

Robert Bunsen's Sweet Tooth: Bunseniana in the Oesper Collections

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AS some members of this audience are aware, Ralph Edward Oesper (figure 1) was the recipient in 1956 of this Division's first Dexter Award for Outstanding Achievement in the History of Chemistry (1). But perhaps fewer in the audience are aware of the reasons for the award, which focused on Oesper's extensive contributions to the field of chemical biography (2). Indeed, the many photographs, portraits, and biographical memoirs which he collected over the years in the pursuit of this interest form the nucleus of the current Oesper Collections in the History of Chemistry at the University of Cincinnati, as well as the monthly frontispieces for nearly 20 years of the *Journal of Chemical Education* (3).

However, Oesper wasn't just interested in chemi-

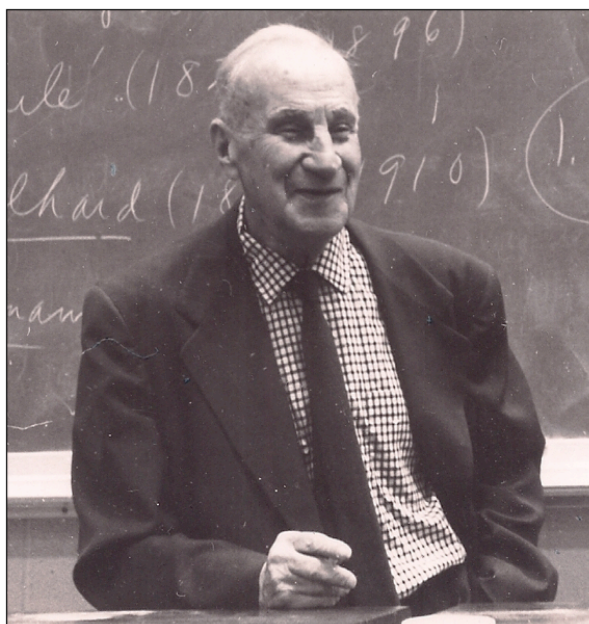


Figure 1. Ralph Edward Oesper (1886-1977).



Figure 2. The cover of the 6th edition of Josef Hauser's book of chemical anecdotes.

cal biography, he was also interested – in keeping with the theme of this symposium – in the biographies of “chemical characters,” taking the term “character” as one whose biography may be easily written in accord with the advice first given by the British humorist, Edmund Clerihew Bentley, in 1905 (4):

In all works of a biographical character it is important to make copious reference to as many as possible of the generally recognized virtues, vices, good points, foibles, peculiarities, tricks, characteristics, little weaknesses, traits, imperfections, fads, idiosyncrasies, singularities, morbid symptoms, oddities, faults, and regrettable propensities.

In keeping with this admonition, we might define a “character” as a person concerning whom many anecdotes – humorous or serious, real or fictitious – have survived and Oesper, as it turns out, was not only a collector and writer of biographies, but also a connoisseur of the art of the anecdote. This is revealed in a

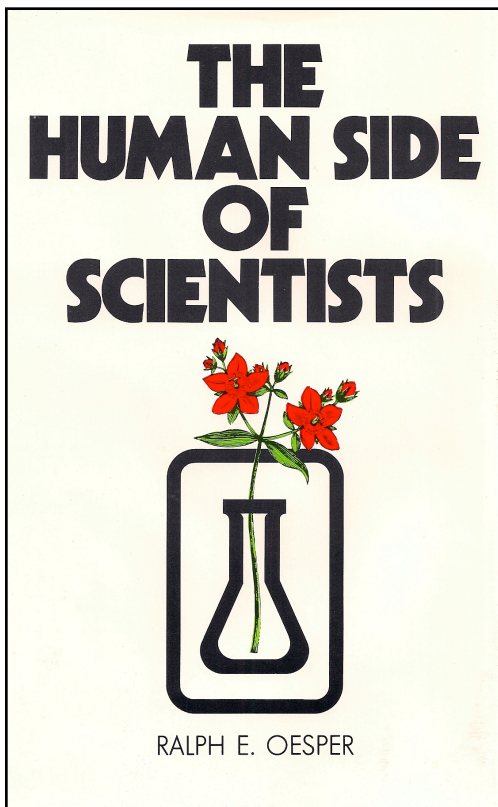


Figure 3. The cover of Oesper's 1975 collection of chemical anecdotes.

small collection of German-language books dealing with biographical anecdotes of famous scientists, which Oesper collected over the years (5). At least one of these – a small volume by Josef Hauser entitled (in translation) *What Can't be Found in the Annalen* (figure 2) – dealt exclusively with chemical anecdotes and was sufficiently popular to have passed through at least six editions (6). This interest culminated in Oesper's own book, *The Human Side of Scientists* (figure 3), published in 1975 when he was 89 years old, and which, despite its title, also dealt almost exclusively with chemical anecdotes (7).

Robert Wilhelm Bunsen

If one were to single out which chemist, among the many Oesper wrote about during his life, was his favorite, the honor would almost certainly go to the German chemist, Robert Wilhelm Bunsen (figure 4). Indeed, one of the first biographical studies written by Oesper was on Bunsen and appeared in the April 1927 issue of the *Journal of Chemical Education* (8). This was followed by a second article in 1941 on Bunsen's participation in 1846 in an expedition sent to investi-

gate the volcanoes of Iceland (9), and by yet a third in 1955 dealing with Bunsen's transfer from the Cassel Gewerbeschule, where he began his teaching career in 1836, to the University of Marburg in 1839, where he remained until his move to the University of Breslau in 1851, and finally to the University of Heidelberg the next year (10).

This latter article was coauthored by the German chemist and historian, Georg Lockemann, who had published a book-length biography of Bunsen in 1949 (11) and had inspired Oesper to translate it into English, though Oesper never succeeded in finding a publisher and the original manuscript of the translation still languishes in our files. Indeed, though a few inferior German biographies have appeared since (12), and there are many chapter-length accounts in both German and English (13), Lockemann's biography is still, to the best of my knowledge, the most comprehensive available in any language.

In his pursuit of Bunsen, Oesper also rapidly acquired copies of virtually every printed book related to Bunsen's research and teaching activities, including the installments of Ostwald's series *Klassiker der Exakten Wissenschaften* dealing with Bunsen's classic work on organoarsenic compounds (14), on photochemistry (15), and on spectrum analysis (16); the definitive three-volume 1904 set of Bunsen's collected papers (17); copies of his 1857 monograph on gas analysis (18, 19), and a wonderful illustrated history of the chemical laboratory at Heidelberg (20). Since Oesper's



Figure 4. Robert Wilhelm Bunsen (1811-1899).

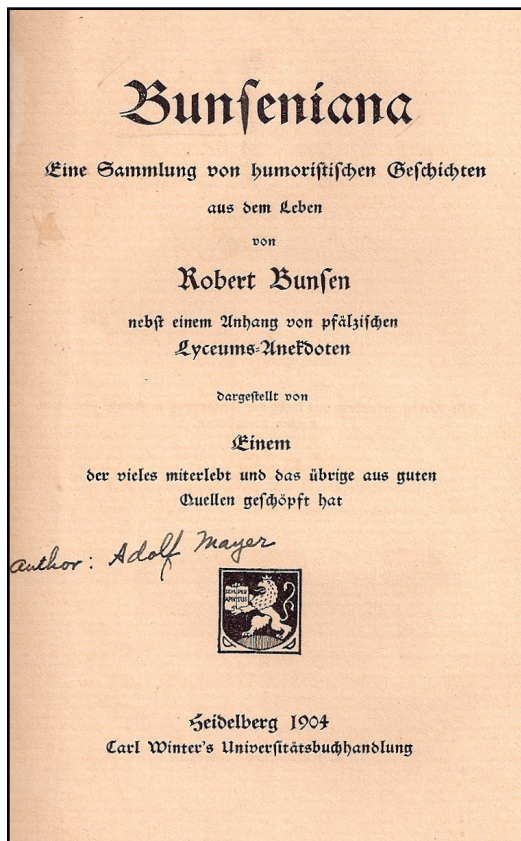


Figure 5. The title page to Adolf Mayer's anonymously published 1904 collection of Bunsen anecdotes.

death, we have continued this tradition by also acquiring copies of more recently published collections of Bunsen's letters (21-22).

Bunseniana

One of the reasons Oesper was so attracted to Bunsen was because there is little doubt that Bunsen was an example *par excellence* of a chemical "character" in the sense defined earlier, and Oesper did not overlook this aspect in his collecting activities. Indeed, one of our prize possessions is a small booklet (figure 5) of Bunsen anecdotes published anonymously by Adolf Mayer in 1904 under the title (in rough translation) of *Bunseniana: A Collection of Humorous Stories from the Life of Robert Bunsen Presented by One Who Experienced Many and Drew the Rest from Reputable Sources* (23). Many of these anecdotes were incorporated in Oesper's 1927 account of Bunsen's life.

Use of the term "Bunseniana" as a convenient descriptor for humorous Bunsen anecdotes seems to have caught on among his former students after his death and was used by the British chemist, Henry En-

field Roscoe, in his Bunsen Memorial Lecture of 1900 before the British Chemical Society (13), and also as a chapter title in his own autobiography of 1906 in which he recounted the incidents which had occurred during a visit that Bunsen, and his well-known colleague and collaborator, the German physicist, Gustav Kirchhoff, had made to Manchester in 1862 (24). Roscoe had spent the years 1853-1855 in Bunsen's laboratory at Heidelberg working with him on the laws of photochemistry (14), and had continued the practice during summer breaks and long vacations until his marriage in 1863. One of the mementos of the 1862 visit was a famous set of group photographs (figures 6 and 7) taken in Manchester and they are now among the best which show Bunsen and Kirchhoff together. During their visit Roscoe also arranged for the two German scientists to visit the London Exhibition and to meet a wide range of British scientists, including Wheatstone, Joule, and an aged Faraday.

As Roscoe noted, Bunsen had a "keen" sense of humor. At one dinner party an elderly lady, on being introduced, mistook him for the famous German diplomat and scholar, Baron Christian Charles Josias von Bunsen, who had died in 1860. "Pray sir," asked the lady, "have you not yet finished your great work on God and History?" "Alas no, madam," replied Bunsen,



Figure 6. The well-known group photo of Gustav Kirchhoff (left), Bunsen (seated), and Henry Enfield Roscoe (right) taken during a visit to Manchester in 1862.



Figure 7. A second group photo taken during the Manchester visit of 1862, this time showing only Kirchhoff and Bunsen.

“my untimely death prevented me from completing my task.” This sense of humor was also shared by Kirchhoff and the two would often tease one another. Thus on being invited by Charles Arnold, the Head Master of the famous Rugby School, to attend Sunday services in the school’s chapel in order to witness its famous boy’s choir, both Bunsen and Kirchhoff, neither of whom were particularly religious, “expressed great unwillingness to do so, Bunsen saying that he had not been inside a church for seven years, the last time being at the marriage of his niece.” Hence Roscoe’s great surprise when Bunsen appeared on Sunday morning ready for church and dressed “in a costume he very seldom indulged in – a tailcoat, white tie, etc., etc., and on his hands a large pair of white kid gloves.” Continued Roscoe (24):

The sight in the chapel at Rugby of all the boys in surplices is certainly a very interesting one, and my German friends were much impressed, Bunsen saying to Kirchhoff afterwards, “Do you know, I really felt quite devout.” “Oh nonsense,” retorted Kirchhoff, “you were only sleepy.”

Caricatures

If the existence of large numbers of anecdotes is a writ-

ten indication that we are dealing with a “character”, then graphic evidence for the same conclusion may be found in the survival of contemporary caricatures and cartoons. Here Oesper’s collaboration (10) with Lockemann comes into play as it uncovered one of the few known examples of a contemporary cartoon of Bunsen – albeit one done quite early in his career to commemorate his move in 1839 from Cassel to the University of Marburg, and depicting him as a tall, lanky young man in a stovepipe hat smoking a clay pipe and reading a book while sitting astride a cart full of chemical apparatus (figure 8). Being accustomed to images of Bunsen (figures 4, 6, 7) showing him in middle age and dating from his Heidelberg period, this may, at first glance, seem like a poor caricature. However, an examination of one of the few formal portraits of a young Bunsen from his Marburg days (figure 9) quickly reveals that it is in fact quite accurate. A modern caricature of our more familiar image of Bunsen (figure 10) is shown in figure 11.

Work Habits

Many Bunsen commentators have noted his lack of interest in chemical theory and his almost total devo-



Figure 8. A period caricature of Bunsen commemorating his move from Cassel to Marburg in 1839.



Figure 9. A portrait of Bunsen as a young professor at the University of Marburg.

tion to experimental work. As a consequence he remained active in the laboratory his entire career and many surviving Bunsen anecdotes center on this activity. He had in fact visited Manchester for the first time in 1844, when he was hosted by Lyon Playfair, and had spent his time analyzing gases from blast furnaces in



Figure 10. Bunsen as he appeared during his Heidelberg period.

preparation for his monograph of 1857 on this subject, which was translated into English the same year by Roscoe (18). This work led to the discovery that cyanogen gas was sometimes formed in blast furnaces – a discovery which almost cost Bunsen his life when he was overwhelmed by the fumes that came rushing out of a tube that he had just tapped into the bottom of the furnace. (25).

Nor was this the first time or last time that Bunsen would have a close brush with death. While working on organoarsenic compounds at Cassel, he had a tube of cacodyl or dimethylarsine cyanide explode, blinding him in one eye and putting him in bed for several weeks with a near fatal dose of arsenic poisoning (13). Later, at Heidelberg, he almost lost the sight

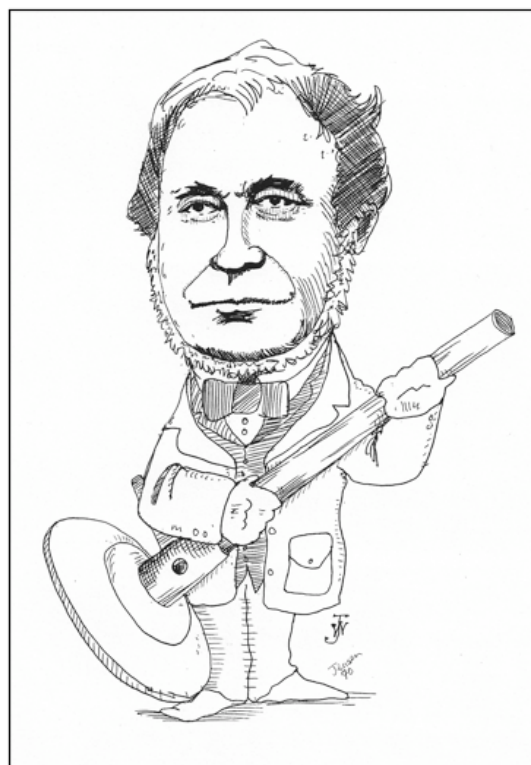


Figure 11. A modern caricature of Bunsen during his Heidelberg period.

in the other eye from an explosion which occurred when he incautiously held a lit taper over a mixture of freshly reduced platinum metals containing a large quantity of occluded hydrogen gas. What happened next has been described by the British chemist, Thomas Edward Thorpe, who had come to Heidelberg to work with Bunsen in 1867 (23):

The next morning the rumor ran around town that Bunsen was blinded, and the Wredeplatz was packed

with students and burghers anxiously inquiring if the news were true. No certain information could be gained and the crowd swayed backwards and forwards throughout the day waiting for tidings. It was late afternoon before a proper examination could be made, when it was discovered the eye was safe. Friedrich, the surgeon, promptly stepped out onto the balcony to announce the fact, when the air was simply rent with huzzas, caps went flying up, men embraced each other, women wept. Such a scene I never witnessed before, nor have I seen the like of it since. If the cheers reached the darkened room in which the dear old man was sitting – as indeed they must, for the noise was terrific – he must have gathered how strong was the hold he had on the affections of the whole place.

Bunsen was particularly proud of the fact that, with his large thumbs, he could seal the end of a gas eudiometry tube and insert it into a pneumatic trough in a single movement, and he would later often use thumb size as a criterion for evaluating the probable laboratory skills of his students. Again in the words of Thorpe (24):

The day came when I was to be indoctrinated into the art and mystery of gasometric analysis – Bunsen’s gasometric analysis – and by Bunsen himself. It was a red-letter day, and I determined to mark it by purchasing the finest eudiometer Desaga stocked. With his help I picked out the longest, straightest, and widest in the shop and returned in triumph with it to the laboratory. As I passed through the swing door, I came upon Bunsen, who asked me what I had got. I showed him the instrument and it met with his approval, but, taking my hand, he showed me to his own amusement, but to my consternation and disgust, that my thumb could not possibly close it. He then proved to me with what ease he himself could close it; his right thumb indeed, by constant use, was like a pad, and to my astonishment much larger and wider than that of his left hand. I am afraid I must have looked – as I felt – rather foolish and chap fallen, as I gazed on my incompetent digit, But he sought to cheer me with the remark: “Sie müssen recht viel arbeiten und es wird grosser werden.” I regret to say, however, that I never succeeded in closing that eudiometer as Desaga sold it to me.

Bunsen’s insistence on the importance of detail and accuracy when performing chemical analyses is revealed in the famous anecdote of the fly. One day the students in the adjoining teaching laboratory heard a loud ruckus coming from Bunsen’s private laboratory. On investigating, they found Bunsen madly leaping from bench top to bench top in pursuit of a fly. It seems

that he had been performing an analysis for beryllium, and returning to his filtration stand after going in search of his wash bottle, had discovered, much to his horror, a fly sitting on the edge of the funnel with its proboscis stuck in the sticky, gelatinous precipitate of beryllium dihydroxide that was being filtered. The fly immediately took off with some of Bunsen’s precious precipitate still stuck to its proboscis. The students gleefully joined in the pursuit and, when the fly was finally caught, Bunsen (7):

... killed it between his thumb and index finger, taking care not to touch the proboscis, he then placed the carcass in a weighted platinum crucible and carefully cremated the remains. The resultant ash was treated with a drop of strong hydrochloric acid and the solution then treated with ammonia water. After evaporation and ignition, the crucible contained about 0.1 mg of BeO. This amount was then added to the weight of the main ignition residue and an excellent result was thus obtained for the analysis.

To the human palate beryllium compounds taste sweet, whence the original name of glucinium for the element, and it is interesting to speculate whether a similar sweetness response was the cause of the fly’s initial attraction to the precipitate.

Bunsen’s ability to become totally absorbed in his laboratory work also led to an incident that would have lasting consequences for his future life style. While still a professor at Marburg it was rumored that he had proposed marriage to a young woman and had been accepted. However, soon after, he became so absorbed in his work on organoarsenic compounds that he failed to materialize for several weeks. When he finally

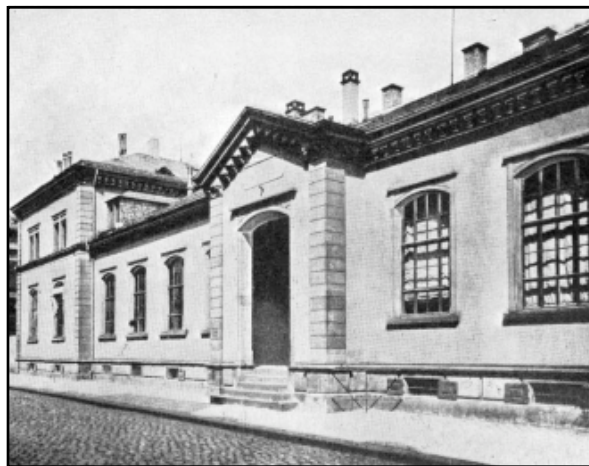


Figure 12. The front of Bunsen’s new laboratory at Heidelberg which was completed in 1855.



Figure 13. Bunsen's official residence at Heidelberg. The attached laboratory is to the left behind the house.

emerged from the laboratory, he could remember his intention of proposing but could no longer remember whether he actually had, so to be on the safe side he made another appearance at the young woman's home and repeated his proposition. She, however, was so outraged at his prolonged absence and inability to remember such an important event that she threw him out (8).

As a consequence, he remained a bachelor his entire life and displayed all of the eccentricities that generally accompany such a fate – eccentricities that only increased with age. When he accepted the appointment at Heidelberg, he was promised a new labo-



Figure 14. A somewhat disheveled Bunsen in old age.

ratory. This was completed in 1855 (figure 12) and came with an attached *Wohnung* or official residence (figure 13). This residence was rather large for Bunsen's simple personal needs and so he left several of the rooms empty, and even used one of them to deposit his unwanted mail in a large heap in the center of the floor (8). By the time of his retirement at age 78 in 1889, he was looking rather tattered around the edges (figure 14). When Emil Fischer was being interviewed as his possible successor, Bunsen took both the candidate and his wife to lunch at his favorite restaurant, which was located in the nearby Grand Hotel (7):

Table 1. Bunsen's more famous improvements in laboratory apparatus.

Improvement	Date
Carbon Battery	1841
Grease-Spot Photometer	1844
Gas Burner	1857
Spectroscope	1860
Filter Pump	1868
Ice Calorimeter	1870
Vapor Calorimeter	1887

As they sat down, Frau Fischer said to the aged celebrity: "Professor Bunsen, where is your necktie?" With a sweet smile, Bunsen reached into his vest pocket and produced a ready-made specimen that had seen better days and put it on. After they had returned home, some of the faculty wives asked Frau Fischer her impressions of the world-famous chemist. Smilingly she replied: "First I wanted to wash him and then to kiss him."

By 1889 Bunsen's laboratory was nearly 35 years old and in the end, Fischer, feeling that the facilities were too outdated, turned down the appointment, which was given instead to Bunsen's former pupil and assistant, Victor Meyer.

Inventions

In his day Bunsen was as well known for his numerous improvements in standard laboratory apparatus (Table 1), as he was for his chemical discoveries, and many of these innovations still bear his name. Several of these

would have made him a fortune had he chosen to patent them. This was particularly true of his carbon battery (figure 15), which replaced the expensive platinum cathode of the standard Grove cell with an inexpensive one made of baked carbon (27). However, Bunsen refused to become involved in such commercial ventures and, on occasion, even expressed great disdain for those who did, saying of a former student (13):

I cannot make the man out. He has certainly much scientific talent and yet he thinks of nothing but money-making, and I am told that he has already amassed a large fortune. Is this not a singular case? ... Working is beautiful and rewarding, but acquisition of wealth for its own sake is disgusting.

Perhaps the most famous of Bunsen's various in-

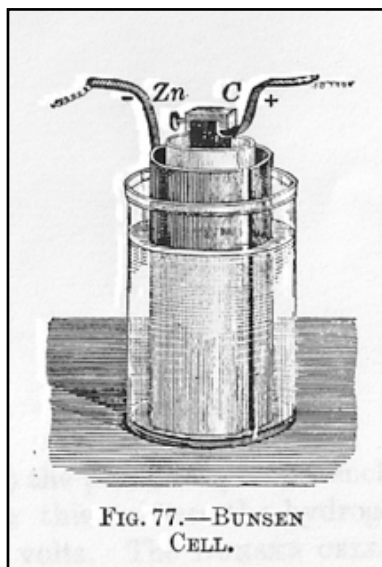


Figure 15. A later commercial version of Bunsen's carbon cell.

novations was his tubular gas burner (figure 16), which was based on improvements made to an earlier laboratory heating device known as a gauze burner that Roscoe had brought to Heidelberg from the laboratories of University College in London (28). Here again was an opportunity to make money, but Bunsen left the commercial gains and patent squabbles to his machinist, Peter Desaga, who had helped with its design.

A standard lecture demonstration (figure 17) concerning the structure of the burner flame was to suspend the head of an unlit match inside the inner cone of the flame in order to show that it was composed of unlit gas and was relatively cool. Bunsen, however, took a more memorable approach in his own chemistry lectures (8): *His large, powerful hands were covered with thick*

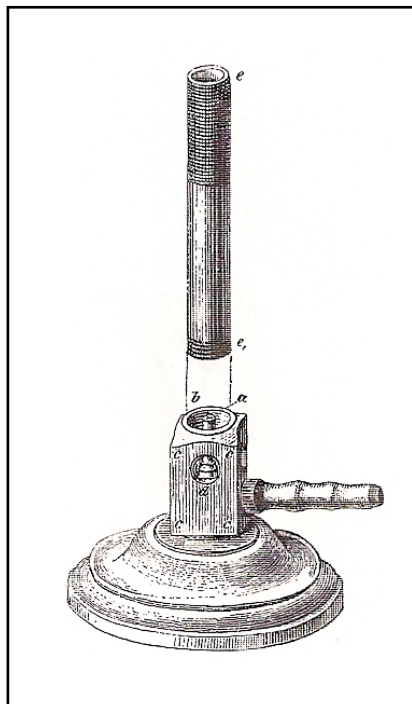


Figure 16. Bunsen's original burner of 1857.

tough skin, seemingly insensitive to heat and, when lecturing to students on his well-known burner, he often amazed his audience by holding his finger in the nonluminous flame until the smell of burning flesh was distinctly perceptible. He seldom needed tongs to remove the lid from a hot crucible. Although very proud of his hands in the laboratory, he was very conscious of their size and appearance when at table with ladies and constantly drew attention to them by his efforts to keep them concealed.

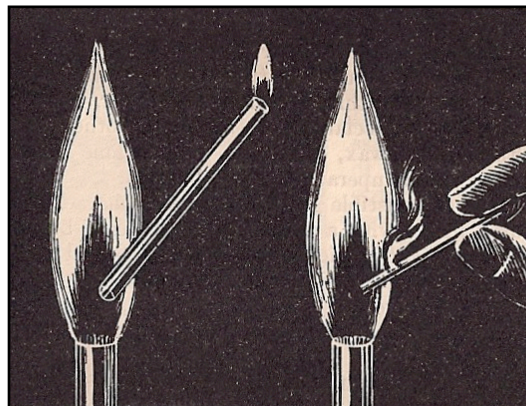


Figure 17. Standard lecture demonstrations illustrating the presence of unlit gas in the inner cone of a Bunsen burner.

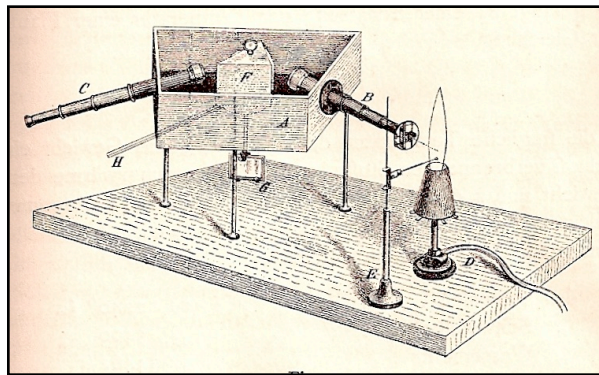


Figure 18. The original spectroscope used by Bunsen and Kirchhoff, supposedly made from one of Bunsen's cigar boxes and some old telescope parts c. 1860.

There is little doubt that Bunsen's greatest contribution to chemistry came through his collaboration with Kirchhoff and their use of the spectroscope (figure 18) as a tool for qualitative analysis, leading to their discovery of the elements cesium and rubidium in 1860 and 1861, respectively. And this, in turn, brings us to the subject of Bunsen's cigars. As may be seen from the paintings in figures 13 and 19, Bunsen became an ardent cigar smoker in later life and, like the cigars brandished by the late G. N. Lewis, they soon became an inherent part of his public persona. But whereas Lewis favored cigars from Manila, Bunsen liked Cuban cigars, though he had to pay a premium price for them from his local tobacconist in Heidelberg. As a consequence, he was always concerned that the tobacconist was cheating him by substituting a cheaper tobacco from another source. Eventually, however, he discovered that the soil in which Cuban tobacco was grown was particularly rich in lithium and that the element collected in the tobacco leaves and could be detected spectroscopically using its characteristic red line. Thereafter, whenever he would buy a new box of Havana cigars, he would immediately head for the laboratory to confirm their authenticity by sprinkling some of the tobacco into a Bunsen burner flame and checking for the red lithium line with his spectroscope.

The cigars, he claimed, helped him to think and to relax (7):

In his younger days Bunsen liked mountain climbing, but as he grew old he evolved a unique and less strenuous system. Together with his companions he would select a peak, and then, near the starting point, find a tree that cast considerable shade. Telling the party to go on without him, he would light a cigar and, having no wife to chide him for his extravagance, would burn a hole in his handkerchief. Then he would

lie down in the shade. Drawing the handkerchief over his face as protection from insects, he would insert the cigar through the hole and smoke and slumber until his companions returned.

Former Students

Ralph Oesper was only 13 years old when Bunsen died in 1899 and so could never have known him as a fellow professional. However, as pointed out in his biographical article of 1927, Oesper did have the privilege of knowing several of Bunsen's students. These included Thomas Herbert Norton, who was the second Professor of Chemistry at Cincinnati, and Alfred Springer, who was a local Cincinnati industrial chemist.

After graduating from Hamilton College, Norton (figure 20) departed for Europe in the summer of 1873 to pursue graduate work in chemistry under Bunsen, and at least three mementos of his two-year stay at Heidelberg are still in the Oesper Collections at the University of Cincinnati (28). These include the textbook which he used (the 1869 edition of Adolf Strecker's *Kurzes Lehrbuch der anorganischen Chemie*), a carefully bound set of handwritten notes for Bunsen's introductory lectures on "Experimental Chemistry" (figure 21) (29), and a set of framed photographs of Norton's Ph.D. committee, which consisted of Robert Bunsen and Hermann Kopp in chemistry, Gustav Kirchhoff in physics, and Johann Blum in min-

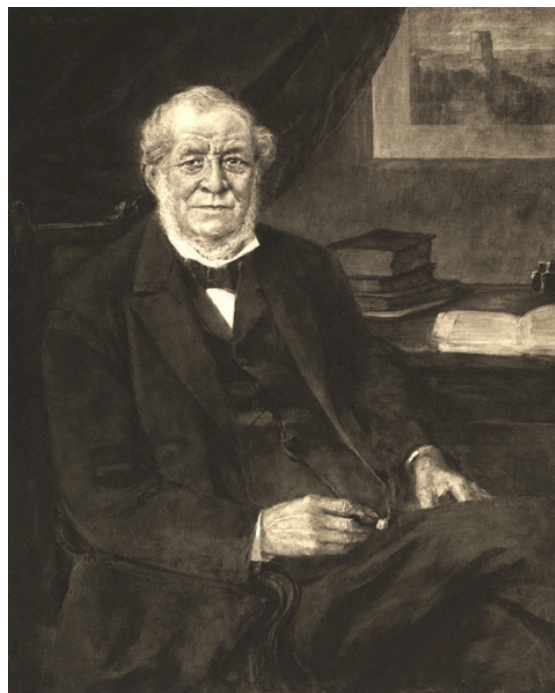


Figure 19. Bunsen in old age with his hallmark cigar.



Figure 20. Thomas Herbert Norton (1851-1941).

erology. On 4 March 1875 this committee granted Norton a Ph.D. *summa cum laude* (30). After further experience in the laboratories of August Hofmann in Berlin and Adolphe Wurtz in Paris, followed by employment as an industrial chemist at St. Denis in France, Norton accepted the position of Professor of Chemistry at the University of Cincinnati in 1883, where he remained until his resignation in 1900, several years before Oesper became a student at the University. However, he visited Cincinnati several times in later years and in this fashion became personally known to Oesper.

The bound lecture notes also call to mind an anecdote concerning Bunsen's introductory chemistry lectures. The old lecture hall at Heidelberg (for which alas there are no surviving photos) had several support pillars situated among the seating for the students. Unlike American universities, there were no examinations or grades given for individual courses in 19th-century German universities, though the students had to present proof of lecture attendance by having the professor sign a certificate of attendance. When presented with the certificate, Bunsen would often observe that he did not recognize the student and was unsure whether he had ever been to lecture, to which the student would inevitably reply, "That is because, Herr Professor, I am the student who sits behind the pillar," whereupon Bunsen would sign the certificate, while observing with a sigh, "Alas, so many sit there" (24).

Alfred Springer (figure 22), on the other hand, was born and raised in Cincinnati (31). Immediately after graduation from high school in 1870, at age 16, he left for Germany to study under Bunsen, receiving his Ph.D in May of 1872 at age 18. Returning to Cincinnati, he became involved in several successful businesses in collaboration with his maternal uncles, Alexander and Gustav Fries, and with several of his Fries cousins, all of whom were chemists, including a company specializing in flavoring agents and another for the manufacture of torsion balances, on which Springer held several key patents. He also played a key role in organizing the Cincinnati Chemical Society of 1880 and in its later reorganization as the Cincinnati Section of the ACS.

Among the Springer mementos in the Oesper Collections are Springer's signed copy of the Strecker textbook which he, like Norton, had used at Heidelberg, and a large collection of photos and letters pro-

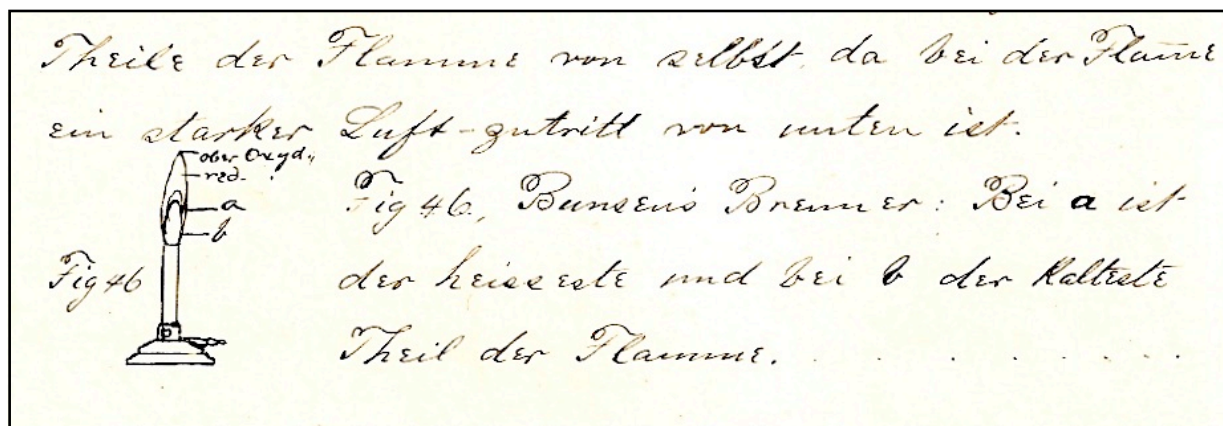


Figure 21. Drawing from Norton's handwritten notes for Bunsen's lectures for the winter semester of 1877-1878 discussing the structure of the Bunsen burner flame.

vided by his granddaughter, Else Miller, who was also a chemist. These include a copy of the terse telegram that he sent to his family on receiving his doctorate (32):

Heidelberg, May 4th 1872

Raised [i.e. promoted] – a splendid examination.

Doctor Alfred

as well as his mother's congratulatory reply, which began (33):

My magnificent boy, My dear Doctor!

Also included is the correspondence detailing Springer's European trip of 1887 to attend the Victoria Golden Jubilee Meeting of the British Association for the Advancement of Science in Manchester, where, among others, he met Lothar Meyer and Mendeleev. While in England he also made a side trip to the continent to visit his old professors at Heidelberg, as recounted in a letter of 12 August 1887 (34):

Here I am, after an interval of more than fifteen years, writing a letter in lovely old Heidelberg. All of us are as much charmed with the dear old place as I was in former years.

... Yesterday morning I went to Bunsen's private house and, after ringing the bell for five minutes, the servant girl opened the door and I asked for "Excellency." The girl told me he was quite sick but she would take my card up. She did so and came back with the answer that "Excellency" would be very much pleased to see me. So I went up to his room and to my sorrow found Bunsen very much aged and reduced in flesh. He was very cordial, made me sit on the sofa next to him, told me that he had an indistinct recollection of me and then, like any other common mortal, began to complain of his ills ... Besides the servant girl, who was downstairs, the old man hasn't a soul in the building to take care of him.

He asked me a thousand and one questions about myself, doings and family. I told him about the torsion scale and said I would bring him one to look at the next day. He said he would be pleased to see it provided he was not too weak. After spending an hour and a half with him, I came back to the hotel. Eda and Lilly [Springer wife and cousin] then went with me to a florist and had the finest basket of flowers made up that we could obtain in Heidelberg and I sent them to him with my card.

This morning I took my scale with me and called again. When I went upstairs he almost shook my hand

off thanking me for my attention. I then showed him my scale. I never yet have seen anybody so delighted with it as he was. He did not know what to admire most – the ingenuity of the construction, the principle, or the wonderful machinery work on the same, including the handsome appearance. But what seemed to delight him the most was that one of his old students should be the co-inventor of the instrument. He asked me whether I would lend it to him for a day or so so that he could examine it at his leisure. I then told him I had brought it along from America with the intention of offering it to him as a slight token of respect. He at first thought it was too much to accept, but afterwards he took it and said he would have it set up in his private room under a glass case.

I spent the whole morning with him, then bid him goodbye, perhaps forever. If his disease lasts much longer, it will ruin all hopes for recovery [But, of course, Bunsen would live for yet another decade]. It is a great misfortune that such men ever grow old, for today he is still the wonderful scholar and the kind-hearted teacher that I loved and respected of yore.

Before leaving that day, Springer had a private conversation with the servant girl about Bunsen's care and possible needs. According to Springer's granddaughter, the girl told him that Bunsen could no longer afford the morning sweet rolls that he dearly loved to



Figure 22. Alfred Springer (1855-1946) as a young student at the University of Heidelberg.



Figure 23. The statue of Bunsen found at Heidelberg. This was part of an elaborate outdoor memorial.

have with his breakfast. As a result, Springer set up a tab, to be billed to him in the United States on a yearly basis, with the local baker to anonymously supply Bunsen with his morning treat for the remaining years of his life. Alas, I have no information on what became of the “Springer sweet roll endowment” after Bunsen’s death.

Canonization

The claims of poverty made by Bunsen’s housekeeper are a bit difficult to believe given that he was virtually canonized after his retirement. Interestingly, this process was initiated, not by his former students, but rather by the German chemist, Wilhelm Ostwald, and started, as already mentioned, in the 1890s with the republication of his classic researches on organoarsenic compounds (14), photochemistry (15), and spectroscopy (16) as part of Ostwald’s newly founded history of science series *Klassiker der Exakten Wissenschaften*. It continued after Bunsen’s death with the reorganization and renaming in 1902 of the Deutsche Elektrochemische Gesellschaft as the Deutschen Bunsen-

Gesellschaft für Physikalische Chemie (35) and its sponsorship in 1904 of the publication of the definitive three-volume edition of Bunsen’s collected papers (16). Concomitant with these events was the erection of an impressive statue (figure 22) and elaborate memorial to Bunsen in Heidelberg and the placement of a memorial bas-relief on the headstone marking his grave (figure 23).

Consistent with Oesper’s penchant for visiting and photographing the graves of famous chemists (his wife once suggested he should form a Society for Dead Chemists), the Oesper Collections contain numerous photographs of both the Bunsen statue and grave site.

References and Notes

1. An invited lecture given as part of the symposium “Characters in Chemistry: A Celebration of the Humanity of Chemistry,” at the 244th National ACS Meeting held in Philadelphia, PA 19-23 August 2012.
2. A. Ihde, *A Quarter Century of Dexter Awards*, University of Wisconsin, Madison, WI, 1981.
3. For a complete listing see J. Palchak, *Dr. Ralph E. Oesper: A Bio-Bibliography*, University of Cincinnati: Cincinnati, OH, 1972.
4. E. C. Bentley, *Biography for Beginners*, Laurie: London, 1905.
5. These include W. Dorn, K. Lütgen, Eds., *Humor in*



Figure 24. Bunsen’s grave site showing his portrait in bas-relief.

- der Technik*, Classen: Essen, 1949; H. Tillmann, Ed. *Humor in der Technik*, Classen: Essen, 1953; and W. Hass, Ed., *Humor in der Technik*, Classen: Essen, 1958. For a more recent general collection, see W. Gratzner, *Eureka and Euphorias: The Oxford Book of Scientific Anecdotes*, Oxford University Press: Oxford, 2002.
6. J. Hauser, *Was Nicht in den Annalen Steht: Chemiker-Anekdoten*, Verlag Chemie, Weinheim, 1958; 6th ed., 1969.
 7. R. E. Oesper, *The Human Side of Scientists*, University Publications: Cincinnati, OH, 1975.
 8. R. E. Oesper, "Robert Wilhelm Bunsen," *J. Chem. Educ.*, **1927**, 4, 431-439.
 9. R. E. Oesper, K. Freudenberg, "Bunsen's Trip to Iceland as Recounted in Letters to His Mother," *J. Chem. Educ.*, **1941**, 18, 253-260.
 10. G. Lockemann, R. E. Oesper, "Bunsen's Transfer from Cassel to Marburg," *J. Chem. Educ.*, **1955**, 32, 456-460.
 11. G. Lockemann, *Robert Wilhelm Bunsen*, Wissenschaftliche Verlagsgesellschaft: Stuttgart, 1949.
 12. H. Debus, *Erinnerungen an Robert Bunsen und seine wissenschaftlichen Leistungen*, Fisher: Cassel, 1901; K. Danzler, *Robert W. Bunsen und Gustav R. Kirchhoff: Die Begründer der Spektralanalyse*, Teubner: Leipzig, 1972.
 13. Most English accounts are based on Henry Roscoe's memorial lecture for the Chemical Society. See H. Roscoe, "Bunsen Memorial Lecture," in *Memorial Lectures Delivered Before the Chemical Society, 1893-1900*, Gurney and Jackson: London, 1901, pp. 513-554.
 14. A. von Baeyer, Ed., *Untersuchung über die Kakodyleihe von Robert Bunsen*, Engelmann: Leipzig, 1891.
 15. W. Ostwald, Ed., *Photochemischen Untersuchungen von R. Bunsen und H. E. Roscoe*, 2 Vols., Engelmann: Leipzig, 1892.
 16. W. Ostwald, Ed., *Chemische Analyse durch Spectralbeobachtungen von G. Kirchhoff und R. Bunsen*, Engelmann: Leipzig, 1895.
 17. W. Ostwald, M. Bodenstein, Eds., *Gesammelte Abhandlungen von Robert Bunsen*, 3 Vols., Engelmann: Leipzig, 1904.
 18. R. Bunsen, *Gasometrische Methoden*, Vieweg: Braunschweig, 1857. Translated as R. Bunsen, *Gasometry*, Walton and Maberly: London, 1857; 2nd ed. 1877.
 19. The Oesper Collections owns a second thin monograph by Bunsen entitled *Flammenreactionen* (Koesler: Heidelberg, 1880). However this appears to be an unacknowledged reprint of a lengthy article originally published in Poggendorff's *Annalen* in 1866.
 20. T. Curtius, J. Rissom, *Geschichte des Chemischen Universitäts-Laboratoriums zu Heidelberg seit der Gründung durch Bunsen*, Rochow: Heidelberg, 1908.
 21. F. Krafft, Ed., *Bunsen-Briefe in der Universitätsbibliothek Marburg*, Universitätsbibliothek: Marburg, 1996.
 22. C. Stock, Ed., *Robert Bunsen's Korrespondenz vor den Antritt der Heidelberger Professur (1852) – Kritische Edition*, Wissenschaftliche Verlagsgesellschaft: Stuttgart, 2007.
 23. A. Meyer, *Bunseniana*, Winter: Heidelberg, 1904.
 24. H. Roscoe, *The Life and Experiences of Henry Enfield Roscoe, D.C.L., L.L.D., F.R.S. Written by Himself*, Macmillan: London, 1906, Chapters 3-4.
 25. W. Reid, *Memoirs and Correspondence of Lyon Playfair*, Harper: New York, NY, 1899, pp. 61-63.
 26. J. T. Stock, "Bunsen's Batteries and the Electric Arc," *J. Chem. Educ.*, **1995**, 72, 99-102.
 27. W. B. Jensen, "The Origin of the Bunsen Burner," *J. Chem. Educ.*, **2005**, 82, 518.
 28. W. B. Jensen, "Thomas Herbert Norton (1851-1941)" in *Cincinnati Chemists: Assorted Papers on the History of the Cincinnati Chemical Community*, Oesper Collections: University of Cincinnati, 2012, pp. 30-39.
 29. Though incomplete, these notes appear to conform to Bunsen's lectures as reconstructed in H. Rheinbolt, "Bunsen's Vorlesung über allgemeine Experimentalchemie," *Chymia*, **1950**, 3, 225-241 and as listed in reference 20. Why they are for the winter semester of 1877-1878 is also a mystery, though Norton remained in Germany after graduation in 1875 and may have reattended Bunsen lectures with the intent of making a set of carefully transcribed notes as a gift for Bunsen.
 30. Interestingly neither Norton nor Springer appear to have submitted formal doctoral theses and neither is listed in P. Jones, *Bibliographie der Dissertationen amerikanischer und britischer Chemiker an deutschen Universitäten, 1840-1914*, Deutschen Museums: München, 1983.
 31. H. F. Fry, "Dr. Alfred Springer," memorial talk given to the Cincinnati Section of the ACS in 1946. Copy in the Oesper Collection.
 32. Western Union Telegram of 04 May 1872 from Alfred Springer, Heidelberg, to Fries Brothers Chemists, Cincinnati, OH. Copy in the Oesper Collections.
 33. Letter of 04 May 1872 from Antonie (née Fries) Springer, Cincinnati, OH to Alfred Springer, Heidelberg. Copy in the Oesper Collections.
 34. Letter of 12 August 1887 from Alfred Springer, Heidelberg, to family in Cincinnati, OH. Copy in the Oesper Collections.
 35. W. Jaenicke, *100 Jahre Bunsen-Gesellschaft, 1894-1994*, Steinkopff: Darmstadt, 1994. The 1894 date is the founding date for the earlier Elektrochemische Gesellschaft.

Publication History

Published in G. Patterson, S. C. Rasmussen, Eds., *Characters in Chemistry: A Celebration of the Humanity of Chemistry*, ACS Books, Washington, DC, 2013, pp. 7-31.

Update

It has come to my attention that the parallel term “Darwiniana” was used as early as 1876 by the American botanist, Asa Gray, to describe a collection of his writings on the subject of Darwinism and was almost certainly inspired by his mastery of the Latin terminology of botany. This same title was also used by Huxley in 1893 for a similar collection of essays on the same subject, and is the most likely inspiration for Roscoe’s coinage of the term “Bunseniana.”