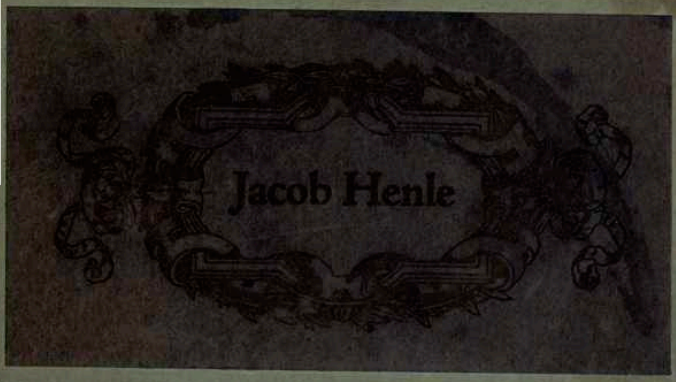

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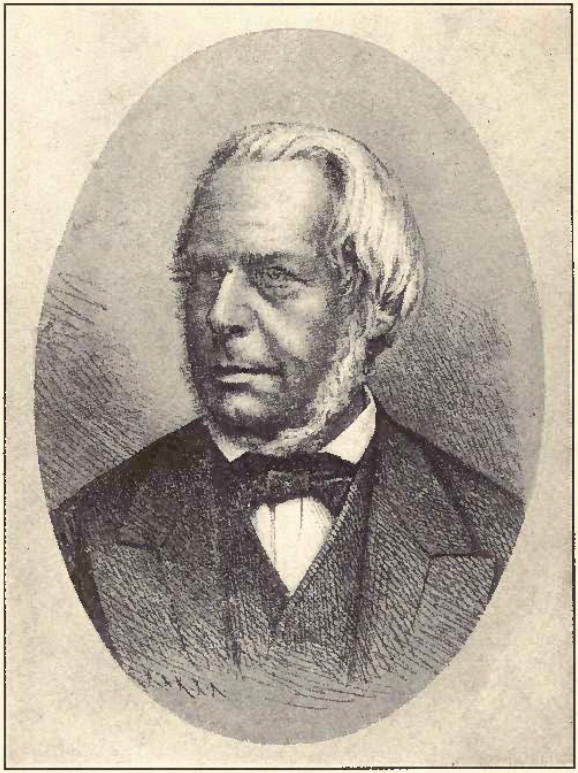

JACOB HENLE

THE LIFE OF JACOB HENLE

By

Victor Robinson, M.D.

Formerly Editor of the Medical Review of Reviews;
Editor of Medical Life.

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Prefatory Note

Cordial thanks are due Lieutenant-Colonel Fielding H. Garrison, of the Surgeon General's Office, for the circumspection with which he read this manuscript—in spite of the inroads made upon his private leisure—and for his courtesy in offering many helpful suggestions.

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Dedication

TO EMILIE RECHT:

If ever I had an inspiration, it was on the day when I first spoke to you about Jacob Henle. I explained that although he was one of the greatest medical scientists of modern times, practically nothing about his career had appeared in the English language. Not being a medical woman, you had never heard of Henle, and were naturally and properly bored. But since it is impossible for you to be unsympathetic, the subject was again broached, and somehow we decided to "do Henle"—as an experiment. Your share of the work was to consist in translating all the available German data, after which I was to use your translations as a basis for my own work.

The first article you undertook happened to be desultory and tedious, and after being engulfed in its discursiveness and battling with its technicalities, you would have abandoned your self-appointed task, but for two reasons: in the first place, you were probably curious to see what I could accomplish with such unpromising material; and in the second place, you are no shirker. So the work went on, and you translated the notices by Leyden, Flemming, and Pagel, the essay by Waldeyer, and Kussmaul's witty chapter in his Memoirs from the Youth of an Old Physician. By this time, the greatness of the man had grown upon us, and the experimental stage was over.

In the foregoing sketches, there were several references to Merkel's comprehensive life of Henle, and it may appear strange that we had not yet come across this work, but the reason is simple: in no bookstore or library in New York could this volume be obtained, and it became necessary to apply to the Surgeon-General's Office for this authoritative biography of one of medicine's noblest figures.

When you opened Merkel, Henle was resurrected. The real enthusiasm for Henle now began, and it added a new thrill to our lives. In those days, no friend spoke to us without first inquiring about Henle.

With what devotion you entered into the work, and how vividly your comments and exclamations brought the man before me! When some characteristic trait or incident stirred you to speak about Henle, I entered his home, observed him in all moods, wondered at his versatility, watched the humorous corners of his mouth, saw the movements of his eyes, and learned to know his very mannerisms.

In the following pages I have followed portions of your version more freely than I would feel warranted in doing if Merkel had appeared in English. For some unaccountable reason, however, this splendid biography has remained untranslated until now, and the English-speaking profession is indebted to you for making accessible to them the life and letters of Jacob Henle. The field of medico-historical investigation is my chosen work; there is rich reaping, and I do not know what abundant harvests I may yet find, but I never ask for a better yield than was gathered in the days when you and I did Henle. It was an unforgettable privilege to be associated with you in this work, and in dedicating this book to you, I feel that I am only returning what already belongs to you, for over every page of Merkel you cast the glamor of your own rare spirit.

VICTOR ROBINSON.

New York.

THE LIFE OF JACOB HENLE

THE LIFE OF JACOB HENLE

I.

BOYHOOD DAYS

Let us begin this chapter with a simple declarative sentence: The book of Genesis and the writings of Lester Ward do not always agree.

According to the ancient author, man was created first and foremost, and later woman was fashioned to help the man—but the modern writer says:

> The female is not only the primary and original sex but continues throughout as the main trunk, while to it a male element is afterward added. The male is therefore, as it were, a mere afterthought of nature. Moreover, the male sex was at first and for a long period, and still throughout many of the lower orders of beings, devoted exclusively to the function for which it was created, viz., that of fertilization. Among millions of humble creatures the male is simply and solely a fertilizer.

But even among the highest creatures, nature needs the male for only a moment. When a child is born, its father may be in another country, or in the arms of a strange woman, or preoccupied, or dead. In the summer of 1809, when the Baiersdorf rabbi's daughter, Helene, gave birth to her son Jacob, no father stood at the bedside. Months passed, and still the growing infant did not learn that a father is a part

of life's scheme. In the long evenings, the mother developed into an introspectionist, living her romance over and over, vividly recalling the most trifling incidents.

She was a member of a large family with a slender purse —which means that she early became a student of domestic science. Her proficiency in this branch evidently became known, for Helene was invited by her aunt, Frau Henle of Fürth, to come to that flourishing little town and help to manage her household, which consisted of a husband and seven sons. If it be admitted that such a household requires expert management, it must further be acknowledged that a sprightly girl, in the midst of seven male cousins, is not apt to be neglected. The cousins appear to have wooed Helene *en masse*—the elder ones with the ease which comes from experience, and the lad Wilhelm with the bashfulness of a first love. "Faint heart never won fair lady," has been dinned into our ears until it has become a platitude; indeed, certain sociologists gravely maintain that even the most civilized woman has a secret craving for the cave-man who comes a-wooing with a club—but this is simply a picturesque theory, of value to writers of fiction. As a matter of fact, it often happens that the masterful courtship of practiced veterans cannot compete with the awkward devotion and mute adoration of a shy lover. Women appreciate modesty in their wooers, but no man is modest after his first conquest.

When Helene and Wilhelm were betrothed, she was twenty-one, and he was eighteen—hardly five feet high, with no money, and his school-books still on his desk. The uncertain future darkened unexpectedly, for the boy's father died

suddenly, and through the legerdemain of unfaithful administration the family estate vanished. So Wilhelm Henle put away his unfinished text-books, and went out into the world.

In those days the shadow of Napoleon lay over Europe, and militarism was everywhere. Wilhelm, like many others, began his career by obtaining employment in the supply-department of the army. He had not the Midas-touch of a Rothschild, and no carrier-pigeons brought him fortunes from the air. But he hummed and whistled at his task, for the goal was clear before him. Wilhelm worked, while Helene waited—and after six years they were married in Leipzig. Then the young husband hurried off to business, absenting himself for considerable periods, leaving his wife alone to enjoy the countless literary and musical associations of Germany's cosmopolis. But neither the high-pitched vault where John Sebastian Bach had played the organ, nor the house where Klopstock wrote passionate odes to his disdainful cousin Fanny, nor the *Hof*, unforgettably portrayed in Goethe's Faust, could save the bride from loneliness and homesickness. Amidst the distractions of myriad-minded Leipzig, she wept for her little room in Fürth.

She prevailed upon her husband to bring her back to the parental home, so that Jacob was born in Fürth instead of Leipzig—thus losing his opportunity to be Richard Wagner's town-brother. The event occurred during one of the merchant's business-trips, and he did not meet his offspring until nine months later. A mother loves her child at first sight, but a father must become acclimatized. When Wilhelm first looked at Jacob, he saw before him a dressed-up child instead

of a naked fetus smeared with vernix caseosa, and yet he could not escape the initial shock which comes to so many fathers. He frankly pronounced the youngster ugly—to the mother's amazement and dismay. But on closer inspection the critical sire modified his opinion to the extent of declaring the little fellow passable, and before again departing for business he had made the discovery that the sunshine lay in his baby's smile, and that his eyes were big and brown and beautiful.

Other children followed, and Jacob accepted it as a matter of course when he found himself surrounded by four sisters —Marie, Rosalie, Johanne, and Helene. They developed under the direction of their mother, as the traveling father was not sufficiently familiar with the family to be its taskmaster. The father who is home nearly all the time naturally assumes the rôle of disciplinarian, but the father who visits his hearth at rare intervals is usually as indulgent as a grandmother. It is among the traditions of the Henle family that Frau Helene was capable of serious procedure, yet seldom was compelled to resort to chastisement, as all the children, although lively, were gentle and easily managed, having inherited their father's gracious nature. The most vivid recollection the Henle children retained of their father was his constant humming and whistling, for this merchant was a musical enthusiast. He was not a performer himself, but there were few operas or concerts which he missed, and after the first bars of any selection, he could finish the melody. Herr Henle cultivated business because it is necessary to live, but he didn't live until the opening notes of the overture.

While Jacob Henle was growing up, Johann Peter Frank was growing old. The founder of modern public hygiene had reached eminence, but the ascent was terrible: when Frank was less than a year old, his inhuman father, enraged at his cries, threw him out of doors; the little outcast survived infancy, but at the age of four was almost murdered by some boys; at nine he was taken to Italy by the Piarists to be castrated because of his fine voice, but he escaped to write in indelible ink the name of Johann Peter Frank on the annals of German medicine. He climbed to the mountain-peaks of fame, but when he looked backward along the trail, the ghosts of his childhood memories arose, all tear-stained and blood-beclouded. How different was the childhood of Jacob Henle! Guided by loving and discerning parents, he imbibed only the good and beautiful, ripening in an atmosphere of peace and culture and music.

Moving day, although greatly dreaded by adults, is much relished by youngsters. Children are natural nomads, and delight in changing their habitats. During his sixth year, Jacob had the opportunity of informing his companions that he was going to move. Fürth had become too limited for the Henles, and they were bound for Mainz—the Rhine-city which gave the printing-press to mankind. In 1815, moving was not an art, and accompanied by a female servant, a private tutor, and their baggage, the Henles rolled along for many a weary day in a hackney-coach before they sighted the steeples of Mainz.

Comfortable days followed, for the star of economic prosperity shone over the Henles. They lived in a good house,

employed a male servant, kept horse and carriage—that badge of respectability—discharged the private tutor and engaged better ones, among them being Monsieur Hugier, who is credited with laying the foundation of Jacob's excellent French. Jacob studied the violin under Kreuser and Marie took lessons on the piano, and soon brother and sister could play duets. It was found that Jacob inherited his father's musical memory, and could reproduce entire acts of even infrequently performed operas. His musical ability, however, could not overcome his boyish passion for noise, for among Jacob's earliest compositions is this appeal:

Dear Mother,—I have heard that there will be a beautiful performance and thinking that you will perhaps attend, I beg you to take me along. Herr Majot tells me that there will be fighting and shooting, and you know this is my only joy. I hope that this is not a bold request; should you, however, not be in favor of it and should not consent, you may nevertheless count upon my sincere filial love.

Your affectionate son,

J. HENLE.

The parents had long planned the family's conversion to the dominant religion, one of their motives in leaving their native town being its essential Jewishness, Fürth owing its prosperity to Jews who had fled from persecution in Nuremberg. In Mainz it was easier to undergo Christian transformation, since it is the seat of a bishop. Having decided to become Christians, it was next necessary to decide what brand of Christian to become, whether Papist or Protestant,

and then select the denomination. The two elder children, Jacob and Marie, had to write out the reasons for their choice, and there was much solemnity in the household—but over the ceremony of changing one theology for another let us draw the charitable veil of silence. To discard the trammels of an outworn creed is splendid, and it is unfortunate when expediency requires the re-riveting of similar fetters. However, we will close this episode by simply remarking that in his twelfth year, Jacob Henle passed through an experience which seldom befalls a rabbi's grandson—he became a member of the evangelical faith.

Business dictates where men should go, and when Herr Henle's affairs drew him toward the French border, the family contemplated removal to Coblenz. In order to make the preliminary arrangements, the father preceded his flock, and the mother prepared to follow—under the protectorate of Jacob. The little man felt the importance of his office, and was keyed up with excitement over the prospect of the journey. He thought the day of departure would never come, but it finally arrived, and caused Jacob Henle to wonder at the perverseness and unreasonableness of life. He did not feel well; his leg was hot and it ached, but he tried to hide his condition, for he was afraid of having to remain at home, and he was resolved, boy-like, to enjoy himself at all hazards. The carriage rattled on, every moment intensifying the aching and the swelling. The mother, engrossed with her plans, failed to notice that her son was unnaturally subdued. At last Coblenz was reached, but Jacob did not jump down in eagerness. He could not walk, and it was necessary to carry

him to bed, where he spent a night of suffering. So the day which was anticipated with joy, brought with it nothing but sorrow.

Dr. Settegast diagnosed the case as periostitis, and for weeks Jacob lay in Coblenz, while his mother kept traveling back and forth from Coblenz to Mainz, to divide her attention between her scattered brood. Professor Leydig, the foremost surgeon of Mainz, was summoned to Jacob's bedside, and eased the patient with an incision; another period of exile followed, and when Jacob was able to be conveyed to Mainz, Leydig removed the necrotic areas with favorable results, although recurring attacks of periostitis plagued Henle at spasmodic intervals throughout his career. During his protracted convalescence, Jacob demonstrated Leydig's operation to his astonished sisters—with the aid of his father's strop and a button-hook. Unfortunately, the invalid's recollection of the operation was vivid enough, for 1821 was in the pre-chloroformic days.

Jacob's illness upset the family plans for a time, and it was not until 1824 that the Henles settled at Coblenz. Jacob was now fifteen, alive to everything, but interested chiefly in music and drawing. As he looked out of his new home, he saw a plain-looking house opposite. There was no gold within for thieves to steal, yet its unpretending walls held priceless treasures. Many youths—and certain elders—passed that humble door-step with desire, and accounted it a privilege to be permitted entrance. That rickety stairway led the pilgrim to a shrine, for here dwelt Herr Zeiller and his five charming daughters.

The blend of male and female voices was often heard in that home, mingling with the voice of the violin and piano, for the lives of the Zeillers were consecrated by music. Naturally the Henles drifted in, and the two families were mutually delighted with each other, passing many wonderful hours in song and play.

Among those who visited the Zeillers was a cobbler's son who neither sang nor played; sometimes his eyes flashed, but he seldom spoke or smiled; yet he came whenever he could, and watched Nanni Zeiller. Johannes Müller looking at Nanni Zeiller—science worshipping beauty.

Nanni's younger sister, the fascinating Malchen, had many admirers; she and Jacob formed the habit of singing together, and the world will not be surprised to hear that the young man's passion for music was complicated by a passion for Malchen. One of the symptoms of love is the desire to bestow gifts upon the object of adoration, but a boy's purse and his impulses are usually at variance, and Jacob was reduced to the necessity of stealing his mother's blossoming plant—which he presented to Malchen with the cautious stipulation not to place it upon a window fronting the street. In return, Malchen brought him a plateful of dumplings, but it is not stated whether he was enjoined to eat these in secret. Jacob's record in mathematics and the classics now suffered a decline, but the blissful hours spent with his first sweetheart compensated him for lowered scholarship.

The lad looked forward to the summer as the time when release from school would give him more leisure for Malchen, but in the summer his idyl was over. For Malchen, lovely

but poor, was abruptly engaged to marry a gentleman, elderly but rich. Young Henle now passed through a period familiar to so many adolescents, when a feeling of suffocation clutches the heart and the grey world is all ennui, when the brooding melancholy of the oppressive day is followed by the deeper anguish of the endless night, and to the memory of lost pleasures is added the realization that these joys have vanished forever.

In this stage, much of the world's poetry is born, and Henle wrote this lamentation to the summer:

O Summer, thou hast taken from me
All my happiness,
And brought me nothing
But sadness and sorrow.
Shall I rejoice with the swallows
Who returned to us,
When a beautiful bird
Has flown from me forever?
Sing, O sing, thou nightingale,
Sing your songs in the bushes;
The sound of one sweet voice
I shall never hear again.
Shalt thou, sweet air of spring,
Caress me with thy flowery fragrance?
Sweeter than all the flowers' scent,
Was the breath of my sweet one.
O heavens, with your azure blue,
Cover yourselves with rainy clouds!
For her eyes too swam in tears,
When our ways were parted.

What care I for the green forest,
Since no longer she walks beside me?
Can I enjoy the flowery meadow,
When she is no longer with me?
O Summer, thou hast taken from me
All my happiness;
O thou cruel summertime
Hadst thou never, never come!

Many other lamentations fell from the sufferer's pen, and Henle closed the cycle of his love-songs with this dirge to the flames:

To the Fire do I consecrate my songs,
Which I sang in my happy days;
With each spark that goes out,
My sweet hopes go to their graves.
So burnt my heart in bright flames
For Thee; thou scornedst it, then it broke;
When, oh when, will come the time
Which will disperse its ashes?

On the day of Malchen's wedding, Henle's tortured spirit would not permit him to remain in town, and he received his parents' permission to visit some of his friends in Mainz. A boy's love is acute, but rarely fatal, and Henle recovered. With the re-opening of school he returned calmly to his benches, and graduated peacefully.

At eighteen, he stood at the cross-roads of life, undecided which way to turn. His friend, Ludwig Lindenschmitt, who even then was an antiquarian enthusiast, urged the talented youth to study the Germanic authors, and become their his-

torian. Henle was impressed with this suggestion, but he thought too of law, and was also inclined to become a preacher. At this critical juncture, Johannes Müller again crossed the young man's path, and the decision was made. Not literature, nor jurisprudence, nor theology, but medicine was to be Jacob Henle's life-work.

II

THE MEDICAL STUDENT

In the autumn of 1827, Jacob Henle matriculated at the University of Bonn—he was no longer a boy at home, but an academic citizen. The day after his arrival in the university town, he received a dinner-invitation from Johannes Müller and his wife—for Johannes Müller had not looked at Nanni Zeiller in vain. Their housekeeping was unpretentious, as the professor's salary was meagre, and Nanni's dowry was nothing but a song-book. They plied Henle with questions about the folks in Coblenz, and were very friendly. After dinner, Henle and Frau Nanni sang together—and perhaps he thought of the days when he used to sing with Nanni's sister. Reticent and introspective, Johannes Müller was a man apart; he did not join in the festivities held in his home, but his face lit up when he heard his wife singing. Henle came frequently, relishing the scientific talks with Müller, and the duets with Nanni.

Henle thoroughly enjoyed his introduction to university life: he subscribed for a season-ticket to the theatre, became expert in dancing, took riding lessons, and never refused to attend an affair that promised to be jolly. He was proud of his social debut, and wrote to Marie:

Can you imagine, dear heart, little Jacob in a frock coat and cravat, holding a teacup gracefully, alone among seven ladies, conversing politely about balls in Bonn and Coblenz—can you imagine your stiff brother like this, at Professor Treber's? I did not feel exactly comfortable as long as there was no other masculine being in the room, but I was sufficiently composed to bow properly, and without dropping anything or smashing any crockery, I managed to sip down two cups of tea.

Even in the midst of accident, Henle exhibited a serene countenance to society. Once, while standing up and conversing vivaciously with the lady of the house, his piece of cake fell from the cup and saucer which he was holding in his hand. In stooping to recover the delicacy, the treacherous spoon also fell. Instead of being flustered and offering a thousand apologies Henle said to the hostess, "Now that the cake and spoon are already on the floor, may I place my cup there also?"—and thus the situation was saved by laughter.

Henle was among those scheduled for Professor Bischoff's grand ball, but he found his raiment inadequate for the occasion. His comrades came to the rescue, and from one he borrowed a hat, another loaned him a cravat, a third came forward with a collar, and a fourth furnished a vest. It always rains at the wrong time, and Henle hesitated to expose his faultless outfit to the Bonnian mud and the threatening weather. A fifth friend, however, permitted Henle to mount his back, and off they went in the darkness of the night. Any honest horse would have halted in front of Bischoff's house, but this human steed refused to drop his rider and galloped with him among the assembled guests, creating what he expected—a sensation.

Henle joined the famous student society, the Burschenschaft, and the members hailed the merchant's son with joy. They liked his tobacco, and smoked his cigars; they ordered

coffee at his expense, and showed a preference for his beer and wine; they praised his ham, and were enthusiastic over his sausages. In fact, Henle found himself so popular, that he soon withdrew from the Burschenschaft, and expected to hear no more of it.

College life appears to be unusually expensive, for nothing is more characteristic of students than the persistency with which they write home for money. Some students are prosaic, and simply say they need more money for food and rent, while others are inventive and announce they require an extra allowance to purchase a celiac axis. As evidence that Henle was a regular fellow, let us submit the following document which he transmitted to his parents:

Money! Money! Money! I have nothing, and I owe my friend Mathieu ten dollars. Money! I paid forty-six dollars for tuition, much for books, and twenty dollars for housekeeping. Money! Otherwise things are well with me, but Money! Money! Money! Last Sunday I visited Müller who grows more congenial and friendly from day today. He gave me some good advice. I remained there until evening. Professor Pugge, with his wife of eight days who has a very nice voice, came in the afternoon and invited me. But Money! Money! Yesterday evening I visited Pugge, where I met many fashionable students, and the professor's parents-in-law, Hasse and his wife—Hasse is one of the most prominent Jurists here. I sang several songs with the lady of the house and remained until half past ten. I also made the acquaintance of Prof. Hasse's son, a young man of my age, and Fuchs too, I learned to know. I think we shall become friends. Money! Money!

You see now that I could live here in dulci jubilo if only I had money, only Money! Money! but quick! Although I am screaming for money, I must also write about something else. I really cannot

use my cloak, and when I assure you of this, you will simply have to trust me and take my word for it. I need eight yards and a fur collar. When you send this, also send a pair of shoes, also my calendar which I left at home by mistake, a few pounds of sugar for the evening tea, and a good Mainz ham. But above all—Money! Also forward to me Biot's Experimental Physics in four volumes. The next time I shall write you about the university. Money! Money! Money! Cloth! Fur Collar! Calendar! Biot's Physics! Ham! Sugar! Money! Money! Money! Money! Ham! Money! Cloth! Money! Fur Collar! Money! Calendar! Money! Physics! Money! Sugar! Money. Your eternally loving, Jacob.

While we were recording instances of Henle's social success, a suspicion might have been born in the reader's mind that the matriculant was unfaithful to the curriculum. The passageway to medicine is through the labyrinth of anatomy, and many turn away in despair, but Henle entered with ease. He wrote his parents:

I derive so much pleasure from these studies that I cannot understand how my good genius permitted me to waver so long, before it brought me upon the right path. What others regard as dry stuff—such as the necesary, thorough and almost minute observation of all the parts—fills me with astonishment and joyous admiration of the manner in which it leads up with one end in view, even in the smallest particulars. I know of no better food for imagination than the beautiful formation of the human body, constructed of individual bones and muscles, which I know accurately and can put together. I know I shall learn something sensible, I shall positively not be a bungler.

From the first, he began to think anatomically and physiologically; in the second semester he illustrated Müller's work on glands, and became active in the master's laboratory.

Vacation time approached, but instead of packing his belongings, Henle lay in bed with a wounded cheek. As a duelist he was not a success. It is true, he was once victorious, but as he stood there with legs apart, proudly lowering his rapier, its point pierced his shoe and cut his foot. When Henle finally presented himself at home, nothing seemed so conspicuous about him as the *schmisse;* his parents were horrified and did not permit the mutilated student to show himself in the streets of Coblenz. For the first time in his life, Henle felt the weight of parental wrath—his mother was especially shocked and angry—although it is difficult to see how a German student could have avoided the inevitable *mensuren.* Saint-Beuve once fought a duel under an umbrella, but Henle found himself under a cloud. Perhaps if he had been more lucky, his parents would have been less indignant. At any rate, there was a rift in the Henle lute, and with impatience the household awaited the coming of the new semester which would call the student away to new duties.

Henle continued his studies at Heidelberg, and was delighted with his teachers: Naegele, whose description of the obliquely contracted pelvis—one of his specimens was that of an Egyptian mummy—is still known as the Naegele pelvis; Chelius, who introduced the surgical and opthalmological clinics into Heidelberg, and whose Handbook of Surgery was translated into six languages and reprinted many times without criticism until Stromeyer pointed out that it didn't contain a single original idea; Puchelt, who adhered to the School of Natural Philosophy, and whose reputation disappeared with the School; Arnold, after whom a dozen structures have been

named, such as Arnold's canal, Arnold's ganglion, Arnold's nerve; Tiedemann, who was Heidelberg's first professor of anatomy and physiology, but whose chief claim to remembrance is perhaps the monograph on digestion which he wrote in collaboration with Gmelin.

Anatomy was Henle's favorite subject. He prepared animal and human specimens, frequently corresponding with Müller, who stimulated his young friend by keeping him informed of his work and writings. Henle practised assiduously in the clinics, and experienced the felicity of being called Herr Doctor—by charity patients. He tried out his first bloodletting on a female, and relates that although on account of the roundness of her arms the veins were hardly visible, yet he completed his venesection without any misfortune. After having cupped three times, he permitted himself to cherish the hope that if he should fail in medicine, he could be a successful bathkeeper.

A medical student is apt to complain that his course consists of an excess of quizzes and a scarcity of clinics, but Henle wrote:

> The professors surpassed my expectations in diligence, politeness and affability, and everyone under whom I study understands his subject thoroughly. However, I have no occasion to regret that I did not come here earlier, for while the practical end is well represented, the preparatory and theoretical courses are poor. Without laying a scientific foundation, everyone rushes into practice, and the results of this superficial and empirical method will come to the surface as soon as the guiding hand of the teacher is withdrawn. The machine-like prescription-writing is certainly not our highest goal, and whatever such a mechanical man appropriates through many

years of experience can soon be equalled if we are willing to seek reason and ground. This is the only way by which we will be able to accomplish something independent, and will not be compelled to follow blindly what others tell us from their experience. The practitioner who is merely concerned about practice, may through some luck and *savoir faire,* attain a decent income, but he will never accomplish anything for his science, and I do not call him fortunate, who is satisfied with just that.

Toward the end of his stay in Heidelberg, irresolution again assaulted Henle. Vacation arrived, and he was still undetermined whether to plan a clinical or academic career, but he expressed his indecision charmingly:

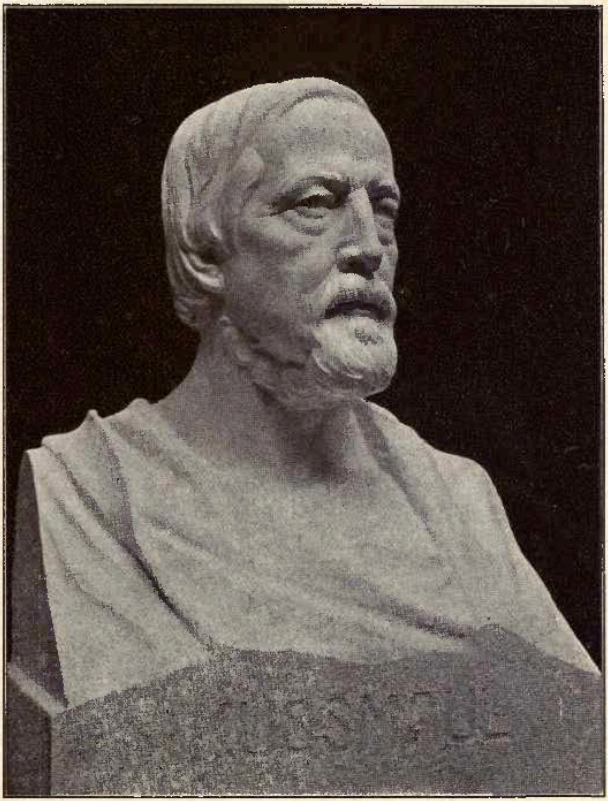
I am still undecided regarding my future. Much draws me to the practical, especially the position of a physician who knows how to make friends and inspire confidence. On the other hand, I have the knowledge that I can pursue the career of a teacher, and to sit in a lecturer's chair with believing open-mouthed youngsters in front of me, devouring with pointed pens every word as though it were an oracle, and laughing at every poor joke which I surely will not fail to make *ex officio*—this is not a bad picture. But the years of a privat docent! the years of dependence and huddling! and on the other hand, the seven first lean years of practice! In short, I am and remain undecided.

In such a crisis, Johannes Müller was the man to whom to appeal, but the inspired teacher was away in the land of Leeuwenhoek and Swammerdam. Upon Müller's return, just before the re-opening of classes, Henle hastened to his mentor, and laid his problems before him. There was no wavering in Müller's devotion to pure science; in the presence of a talented youth, his flaming enthusiasm swept aside all hesitation and Henle followed Müller to Bonn, with the settled purpose of

dedicating his life to anatomico-physiological research. The comfort that comes from resolution is evident from Henle's communication to his parents:

Recently I had the good fortune of making an anatomical discovery, which when I introduce it into the medical world, will make for me somewhat of a name. Müller to whom I spoke of it is much pleased and he confirms my opinion, so I may now call him as witness. If Müller goes to Paris this fall, as he expects to, I shall make my further investigations and write down my findings partly in Coblenz, and am looking forward with much pleasure to spending several weeks with you.

Since my arrival here, I have become convinced that I should take up the teaching profession. Since my renewed intercourse with Müller, my desire for anatomy, which I will be able to pursue only as docent, has awakened once more. I find that I know much more about it than I gave myself credit for, and the investigations which I conduct upon Müller's instigation convince me that I do not lack talent. Furthermore, there are other conditions which draw me to this career. First, Müller's friendship, which can be of so much help to me. Second, I can make good use of my skill in drawing. Third, although I cannot deny that it will take some years before I become independent, yet I need not hurry especially. And now, that I have once more gained self-reliance, and hope to accomplish something worth while, I also have the courage to ask for your parental love. Fourth, I see too, how my entire being inclines me more and more to the life of an instructor. I am daily growing more sedate, more quiet, more one-sided, and am losing more and more the qualities necessary to the practical physician. I should not like to choose a profession that would make it necessary for me to take off my dressing-gown before eleven o'clock in the morning and allow my pipe to go out. Fortunately, I find the other reasons which I am giving you conclusive enough, otherwise



ADOLF KUSSMAUL

you might blame this last one for my decision. Finally, there is not a single one of my acquaintances, either wise or unwise, who does not recognize my plan as a very good one, while Müller greets my decision with hearty joy.

Now that I am clear regarding this important question, I have decided to remain here over this winter. The reason for this I need not explain to you. The rich clinics in Berlin do not attract me any more; I intend to devote myself exclusively to anatomical studies and researches, and where can I do it better than here? I can do my work under the very eyes of Müller, and call upon him for advice whenever I am in the slightest doubt; his instruments, microscopes and books are entirely at my disposal.

I am also on good terms with Weber, and he has already spoken to me about some preparations for his lectures, and in return has promised me as much material for dissection as I need. I am therefore looking forward to a very pleasant period, where I can lay aside all examination-studies, and busy myself entirely with my favorite occupations. In the morning I shall do anatomy, the afternoon I shall devote to dissection, either for myself or for Müller, and in the evening I shall read. I cannot tell you with what expectations I am looking forward to this time. And still more. Müller proposed to me material upon which I can work and perhaps submit to a Journal; in fact, Müller asked my co-operation in a larger work, which it would not be advisable for one person to perform, and then I shall allow myself to be led into the world by him and shall hang my name to his, and let him drag me along. This is all really too beautiful, and I don't know whether I am right in telling you everything, as I myself fear that Fate will not permit me so much bliss.

My life plan, at present, is as follows: At the beginning of vacation, I contemplate taking my doctor's examination; during vacation I shall write my dissertation, and around Christmas I will permit the doctor's cap to be placed upon my head. I shall stay here throughout this winter and work hard, and after Easter I shall

go to Berlin to prepare for the State Examination. I shall next look for a place and try to advance as rapidly as possible, then shall marry a young, beautiful, wise and rich girl, who speaks French, plays the piano and knows how to manage horses.

Now I beg you to let me have your opinion regarding these plans. If I, perhaps, am a little broad or confused in my explanations, you must forgive me, for I am writing this note in the class of Professor Bischoff, whose monotonous phrases ring into my ears from time to time.

The keen edge of remorse over wasted hours never cuts more deeply than on the student's day of reckoning—the day of final examinations. But destiny is not always decided in class rooms. A student who passes his examinations *magna cum laude* is not necessarily successful in the postgraduate school of life. What happens to all the valedictorians? Many of them become employees of men who failed in college. It would be piquant to recite a list of celebrated individuals who were the despair of their forgotten teachers. Nevertheless, it should not be considered discreditable to pass with the highest marks. An examiner who perused Henle's papers, expressed himself to the effect that during his lifetime he had not seen their equal, and Johannes Müller was so impressed that he invited the brilliant graduate to accompany him on his long-planned visit to Paris.

It is a prize platitude to say that there is something about a trip to Paris which appeals to everyone. It is not difficult, therefore, to imagine Henle's joy; he was naturally of an enthusiastic temperament, and to travel with Müller was the

rarest of privileges. Arrived in Paris, the two Germans conversed only in French, and swelled the applause at numerous operas and theatres. Henle was not pleased with the French—that is, with the male portion, but he chanted paens of praise for the French girls, asserting that in grace, dress and poise, they could serve as models for all Europe.

At Müller's approach, the laboratories and cabinets of the French naturalists opened in welcome. Cuvier, who was then the potentate of French science, placed his own workroom at the disposal of Müller and Henle. Müller, who achieved immortality on a frog's back, had proved the correctness of the Bell-Magendie theory of the spinal nerve-roots, and he invited several distinguished Frenchmen to witness his demonstration. Alexander von Humboldt, who was in Paris at the time, was also invited, and Henle, who of course assisted in the experiments, has left us this glimpse of his illustrious countryman:

Humboldt has gone again *bien satisfait des jolies manoeuvers* which we had the honor to perform before him. He claimed to be delighted at having made my acquaintance, which, probably, was just prattle, and he told me the story of a young man, whom I didn't know, that he had married, regarding which I expressed inhuman joy. At the end he left five francs, most probably a tip for me. I, however, brought the money proudly back to him, and in return for this I received my handkerchief, which he pocketed by oversight. He brought with him a number of other prominent scientists, whom I now know personally, and upon my return to Bonn, I shall have something to boast of. You should have seen the way we fixed up our poor room for the reception of these important

guests. First of all we put everything in order. But then we found that a hole in a chair, there a tear in the table-cover, had to be covered with books, and so we chose the system of artistic disorder, as we preferred to appear careless rather than poor; it of course would have been differently arranged, if dear mother had announced that she would visit us. His Honor, the Minister, was placed upon an armchair covered with red flowered velvet cloth, the other gentlemen on similar chairs only filled with feathers, so their dignity might sink a little deeper. Müller and I camped on two cane chairs, which together numbered seven legs. We two were dressed entirely in black, including our linens, as our *femme blanchisseuse* disappointed us *perfidement*.

Upon his return to Bonn, Henle worked with such diligence upon his doctor's thesis that some of his friends were neglected—but when evening came, he found time to sing with Frau Nanni. Henle's increasing intimacy with Müller may be sensed from certain passages in his description of his graduating exercises:

Graduation has occurred, and was very solemn. I appeared in Müller's breeches and my own calves, which excited general admiration. . . . ..The dissertation met with much approval, and I myself, am satisfied with it. As I remarked, I am getting always friendlier with Müller, and our mutual tenderness is reaching the stage of mush.

Instead of the usual graduation dissertation—an academic review of ancient and modern opinions on a given subject—Henle presented his teachers a research-essay based on his own dissections of the optic membranes in man and various animals. Henle's *De membrana pupillari aliisque oculi membranis pellucentibus* was not a thesis wrung from an unwilling student by the exigencies of graduation, but a contribution to science that foretokened a future discoverer.

III

ADVENTURES IN BERLIN

One obstacle still lay in Henle's path—the State Examination. The young man sighed as he thought of it, for this meant an enforced renewal of his acquaintance with subjects which no longer interested him—symptoms, diagnosis and treatment. Dr. Henle had nothing to do with practical medicine. The clinic was now foreign territory to him—his home was the laboratory. Besides, the State Examination could be taken only in Berlin, and thus it was necessary to part from Müller, whose note of farewell lay before him:

> It is true, then, my dear Henle, that you are to go. I miss your dear society, but I know that you have left us that you may progress further. I hope to hear from you real often. I shall certainly not let you wait for an answer. Go then, accompanied by a thousand good wishes and by our love, and return to us the same affectionate friend.

Henle entered Berlin a stranger, but armed with Müller's letters of introduction to such scientists as Rudolphi, Schlemm, Dieffenbach and Romberg; from his father, Henle carried letters to commercial and juristic groups. A man who relies upon letters of introduction for his friendships, is apt to be solitary—but Henle was always a social animal. Merkel says

that when Henle was a short time in Berlin, the circle of his acquaintances changed considerably, for the families to whom he had been recommended, receded into the background, and the friends he found for himself, stepped into their places.

Among these friends was a certain Fräulein whose charms effaced the memory of Malchen. It is asserted that Henle was infatuated at first sight—"a glance from her was lightning and a thunderbolt at the same time"—and he was fully determined to ask her in marriage as soon as he obtained an income. Some women wait, and others don't. While Henle wooed and postponed, a landed proprietor wooed and proposed—with the usual success of wealthy men. This was Henle's second shock, but Wertherism was antiquated, and suicide did not follow. On the contrary, within a short time he wrote that he experienced the sensations of a bird on a branch who peeps into the room where stands his late cage.

Another friend of this period was Felix Mendelssohn. It was Henle's privilege to witness the origin and development of some of his compositions, and the musician became so attached to the scientist, that when he passed through Coblenz, he paid a special visit to Henle's family. Sister Marie's talent for music eclipsed even her brother's, and Mendelssohn enchanted her with a private performance of the overture to Midsummer Night's Dream, which he had composed in his seventeenth year, and which carried him to fame's pinnacle. Some years later, Henle and Mendelssohn might have been related by marriage, but when Henle proposed to one of the Mendelssohn girls, he discovered she was already secretly betrothed.

In spite of the imposing examination which loomed before him, Henle entered into the social life of Berlin with zest. He was always good company; he could chat superficially on trivial topics, knew how to play whist with the ladies, how to drink tea leisurely, and how to smoke a pipe comfortably.

He would have been content, if only Müller could have been with him—and then, with dramatic suddenness, Müller did come to Berlin, for Rudolphi, the professor of anatomy and physiology in the University of Berlin, unexpectedly died, and Johannes Müller was appointed his successor, thus becoming, in his early thirties, the central figure of German medicine. Müller and Henle hailed each other with joy and a renewal of their friendship meant a renewal of work. Müller now founded his epoch-making *Archives of Anatomy, Physiology, and Scientific Medicine,* familiarly called Müller's *Archiv,* which was the most influential journal of its kind until displaced by the periodical founded by one of Müller's pupils—Virchow's *Archiv.* Henle's name appeared conspicuously in the prospectus of Müller's *Archiv;* he was, in fact, the managing editor. Müller drew Henle still closer to him by appointing him his assistant at the anatomical museum. Henle went through the state examination without mishap, and soon celebrated his release by writing articles for medical dictionaries and encyclopedias, and by immersing himself in research.

Now that Henle was a teacher, every academic upheaval interested him—he might be appointed. When Ratke was called from Dorpat to Halle, as successor to the deceased Meckel, Henle reasoned as follows:

Through this the professorship in Dorpat is open, and as Russia likes to recruit from here, and as there is hardly a surplus of physiologists, it is possible that I will get the place at Dorpat.

While waiting for a stray professor's chair, Henle deemed it expedient to utilize his artistic talent by offering his services to the academy of art, and he wrote his parents an account of his adventures in pursuit of this position:

I was glad to give you pleasure by my appointment as prosector, especially as the joyous expectation of the other post may not be realized. I shall have to tell you the entire procedure, so not to have you think that I am as frivolous as may appear. When the place became vacant about three months ago, I foresaw but one who could contest it with me, and that was my friend Froriep. I went to him and spoke as Abraham spoke to Lot: If you wish to apply for this position, let us not be enemies; you have the qualifications for it, you are a good draughtsman and a pater familias, and therefore, I shall step aside, although I have been requested to apply. My behavior at the time was considered noble. After much controversy Froriep wrote to his father—it must be said a real politician—who advised him not to apply—that is, never mind the 400 thalers. Froriep confessed to me that he was heartily pleased over this, as he need not consider the income, and the work at the academy would distract him. I apply and all is well. I leave, I return, I inquire, and Privy Councellor Schultz, Professor Rauch, and Director Schadow, all assure me that I will be successful. Only the matter proceeds slowly, for the Minister needs time, as always. All of a sudden, old Froriep appears, calls upon the Minister and the Councellors, and my friend sadly informs me that he is compelled to make an application for the post.

My view of the affair, as far as I am able to judge, is this: old man Froriep informs the authorities that his son has been professor

for three years, and still receives no salary. The Minister recognizes his complaint as just, and even if he does not, he agrees with old Froriep, with whom he is on good terms. The Minister, however, as always, has no money to dispose of. Then he reminds himself of the yet unfilled post at the academy of art, with 400 thalers attached. I, the only applicant, am a young unmarried man, who has just entered into State service, and already has a salary of 500 thalers, and I ought to be satisfied with this. The academy's 400 may be utilized to stop the mouth of some one else for the time being, and Papa Froriep brings home with him a request and, most probably, a promise of success. Whether it is right for Froriep to take back his promise and compete with me, I shall not try to judge. If it is a crooked way, then it is the old man's fault, and I have set my pride upon it, that our friendship shall not be shattered on this rock. I told Froriep that I shall pursue my course as I have begun, as I may be able to use even a negative answer for the future. I have not, however, attempted to use any subterranean means, and our applications lay fraternally together before the Minister. You can readily understand that under these circumstances there is little hope for me.

My relationship with Müller is such as I imagined it, and that is saying a great deal, as I imagined something very beautiful. I always seek to do more than is expected of me. . . . I see more and more, what an invaluable treasure, the tested friendship of this excellent man really is. I now have an assistant, in the person of little Friedlander, whom you know. He assists me with my work when necessary and in return for this, he enjoys my special instruction in dissection, and in return for this again I enjoy an occasional dinner with his parents. He is very industrious and modest, and I think we shall be satisfied with each other.

The diplomacy of the elder Froriep was successful, and Henle reported to his parents:

The academic affair is finally decided, and it has brought me a great deal of disquietude and some pleasure. I realized very soon that this was not the time to indulge in high-minded sentiments, and without giving myself any false hopes, I determined to bring my competition with Froriep into the open. I, therefore, submitted my drawings to the academy, and personally called upon the individual members of the senate, and found that they were unanimously in my favor, as they considered me especially qualified for the post, and they requested the Minister to appoint me.

In the meantime, the Minister, paying no attention to their wishes, appointed Froriep temporarily. The entire academy resents this act, and there is talk of protest. That of course would be futile, as the Minister will not alter his decision. It is, however, enough satisfaction to me, and in other respects may prove very useful, as you can readily see that the Minister will have to make good this injustice done to me. In fact, when I called upon him recently, he was very cordial and promised to see to it that I should better my position through a more scientific occupation, than that which was recently vacant at the art academy. According to this, I can even demand an extraordinary professorship, and that certainly would be more advantageous to me than the little distracting by-office. On the whole, I can say that my old luck has not deserted me. I gained, if not in money, in prestige, and I can step forth with unsullied pride, side by side with my successful competitor, and the fact that our friendly relationship has not suffered through this affair, is something which, all who know the circumstances, count in my favor. Müller says he is glad for his and my sake that I did not appeal, and that too is of importance.

When Henle applied to the authorities for formal habilitation as privat docent, he expected a routine confirmation in due course of time. In reply he received an unpleasant reminder that he was an ex-Burschenschafter, and he was in-

formed that his political past was under investigation. This attitude of the State was entirely unexpected, and filled Henle and his parents with consternation. But a calm review of the situation relieved their panic, for they saw no genuine reason for alarm. Of course, the present misunderstanding was disturbing, but after all, Henle's participation in the Bonn Burschenschaft had been so slight, his exit so speedy, his subsequent devotion to science so complete, and his career so promising, that it was unthinkable that he should be condemned to any punishment severer than a reprimand.

But society must be saved, and church and state must be protected, and prosecutors must prosecute—and therefore the criminal inquiry proceeded apace. As the evidence was being sifted, exciting rumors leaked through the sieve: one day the academic circles of Berlin heard that both Müller and Henle had been arrested, but those who sought verification of the story, found the professor and his prosector at work in the Anatomical Museum. After a comparative lull, Henle would persuade himself that danger was over—until the sudden imprisonment of one friend after another, no more guilty than himself, stirred new terror in his heart. During this unsettled period, torn between hope and fear, uncertain whether the morrow would find him a state teacher or a state prisoner, Henle's scientific output was naturally diminished, but he produced at least one essay which won the enthusiastic admiration of Alexander von Humboldt.

In the meantime, there came to Henle, a friendly and highly respectful letter, from the Ministry of Dorpat, offering

him the professorship of human and comparative anatomy, zoology, physiology, general pathology, and pathological anatomy. However, there was compensation for this work, for the letter explained that after twenty-five years of service, the professor is retired with full salary, "which he may spend where he pleases," and after his death, his widow receives a pension.

The latter item held little lure for a bachelor, and Henle's reply was indefinite. Early in the morning of the second of July, 1835, as Henle lay comfortably in bed, dreaming perhaps of the Dorpat proposition, unexpected visitors entered his room. In that summer dawn, they affixed seals to the door, and took Henle with them. Throughout the day, Müller waited in vain for his prosector, for he had been transferred to the most famous institution in Berlin—the Hausvogtei. His cell swarmed with vermin, there was nothing to read except the Bible, no one came to see him, and he did not have a cigar.

A landlady is usually ubiquitous, but unfortunately, the sympathetic Frau Hegel failed to live up to the tradition; when the police arrested Henle, instead of being present, she was out of town, and the deed was witnessed only by the servant-girl. Now this servant-girl, in spite of her humble position, possessed a mind corresponding with that of certain eminent jurists—she recognized no distinction between a political prisoner and a common prisoner. She knew that no good man is carried off at dawn by the police, and she shuddered when she thought how often she had swept this criminal's room—un-

aware of any danger. As the day advanced, callers began to inquire for Henle, but ashamed to acknowledge that an inmate of her house was in the hands of the authorities, she covered the official seals on the door-knob with her apron, and persistently announced that the doctor was out. It was due to the intervention of this well-intentioned servant-girl—truly, a pillar of society—that Henle passed many weary hours in the Hausvogtei without seeing a friendly face. As soon as his new residence became known, numerous friends, with attentions and gifts, made his position as bearable as the authorities permitted.

During this episode, the Dorpat officials pressed for an answer, and were startled to learn that their intended professor was a prisoner. Efforts to have Henle released from his lice-laden cell, pending the result of the Burschenschaft investigation, were long unsuccessful. Müller, impracticably lovable, did not help matters much by his constant reiteration that Henle was indispensable as a prosector; the Gustav Magnus family rendered more effective aid by their pressure upon the proper authorities, but it was probably due to the powerful intercession of Humboldt that Henle was liberated.

After four weeks of prison-life, the genial young man again joined his many friends, and the rejoicing was great. Unnumbered visits were received and returned, congratulations flowed in from all sides, champagne ran like water for him, Berlin pancakes were stacked in hills before him, men embraced him, women wept with emotion, and in the midst of a large assemblage, a pretty woman came forward and kissed him—and with characteristic male exultation, Henle notified

his parents that for rewards like this, he would gladly spend another month in prison. Müller informed him that his four weeks in the Hausvogtei brought him more popularity than if he had written a thick book. The climax came when a carriage stopped in front of the released prisoner's door, and a gentleman accompanied by a liveried footman mounted the three flights of stairs that led to Henle's apartment. The caller was one of the European powers—Alexander von Humboldt. His wishes altered the decisions of governments, and kings bored him with their society. To have Humbolt climb three flights of stairs to see you, was an epoch in a man's career. But this drama did not end with the climax—it was followed by a farce. In the liveliest thoroughfare of Berlin, the prosecutor Kamptz greeted Henle affably, and explained for an hour that he personally was convinced of the innocence of the Burschenschafter and how differently all would have been if he had the sole authority—and passers-by could hardly trust their eyes when they saw this peaceful promenade.

Yet the investigation was by no means over, and in the harassing months that followed, Henle's mother went to her grave without knowing what fate was in store for her son. It must have been the extenuating circumstances of the case which kept the judges so long at their task. The problem was indeed a delicate one, for it required due exercise of the judicial mind to determine a fitting penalty for a student who had joined a students' organization, but instead of remaining to plot against the government, had withdrawn when he noticed his fellow-conspirators were too generous with his tobacco. It was not until the fifth of January, 1837, that this verdict was

delivered: deprivation of state office, and six years' incarceration in a fortress. If the sentence seems severe to us, we may console ourselves with the reflection that in every city throughout civilization today, there are judges eager to impose similar sentences upon those whom they deem guilty of intellectual insubordination. Had Henle been without protection, his career would have been blasted at its outset, but powerful influences among them being Humboldt, worked for his pardon, and on the second of March, the shadow was lifted.

Then began a remarkable period of productivity in which Henle became one of the chief builders of modern medicine. His contributions to Müller's *Archiv* were sufficient to make the reputation of a dozen professors. In those days the Berlin presses printed monographs, signed J. Henle, which opened up new paths to science. Had he never accomplished anything beyond his researches from 1837 to 1840, the name of Jacob Henle would still rank with the foremost investigators of modern times. Yet Henle was not happy in Berlin. Unable to forget the vermin and the Prussian officials, he itched for a professorship in another land. When Henle's co-worker in Müller's laboratory, Theodor Schwann, was appointed professor in Louvain, Henle watched the departure of his young friend with envious eyes.

In the early months of 1840, came Henle's turn: he received the offer of a professorship in Zürich—and a hint not to interest himself in Swiss politics. With eagerness, he accepted the proposition, and set out for Switzerland—and Destiny waited across the border.

IV

THE ZURICH PERIOD

The Switzerland of the present is a well-ordered tourist's paradise over which shines an array of Baedecker stars, but in Henle's time the beauty of its lakes was defiled by politics, and wrangling men impaired the majesty of its mountains. In Zürich, the controversy was precipitated by D. F. Strauss, the storm-petrel of theology, whose *Leben Jesu*—Englished by George Eliot—is one of the classics of freethought. The liberals of Zürich, being temporarily in the ascendant, were daring enough to appoint Strauss to the chair of theology, but the threatened invasion of the Tübingen rationalist aroused such protests, that although the administration pensioned Strauss before he commenced his duties, the forces of reaction were not appeased, and in the upheaval that followed, the conservatives rode into power with the determination to punish the young university—in revenge for the invitation to Strauss. From this imbroglio, Henle was glad to retreat to the calmness of his dissecting-room.

When Henle arrived in a new town, before settling down to work, he found it necessary to relax. During his first winter at Zürich, he spent more time in the tavern than at his

books. His evenings were a succession of balls and entertainments, followed by concerts and theatricals. In one of his letters, Henle describes the Swiss system of chaperonage:

Everyone dances. Old ladies, mothers and aunts are seldom present, and if they are, they go home at eleven, and consign their daughters to the care of a young man who is not too much of a stranger. On the way to the ball, a servant precedes with a lantern, so that the stockings should not be soiled. On the return, this foresight is dispensed with, and with it the servant. Is this not idyllic?

The deluge of merriment was tinctured with adversity when Henle found himself compelled to change his lodgings—because his landlord Hagenbuch expected him to court one of his daughters. However, Henle had fallen in love with women in Coblenz and Berlin, and he was not insusceptible in Zürich. He was irresistibly attracted to an army captain's daughter: he proposed, and was accepted, but the first cold embrace appalled him. It soon transpired that the girl already had a lover whose passion was on the wane, and she resorted to the expedient of winning him back by arousing his jealousy; after success had crowned her efforts, Henle was quietly dismissed, and the guileless professor thus found himself a victim of one of the oldest tricks in love's tangled game.

The ardent-hearted Henle was deeply wounded, and sought solace in music. Already skilled on the violin, he now took lessons on the violincello, and after mastering the bass member of the family, became conspicuous in the musical circles of Zürich as singer, violinist and 'cellist. The same fingers which could dissect a cadaver so adroitly, knew also the wondrous secrets of four strings of catgut. Upon

one occasion, a theatrical company to which Henle belonged, prepared for a public performance, and among the names posted on all street-corners of the town, was that of the versatile professor of anatomy. Sober-minded citizens, including Henle himself, felt that this was carrying virtuosity too far.

Throughout the career of Henle, the golden thread of friendship ran unbroken, and it gathered its richest strands in Zürich. For many years that boorish genius, Johann Lucas Schönlein, made medical history in the Swiss city. Typhus abdominalis and typhus exanthematicus are terms of his devising; he described peliosis rheumatica so well that we call it Schönlein's disease; he discovered the cause of favus to be achorion Schonleinii, and as he disliked writing, he described his discovery in twenty lines. But in 1840, the mighty Schönlein, founder of the Natural History School of Medicine, retired from Zürich to reap homage and money in Berlin, and into his chair climbed the young clinician, Carl Pfeufer. Pfeufer's arrival in Zürich coincided with Henle's, and before long the two new teachers became acquainted. It was friendship at first sight, and with joy Henle wrote:

> Pfeufer is one of the most charming men I ever met, merry, exceptionally witty, yet genial, modest and full of ambition. He is young and advanced enough to be able to discard the obsolete—in other words, he is the man I need.

The anatomist and the clinician talked matters over, and decided it was time to revolutionize science. Accordingly they founded the School of Rational Medicine, and its fearless mouthpiece, "The Journal of Rational Medicine," trumpeted

abroad the progressive ideas of its editors, and blasted many venerable hypotheses which had survived from the days of Stahl. But Henle's most important literary undertaking, during the Zürich period, was his "Handbook of General Anatomy."

Every university should be a capital of the Republic of Arts and Sciences which recognizes neither frontiers nor partisans—but the University of Zürich lay in the political path. Perhaps the study of anatomy promotes impartiality, for Henle complained without bias:

> Rankling with fresh hatred, the two antagonistic parties, the aristocratic-religious and radical, face each other, and both are tearing us apart: the reactionaries inquire whether the university is worth its expense, and the radicals, who consider themselves the enlightened ones, resent our non-partisan attitude.... Even with diligence, patience and ability, it will never be possible to make anything out of our university in the face of such a struggle.. There is only one good side to the situation, and that is that we all stand solidly together. Many little animosities and much raillery have been forgotten in the face of the common foe, and we spend the beautiful summer evenings and Sundays out in the open, and amuse ourselves by scolding and jests at the expense of the powers that be.

Henle's passage through the university was marked by a series of calms and tempests, but each time he triumphantly reached his goal. When entering upon his duties, he was much pleased with the new and practical anatomy-building, but was disconcerted to learn that one microscope had to serve for all students. The authorities came to the rescue by permitting him to order another, and they placed at his

disposal the sum of 480 Swiss francs to be spent exclusively upon instruments.

Henle was greeted a trifle pompously, yet affably enough, by his prosector, and this assistant would have sufficed for most professors, but Henle never considered a pretentious demeanor a substitute for anatomical knowledge. During a certain semester, he intimated that his prosector be removed to another department, and after adding a few other suggestions in the form of an ultimatum, Henle went upon his summer vacation—little expecting to resume his chair, for authorities are usually deaf in the presence of requests. Upon his return in the autumn, to his surprise he found that all his wishes had been met: the appropriation for the collection of comparative anatomy had been secured, and not only had the prosector been transferred, but in his place was Albert Kölliker.

From that moment Henle became a great teacher, because he had a great pupil. Kölliker was a Züricher with a Heidelberg diploma, but his real education was gained in Berlin where he had sat at the feet of Johannes Müller, and during his prosectorship under Henle he contributed to Müller's *Archiv* a monograph in which he carried the Schleiden-Schwann cell-theory into embryology, being among the earliest investigators to recognize the ovum as a single cell, and treating segmentation simply as normal cell division. Henle had discovered unstriated muscle in blood-vessel walls, but Kölliker was the first who succeeded in isolating it, and demonstrated that smooth muscle is composed of nucleated muscle-cells. In the seventeenth century, Leeuwenhoek described

the spermatozoa, but it was left for Kölliker to explain their true development, and he again recalled Leeuwenhoek when he increased our knowledge of the branched muscle plates of the heart which had first been seen by the Delft microscopist.

Kölliker extended Corti's discoveries in the histology of the ear, and was the first to supply a satisfactory description of the fibrous layer of the substantia propria of the iris. Kölliker's proof that nerve-fibres are continuous with nerve-cells was sufficient to establish an immortal reputation, and it is perhaps in the minute anatomy of the brain and spinal cord that Kölliker accomplished his most valuable work: the neuroglia is known as Kölliker's reticulum, the ganglion-cells are spoken of as Kölliker's tract cells, and the gray matter surrounding the spinal canal is eponymized into Kölliker's nucleus. The journal of zoology which he edited for half a century, his treatise on comparative embryology, and his textbooks on microscopic anatomy and human histology—the first comprehensive works on the subject—were replete with his unnumbered researches and discoveries.

It has truthfully been said of Kölliker—or von Kölliker, as he became in his age—that "there is no fragment of the body of man on which he did not leave his mark," and that "he knew more by direct personal observation of the microscopic structure of animals than any one else who has ever lived." He was one of the greatest histologists of all time, and one of the chief creators of its modern phase. With the exception of his prosectorship, and later professorship, in his native Zürich, Kölliker's academic life was passed in

Würzburg. He has not lodged in the imposing palace whose walls took twenty years to complete, built for Bavarian bishops and grand-dukes in imitation of Versailles, but with the microscope which he brought to the archaic town, Kölliker built temples of science where succeeding generations shall dwell.

The only time a professor feels really independent is when he receives a call from another university, and when Henle was invited to Tübingen it was a signal for another ultimatum, although on this occasion his demands were more on behalf of his colleagues than for his own department. Zürich, which had lost Schönlein, determined to keep Henle, and so prompt was its compliance with Henle's wishes, that he leaned back in satisfaction and wrote:

I decide to remain. I would have to give up dear friends, a magnificent country, pleasant neighbors in Bern and Basel, and a brand-new anatomy, a large hospital, surplus of cadaver, good beer, an excellent servant, a prospect of numerous visits, leisure for work and much else.

Here was a profusion of reasons for remaining on Swiss soil, and yet Henle left unnamed the prime reason—Pfeufer. The friendship between these two men had grown until it could no longer be uprooted; socially and scientifically, the founders of the School of Rational Medicine were indispensable to each other. Pfeufer, the practitioner, could keep abreast of all anatomical and physiological researches by merely consulting Henle; and Henle the scientist, could undertake an elaborate treatise on general pathology without

visiting a sick-bed, as long as he had the benefit of the clinical experience and diagnostic keenness of Pfeufer.

So Henle sent to Tübingen a letter of declination, and its ink had hardly dried when Pfeufer received a letter which caused fresh excitement—a call to Heidelberg; and the situation was further complicated when Tübingen answered that it would not consider Henle's refusal as final. Once more arguments were weighed and plans measured, and again they tried to read the secrets of the future, but mature deliberation simply served to bring the two friends back to their starting-point: the thought of separation was unthinkable: Henle said No to Tübingen, and Pfeufer said No to Heidelberg.

The students of Zürich expressed their gratification at the decision by a torchlight procession in joint celebration of the two professors. Leaning out of his window, Pfeufer thanked them for their speech, while the genial Henle descended to the street, and expressed his joy that he was in the midst of sympathetic colleagues and of students who were not merely concerned to acquire the superficial ability to practice, but desired to lay a scientific foundation underneath the superstructure of medicine. The flaming torches and the full-throated cheers replied with enthusiasm, and Henle and Pfeufer seemed destined to become the veterans of the Zürich faculty.

A few years previous, Henle had vainly scanned the academic horizon for a chair, but now alluring seats were offered him. Tiedemann, the ageing anatomist of Heidel-

berg, was anxious to secure Henle as his associate, but knowing that Henle would not stir without Pfeufer, it occurred to Tiedemann to bring Pfeufer along too. Together the friends were invited, together they accepted, and in 1844 they became members of the Heidelberg faculty.

V

ELISE EGLOFF

Confidential as was the relationship between these men, Pfeufer could not guess that Henle was motivated to leave Zürich at this time because there was a woman in the case. During a considerable portion of his Swiss sojourn, Henle lived in the house of his friend Loewig the chemist, in whose employ was a pretty nursemaid, named Elise Egloff. A man frequently imagines that a girl yearns for him when she only finds him ridiculous, and when a girl really loves him he is apt to overlook it—until some one tells him.

Henle had proposed marriage to several women who despised him for his meagre pocket-book, and he did not see that Elise Egloff trembled with joy whenever she was permitted to serve him at table, and he could not know that when he played the piano or raised his voice in song, behind the closed door stood a woman listening with tears of passionate rapture. Elise guarded her emotions as carefully as she could, and Henle himself probably never would have stumbled upon the truth, but the girl's condition could not escape the vigilant eye of Frau Loewig.

One day she informed Henle that her maid was in love with him, and then impersonally called his attention to Elise's goodness and unusual beauty, never imagining that anything could ever bridge the social chasm which separated the young servant-girl from the great scientist. But as the man listened to the words of Frau Loewig, the heart within him leaped, and he was eager to begin an affair with Elise Egloff. Certainly he did not contemplate marriage, in fact, he could not explain what he expected, but his aroused instincts responded to sex-lure. Smilingly he entered into a light flirtation, but after the first careless step he could not retreat, for the fires of love blocked his path. In his graphic and matchless manner, Henle described the unexpected turn of events:

> My Lisette, was a dear prattling Gretchen; I was learned and ripe enough for Faust, and bewitched enough. But Mephistopheles was missing, and there occurred the most ludicruous thing that could ever happen to a worldly cavalier in a relationship of this kind. I interested myself not only in the girl's beauty but also in her soul. I was won by her honesty, her kindness, her warmth and also her pride, which was doubly becoming to her because she felt her dependent position and bore it with resignation.

Since it is not considered proper for unwedded lovers to dwell under the same roof, Elise left the service of the Loewigs, and supported herself as a seamstress, and in this capacity still came occasionally to Frau Loewig. The intensity of her feelings caused her such deep suffering, that the alarmed Henle instituted himself her protector, and sought to deliver fatherly advice: he assured her that the most sensible thing

she could do would be to forget him, and he pointed out that it would be best if she secured a position with a reliable family in some other town. So they agreed to part, but in spite of their repeated resolve never to meet again, their mutual passion swept them closer and closer together. The abyss that divided them was wide, and seemingly impassable, while the whirlpool of society's prejudice eddied underneath ready to engulf all who approached—but it was bridged by Elise's gentle hand. From the tender clasp, Henle could not withdraw, and in an illuminating passage he explains the situation:

It was too late, and the gayly-made acquaintance now became a deep fountain of doubt for her and a great distress for me. For weeks I would avoid her; but when I saw her again, pale and thin, and I heard from the Loewigs how changed she was, and that they feared she was in a bad way, then I sought her out again and thought of nothing else but of consoling her and of trying to convince her to accept the untroubled present without thinking of the future. We had seen each other a few times again, when I received a letter from her friend, in which she implored me to leave Elise, and described her deplorable condition.

I had never experienced anything so humiliating, or that shamed me so much, and I decided that things must change at any price. We agreed that she was to leave Zürich, and I advised her to go to the French Switzerland and later to take a position with a good family. A few days later, when I saw her again in the Botanical Garden—the place we had appointed for our rendezvous—she had upset all these plans: she could not leave Zürich; as long as she was able, a few times a week to pass by my hearth and see the fire burning there, she would be happy.

In the meantime Henle received the call to Heidelberg, and out of his confused sensations arose one clear inspiration: Elise already possessed more charm and beauty than many a high-born dame; she was untaught but intelligent, and though she knew how to suffer, she loved life. Why not take this charming creature to Germany with him, and have her mingle with well-bred folks until she acquired the education and proprieties that would fit her to become Frau Professor? It was a hazardous experiment, but Henle felt that only in this way could he assure himself of a happy, or—if the experiment failed—at least, of an unreproachful future.

Henle was accustomed to solve physiological experiments by his own resources, but in this present problem, with its human entanglements and uncertainties, he turned helplessly to his sister Marie, announcing to her that he had a protégé in Traben for whom he felt a philanthropic interest. A portion of this statement was true, for in the spring of 1844, Henle had placed Elise in the little town on the Moselle to undergo her preliminary training before passing into Marie's hands, but he neglected to inform Marie that some day he intended to marry Elise. However, he confessed his secret to Marie's husband, Mathieu, and indeed it was his friendly brother-in-law who helped to locate Elise in Traben-on-the-Moselle, and rendered further aid by concocting a fantastic story regarding Elise's origin.

Henle knew Mathieu from the days when they were boys together in Coblenz, and Malchen Zeiller's rosy face seemed—to young Jacob—the sweetest thing in the world. Mathieu was

interested in art to the extent of nailing classical prints upon his door, and after Henle explained this circumstance to Malchen and heard her comment, "That must be nice," he begged her to wait a few moments. He was a knight who lived only to gratify his lady's whims, and running at full speed to Mathieu's room, he lifted the door from its hinges, placed it upon his back, and carried it down the flights and across the streets—exhibiting masterpieces of Dürer and Holbein to passers-by—until breathless but triumphant, he showed the pictures to his beloved. Mathieu would have been incapable of such a feat, for he evaded the opposite sex so scrupulously that he was considered a woman-hater, but the sophisticated reader will understand that he was simply bashful. Whenever he visited Henle, he scrambled hastily up the steps in order to avoid meeting any of his friend's sisters, but it must be recorded that though Mathieu mounted the stairway three steps at a time, he evidently met Marie at the head of the stairs once in a while, for in the years that followed, when the gallant Henle was endeavoring to throw away his bachelorhood in three cities, the shy Mathieu was blissfully married to Henle's eldest sister.

Henle's second brother-in-law and intimate friend, the Hofrath Schoell, also knew of Henle's relationship to Miss Egloff, and after visiting the girl, related his impressions:

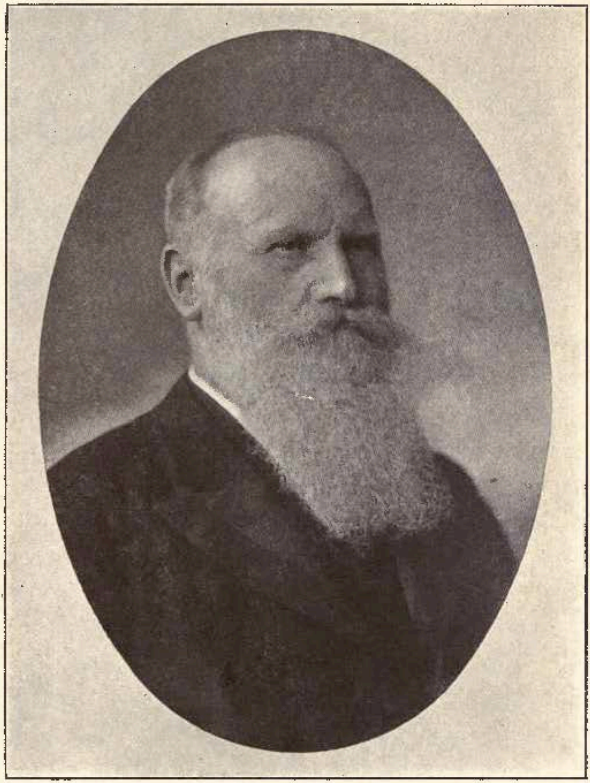
> She made an exceedingly favorable impression upon me. I found her very charming and was greatly moved. Then as it happens to everyone who stands face to face with her, I realized her peculiar position and I felt deep compassion for her. The thought that the

situation may become extremely painful, if it should last much longer, troubled me. The fact that she was among strange people in a strange place, who had to remain strange to her, despite all their friendliness, because they were not permitted to know anything about her life, then the stress of her belated education, the change of conditions, the longing and secret passion, and the unknown future—all this is too much. If her lover had been of a less sentimental turn of mind, a more prosaic but for the girl a more practical way could have been found, which would have led to the same goal.

Apparently, Schoell did not know that Marie was not in the secret, for it was some chance words of his which first disclosed the actual state of affairs to Frau Mathieu. Naturally, she was indignant at the deception, and it is on record that she could not suppress the remark that she would have been far better pleased if her brother had revealed the truth to her before. But Henle managed to pacify her, and there was no interruption in their devotion to each other. That Henle did not belong to the international army of unappreciative brothers, may be seen by the following letter which he sent Marie concerning Elise:

I do not, of course, lay stress upon history, mythology, etc., but I wish that my protégé should acquire poise and deportment, which can come only through association with cultured people, and I wish her to learn to appreciate the finer shades of feeling and taste, which ennoble life. The school should merely round out the rough edges so as to make her capable of entering into select circles, where she can develop further.

In whom, but you, dear sister, can I place my hopes! You remember that I told you a long time ago, at a time when it did not sound like intentional flattery, that of all women I know, I should like to



WILHELM WALDEYER

choose a wife who would resemble you in every respect. I was also convinced that you are capable of making sacrifices, great and small, in order to help me to reach happiness, which you know well how to value, and that you would be the last in the world to lose patience should the result not meet with expectations, and that you would be the first who would frankly, and free from prejudice, either approve of my decision or dissuade me, without any emotionalism, from the step I am about to take, depending entirely upon your judgment of your charge.

Marie now traveled to Trahen to see Elise, and when these two women met, both were embarrassed. Later, Miss Egloff moved into Marie Mathieu's home, where everything possible was accomplished for her advancement. Herr Mathieu enthusiastically read to her the classic poets, while Frau Mathieu instructed her in the labyrinthine intricacies of social intercourse. Marie performed her duties faithfully, and her example was of inestimable advantage to Elise, but no one should be surprised to learn that Miss Egloff was more at ease with gentlemen like Mathieu and Schoell, who welcomed her cordially, than in the presence of Marie, who obviously could not help thinking that it was a trifle unreasonable for Miss Egloff to have fallen in love with her distinguished brother.

Since music was a necessity to Henle, a course of lessons in this branch was mapped out for Elise, but though she remained at the pianoforte with the assiduity of a child practising for a much-desired reward, she made little progress. There was rhythm in her walk and music in her smile, but she could not master bars and scales. Aside from this failure, the experiment was such a brilliant success that within a short time Elise Egloff was transformed into a lady of the world

who moved becomingly, amid general approbation in circles bristling with cleverness and repartee, yet she made no breaks and she violated no commandment in the decalog of etiquette. A certain moralist laid it down as an axiom that all women should act as seamstresses for their own families, but Elise did not discuss the art of needlework. The impoverished poet who was invited to the home of a lady of wealth, and began the conversation by asking his hostess if she had noticed the different colors of pawn-tickets, had no counterpart in Elise Egloff. Her feverishly acquired education, added to her native sense and delicacy, served to pilot her through society's breakers, and though there were dangers which threatened at times to wreck her peace, high above the foam gleamed the beacon of her faith in Jacob Henle.

Events now moved rapidly. In 1845, Henle asked his father's permission to marry, the betrothal was announced in the early months of 1846, and during the easter vacation Elise became Henle's wife. The honeymoon was spent in Vienna, where Henle was warmly greeted by the foremost medical men of the day, including Rokitansky, and especially by his friend who "spoke like Cicero and wrote like Heine"—the incomparable Hyrtl. In the celebrations and banquets that were accorded them, Henle noticed that not all the admiration was directed towards his learned self, but that a generous share was lavished upon his wife's charms.

On the return journey, the bridal couple passed through Weimar, where Elise attended the theatre. The Grand Duke was one of the audience, but did not give his undivided atten-

tion to the play, for he looked long at young Elise, and finally sent his adjutant from his court-box to inquire who was the beautiful stranger who so fascinated him. And Henle, the ex-Burschenschafter, the dangerous demagogue who faced six years in a fortress because of his democratic principles, was overjoyed at this mark of royal favor. Perhaps he reasoned that if the Grand Duke knew nothing else, at least he knew a handsome woman when he saw her. The ladies of fashion who crowded around Elise, would have been either amazed or enraged to learn that two years ago she might have been their seamstress.

On reaching Heidelberg, Elise's defective education became evident, for she was forced to stand by while her husband fixed up their home according to a man's ideas, and the results were sometimes incongruous. Merkel admits that as a reformer in science, Henle was more successful than as a reformer of the household—he objected to curtains because they cut off some of the light. But in Henle's defence it may be urged that even if he did serve the roast on an earthenware platter, he bought the largest and most comfortable chairs and lounges obtainable.

Henle's most frequent guest, of course, was Pfeufer; one day when the clinician was visiting his friend's home, his eyes opened wide with alarm, for he heard Elise cough. An hemoptysis confirmed his suspicions, and Pfeufer diagnosed pulmonary disease. A period of rest improved her condition, and during the fall vacation Henle prepared to take his wife to Zürich. Henle loved company, managed to persuade sister Marie and brother-in-law Mathieu to come along, and made

arrangements to meet Pfeufer on the way. It gave Henle pleasure to anticipate the look of wonder on the faces of the townspeople who had speculated over Elise's sudden disappearance, and would now find her a different being. But hardly had the merry pilgrims reached Zürich when Elise's malady awoke, and instead of a holiday companion, Pfeufer assumed his familiar rôle of physician.

As the days went on, repeated messages from Heidelberg called Pfeufer in consultation regarding some aristocratic personages, but he would not move from the sick-bed of Elise. It was due largely to his efforts that she returned home in such health that she was able, in the month of December, to undergo her first confinement without complications. The child was named Carl, and Henle reported: "Immediately he began to suck his thumb and to put out his tongue, from which I conclude that as far as his appetite and temperament are concerned, he will take after his father."

As Henle could not be content without frequent social gatherings, Elise arranged many parties and feasts for him. She proved to be one of those hostesses whose characteristics are a puzzle to men. Often she would get up in the morning pale and tired, and all day would be out of sorts and complain of depression, but as soon as the guests began to arrive, her features grew animated, beauty bloomed in her cheeks, and she radiated life. To entertain was easy for her, for she was the center of attraction.

It was a happy household, but tuberculosis draws a line from the home to Badenweiler. In the summer of 1847, Pfeufer ordered Elise to the famous health resort, but from its climate and springs she borrowed no relief. She returned to

Heidelberg an invalid, and after several sad months gave premature birth to a daughter, named after herself. Then darkness settled over the house of Henle, and life and death waged their never-ending battle. The infant hovered between the two antagonists, and it became difficult for Henle to reach the bedside of his wife or child, for his old affliction assumed such aspects that the doctors debated whether amputation was indicated. During this critical period, Henle's sisters made splendid nurses, and Pfeufer was as efficient as an entire hospital staff.

As the days passed, the issue of the battle became apparent. Henle improved and was able to walk again, and baby Elise smiled at its first victory over death, but the lips of mother Elise were closed forever. Henle was inconsolable; for a long time he refused the distractions of society, and the sight of a woman was especially unnerving. He could not bring himself to visit the cemetery where Elise lay buried, and those who have read his private letters in which he bemoans the loss of so much grace, beauty and nobility of soul, say that their pathos is beyond words.

Her portrait was painted by Eduard Magnus—one of Henle's most important friends throughout the Berlin excitement—and the sculptor Meyer perpetuated her in marble. Berthold Auerbach, the distinguished novelist, was a daily visitor to Henle's shattered home, and later utilized Elise's life-story for one of his tales. Charlotte Birch-Pfeiffer, the famous actress and playwright, whose collected productions number twenty-six volumes, brought Elise upon the stage. Henle was deeply hurt at the manner in which these writers

handled their theme, but the life of Elise Egloff was essentially dramatic: the secret passion and despair, wisdom captivated by beauty, the transformation from seamstress to hostess, the triumph followed by tragedy—these emotional situations could not escape the authors.

In her brief career she added a fragrant chapter to biography, for a sweeter figure than Elise Egloff never strayed across the annals of medical history—she is one of those who enriched the world with a romance it can never forget.

VI

PROFESSOR IN HEIDELBERG

The most vivid description of Henle in Heidelberg was drawn by a student who did not follow the Henlean path, but became one of the greatest clinicians of the century—Adolf Kussmaul. In his old age, recalling the memories of his youth, Kussmaul devoted a chapter to Henle from which we extract these picturesque passages:

Henle's lecture was like a fresh, clear brook, upon whose lightly-stirring surface merry lights were playing. Although he framed his sentences in a simple manner, and retained his poise and calm, he was always entertaining, and his remarks, his humorous comparisons, and his sudden and unexpected flashes of thought, permitted of no ennui. When he said a witty thing, there was a smile upon his lips, he touched the tip of his nose with his finger, and threw his head a little to one side, as though he wished to shake off this idea which escaped him while off his guard. Within a short time, the youthful professor won the favor of his audience. His academic and political past contributed to it that the students loved and honored him. A small sword-cut upon his left cheek reminded them that he had belonged to the Burschenschaft, and was therefore arrested and confined in the Hausvogtei. There, too, shone about his head the halo of a romantic love.

Henle's marriage with a charming girl from the lower classes—he, however, had his sister educate her—corresponded with the social tone

of the time. It was the medical men who arrived at the conclusion that the anatomical equality of Eve's daughters should extend to social equality as well. Several of my acquaintances, and two honored professors of the faculty of medicine of Strassburg, stepped down from academic heights to take back with them untutored daughters of the people. A story reached me, in the spring of 1847, how a Heidelberg teacher and anatomist, a pupil of Henle, was given his congè by a pretty child of the merry Pfalz. He wished to follow his adored master not only in the study of medicine, but in the choice of a wife as well. His young, fresh waitress appealed to him, and he made her a proposal of marriage with the proviso that she should first be educated in a private ladies' school at his expense, so as to be fitted for the position which she was to occupy as his wife. But he fared badly. She flared up and demanded to know whether he was in his right senses; she told him she already had a sweetheart for whom she was well enough educated; a trim butcher, who outweighed two such lean doctors.

In the forties, science had not secured its divorce from superstition, for their union was upheld by many professors who were better versed in piety than in pathology. The name of Obermedizinalrat Ringseis means little to the present generation, but in his day he was a power in Germany; the filling of numerous posts depended upon his judgment, and this man firmly believed that disease was due to sinning against God and could be cured only by the grace of the church. Moreover, a host of system-spinners performed no experiments, but built up fanciful little cults into which they attempted to fit the science of medicine. Across these winding mazes—beginning in involved hypotheses, and ending in an interminable network of classifications and sub-divisions—Henle cut a bold new road, and the academic youth of Germany followed the pathfinder. They swarmed to his lectures, and the venerable members of the faculty found themselves neglected for the new

favorite. Shortly after Henle's arrival in Heidelberg, an incident occurred which brought back the Zürich period. The night grew alive with light, and music blended with the upraised torches and then a student stepped forward and spoke:

We are assembled here this evening, that we may show a slight mark of our appreciation of one whom we esteem as a thinker and research-worker, whom we admire as a teacher, and whom we love as a man. As a discoverer, he struggles untiringly and indefatigably at the head of those who oppose the wretched empiricism of medicine. The frost which had covered our science has been broken by his efforts, and already the tree bears spring-blossoms for the cure of suffering humanity.

With pride, the German nation points to the astronomer Kepler, who through telescopic research guided us into the immeasurable starry infinite, and so has our teacher's microscopic research opened to us the organic infinite. We admire him I say, as a teacher, for he has presented to us the truth, simply and convincingly, free from the nimbus of exaggerated erudition. I repeat, we love him as a human being, for science did not extinguish in him the desire for the well-being of mankind and for the fatherland. From a full heart, let us call a thousand-voiced Hoch to this honored man.

Henle's answer, which was hailed with loud rejoicing, was simple and inspiring—a model of what such replies should be:

Gentlemen, I accept this unexpected mark of your appreciation with thankfulness and pride. I shall not say, as is so often done, that this honor is impersonal. I say, this is done to me personally. But what may be the reason for this appreciation? I believe it is nothing else but that I am one of you. Much rubbish is at hand, which we have to clear away. With united forces, we are endeavoring to do this. We are commilitants—truly a wonderful name. Comrades-in-arms are we, in the campaign in which we are going to make new discoveries. Let us call a Hoch to the comaraderie of our science and to our university.

The significance of this ovation lay in its spontaneity, for

it was not Henle's birthday nor the anniversary of anything, and the whole celebration was the instinctive tribute of youth to a new leader. The Easter of 1845 witnessed an even stranger event: Henle utilized this vacation to call upon his publisher in Braunschweig, and upon his return, visited Leipzig, where Felix Mendelssohn invited him to dinner and music; next he turned toward Halle, where he had an appointment with some scientific friends, and let Henle relate what happened at Halle:

On the second evening, I was surprised by a serenade by a deputation of medical students; one of them made a beautiful speech and they cheered me, to which I replied from the window with the calm and self-possession of a man quite accustomed to such occurrences. The speaker said among other things that fault had been found with the medical men of Halle for following practice to the exclusion of theory—but they simply kept at a distance from the poor theories of the past. Now, however, that I constructed a new basis, founded upon physiology, they were just as zealous as any one to follow this path, etc., etc. My reply was not exactly beautiful, still it was fluent. I was somewhat embarrassed as Halle's professors were standing by, and had to witness this boosting of a stranger.

How frantically some men have worked to become a Hofrath, how ceaselessly they have schemed for it—and how easily it is thrust upon others who never coveted the aulic counselorship. When the Government of Baden conferred this distinction upon Henle and Pfeufer, the former wrote to his father:

You know what I think about this. I am not exactly overjoyed that I shall no longer hear my beautiful and well-earned Professor's title; under the present condition, however, and as we did not behave very tamely to the administration and did not take one single step to

reach this honor, and as hardly a year has elapsed since our appointment, we have to acknowledge it a mark of recognition, which promises a certain influence for the future, and this is in no way desirable to our cringing colleagues. My chief regret is that I have no longer any right to tease Schoell. I spent a few enjoyable days in Halle, and was received by the students with a serenade there, which gave me more pleasure then the so-called favor of the lordships.

The year of destiny, 1848, opened inauspiciously for Henle. His Elise lay on her death-bed, and on the twenty-first of February, death took her. Quiet had come to her, but the world was in revolution, and Heidelberg was the center of the cauldron. From the public turmoil which naturally agitated Henle, he could not escape to a home of peace and comfort; after the day's labor, no hearth awaited him where he could throw off his cares with his overcoat—eventful 1848 was the unhappiest year of his life.

As the weary months wore on, his sister Helene determined to come to his rescue. She had a friend named Marie Richter, the daughter of a Prussian army officer, and eloquently she sang Jacob's praises to Fräulein Marie. Fourteen months after his wife's decease, Henle visited his father and sister Helene at Coblenz, and there he met not only his relatives but was guided to the vicinity of Miss Richter—while Helene watched and waited. Her patience was not severely tried, for Helene's brother and Helene's choice fell in love with each other at once. Within a few days, the scientist proposed, and was eagerly accepted. Frau Mathieu now visited the girl and the letter of sister Marie is full of praise for sweetheart Marie, but it reveals also the writer's own nobility:

As far as human insight goes, we can be pleased over this union,

for Marie Richter possesses all the qualities from which we can expect that she will adorn the family hearth, and from the very first meeting with our brother she seemed to have become heartily attached to him, and affection is to him a life's necessity. She is a charming well-appearing girl, and will, according to all indications, be a good mother to his children.

Unlike poor Elise, Marie Richter was proficient in music. After an engagement of a few months, Henle and Marie were married, and they made the fairy-tale come true by living happily ever after. In due time, a merry daughter, Anna, was born to them, and she was followed by little Sophie. With children and honors and the pages of his Handbook of Rational Pathology periodically increasing, Henle seemed rooted to Heidelberg. Contentment reigned at his fireside, but with his colleagues he was at constant war. When Henle was a Heidelberg student, Chelius, Tiedemann, Naegele and Puchelt were of the faculty: years later, on returning to Heidelberg as professor, Henle found the faculty unchanged. Science had marched on, but Tiedemann, Puchelt, the stately Chelius, and their confrères, still sat in their well-worn chairs,—untouched by the new era. Upon their doors the young generation knocked loudly, for the modern Dioscuri—as Henle and Pfeufer were called—had valiant hands. Henle's opinion of his venerable colleagues may be plainly seen in the following letter, brief but bristling with invective:

I am still somewhat strange here, and hope to remain so unless new elements appear. To feel at home among these boresome antique university-pigtails, would, as Pfeufer and I tell each other, be for us a degradation. Here nothing remains but to allow the old to die out, and to found a new colony. Both the government and the students

seem to wish to help us as much as possible. The government, whose eyes have now been opened, is astonished how the faculty utilizes Heidelberg's reputation and its wonderful location, to fatten in comfortable calm and lock themselves in from intruders. Everything except the residences, country houses and vineyards belonging to the old gentlemen, is in a wretched condition. But the students are already beginning to see that something new, something capable of development, is offered them. They are full of enthusiasm for our rational medicine, and consequently enraged at the backwardness of affairs here.

Even Henle's friends have blamed him for the bitterness here displayed, but whether justifiable or not, the letter expresses Henle's attitude—and it did not soften with the passing years. The hostile relationship between the Henle-Pfeufer group and the elder members was further strained by a powerful series of unsigned articles in the recently-founded *Deutsche Zeitung*, praising the progressive elements in the university, such as Henle, Pfeufer, Vangerow, Jolly and Rau, and lashing the "reactionary periwigs." But though these articles were anonymous they were not the production of a nameless journalist, but of Georg Gottfried Gervinus. He was one of the famous seven who left the university of Göttingen when the king of Hanover tore up the constitution, and he became professor of history at Heidelberg in the same year that Henle was appointed professor of anatomy. Gervinus wrote the first satisfactory History of German Literature, and after a venture in practical politics—from which he soon retired in disgust—he devoted his time to the thesis that his favorite poet, Shakespeare, and his favorite musician, Handel, were very much alike intellectually, because of their common Teutonic origin.

As already indicated, it was the anatomist Tiedemann

who had opened the gates of Heidelberg to Henle, but after their first personal contact, the elder man took no pride in his protégé, and the younger felt he owed the other no gratitude. They represented different viewpoints, and between them there could be no sympathy. Oddly enough, it was a question of architecture that fanned Tiedemann's smouldering animosity into a wild paroxysm. The new Anatomical Institute was then nearing completion, and as its nominal director, Tiedemann gave certain orders for the furnishing of its interior —during the absence of his associate. Henle was an indefatigable worker, but he was so human that he went off on a vacation every time he had a holiday; upon his return, he criticized Tiedemann's plans, and was especially displeased with the arrangement of the auditorium, which he pronounced unserviceable. When leading architects confirmed Henle's statements, old Tiedemann's anger was uncontrollable: not only did he accuse Henle of a dastardly lie, but he shouted that his young colleague was a shameless Jew.

Tiedemann's shriek reached farther than he expected, for Zürich heard that Henle had resigned, and cordially offered him his chair again. Henle was undecided whether to accept, and it is interesting to note that at this period he was so adrift that he even contemplated emigration to America. But Heidelberg would not let Henle go: the ministry rebuked Tiedemann for his insult, demanded that he apologise in writing, and conveyed a hint to Henle that the director would soon retire. Henle's friends, such as Pfeufer, Gervinus, Vangerow and Jolly thereupon met in supreme council, and having decided that his honor had been sufficiently vindicated, they induced him to remain.

Fate practised its cruelest tricks upon Tiedemann's declining years; his adored son was one of the revolutionists of 1848, and when the wonderful year was dead and retrogression again assumed its ancient throne, the young man was court-martialed and shot. Then the old professor resigned from the university where he had become a tradition, and at last Henle's heart went out in sympathy toward his fallen antagonist.

But the same forces which murdered young Tiedemann, eventually drove Henle from the faculty. During the fifties, darkness held its carnival at Heidelberg, dispersing the liberal circles that had gathered there. For publishing an essay which was to serve as an introduction to his History of the Nineteenth Century, Gervinus was placed on trial for high treason. The proud man disdained to defend himself except to say, "This charge, though it appears directed against me, is really an accusation against History, which cannot be condemned." But the reactionary government of Baden was not afraid of History: it burnt Gervinus' pamphlet, and sentenced the writer to four months in prison.

When Heidelberg had become impossible, Pfeufer and Jolly accepted Munich's welcome invitation, and Henle responded to the call from Göttingen. After twelve years of constant association, Henle and Pfeufer were to part. "That we do not go together," wrote Henle to his sister, "pains us both, but I think I may say that our friendship has reached its zenith, and it is better that it should be forcibly rent asunder than that it should cool off." Even when moving day came, Henle did not experience the usual sadness of farewell, and his first Heidelberg letter was rounded out by his last:

I depart, for the second time from a wonderful country, with the regret that it is not peopled with better men, and I shall gladly take in its stead some sand and meadows in order to be able to live among scientific colleagues and under a government to whom one does not become objectionable because of one's justified ambition for one's institution.

So the scientist left the wooded banks of the Neckar and turned to the North, but the stormy Heidelberg years were not barren, for Jacob Henle carried with him to Göttingen the completed copy of his great Handbook of Rational Pathology.

VII

THE CALL TO GÖTTINGEN

In the anatomical building of Göttingen's university—"the great university in the small town"—old Rudolf Wagner, conspicuous for his religious zeal and remembered for his discovery of the germinal spot, awaited the coming of Jacob Henle. Professor Wagner had feared this day, and long fought against it; it was his heart's desire to die teaching anatomy, but as his years advanced and his health declined, both colleagues and students insinuated, gently at first and later with increasing pressure, that he step aside; he prepared to withstand all his opponents, but a hemorrhage came to their aid, and the pious man humbly said, "Now that the living God has spoken, I must bow my head,"—and in submission he sent for Henle. After Wagner and Henle met, the latter, with his usual perspicacity, explained: "My position towards Wagner is similar to that I once held in relation to Tiedemann, with all its difficulties, except that Wagner is a much finer character, and fundamentally a good man. But it is asking too much that he stand by, and see how someone inherits from him, while he is still alive."

The halo of spirituality which shone about Wagner, received a few crimps from Karl Vogt, but it shed its beams upon Henle, who was accordingly granted an interview with George V., the sightless king of Hanover. In those days,

many letters passed between Göttingen and Munich, and Henle wrote to Pfeufer:

I have had the honor of dining with his majesty at Rotenkirchen. This is not so remarkable that you should be informed of it, but that this honor is due to my piety, will surely amuse you. The king received me with the statement that he felt it a necessity to inform me how much he congratulated himself upon the acquisition of a teacher whose reputation as a scientist was combined with that of a strictly Christian mind. The poor deluded man had, on his way through Heidelberg, received a visit from colleague Wagner, and apparently had some specific conversation with him, and then, because of my matter then pending in Heidelberg, he somehow connected me with this visit, and so I stood face to face with him as a brother in Christ in talar and a white neck-tie, in which you once, in your friendly partiality for my exterior, compared me with calf's head en tortue, and with a countenance which must have appeared still more strange, as my heroic efforts to set it into strict composure were lost upon the blind king and the entire work was done merely for the love of God.

I did not have the heart to spoil the king's joy, for he cannot get rid of me now; and when he began to reason about deists, I was able to assure him without hypocrisy, that I too did not believe much in deism, and when he expressed the conviction that a professor of anatomy could, in his lectures, do much for the propagation of religious faith, I made him very happy when I remarked that I always call my hearers' attention to the defects of human understanding, even in tangible things. If I talked a Guelfenorder on my neck or into my button-hole, you may rest assured that I shall put it on with a blush. His majesty immediately grasped the opportunity of informing himself regarding the utility of the blind gut, and we had arrived in this remarkable private audience as far as tapeworms, when the Hofmarschall announced that the soup was served.

In the fifties, pastorals could have been bred in Göttingen, for rusticity was its keynote. The same sylvan paths served

for professors engrossed in meditation, and for cows intent on rumination. There was no railroad nor thriving industries, but every family kept a pig-pen whose dwellers spread the fame of Göttingen sausage. It is true, the principal streets of the town were lined with paving stones, but between their crevices the grass grew with sufficient luxuriance to satisfy herds of sheep. On his initial contact with this ruralness, Henle was appalled—it seemed incredible, after his active career, that he should pass the remainder of his days amid such provincial surroundings. As soon as he heard that Pfeufer was negotiating for him at Munich, Henle left his home half-furnished and wrote to his friend:

I would much rather use my energies in connection with yours, to build up Munich's university than work here in this retirement, for the preservation of a university which blinks melancholically backward upon the good old days. I long for the merriment of the South and the animated life of a large city, more so for the sake of my wife and my growing progeny than for myself, for I, at least, have beautiful memories to live upon.

Gradually the peace of the small town enveloped the spirit of Henle, and Pfeufer learnt that his Göttingen comrade began to lecture on special anatomy, "in that melancholic-trembling voice which you know so well," and the following bucolic was transmitted to Munich:

I find myself in the cleanest and richest of anatomical professorships imaginable. To use the classroom expression, I am "surrounded by all the integral stimuli" which a man and a professor requires in life—only the vexatious and the exciting ones are lacking. We have time, money, devout pupils, and complete teaching apparatus. The colleagues are nothing but open encyclopedias. All are as virtuous and as industrious as I hope to become, because there is no opportunity for anything else.

The city lodges many students and their teachers; it also harbors

the necessary bootblack, a cobbler, a tailor, an inn-keeper, and a burgomaster and four gendarmes who govern these citizens. At the stroke of the hour when the lecture is over, it is somewhat livelier in the streets; at twelve it is noisy, because besides the home-returning men, the streets swarm with maid-servants with baskets filled with berries and prunes. Carriage wheels are heard only when there is a ball, or when a professor is being buried. At four o'clock everything rushes on the Wall, and runs once or twice around the town, after the fashion of hemorrhoids, more or less completely blind.

I have already found a student who plays the violin; as I wished to form a trio and needed a C string for my violincello, I inquired at the store and found that the store-keeper permitted the article to run out, because for two years there had been no demand for it. She would, however, have one spun for me. When it was ready, I had to have the opening in the tail-piece of my instrument made larger, because the string would not go through.

In public and social life, much has been retained to remind one of the town's former connection with England. There is much more civic freedom here than anywhere else in Germany; restrictions of hats, books, collections, etc., woud be just as impossible here as in England. We know nothing of either the religious or political faith of our neighbors. But aside from independence in vital matters, there is to be found the English sameness in non-essentials; the unalterable roast at dinner and a certain stability in food and drink, which in spite of the hospitality of the host and the merriment of the guest, would bring people of your sensitive taste to despair. Every Sunday we meet the same valet de place, who tells us in advance where we shall dine together the forthcoming Sunday, and everywhere are to be found the culinary products of the same cook.

Henle sealed his contentment with Göttingen by buying a home, situated directly on the promenade which led around the town, shaded by magnificent lindens, and enriched with a garden of rare plants and old trees. The house had formerly

been Langenbeck's private hospital, and the walls which once saw the master surgeon amputate a shoulder while you took a pinch of snuff, now witnessed happier scenes. If an academy, a library, an opera and a dramatic troupe had arrived in Göttingen, all at once, they could not have aroused the town more than did Henle's advent. He formed his colleagues into a Friday Night Club, and was its animating spirit, but intercommunion with fellow professors never sufficed for Henle; gathering groups of students and young privat docents around him, Henle organized musical and theatrical circles. His home became the headquarters of visiting artists, and his position as director of the museum enabled him to utilize the museum's hall for concerts. Renowned men and women participated in Henle's musical evenings: here were heard Joachim's violin, and the mezzo soprano of Amalie Weiss.

Among Henle's new professional friends was the dermatologist, Conrad Heinrich Fuchs. "I begin to feel," wrote Henle to Pfeufer, "a great attachment to Fuchs, because of the pleasant recollections which his doubtful hard 'b' awakens in me, and also for his kind nature and modest manner, in which there is nothing to remind one of the pretentious Systems of Skin Diseases." The point of this note is that Pfeufer and Fuchs were natives of Bamberg, and therefore found it difficult to pronounce the alphabet's second letter; moreover, Fuchs was an adherent of the so-called Natural History School, and he proved it in his once-famous book on diseases of the skin, for while it contains many valuable observations on etiology and diagnosis, and even on therapeutics, the effect is marred by its incomprehensible nosological arrangement. Had Fuchs not made the slightest attempt at classification, instead

of devoting his chief energies to it, the result would have been less bewildering.

Another friend was the obstetrician, Eduard Caspar Siebold, a member of what Lorenz Oken called the "Asclepiad family of Siebolds." He is now remembered for his classical history of midwifery. Siebold was a singer, and played the kettle-drum and tymbals with unusual skill—and Henle did not permit him to neglect these instruments. Henle asserted that at the very first tone, he could tell whether Siebold or an ordinary drummer was playing.

Then there was Friedrich Wöhler, who was certainly worth knowing. He graduated in medicine and surgery at Heidelberg, and intended to become a practitioner, but he had already worked in the laboratory of Leopold Gmelin, and was persuaded by him to devote his life to chemistry. Gmelin discovered potassium ferricyanide but Wöhler may be regarded as Gmelin's chief contribution to science. The young Wöhler went to Stockholm to study under the great Berzelius, and in later years, along with original researches, he translated his teacher's work from the Swedish. His friendship with Berzelius was matched by his lifelong relationship with Liebig, with whom he was associated in many important researches. Wöhler taught for brief periods in Berlin and in Cassel, but for almost half a century he held the chair of chemistry in the medical faculty at Göttingen. Wöhler was the man who broke down the barrier between organic and inorganic chemistry by constructing an organic substance out of its inorganic constituents—and thus the vital force theory received its death-blow. It was granted to Wöhler to make another discovery of permanent

importance: just as his synthesis of urea marked the beginning of modern organic chemistry, so his demonstration that benzoic acid taken into the body reappears in the urine as hippuric acid, opened the modern era of the chemistry of metabolism. Wöhler was equally interested in analysis and among the elements he isolated were aluminium, beryllium and yttrium.

In the spring of 1858, the sons of science went into mourning, for the father of scientific medicine in Germany bade them the last farewell. No longer would his voice be heard in the lecture-room, nor his guiding hand felt in the laboratory. His pupils remained—Schwann was at Liège, Henle at Göttingen, Kölliker at Würzburg, Brücke and Ludwig at Vienna, Wilhelm His at Basel, Virchow at Berlin—but their teacher had left them. Johannes Müller was dead, but the work must go on, and mighty Berlin turned its eyes towards the town of Göttingen, where now dwelt Germany's greatest anatomist, Jacob Henle. The times had changed, for the city which had thrust the youth into prison, invited the man to enter its university as Johannes Müller's successor. When Pfeufer read in the newspapers that Henle had received the offer from Berlin, his emotions were on edge, and he immediately wrote to Henle asking him if he intended to accept, and assuring him that though he might conclude his life with more contentment in Göttingen, yet it was certain that he belonged in Berlin. Without delay, Henle replied to his most intimate friend:

> It is true I received an offer from Berlin, as brilliant as possible, purely for anatomy, with a to-be-newly-constructed building, with a prosector of my own choice, with a seat in the faculty and at the state examinations—and I have rejected it. Not without a great mental struggle; but on what solid basis my final decision was founded was

proven to me when I read your letter, which in spite of the fact that I have always valued you as an authority in practical matters, could not shake my peace of mind. How much I would have liked to have gone for advice to my old friend! The matter was left entirely to me, as not even my wife would give a sign of what preference she felt, and the Berlin Geheimrath who unexpectedly crashed in on me with this offer like a bomb, insisted on coming back for my answer on the following day, and could only be persuaded to depart when I gave him my assurance that I would forward my decision within forty-eight hours.

You may voice your objections that I permitted myself to be so hurried. I however, wished that the Prussians should not lose more time than necessary, as I felt from the outset that their efforts to get me would be unsuccessful. I am greatly attached to Göttingen; I felt at home here from the first moment; every change that has occurred has made my position more comfortable; and I can surely count upon it that it will be the same in the future, and that in any matter concerning the university I shall have a decisive voice. I contemplated Müller's position without the slightest envy, while he, on the other hand, called my position a more enviable one. Why should then, the accident of his untimely death give me an incentive to see if I could not have things better than I already have them?

The great city and its manifold contacts do not possess the same attraction for me as they do for you; it is probably the result of my provincial origin that the bustle of strange and stiff people makes an unpleasant impression upon me, and that I find more comfort in the quietude in which our life flows on here, under the shadow of our trees and among a few everyday friends. Besides, you must not draw a parallel between Berlin and Munich, and between Göttingen and any other small town. For Munich has, besides all the agreeableness of a large city, still many congenial rural elements, which Berlin lacks, and Göttingen is more a country seat for a number of professors and students than a small town. If we gradually appropriate *das Geschmaeckle* of which you speak, we do not notice it upon each other, and if it is apparent to our friends from large cities, whom we unfortunately meet

but seldom and but for a few days we must hope that they like us well enough to put up with it.

If I felt some of that self-confidence, with which I would have gone into Parliament in 1848, if my leg had permitted me to stand up at the time, I would consider it my duty to become the citizen of a state, which after all, is the dominant factor in German affairs. But I have not yet forgotten, how at the time, it was not my wit, but merely my misfortune, that saved me from compromising myself. That I can bring up my children here physically stronger and mentally less blasé than would be the case in Berlin, I know for certain. And for me the reflection over going or remaining was merely a struggle between inclination and duty. Whether it was right for me to withdraw myself from such an important and influential post, with great resources, and participate in the list of a tournament to which I was called, I shall have to justify myself before my conscience and my friends whose eyes are focussed upon me.

How alone I would have stood! Was it not characteristic that not the slightest hint, not a friendly word of persuasion from the lap of the faculty, or from other friends, preceded the arrival of the Berlin mediator? Could I be indifferent to the fact that since leaving Berlin, I received not the slightest mark of distinction from the medical societies that spring up there, and that the Berlin Academy purposely avoids me? Though I am not in the habit of imagining things, still it seemed to me quite clear that I made myself unavoidable through my book, and that I was proposed and expected as the inevitable one. And Fr. who was supposed to have dished out the gravy, belongs to those who will not forgive me because I did not wait for the physicians to clean out the pathological stall. . .

Could I, without flattering myself, hope to exercise influence upon the course of studies in Prussia? Dear friend, we both know that we, with united forces and in younger and more spirited years, were unsuccessful with the subdual of a less tough dough. A man of Müller's importance had difficulty enough, and had to, often play his highest trump to remain unattacked in his own field. This is, and we have often acknowledged it, not my terrain, and a man of fifty years should

not deceive himself into imagining that through transplantation into a new soil, he can acquire new qualities. I live chiefly to please myself, and believe myself to be useful to others if I give to the world the results of my quiet musing.

To satisfy this passion, there is no place more suitable than Göttingen. Were I to go to Berlin, I would have interrupted my work for a few years, first because of the removal and then because of the work incidental to the building up of a new collection. How terribly Müller had often sighed over the burden of the state examinations, which took up, year in and year out, so much of his time. Forgive this long exposition. But as you do not know either Göttingen or Berlin in their modern phases, the matter could not be explained briefly. Verbally, I could even say much more. Could you but glance into our activities! You would not wish to live here, but you would understand why others feel themselves so attached.

Until he came to Göttingen, Henle was a peripatetic: six years he was Müller's prosector in Berlin, four years professor in Zürich, and for eight years professor in Heidelberg—but for the remaining thirty-three years of his life he was settled. It was Reichert who went to Berlin as Müller's anatomical heir. Henle remained in Göttingen, cultivated his garden, paid the mortgage on his house, and worked on his masterpiece, The Handbook of Systematic Anatomy.

VIII

THE JUBILEE

In 1866—a year famous for its quarrels—Bismarck and King George could not agree, and Bismarck characteristically ended the argument by annexing Hanover. By this act of absorption, the University of Göttingen ceased to stand apart in cloister-like aloofness, for its faculty automatically became members of the University Society of Prussia. Henle had refused to come to Prussia, but Prussia had come to Henle.

The new state of affairs divided Hanover into those who favored the annexation, and those who disapproved, and in the factional disputes that naturally followed, many old friendships were broken. Henle was at all times opposed to Bismarck's internal policy, and bitterly resented the statesman's present tactics, and therefore five professors resigned from his Friday club. For some time to come, at the least provocation, Göttingen was split into Prussians and Hanoverians; for example, in 1868, Henle's son Karl, arranged a ball at the museum, and a sleigh-party comprised of students and young ladies. They rode out into a storm that traveled straight to the door of father Henle, who thus explained the cause of the tempest:

The sleighing party which took place a few weeks ago and the dance that followed, resulted in a complaint of the police-director to the pro-rector, wherein he summed up the sleighing party under the heading of 'gathering under free skies,' for which the police is to grant permission forty-eight hours in advance. It required much paper to convince the bone-headed bureaucrats that you could not order snow to remain on the ground for forty-eight hours.

Another and much worse excitement, which extended even to the lowest strata of society, and which once more divided the city into Prussians and Hanoverians, was the ball arranged in the Museum by Karl and his friends. It required a general meeting of 120 earnest men to decide in a conference, whether there is a difference between a feast and a ball, and whether the feast could only be arranged by private individuals and the ball only by the director. To speak more correctly, they merely seemed to hold this conference, for its actual purpose was the official assassination of the present director. I shall, therefore, like Bismarck, be more constitutional than is expected, and shall resign the post which for seven years deprived me of much time, and during the past two years caused me much aggravation, and was only of value to me in so far as I had the disposal of the hall at my command, and was able to invite artists here and keep in touch with them.

Henle sought relief from these agitations by an excursion to Upper Bavaria. Tourists who visited the Tegernsee during the fall of 1869, were apt to come across a quintet whose hair was grey, but who chatted together with all the abandon of youth. Many years had passed since the dissolution of the Heidelberg circle, but now Henle, Pfeufer, Jolly, Gervinus and the orientalist Hitzig were together again, reveling in the beauty of the mountain-lake and in the luxury of old memories. Towards the end of the vacation, when Henle and

Pfeufer clasped hands with the love of thirty years between them, they promised each other to meet again next year; three days later, word was brought to Henle, that Pfeufer, while journeying to the Achensee with his wife and daughter, dropped dead in the boat. Henle wrote to his sister:

Those were three wonderful weeks which I spent with my old friend. Never since we left Heidelberg to go in different directions, did we associate with each other so long and so uninterruptedly. Although the lake lay between our residences, we were together every day and usually twice a day. In the morning I had myself rowed over, and at noon his daughter rowed me back in a boat which she had hired. In the afternoon, we generally met together with our retinues on some beautiful spot whereto we went on foot, and Pfeufer in his carriage. Then I had to sit at his side while his grandchildren and my children played around us, and from time to time he would send me away to talk to his wife, who found it painful when she did not hear me.

We spoke of everything—our science, our politics, our families; it seemed as though I was to carry with me the conviction that we were of one mind in everything. He suffered somewhat from asthma, was more sluggish in his movements than before, tired easier, but mentally was as fresh and alive as ever. He did not think of any danger; his concern was chiefly that he would become too weak for his teaching activities, as the clinic exhausted him and the crowds of hearers in the hospital rooms oppressed him. He contemplated giving up the clinic. He still felt strong enough for lectures and for his office. We parted with the understanding to meet again next fall in a different place, for though we found Tegernsee charming, we had already drained its beauties.

Three days later, he was dead. His death was such as he wished for himself and for me, for he said this in a letter which he wrote to me

after our father's death. We cannot bemoan his fate; the autopsy showed that he had been approaching an unforboded serious affliction. But the situation of the wife and daughter who returned from a trip so joyously undertaken, with the corpse at the bottom of the boat! We received the sad news in Munich at the art exhibition. The distraction of the return journey, the life in the overfilled family house in Nürnberg, the pleasure in seeing the sisters in Mainz in good health, helped me to bear the first pangs of the grief. Now when I find myself in the old familiar rooms, I first feel how much the absent friend was tied up with all my doing and thinking.

Henle kept a bust of the departed upon his desk, and Merkel says that many a hallowed glance fell upon it. Henle wrote to Pfeufer's widow:

That our dear friend is unforgettable and that the breach which his death created can never be filled, I feel as much as you do. To me too, the world looks changed since I miss the heart which shared all my joys and sorrows, and I no longer can hope to give him pleasure by my work and draw from him a word of approbation. How vague everything seems that remains to me of friends, besides the memory of this one! You may, therefore, be certain that I find your laments justified, and that I shall never tire of hearing them as long as you feel the need to express them. There is a certain equalization of justice in this, that whoever had the happiness of possessing such a man as you did, must also accept the danger of the terrible contrast which death creates. But who would, because of this danger, place a limit upon such happiness! And when parting must come, there is no better consolation than the knowledge that nothing in happiness had been missed.

In this same year, our much-quoted Friedrich Siegmund Merkel, who was then a young doctor of twenty-four, arrived

from Erlangen to become Henle's prosector in Göttingen, and showed devotion not only to the master's system of anatomy, but to his daughter Anna, and thus Henle acquired his first son-in-law. Merkel later became professor at Rostock and then at Königsberg; he wrote numerous anatomical articles and pamphlets, among his chief contributions being his treatise on topographical anatomy, and his description of the tactile corpuscles of the papillae of the skin. Merkel edited successive editions of Henle's Ground-plan of Anatomy. It has been asserted that sons-in-law make the best biographers, and Merkel's life of Henle has proved indispensable to the present writer.

Henle's fourth daughter, Emma, and his second son, Adolf, were born at Göttingen. During the seventies, three more of Henle's children—Karl, Sophie, and Elise—were married. Grandchildren added to his joys, except when death chose infancy as its untimely victim. But sunny countenances were the usual visitors to the patriarch's fireside. When trouble came to any members of the household, they instinctively turned to Henle, and the hand that might have been penning an immortal idea a moment ago, would be kindly stretched forth to comfort a child's distress. Fame never disarranged Henle's simplicity. Sitting at his desk until ten o'clock, teaching for the remainder of the morning and part of the afternoon, a post-prandial application to belles-lettres followed by devotion to science until supper-time, then smoking a cigar while his wife read a novel and his daughters busied themselves with needlework, and back to his desk again where he worked until midnight, finding his recreation in his musical and literary circles, his days flowed peacefully

on, and for long periods he moved merely between his home and the anatomy building. The spring of Henle's life was stormy, but its winter was mild. Tranquility was the keynote of his venerable years.

During 1882, three of Henle's eminent friends, the novelist Auerbach, the chemist Wöhler, and the histologist Schwann, passed away. The old Henle immediately prepared a standard memoir of Theodor Schwann, the co-worker of his youth, living again through the stirring days when he and Schwann moved into one house and reconstructed biology. Henle received his diploma in 1832 and it was now 1882—a span of half a century. The fiftieth anniversary was on the fourth of April, and on that day glad outbursts of music were heard near Henle's home—the Göttingen militia's serenade; the chief burgomaster delivered the town's greetings, the students presented their teacher with a golden laurel wreath, and in the celebrations that followed, Henle saw before him some of the most distinguished scientists of Germany. It was the master's Jubilee, and his former pupils came from their academic chairs to honor him. Kölliker prepared a noble address, signed by great names, in which he said:

You celebrate to-day the day on which just fifty years ago, you delivered your famous dissertation De membrana pupillari, and upon which you received your doctor's degree. This day is not only a day of honor for you, but a great joy for all who ever stood close to you. Permit us then, your one-time pupils and now your colleagues, to offer to you our sincere esteem and our gratitude.

A worthy pupil and friend of Johannes Müller, you followed him first into the field of comparative anatomy, but only to soon go your

JOHANNES MÜLLER

own way. With full recognition that the work of Schleiden and Schwann, based upon the groundwork of Bichat, had to be upbuilt and reconstructed, you created your General Anatomy, a scientific work of the highest importance, which in truth was to become the keynote of your future work. Conspicuous from the beginning, through its abundance of facts and ideas, through the masterful discussion of the physiological activity of tissue on the ground of their anatomical structure, and through the careful and just valuation of previous works, this work will remain for all times, a paragon. With the complete understanding that physiology is the foundation of pathology, you erected for yourself in this field an indestructible monument by your Pathological Researches in which you foretold, with great keenness, the latest developments in the theory of epidemic diseases. Besides this, your Anthropological Lectures, and the Journal of Rational Medicine which was founded by you and Pfeufer and continued for more than two decades, also your Yearly Reports, bear brilliant testimony to your vigorous and fruitful activity.

The climax, however, of your achievements are your researches in the field of human anatomy, and it is here where your extraordinary talent shines triumphant, not only in the way your discoveries were made, but also the manner in which they were presented. In fact, your Handbook of Systematic Anatomy is recognized as the sole work of its kind, raising the ancient and supposedly final anatomical sciences to an unprecedented degree of perfection, which must serve as a foundation for all future builders.

The picture of your manifold and unusual labors would still remain incomplete, if we were to omit mention of your activity as an academic teacher, and in this field we, your pupils and colleagues, are competent judges. There was no one more eloquent, clearer in presentation, deeper in thought and conviction, and in these respects you will always

be to us an unattainable example. Accept then, much-beloved and highly revered master, our sincerest thanks, for all that you have meant to science and to us! Accept our best wishes for the glorious event which you celebrate to-day, and permit us to give expressions to our hopes, that there may remain to you many years of great happiness and blessed work.

Of the numerous other addresses, the best remembered is the one from the medical faculty of Kiel, which began with the remark that their greeting was not an isolated word out of the large sum of gratitude which had been coming to him for the past fifty years, for physicians and research-workers without number owed to him their education and inspiration. The characteristic Festschrift, the university of Göttingen's commission to the sculptor Hartzer for a bust of Henle to stand in the vestibule of their anatomical building, the decorations from various states including the government of Prussia, were other tokens of esteem which marked this jubilee. Henle's alarm that he was being honored beyond his merits, combined with his naive pleasure at the constant stream of well-wishers and the ever-accumulating messages of congratulation, added to the sincerity and geniality of the celebration.

After the elaborate public entertainment was over, Henle's children and grandchildren gathered around him, and in their midst, decorated only with the "Jocose order of the patriarch," he was most content. To this inner group a few chosen friends were invited, among them being Henle's illustrious pupil, Wilhelm Waldeyer, who has given us this exquisite picture:

Another beautiful phase of his being was his love and highly-

developed devotion to his family. Whoever had an opportunity of seeing him in the circle of his family, will never forget how well Henle understood to make his dear ones happy. It was then that his warm heart, his delightful sense of humor showed itself. I found him thus in the spring of 1882, when he afforded me the pleasure, after the official days of his Jubilee were over, of inviting me to a celebration in his most intimate family circle, and also a year later in Herrenalb, where he and his family were spending their vacation, and I was tramping through the Schwarzwald. These days will remain unforgotten; and as he was then unbroken, so he remained to the very end.

Unbroken but not unbowed, for the autumn of 1884 found Henle a sick man. Yet throughout the winter semester, even when the physical agony of intercostal neuralgia forced him to resort to morphine, that flashing eye and winning tone still captivated the student-youth of Göttingen. Not till the official vacation began, did he seek relief—but what can Baden-Baden do for a renal sarcoma with metastasis in the vertebral column? Henle re-discovered the kidneys, but his own kidneys killed him. Upon his death-bed he spoke cheerfully and consolingly to his wife and children to the end—the thirteenth of May, 1885.

On that day, the curtain descended upon a career of dramatic completeness, for it opened with a prison and ended with a jubilee. No longer would the students see their "old Jacob," and son-in-law Merkel was called from Königsberg to become the anatomist of Göttingen—and here, in his sacred hours, he enshrined in his book the imperishable name of Jacob Henle.

IX

CONTRIBUTIONS TO SCIENCE

Henle's history does not end with his death, for though the man is dead, his work endures. Henle's first contribution to science was his dissertation on the membrana pupillaris (1832), by which he increased our knowledge of the embryology of the eye. The organ of vision continued to attract Henle: he described the histology of the retina (1839), its anatomy (1864), the physiology of the lachrymal canal (1865), the fibres of the crystalline lens (1875), the construction of the lens (1878), and its development (1882). As a result of these studies, we have several eponyms. Within the palpebral conjunctiva, Henle found structures resembling lymph follicles whcih are now known as the trachoma glands of Henle, or the aggregated glands of Bruch. This discovery was responsible for an ophthalmological puzzle, for it is still undecided whether these glands are normal or pathologic. The lamina basalis which forms the inner boundary of the choroid is known both as Bruch's layer and as Henle's membrane. The zone of cone-fibres and rod-fibres in the region of the macula lutea, bears the name of Henle's fibrous layer. The retinal layers exclusive of the rod-and-cone layer are known as Brücke's tunica nervea or Henle's stratum nerveum. The

masses on the cornea, near the border of Descemet's membrane, are Henle's warts. After witnessing an execution, Henle wrote "Experiments and Observations on a Decapitated Person" (1852), which states his discovery that the yellow spot contains no rods but cones only.

During Henle's early years in Berlin, the medical faculty was preparing the Encyclopedic Dictionary of the Medical Sciences, and Henle was commissioned to write the articles on albumin, olein, epidermis, epithelium, eructation, excreta, sepsis (1834), falx cerebri and cerebelli, fibro-cartilage, fibrin, fauces, fat, yawning, goose-flesh, gall-bladder (1835), vascular glands, sense of hearing (1836), hallucinations (1837). He wrote also for Froriep's Notices, Hufeland's Journal, Wiegmann's Archives, Casper's Weekly, Oken's Isis, and the English Magazine of Natural History, but most of his work during the Berlin period was published in the journal with which he was himself connected—Müller's *Archiv*. His contributions to these periodicals included his observations on the acqueductus vestibuli and cochlea (1834), Owen's trichina spiralis in human muscle (1835), musculus spinalis cervicis in man (1837), mucus and pus formation, extension of epithelium in the human body, the retention of memory in the special senses (1838), the microscopic elements of milk, the construction of glands (1839), the contractility of vessels, dropsy, and the structure and formation of the human hair (1840). The outer cellular layer of the inner root-sheath of the hair follicle, surrounding the layer of Huxley, is known as Henle's layer.

After the suave Humboldt succeeded in persuading the Prussian government that its institutions were safe even with the conspirator Henle out of prison, Henle produced his

habilitation-thesis, Symbolae ad anatomiam villorum intestinalium imprimis eorum epithelii et vasorum lacteorum (1837). With this treatise the modern knowledge of the epithelial tissues begins, and the young man of twenty-eight was among the immortals. In these researches, although they were conducted with nothing better than a Schieck microscope, the investigator established names which have become permanent parts of histology, such as pavement epithelium and cylinder epithelium, and was the first to define columnar and ciliated epithelium, and the first to describe the stratum mucosum of the epidermis, and the intestinal epithelia. His pronouncement, in the following year, that "all free surfaces of the body, and all the inner surfaces of its tubes and canals, and all the wall of its cavities, are lined with epithelium," was one of the most momentous generalizations of the century, and it paved the way for the far-reaching cell-theory of Schleiden and Schwann, which in turn prepared the path for the Darwinian theory. Henle is the first author mentioned by Schwann, and on account of the fundamental importance of Schwann's work on the cell-theory—which, like Henle's researches on the epithelium, originated in the lodging-house at Number 66 Friedrichstrasse—we will quote some of Schwann's references from his "Microscopical Researches into the Accordance in the Structure and Growth of Animals and Plants" (1839):

A very important advance was made in the year 1837, when an actual growth of the elementary particles of epithelium was proved to take place without vessels. Henle showed that the cells in the superficial layers of epithelium are much more expanded than those in the

deeper strata, a fact which leaves scarcely any doubt as to their true plant-like—that is, non-vascular—growth.

There is another observation of Henle's, which is opposed to the epithelium being regarded as a lifeless substance secreted from the organized tissue; I allude to the passage where he proved that the vibratile cilia, whose motion it is so difficult to explain by physical laws, stand upon little cylinders which are merely a modification of the epithelium.

It often occurs that the tabular epithelial cells are not regularly hexagonal, but represent flat elongated stripes, a fact which has been observed by Henle in the epithelium of the vessels. The cells which are prolonged into cylinders constitute the other modification in the form of the epithelial cells. They were discovered by Henle in the intestinal mucous membrane.

With regard to the formation of the epithelial cells, Henle has already proved the rete Malpighii to consist of round nucleated cells, probably the young epidermal cells, and also that the diameter of the cells increases towards the outside, so that in the fetal pig he was enabled to trace the gradual transition of the cells of the rete Malpighii into those of the epidermis.

Henle's treatises on the Narcine, a new kind of electric ray (1834), on the Branchiobdella and on the explanation of the sexual organs of the Annelida and hermaphroditic snails (1835), on the Enchytraeus, a new annelid (1837), and on the larynx, with special consideration of the larynx of reptiles (1839) constitute his independent work in comparative anatomy. In the important monograph on the larynx—which aroused the enthusiasm of old Humboldt—Henle traced the development of the organ of voice from the simple cartilage-

strip in the Proteus to the complex structure in higher animals, saying in the introduction:

> As our knowledge regarding the development of the larynx and the significance of its individual parts is still very incomplete, and in fact, the origin and gradual development of the larynx in the embryos of the highest animals is so difficult to follow, I determined to undertake a comparative-anatomical research of this organ, in the hope of showing the various degrees of development in the different organisms, graduating from the lowest to the highest. In this sense, I have given a zootomical description of the larynx in the form of the story of its development.

It is one of the oddities of science that these words should have been written twenty years prior to the publication of the Origin of Species, and by a man who was never reconciled to Darwinism.

All of Henle's work in comparative anatomy was accomplished under the influence of Johannes Müller, with whom he collaborated in the systematic description of the Plagiostomi. Müller, who was a great student of fish, already knew the Plagiostomi through his study of the Myxine and Petromyzon, while Henle was familiar with the subject on account of his Narcine investigation, and when a barrel of Sicilian fish was opened in the Berlin museum at the same time that a collection of India fishes arrived, both scientists found many interesting points to discuss, and decided to systematize and extend the data on sharks and rays. As the material in Berlin, although extensive, was inadequate for their purpose, they journeyed to Rotterdam and Leyden, and later to London, everywhere accumulating scientific friends and treasures. In

London they became greatly attached to the Owen family, and while the distinguished Sir Richard painted Müller's portrait, Henle improved the German of Mrs. Owen—the cleverest of female diarists. After leaving England, the travelers separated in the interest of the investigation, Henle going to Frankfurt, and Müller proceeding to Paris.

When they met again in Berlin, both had numerous observations and discoveries to report, and prepared their manuscripts for the press. In order to insure the publisher against loss, the authors agreed to purchase twenty copies annually as long as a deficit remained. "The Systematic Description of the Plagiostomi" (1838-41) was certainly a splendid piece of research, but as the Plagiostomi didn't read it, and as few human beings did, and as the practical publisher demanded that the contract be fulfilled with scientific exactitude, Müller and Henle, in the course of years, possessed scores of copies of their mutual masterpiece.

During Henle's last year in Berlin, his "Pathological Researches" (1840) appeared. In the brilliant essay on fevers he dethroned the archaeus of Helmont and the sensitive soul of Stahl, and offered a rational explanation of elevated body-temperature. But the feature of the book was the essay on "Miasms and Contagia," which laid the foundation of the germ-theory of disease, as it contains the first clear statement, in modern terms, that infectious diseases are due to specific microörganisms. Henle said that if these organisms are invisible, it is not because of their extraordinary smallness, but because they differ so little from the tissues in which they are imbedded, that they remain unrecognizable. The

predictions which Henle made in 1840 were fulfilled, more than forty years afterward, by his pupil, Robert Koch. When the stain was introduced into bacteriology, Henle was hailed as a prophet—but in the Berlin days, when Henle and Hirschwald met for the last time, the publisher complained that the entire edition of "Pathological Researches" was still on his hands.

After his removal to Zürich, Henle discovered the Demodex folliculorum (1841), the ubiquitous pimple-mite which presides over spoilt complexions. But as Henle mistook the rear end of the parasite for its head, he was not particularly proud when this acarus was mentioned, and although he later wrote on the gregarines, the parasites of invertebrates (1845), he was never completely at home in Johannes Müller's domain of zoology and comparative anatomy. As the master's welcoming and guiding hand was now lacking, Henle turned to a field where he had few compeers—human anatomy. In a communication to Schoell, he says:

With infinite joy, I now write my Handbook of General Anatomy. It is splendid to cast away a few old prejudices and to watch how here and there a light, or at least, the twilight, breaks through, and how a new principle substantiates itself in a newly founded fact. And now I work faster than in the olden times when I had to run in to you every two hours or so, with a half page of my Contagia. You had to stand a great deal from me in those days, but I have profited much, and know, therefore, that you are not regretting it. I was, in those days, almost too modest, but I believed implicitly, that which to me appeared absolute and vital, must surely have already occurred to other sensible people. Now when in spite of all the mistrust against me, and in spite of my wish to agree with the majority, I daily find fresh confirmation

or refute them, I feel more comfortable and I learn to proceed without apprehension.

My book creates sensation enough, and the critics find two ways of dealing with it: some sing me all sorts of praise, but find this and that to be startling, and believe that this and that holds entirely too fast to need to be defended against my attacks; if we were to do so and so, then there would remain little that was certain. Others belittle me in the very beginning, and hold me up as a warning example why a theoretician should not treat of practical things, and then believing they have accomplished enough, they concede the details, step by step, or break their teeth on it. Only a few, young, sanguine, and still unoccupied people, gape with open mouths, and on these my hopes are centered.

Aside from its new facts, such as the demonstration of unstriped muscle in the endothelial coats of the lesser arteries, the broad conceptions and the new principles enunciated in Henle's "General Anatomy," made its publication the most important medical event of the year 1841. Bichat was surpassed, and science acclaimed a new master. "To us young medical men," wrote Kussmaul, "a new world opened up through Henle's General Anatomy. It holds its readers almost more by the vistas it suggests, than by what already exists. Curiosity drove me to read the book, and the impression which it made upon me I can only compare with which I received on reading Liebig's works, and I began, just as I did with the latter, to commit the vital parts of the contents to memory." Of the numerous encomiums which this work has received, none is more illuminating than the tribute of Walther Flemming, one of the greatest names in cytology, author of the aphorism, *Omnis nucleus e nucleo:*

It was Henle, who in his researches and studies on epithelium, made the most important references to the cellular construction of animal tissue. How deeply he became absorbed in the general problem of the cell theory is plainly evident from the fact that two years after the publication of Schwann's book, he published his General Anatomy; and one may say that this contained the first real, rational tissue theory of the animal body, so comprehensive and many-sided, that it earned the admiration of the entire biological world. If I may use a paradox, it is not a work which can be accomplished in two years, and it shows that Henle occupied himself with animal tissue in the sense of the cell theory, long before it was proclaimed.

During his latter days in Zürich, Henle collaborated with Kölliker in the publication of a monograph on the Pacinian bodies (1844), and in this year appeared the first volume of Henle and Pfeufer's *Journal of Rational Medicine* (1844-69). The contents opened with Henle's belligerent manifesto on Medical Science and Empiricism, and early issues of the magazine contained his essays on hypertrophy and tumors through checked resorption, wherein he explained the relationship between the blood and lymph streams, and on tonus, cramp and paralysis of the bronchi and expectoration, which was valuable for its observations on the physiology and pathology of breathing, and for its demonstration of the contractility of the bronchi through the action of the smooth musculature. The journal grew in influence, and to later numbers Henle contributed his observations on cylindroma-siphonoma, a new genus of tumor (1845), on the absorption of narcotics through the lymphatics (1846), on blood analyses, on Hassall's corpuscles (1849), on the coracobrachialis muscle (1857), on the tissues of the suprarenals

and hypophysis cerebri (1865). The *Journal of Rational Medicine* existed for twenty-five years, and upon the death of Pfeufer, Henle closed the magazine's career with the words: "If our successes were helpful, if our errors served as warnings, then the flag of Rational Medicine has not waved in vain."

Apart from his periodical editorship, Henle was the annual reviewer of medical progress, a task which was begun in Berlin, and extended through the Heidelberg period, far into the Göttingen times. These Yearly Reports were on the progress of physiology, pathology and pathological anatomy (1838-9), on pathology (1845-6), on histology (1844-8), and on general and special anatomy (1849-55). The anatomical reports were published in Canstatt's Yearly Reports until the publication passed into the hands of Virchow, and Henle then continued these annual summaries of anatomy in Henle and Meissner's Yearly Reports (1856-71). "One of Henle's most important activities," said Leyden, "were his Yearly Reports, a literary creation which ranks exceptionally high, and is practically the only one of its kind. These Yearly Reports were always looked forward to with great expectation."

Even as an annual reporter, Henle was too much alive to be tedious, and if his Yearly Reports were not as calmly indifferent as Hofmann-Schwalbe's, they were far more readable and stimulating. To offer simply the bare facts, to abstract all the articles on a given subject and put down the data without interpretation or comment, to present the status of every topic with the routine impartiality of an index-

catalog, did not accord with Henle's idea of what an annual report should be. He could not help becoming incensed at statements which he knew to be unwarranted, and work which he regarded as significant, aroused his enthusiasm. If certain points seemed dubious, Henle laid aside the pen, and his scalpel or microscope either confirmed or confuted the author he was reporting.

These reports became famous for their commentary, and it is said that toward spring, at which time they appeared, there was an annual uneasiness among authors, and they turned the pages with shaky fingers to see how they had passed the censorship of so keen a critic. "It is not of so much importance," said Henle, "to write up pathologico-anatomical facts; in this direction our report does not even pretend to be complete, as it does not comprise all the scattered and so-called interesting instances. On the other hand, I am endeavoring to group together those discoveries which promise to disclose facts regarding the nature and organic foundation of disease phenomena, as well as experiments which are made in order to bring the connection of the phenomena upon the path indicated by physiology. As there are not only facts to be taken into consideration, but also the mode of the connection, theory and polemic cannot be avoided." In the numerous tilts that ensued, Henle was not invariably the victor. Virchow maintained that connective tissue contains fully developed cells with all their attributes, while Henle insisted that only the nuclei were present, and that what Virchow mistook for complete cells were optical delusions. He wrote:

These optical delusions bring to mind the kind of pictures, which were rather widely distributed after Napoleon's death. At first glance, one sees an urn, and over it a drooping willow tree, and between the two a low cypress; if, however, one looks at the white space which these three objects create, one recognizes the profile of the figure of Napoleon, and once we are accustomed to contemplate the white silhouette which surrounds the pictures, they themselves become meaningless. Virchow's connective tissue corpuscles are vacant spaces, surrounded by fibres or strata, which one overlooks or considers a homogenous mass when one becomes absorbed in contemplating the vacant places.

In this dispute, Henle went down beneath the lance of his junior, but the above-quoted paragraph is evidence that Jacob Henle was delightful even when he was wrong. It is due largely to these Yearly Reports that Henle's books are so rich in references to the history and literature of the medical sciences.

Henle's chief contribution to pathology was his "Handbook of Rational Pathology" (1846-53). It is the product of an intellectual revolutionist, and not only did it overthrow antiquated systems, but it brought forward certain speculations whose utility had not been fully established. To those who argued that we should cling to the old dead theories until the new ones proved to be of permanent value, Henle proposed the following parable:

A pedant owned a nightingale for a long time, and had great pleasure in its song. Then the bird died. The pedant found the silence unpleasant, and went out to purchase another bird. There were but a few pilfered nests in the market, and the vendors did not know whether the eggs were fertile, or at least would not guarantee that

male birds would hatch; then too, the brood would require much attention before they grew up to be singers. The pedant thought this to be too risky, and he went away saying that he would rather keep his dead nightingale. This was conservative, but to what purpose? That the care might be wasted on the young brood was possible, but that the dead nightingale would never sing was certain.

Written in a graceful and brilliant style, opening with the dictum, "The duty of the Physician is to prevent and to cure diseases," studded with such epigrams as "The day of the last hypothesis would be also the day of the last observation," and "An hypothesis which becomes dispossessed by new facts, dies an honorable death; and if it has already called up for examination those truths by which it was annihilated, it deserves a monument of gratitude," laughing the medical devil out of existence and establishing rational concepts of disease, the Handbook of Rational Pathology created a sensation, and what made it of epochal importance was its cardinal principle: "The physiology of the sick and of the healthy are not different, physiology and pathology are one." As Walther Flemming said:

There is no better testimonial of Henle's success than this: that the principles which he, as a pathologist, fought for, have become a part of us to such an extent that we forget there could ever have been an opposition. For who knows to-day much of the natural-philosophico-medical system, which was in vogue during Henle's youth? One has to question the elders, as the young have but little time to devote to the history of medicine. That the systems of those days are ancient and already belong to history, is largely due to Henle. His reform-cry,

Rational Pathology and Physiology are identical, became the watchword of all true physicians.

Henle's anthropological lectures at Heidelberg were exceedingly popular, and were attended not only by students of all the faculties, but by such men as the historian Gervinus and the Swiss Gottfried Keller, one of the foremost lyrists and novelists in German literature. Henle first met Keller in Switzerland, and remarked, "It was all one whether a tame young bear or a poet had been sitting at the table with us, for outside of some inarticulate growling, we heard nothing else from him." After hearing Henle's anthropological lectures, Keller interwove their essence into his chief novel, *Der grune Heinrich*. In his old age, it gave Henle much pleasure to prepare his "Anthropological Lectures" (1876-80) for the press.

After his settlement in Göttingen, when Henle felt that the time had come for his main work, he undertook a complete re-examination of the human body, a labor which he completed after sixteen years of unremitting toil; his osteology (1855), was followed by syndesmology (1856), myology (1858), splanchnology (1862-66), and neurology (1871), these instalments comprising his three-volumed "Handbook of Systematic Anatomy" (1855-71), which was followed by an "Atlas" (1874-77), for use in the dissecting-room, and by a condensed presentation of the subject, "Ground-plan of Anatomy" (1880), later editions of which have been edited by Merkel. Upon the publication of the great textbook, Henle complained humorously that now he was compelled

to teach according to Henle. The illustrations, whose number and excellence impelled universal admiration, were drawn by Henle himself, and the language of the text was classic. "Henle," said Flemming, "was an orator with his pen as well as in his academic chair." Henle advocated a neutral, common-to-all, Latin terminology in science, saying "There are other means of expression of love for the fatherland and mother-tongue, than the sacrifice of time and tongue which makes one say, instead of n., a., and v. cruralis, schenkelnerv, schenkelpulsader, and schenkelblutader." Henle wrote on the disadvantage of eponymic terms in anatomy, but his own name is found on the bones, muscles, vessels and viscera of the human body; examples, besides those already mentioned, are Henle's spine, Henle's fissures, Henle's ligament, and Henle's fenestrated membrane.

Special reference should be made to Henle's urogenital work. He discovered cylindric casts in the urine; pointed out that varicocele is almost invariably left-sided; described the expanded outer half of the Fallopian tube, known as Henle's ampulla; the portion of the uriniferous tubule, known as the canal of Henle; the granular mononuclear cells in the seminiferous tubules, known as Henle's cells; the fibrin formed by precipitating semen with water, known as Henle's fibrin; the remains of the gubernaculum surrounding the vas deferens and vessels of the spermatic cord, known as Henle's internal cremaster; and the striated muscular fibres encircling the prostatic and membranous urethra, known as Henle's sphincter. But his most interesting find in this field was the U-shaped turn of the uriniferous tubule which is formed by

a descending and an ascending loop-tube, known everywhere as Henle's loop. Concerning this discovery, the fortunate Henle wrote one of his characteristic notes to Pfeufer:

> It is about time, my dear friend, that I inform you of the good fortune which has befallen me, of making a discovery in my old years, which is far more surprising and remarkable than any other heretofore made by me. Apart from the joy of having found something new in an organ a thousand times investigated and settled, I also enjoy the extraordinary satisfaction that my find is based on injection, and that the colleagues who credit me merely with the gift of the tongue, can no longer look down upon me from their injection-syringe.

Henle's medico-historical knowledge was extensive, and he was intimate with many scientists who made history in the nineteenth century, but he produced only three biographic memoirs: on Albrecht von Haller (1872), on Ernst Heinrich Weber (1878), and on Theodor Schwann (1882). In the year of his jubilee, Henle's scientific work was nearing its close, but in that year a man whom he had trained, and who was deeply influenced by his theory of contagion, electrified the world by his discovery of the tubercle bacillus. Forty years earlier, Henle vainly searched for microörganisms in typhoid cadavers, in smallpox material, and in the scales of scarlatina, but by his fixing and staining methods, Robert Koch substantiated his teacher's theories by demonstrating bacillus after bacillus.

Henle's last publication was appropriately in anatomy, a noteworthy monograph on the growth of the human nail and the horsehoof (1884). In sending a copy to Waldeyer, on the twenty-ninth of December, Henle wrote:

Enclosed is the child of my ageing loins; it is a great pleasure for me to send you this, as it gives me an opportunity to renew our neglected correspondence, and to inquire as to the state of your health. I cannot say much for mine. Since the beginning of this semester, I worry along with a leftsided intercostal neuralgia, which I have been able to tame with morphium to the extent of being able to deliver my lectures. Besides the physical suffering, it also causes me great sorrow to find that it in no way conforms with my beautiful theory founded on the process of vena hemiazygos, as the exacerbations are evidently wholly independent of venous stagnations. Under these conditions, the days of our external existence pass in quietude and monotony.

In the coming spring, the old scientist reached the end of his journey, but before he passed from the sight of men, he had bequeathed to us the true knowledge of epithelium, the rational outlook upon pathology, the germ-theory on which we have built the corner-stone of modern medicine, and the most comprehensive study of the human body that had yet appeared. *Sic itur ad astra, O Jacobus Henle!*

(*The end*)