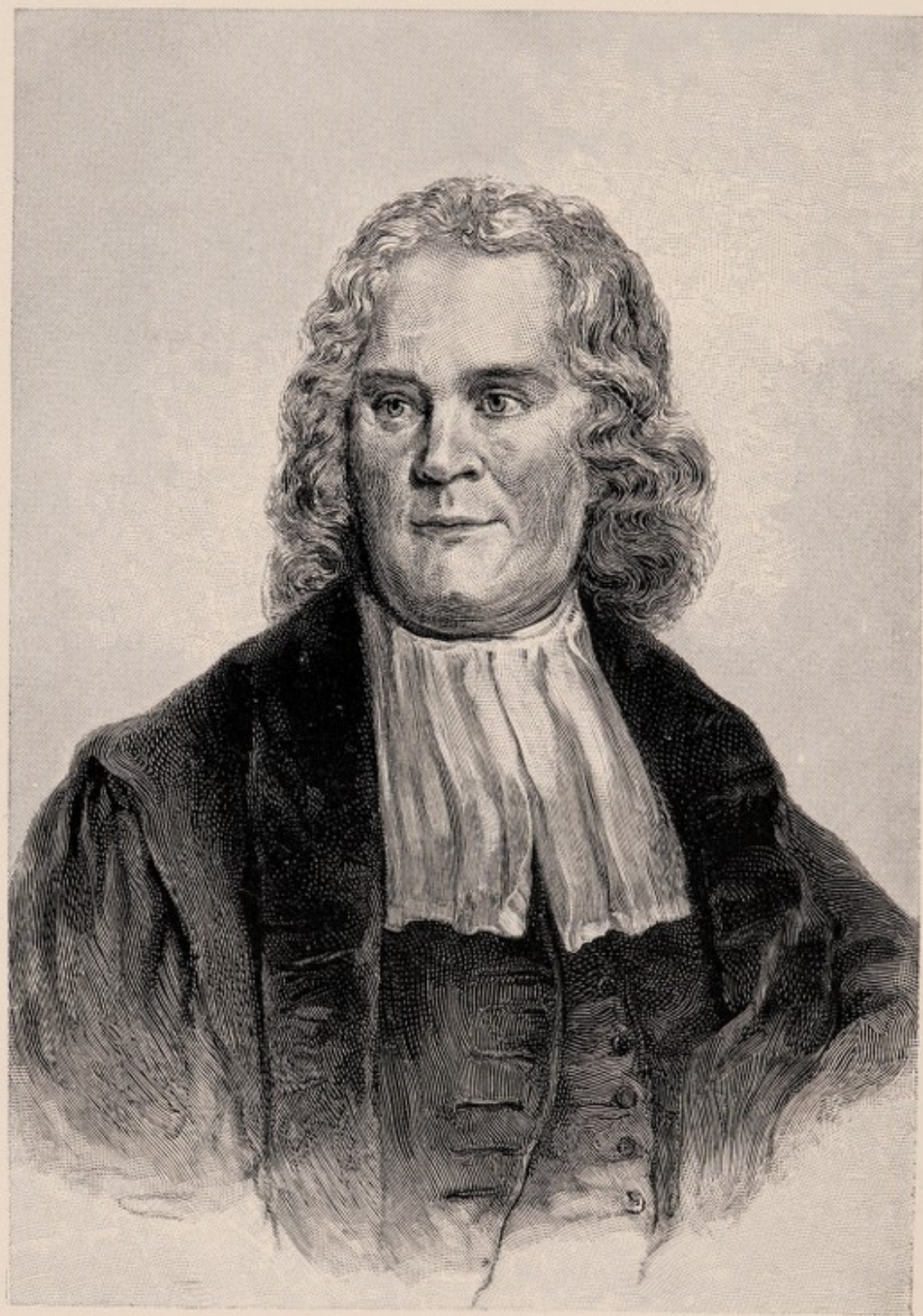
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HERMANN BOERHAAVE.

THE ILLUSTRIOUS BOERHAAVE.*

BY WILLIAM T. LUSK, M. D., LL. D.

OF the serious questions which need to be considered at the outset of a professional career there is none more vital than that of personal conduct. This is recognized by the provision for the medical man of a code of ethics, which shows him how the portion of the ten commandments which teaches one's duty toward one's neighbor, is applicable to his dealings with the public and with other medical men. It is useful to the class which need to be reminded that for uprightness a man should do no murder, should not steal, should not bear false witness, should not covet. But the sweetness and light which should govern our relations to others are not the product of written law. The real training comes from action with attendant victories and defeats. There is, however, a special inspiration to higher effort which is derived from the study of the lives of distinguished men. For this reason I have thought it might be profitable for you to follow with me on this occasion the career of the Dutch physician HERMANN BOERHAAVE. In his day his fame was world-wide. A letter addressed to the "illustrious Boerhaave, physician in Europe," by a mandarin in China, in those days of limited communication, reached him without inquiry or delay. In the history of medicine he ranks as the peer of Hippocrates and Sydenham.

He was born in Voorhut, a small village, two miles distant from Leyden, on December 31, 1668. His father, James Boerhaave, was a poor minister with a large family. He had, as

* An address delivered before the graduating class of the Medical Department of Yale University, June 26, 1894.

we learn from a few but very precious memoranda left by his famous son, a good acquaintance with Latin, Greek, and Hebrew, and was well versed in historical studies. He was, in fact, a modest scholar, simple and unpretending, but with high ideals, and respected by all for his probity and honor. With special gratitude the son recalls the self-denying economy by which the father sought to provide the means of educating his nine living children.

James Boerhaave was twice married. Hagar, the mother of Hermann, died when he was five years old. She left seven children. From her Hermann inherited his taste for natural science. At the end of a year, James married a Mrs. Dubois, a minister's daughter. By her he had six children, but, owing to her obliging, impartial disposition, the old home sheltered an undivided family. In his memoranda Hermann commemorates the "*mores sanctissimos, raram virtutem, amabilem indolem*" of this beloved stepmother.

The elder son by the second marriage, James was selected for the medical profession, but the influence of heredity was too strong. He tired of physic, and became an eminent divine at Leyden.

Hermann, on the other hand, was designed for the pulpit. His maternal grandfather, Hermann Daeldir, was famous as a maker of instruments of navigation in Amsterdam. His mother was regarded as a great authority in the simple medication for the parish poor. He was brought up to regard divinity as the highest of all professions, and was deeply imbued with the religious sense; but his native instincts and tastes were always for scientific investigation, and a trivial incident made him one of the greatest physicians of all times. In after life, when at the zenith of his fame, he modestly wrote a dedication of his work on chemistry to his brother; in referring to the plans laid out for them both in their boyhood he says: "Providence disposed of us otherwise; and exchanging our views, consigned you to the service of religion, and made me, whose talents were unequal to higher things, humbly contented with the profession of physic."

At eleven, under his father's instruction, he was well versed in Latin and Greek, and ready at the grammatical rules of both tongues, for to be a good grammarian was the ambition of the countrymen of Erasmus. To write Latin with elegance and ease was essential when the Latin language was the means of communication between learned men over the entire civilized world.

In those childish days it is interesting to learn that the serious minded boy delighted in devoting his leisure hours to the culture of the little garden of the parsonage. Holland was then,

Griffin tells us, the gayest garden land of Europe, and later, under the skilled direction of Boerhaave, the botanical garden of Leyden became the most renowned in the world.

From the twelfth to the seventeenth year the boy suffered greatly from hip disease. He tells us it was the grievous pain from this source which led him to contemplate the study of medicine. But the malady seems scarcely to have affected his progress in his studies. At fourteen he was sent to the public school in Leyden, where he was rapidly advanced in his studies, winning all the prizes, and at sixteen, he was admitted to the university. It may here be parenthetically stated that the schools of Holland were the best in the world. They received state aid, and were free to the needy student.

Meantime the father of Boerhaave had died, and left his family in straitened circumstances; but, in Leyden, where, after its heroic siege, while the memory of plague and famine was still fresh upon them, its people had asked for a university in place of the proffered exemption from taxation; in Leyden, which, when Scaliger was invited to a professorship, had ordered a ship of war to receive him, a helping hand was always outstretched to aid the meritorious student. Trigland, one of the divinity professors of the university, who had been a friend of Boerhaave's father, and who entertained great expectations as to the boy's future, procured for him the patronage of Van Alphen, the burgomaster, to whose paternal, continuous, and benevolent interest Boerhaave renders grateful tribute.

While a student at the university, by the advice of his instructors, in addition to studies in Greek, Latin, Hebrew, and Chaldee he attended lectures on natural philosophy and mathematics. During his undergraduate course he was often called upon by Siguerd, his professor, to take part in discussions upon the latter subjects. The study of algebra, geometry, and trigonometry he tells us he found most entertaining. In his twenty-first year he delivered the academic oration upon the subject that "the Doctrine of Epicurus concerning the Chief Good was well understood by Cicero," for which he received the gold medal.

It may perhaps be of interest to recall at this time the dignified formalities with which the competition for university honors was then surrounded.* The candidate first announced his intentions to the rector and senators, and these in turn informed the curators, who appointed the day for the oration. Then the applicant waited on each of the curators, and on the chief magistrate and sheriff of the city, to desire their presence. If the oration

* Burton's *Life and Writings of Boerhaave*, 1746, p. 9.

gave satisfaction to the curators, their secretary was sent to his habitation to thank him in their name, and to acquaint him that he should be presented with the gold medal. This was worth thirteen pounds, and bore a Pallas in relief on the front, and an engraved inscription relating the name of the person and the occasion on the reverse.

"The University of Leyden," Thorold Rogers tells us, "was far more renowned in the seventeenth century than Oxford, Cambridge, or Paris, and students from all countries crowded into this the youngest of the great universities. The student was exempted from taxation; he received his wine, beer, tea, coffee, salt, soup, and books free; and when once his name had been on the university rolls he was amenable for all offenses to a special court composed of the rector, four professors, and a representation in the city magistracy. One of the gravest punishments with which he could be visited, in the popular apprehension, was banishment from town for a term of years, and deprivation of academic privileges.

After receiving his philosophical degree, Boerhaave entered upon his theological studies. He delighted, he tells us, in the primitive fathers, whom he highly revered for the purity and simplicity of their doctrine, for the sanctity of their instruction, and for the perfection of their lives, dedicated to God; but he had no patience with the efforts of the schoolmen to make the sacred writings conform to the metaphysical abstractions of Plato, Aristotle, Aquinas, Scotus, and Descartes, with the confusion ensuing, and with an outcome, as he regarded it, contrary to peace with God and man. Independent judgment, it may be stated, was not favorably regarded in those days by the orthodox in Holland.

Meantime, to aid in his support, Boerhaave received a small number of pupils for private instruction, and, contemporaneously with his religious exercises, he took up the study of anatomy as a diversion. To him the works of Vesalius, of Fallopius, and of Bartholin were of absorbing interest. He attended likewise the dissections of Prof. Nuck, and with the true scientific spirit, eager for personal observation, he frequented slaughterhouses, and sought to increase his knowledge by vivisections. Anatomy was then to the student a revelation, and not a compulsory task. Chemistry, too, with the hopes it inspired of new and wonderful discoveries, filled him with splendid dreams.

Thus it came to pass that while loyal to his father's wish that he should devote his life to the ministry, and though still believing that his duty lay in that direction, he decided that he would, in addition to his theological studies, take a degree in medicine. For that purpose he entered the University of Harderwick, and

in July, 1693, was made a Doctor of Physic. There now occurred to him one of those accidents which happen to most men at some time in their career by which the nature of their life's work is determined for them independently of their volition. On his way home from Harderwick a discussion was started on the passage-boat about the doctrines of Spinoza as subversive of all religion. Now, the universal education which was the glory of Holland bred a goodly number of blatherskites as well as famous scholars. One of the former was filling the air with loud invectives against the great philosopher; whereupon Boerhaave quietly asked him whether he had ever inspected the works of the author he decried. The clamorous orator, Burton tells us, was struck dumb. Inquiry was at once made as to the name of the troublesome student, and, after their arrival in Leyden, it was soon current gossip that Boerhaave had become a Spinozist. Strong opposition was organized to his receiving a license to preach. On the advice of his three steadfast friends—Van Alphen, his earliest patron; Trigland, the most famous of the instructors in the theological department; and Van der Berg, for some time burgomaster, a man of wealth and great influence—Boerhaave decided not to risk a refusal, but to devote his life to the practice of medicine.

He had already a reputation for prodigious powers of intellect, and those who knew his easy mastery of every subject to which he directed his attention anticipated for him a most brilliant future. Yet for a long time few patients sought his counsel. While awaiting at Leyden the advent of remunerative practice, he was invited by a prime favorite of King William to settle at the Hague and to establish himself as a court physician. But this temptation he resolutely put aside. He devoted the waiting period which falls to the lot of most young physicians to teaching mathematics, to work in a laboratory which he fitted up in his own domicile, and to reading the Scriptures and those authors who best teach the true way of loving God.

It may be interesting to state that Leyden, in the seventeenth century, according to the account of John Mollett,* was "rich and prosperous, beautiful, clean, and pleasant, abounding in handsome houses, intersected with canals of fast-running water, its broad streets planted with trees; its houses of red brick, faced with white masonry, shadowed the pathways with their projecting gables; and their ornamentation of arches, festoons, and medallions carved with quaint and heraldic devices completed a style of architecture that was characteristic and charming. Above these houses rose a large and splendid Town Hall, two beautiful

* Rembrandt, by John Mollett. The Great Artist Series.

Gothic churches, and a number of buildings originally dedicated to religious but at that time to secular uses."

The city, in the height of its prosperity, had a population of nearly one hundred thousand souls. The most perfect order prevailed. At the same time there were everywhere activity, vigor, and exuberance of life. It had a wide fame for the product of its looms, and Leyden cloth, Leyden baize, and Leyden camlet became familiar terms at home and abroad.* It was the birthplace of Rembrandt, Jan Steen, and Gerard Douw. Important works of every kind issued from its printing presses. The classic editions of the Elzevirs of Leyden are still the book-lover's delight.

In this favorable environment, Boerhaave's mental powers were ripened by observation and study. In 1701, in his thirty-third year, he was induced by his friends, on the death of Drelin-court, to lecture on the institutes of physic. His success was such that at the end of his course his delighted pupils prevailed upon him to instruct them in chemistry likewise.

Two years later he was invited to a vacant professorship at Groningen, which he declined with grateful acknowledgments. Thereupon his trusty friend Van der Berg, President of the Burgomasters and one of the seven curators of the university, induced the authorities to increase his salary, and to promise to him the first vacancy in the regular professorships. This did not occur until 1709, when, on the death of Dr. Hotton, he was made Professor of Medicine and of Botany.

By the aid of returning captains, at a time when Dutch ships ruled the sea, and by a system of exchanges with noted correspondents, in ten years he had doubled the number of plants in the botanical garden. Crocodiles, turtles, and other strange creatures were imported from distant settlements in the Indies. The bamboo, the papyrus, the palm, the coffee plant, trees of cinnamon, camphor, and mahogany could be seen growing in the open air and in hothouses. The plants were especially remarkable for their strength and vigor. In their classification Boerhaave prepared the way for Linnæus.

In 1714 Boerhaave was elected to the rectorship of the university—"of their Noble High Mightinesses' University of Leyden," he terms it in his correspondence—and in the same year was appointed Professor of Physic in place of Prof. Bidloo, and to a position in the University Hospital. By this time his fame had outgrown its local limits, and students flocked to him from all parts of the world. When he began his public teachings, the doctrines of Van Helmont and Paracelsus were held in high favor. Indeed,

* British Encyclopædia. Art. Leyden.

he tells us that the works of the former he read through seven times and those of the latter four times. Van Helmont he regarded rather as a philosopher than as a physician, as his boasted remedies fell far short of their promised efficiency. Yet Paracelsus swore by his own soul, and calls every god in heaven to witness, that with one single remedy he was able to cure all diseases, be they what they would; and in another place he declares that no one need scruple about getting certain secrets of physic from the devil, and boasts of holding conversations with Galen and Avicenna at the gates of hell. By the school of Paracelsus it was claimed that the doctrine of transmutation was contained in the Pentateuch, in the books of Solomon, and in the Revelation of St. John.

Van Helmont's methods are illustrated by an account he gives us of how he treated himself for pneumonia. In 1640, in the sixty-third year of his age, he was seized with a fever, attended with a slight shivering which made his teeth chatter; a pricking pain about the sternum, a difficulty of respiration, and a spitting first of bloody matter and then of pure blood. For the removal thereof he took certain scrapings, which seem to have been in anticipation of the animal extracts of the present day, upon which the pains grew less. Then he took a drink of goat's blood, and the spitting of blood ceased in four days, leaving only a slight cough with a moderate expectoration; but the fever still remained, and was followed by a pain in the spleen, for which he took wine boiled with crabs' eyes, whereupon all the symptoms disappeared.

Medicine was not only obscured by the vagaries of the chemists, but knowledge was darkened by the theories of philosophers, who sought by shutting their eyes to arrive at truth by purely intellectual processes. Now, Boerhaave's teaching was an unceasing protest against the errors of his times. His introductory oration at the beginning of his career as a teacher was one extolling Hippocrates. To you, to whom the father of medicine is probably little more than a name, it may be proper to mention that the veneration in which he has been held is due to his having been the first to found medical teaching upon naked and indisputable facts. He was the nineteenth physician in succession in the same family. The records of his forefathers, the fruits of travel, the clinical experiences upon the isle of Cos, and the reports of his pupils formed the material of his *Observations*, which still are read with wonder and with profit. After him, from Galen to Vesalius, great advances were made in anatomy, and Harvey had discovered the circulation of the blood, but there was little contributed to the practice of medicine until Sydenham—the "immortal Sydenham" Boerhaave loved to term him, though at

that time his merits had not been recognized by his own countrymen.

The qualifications of Boerhaave for the reconstruction of medicine were extraordinary. His memory was amazing. He had a familiar acquaintance with the works of his predecessors in medicine and in the kindred sciences. He conversed in English, French, and German, and could read easily Italian and Spanish, so that few new reports from those countries escaped his notice. He had studied with profit the writings of Lord Bacon, of Sir Isaac Newton, and of Robert Boyle. He had followed with eager interest the microscopic discoveries of Malpighi, Leuwenhoeck, and Ruysch, and he had a vision which could overlook the entire field, and see all branches of knowledge in their proper relations. With such gifts and training his Institutes of Medicine, published in 1707, in which all the teachings in anatomy, in physiology, and in pathology up to his time were, after the severest personal scrutiny, made the foundation of the theory and treatment of disease, rapidly became the text-book of Europe and of the East, and long remained in the hands of his pupils the basis of medical teaching. Yet there were so-called "practical men" in those days who received the work with scant favor. They boasted that they read nothing; that all available knowledge was the product of experience only. They sneered at museum doctors, and said that such were not fit to doctor a cat.

But Boerhaave's greatest glory was the prominence he gave to clinical instruction. Instead of aimless wandering through the hospital wards, he adopted the plan of examining few patients, but with them to be exact, thorough, and exhaustive. At the bedside he taught with great minuteness the conditions that prevail in health, and then the changes wrought by disease, and upon these data he proceeded to formulate his therapeutics. Under him the post-mortem room assumed the same importance as the library, the chemical laboratory, the dissecting room, and the botanical gardens. His pupils in other lands established clinics and clinical instruction in conformity with the precedents he established. The clinical schools of Edinburgh and Vienna, under the guidance of Cullen and Van Swieten, owe their glory to his transplanted spirit.

His system of treatment, like that of Sydenham and Hippocrates, comprised few remedies, and laid great stress upon hygiene. He had little faith in the prevailing *elixirs ad longam vitam*. "As to nostrums," he says, "let those who have them keep them till they can convince impartial observers of their real worth." In a footnote to this, Burton, who was his Boswell and worshiper, says, "Mrs. Stephens' saponaceous dissolvent for

stone in the kidneys and bladder may be a proof of one of them."

In 1718 he accepted, in addition to his other public positions, the professorship of chemistry, then left vacant by the death of Le Mort. In 1738 he published his *Elements of Chemistry*. It is divided into three parts. The first is historical, and is full of curious learning; the second part presents Boerhaave's theoretical views; while in the third part the author's personal observations are given. These are chiefly of interest as showing the volume of useless experimentation that preceded solid advances in chemical science.

As a sample of old-time ways, Burton, with loving admiration, details Boerhaave's attempt to accomplish the consummate purification of quicksilver. "With matchless perseverance he tortured it by conquassation, trituration, digestion, and by distillation. He amalgamated it with lead, tin, or gold, repeating this operation to 511 or even to 877 distillations." But alas! owing to an inherent turpitude in the metal, at the end it was only the same quicksilver as at the beginning.

That this and similar experiences were not satisfactory to Boerhaave is evident from his preface. The work, he complains, was produced at the instance of his friends, and because of spurious accounts of his lectures which were then in circulation. "This brought Petrarch to my mind, who bewails the unhappiness of his age upon finding himself ranked among the chief poets in it. With what confidence could I, conscious of my own insufficiency, and full of admiration of other authors, enter the list of writers of chemistry? At length, however, I undertook the disgusting work which I now declare was extorted from me."

In his prime Boerhaave was tall, robust, and athletic, hardened by exercise, negligent in dress, with a large head, curly brown hair, bright, piercing eyes, and a florid complexion. He was a sincere and affectionate friend, courteous in his professional intercourse, never talking of his own affairs, ready with praise for others, but silent concerning himself.* "There was in his air something rough and artless, but so majestic and great at the same time that no man ever looked upon him without veneration and a kind of tacit submission to the superiority of his genius." He rose at four o'clock in summer and at five in winter. Ten was his usual bedtime. One hour he devoted to prayer and meditation. This, he said, gave him spirit and vigor in the business of the day. All his abilities he ascribed to the goodness of God. In the severest winter he had neither fire nor stove in his study, where he passed three to four hours in the morning. His

* *Gentleman's Magazine*, 1739.

library abounded in the works of the best historians, poets, and authors of polite literature as well as in those upon medicine.

By unceasing industry he produced in rapid succession books, minor treatises, orations, and discussions. Besides the public lecture on botany and the private lectures on chemistry, the institutes and practice of physics, which employed him four hours in speaking, he frequently spent an hour in giving a public lecture on some special subject. He allowed nothing to interfere with his duties as a teacher.

He brought to the lecture room a vast comprehension, a prodigious memory, and a solid experience. He used no notes; his manner was concise, clear, and methodical. He illustrated his subjects with quotations from the poets, of which his favorites were Virgil, Ovid, Rapin, and Cowley. Sometimes by a delicate irony he stirred his audience to laughter, but never moved a muscle of his own face. His lecture room was thronged. Men came to Leyden from all parts of the world, who regarded it as a special glory to have been taught by the illustrious Boerhaave. As a writer said of him after his death: "Long was he the oracle of his faculty. Never was preceptor more beloved, professor more celebrated, nor physician more consulted."*

His practice was enormous. A hundred patients, it is said, were frequently waiting in his anteroom. The Czar Peter once lay all night in his pleasure barge outside of Boerhaave's house, to have two hours' conversation with him before college time. He was temperate in his habits. He rarely touched wine. Water was his common drink. In the German student song it reads:

"Hermann Boerhaave schreibet ja:
Aqua paullo frigida
Potio est optima."

Until infirmity came upon him his favorite exercise was riding. When he was weary he distracted himself with music, of which he was very fond. He had a good voice and played a number of musical instruments. It was his custom to have a weekly concert at his own house.

At forty-two he married Mrs. Mary Drolenveaux, the only child of the Burgomaster of Leyden. They had four children; three died in infancy—one, a daughter, survived him.

In 1722, when fifty-four years of age, his physical constitution gave the first warning of the effects of the strain to which it was subjected. He had an attack of arthritis, whether of a gouty or rheumatic nature is uncertain, though it is stated that it was the result of exposing himself to the morning dews before sunrising,

* * Burton, footnote, p. 73.

which kept him in bed six months. The pains were atrocious. Once, after fifteen hours of continued suffering, he prayed that his disease might end his life and misery. This afterward gave him great concern, for he wished, he said, to abide by this maxim living or dying: "That only is best, and alone to be desired, which is perfectly agreeable to the Divine Goodness and Majesty."

When in 1723 Boerhaave had sufficiently recovered to reopen his private college, the citizens of Leyden celebrated the event in the evening by illuminations and by public rejoicings. In 1727, on a return of the attack, he gave up the chairs of chemistry and botany, though he continued to teach actively in other branches until his final illness. In his later life his greatest pleasure was in his country home. This was large and roomy, with eight acres of ground. His garden was filled with the exotic shrubs and trees which would flourish in that climate. A present of American shrub seed he styles "a gift more precious than gold," and two cedar trees "a royal benefaction."

In 1725, at the expiration of his rectorship, he delivered an oration in which he reprehended the philosophers who have attempted to invent rather than to discover principles, and in particular he singled out Descartes. Andala, an orthodox Cartesian professor, set up a cry that the Church was in danger, and that the dreaded evil of Spinozism would be the result. But the times had changed since the journey of the young student from Harderwick. The governors of the university insisted on a retraction. To Andala's recantation Boerhaave replied with fine courtesy that the most agreeable satisfaction he could receive was that so eminent a divine should have no more trouble on his account.

Boerhaave was through life cheerful and desirous of promoting mirth by a facetious and humorous conversation. He was never soured by calumny and detraction, nor ever thought it necessary to confute them, "for they are sparks," he said, "which if you do not blow them will go out of themselves."

In 1728 he was elected a member of the Royal Academy of Sciences in Paris, and in 1730 a member of the Royal Society.

He accumulated an immense fortune, estimated by some at two millions of florins, and yet through life no one appealed in vain to his generosity. "The poor," he said, "were his best patients, for God paid for them."

About the middle of the year 1737 he began to suffer from cardiac disturbances, from dyspnœa, and from dropsy. If for a moment he fell asleep, the respiration was interrupted, and rest was prevented by a terrible sensation as of strangling. Yet in a letter he writes, "I have lived to upward of sixty-eight years, and always cheerful."

In the library of the Faculty of Medicine in Paris there were

found in 1877 ninety letters from Boerhaave to his friend Baron Bassand, physician to the Duke of Lorraine, afterward the Emperor Francis I. In one of these, written two weeks before his death, and intended for private eyes only, he says: "My malady gathers in force. The cardiac oppression due to polypi is constant, and of the last degree of cruelty. God wishes it thus. His perfect and sovereign will be glorified by the submission of his creature, who loves and adores only the infinitude of the eternal."*

He died on the 27th of September, 1738. His monument in the St. Peter Church, where his body was interred, bears the inscription "Salutifero Boerhaavii Genio."

* Article by Chireau, *L'Union Médicale*, 1877, p. 584.



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