

prove it in the light of experience and advancing professional sentiment. With increased patronage our institutions will be encouraged and enabled to increase their facilities, and stimulated to greater excellence in teaching. There will at once arise a desirable increase in the sympathy and interest of the profession, and of the public generally in the schools. Responsibilities will be focused definitely, and the whole scheme susceptible of steady improvement. I love to contemplate in an imagination quickened by a strong faith in early realization, the working of the better plan, and to picture its results even with the old term of study, three years, although a lengthening of the time will inevitably follow in the near future.

Think of medical classes composed entirely of educated men spending all their time under opportunities for the best work, and compelled to do it! Recitations, lectures, clinical lessons, reviews, laboratory work, microscopic, physiological, chemical, anatomical, each and all in proper time and place. Picture to yourselves the change that a few years will bring in the tone and character of the profession under this system. *Then* we shall have some approximation to a proper balance between demand and supply as regards numbers. *Then* it is to be hoped that knowledge and skill will find such remunerative employment and honorable recognition that necessity cannot be urged as an excuse for illegitimate or questionable methods of practice. *Then* shall we begin to see such general excellence in the regular profession and such average uniformity in results among different practitioners in ordinary diseases as shall strengthen the confidence of the people in scientific medicine.

Then shall medical experts display such knowledge and judgment on the witness stand, and testify with such unity of opinion on all ordinary matters as to remove the stigma of disgrace now resting upon this class of witnesses, and medico-legal inquiries shall attain to the dignity and importance they deserve.

Then the false and disgusting specialism so prevalent now shall pass away, and beside the main and earliest natural division of medicine and surgery he who selects a smaller division of labor will do so because of some special fitness or opportunity super-added to a thorough general knowledge and a broad and ripe experience.

Then both profession and people will learn that with properly educated physicians and surgeons specialties are not a necessity, but a matter of taste or convenience.

In short, *then* will the scope and scheme of medical education begin to be in some degree commensurate with the needs of suffering humanity; and to give something nearer a fitness for the noblest and most sacred work that falls to the lot of man. Fear not, my brethren, that any insidious comparisons will be drawn between then and now. Professor Morse of telegraphic fame still wears his historic laurels unchallenged though the telephone has made the message vocal. The reputation of the fathers in medicine rests on the same sure foundation, and the examples of untiring zeal, sublime devotion, and heroic self-sacrifice that they left for us shine with undimmed lustre, although the truths which they with prophetic eye saw dimly shadowed on their horizon are revealed to us in all their fullness.

The question between the new and the old, so far as merit goes, will always be, not what was the opportunity as compared with now, but how was that opportunity improved; and the same honor and praise await

the man who does his best, no matter in what day he lived, or under what system he worked.

So we who were educated in a time of fewer privileges and more imperfect methods, shall ever claim credit for whatever of earnest, honest endeavor was made and for all attained and accomplished under less propitious circumstances. Nor shall the spirit of jealousy or envy even for one moment find place here. But in the true scientific spirit every member of our profession shall hail with glad acclaim the dawning of a better day; and shall lend willing influence and hearty aid to every movement which tends to enlarge the sphere, and ennoble and strengthen the character of scientific medicine.

Gentlemen, all that is necessary to accomplish this great change is conviction. No money, no legislation, no organization of forces is needed, simply let every member of the profession realize the need and act and advise accordingly, and the work is done, or rather, well begun. I believe that if every member of this association would from this time forth take this position, in three years from now there would not exist such a thing as private preceptorship in this state. Still more, if this Association as a body should put itself plainly on record as indorsing the new way, the effect would be incalculable. The profession, the world over, is ready to give hearty assent. It only needs that some one speak and move, other State societies would immediately take up the theme and the schools could afford to, and would, promptly settle the matter by refusing all private certificates of time. The movement once started, so ripe are the times for it, would, I believe, very soon become universal. It lies in the power of the Maine Medical Association to-day to give such emphatic condemnation to the old plan, and such cordial indorsement of the new as shall awaken the professional mind generally to the great importance of the change. I believe that such awakening would surely and quickly be followed by a profound conviction of the needs of the present time, and that within a few years *private preceptorship* would be a thing of the past.

To organizations, as to men, great occasions for good seldom arise. Opportunities to make history that shall redound to the honor and highest welfare of the race rarely come. Fortunate are they who are equal to the occasion; who improve the opportunity.

COAL-GAS POISONING.

BY HERBERT TERRY, M. D., PROVIDENCE.

On the subject of coal-gas poisoning there seems to be but little written, though the accident is by no means uncommon, two sets of cases having come under my notice during this winter.

January 1, about four A. M., I was called to a family consisting of father, mother, daughter, niece, and nephew. Their sleeping rooms were on the third floor, and were heated from a furnace in the cellar. Shortly after three the daughter awoke with a sense of suffocation, a distressing headache, and nausea which was soon followed by vomiting. She attempted to arouse the mother, and was in part successful. The noise awakened the father. Not realizing the trouble he questioned the mother, but could get from her only: "They're all just so! They're all just so!"

This she repeated over and over again. She has since told me that she knew what she was saying, but "felt too silly to say anything else."

After the father had been awakened, the daughter fell at once into an unconscious condition, but she was, with some difficulty, made to get up and dress, while the father came for me. Under the influence of fresh air and the excitement she recovered in a short time. She was left in a dazed condition, with deafness and headache. The effect on the father seemed similar to intoxication by alcohol. There was confusion of ideas, thickness of speech, and staggering. A severe headache kept him at home during the day.

The nephew (twelve years old), seemed at the time to be least affected. He was crying with a headache, and there were vomiting and purging, but the nervous symptoms seen in the other cases were wanting. For several days, after the others had recovered, he complained of loss of appetite, nausea, vomiting, and headache.

The niece, when found, had attempted to get up, but had fallen on the floor, where vomiting and extensive purging had taken place. When seen she had a quick, weak pulse; rapid, stertorous breathing; hot, moist skin; widely dilated pupils. She complained of being cold, and there were very severe rigors. She needed little attention, and was able to get up by eight A. M. Headache, giddiness, and dullness of perception, lasted through the day.

The mother seemed to be the most profoundly affected. Purging had occurred before I arrived, but she did not vomit until some time after. She was unconscious and breathing very rapidly, with considerable stertor. The pulse was quick, and almost imperceptible, the skin abnormally warm; the pupils widely dilated. She could be roused by slapping the face or shouting in the ear, but would sink into a comatose state immediately. This condition of things lasted, perhaps, half an hour, when convulsions suddenly appeared. They would begin by a loud complaint, such as, "Oh! my head!" followed by a short tonic spasm, and ending in a series of clonic spasms lasting several minutes. There would then be an interval of quiet, lasting perhaps three minutes, followed by another convulsion. About 6.30 A. M., she became perfectly conscious, and on account of a headache, which seemed to be excruciating, I determined to feel my way with small doses of morphia. Accordingly gr. $\frac{1}{2}$ of the sulphate was given, and in a few minutes she was totally unconscious, and so remained for half an hour. The breathing was very slow, the pulse rapid and weak. Twice the breathing seemed to stop, and artificial respiration was resorted to. For a short time the pulse was imperceptible at the wrist. No more morphia was given, though I cannot believe that this small amount can be blamed for the alarming symptoms following its administration here. At ten A. M. all the symptoms that remained were headache, deafness, sluggishness of thought, and prostration. She did not leave the bed for several days.

Dr. A. D. Weeks kindly saw these cases with me, but when he arrived they were so far recovered that he did not think it necessary to suggest any additional treatment.

February 18, a man and his wife were found under the influence of coal-gas in a house of which they were the only occupants. The man's sister called about eleven A. M. Not gaining admission, and remembering

that the wife was ailing the night before, she went to the window of their bedroom, which is on the ground floor. The man was lying diagonally on the bed, the wife lying across his chest. The sister, instead of fainting, got a chair and crawled in at the window.

I arrived at 11.30 A. M. Both were insensible and frothing at the mouth. Respirations 36 a minute, both stertorous and blowing; pulse in the man 124, in the woman 132; skin of the face and arms reddened (not purplish). Surface of the body warmer than natural, and somewhat moist; pupils not sensitive to light, and slightly larger than normal, but not so widely dilated as in the other cases; eyes partly open; conjunctivæ not sensitive to the touch. Both were motionless after even a very severe slap on the face, unless it was several times repeated, when a slight and slow wrinkling up of the features would occur. Vomiting and extensive purging had taken place in both, apparently some hours before. The stench was horrible, but I think characteristic. It was the odor of coal-gas partly disguised and made infinitely more disagreeable by that of the dejections. The muscles were rigid, and the mouth firmly closed.

12.30 P. M. The wife now began to notice those around her, and when approached seemed to try to shrink away as if in fear. The man was still unconscious, but as the last few drops of brandy left the hypodermic syringe, his arm would be drawn up a little and very slowly. Touching the conjunctiva would cause a slow and incomplete closure of the eyelids.

1 P. M. The wife answered a question shouted in her ear by a slow nod of the head. The man's condition was unchanged. It was noticed that no movement of the eyelids took place when the hand suddenly approached the eye.

1.30 P. M. The woman could speak, but only with great difficulty, and in monosyllables. She would say over and over again, "Cold! Cold!" though the surface of the body was very warm. She was fully satisfied with a hot bottle to hug. She could hear only very loud talking. The man seemed to breathe easier, but there was still considerable stertor. The breathing would seem to stop every few moments, but would start up again when the air was pressed out of the thorax. The pulse had grown worse rather than better. It was now 128, and very weak. Tincture of digitalis was added to the brandy in the proportion of twenty minims to the drachm, and half a drachm of the mixture repeatedly injected beneath the skin.

2.30 P. M. The wife was washed and removed to another room. She seemed quite rational, and began to understand that we were not thieves. Her hearing gradually came back, and she continued to improve without further treatment. The man's pulse showed a marked improvement from the digitalis, but he was still unconscious.

4.30 P. M. The woman could sit up, but her pulse remained at 130. The man's pulse had come down to 108, and was proportionately stronger. The breathing, which for some time had been irregular, was now noticed to be regularly so. He would breathe ten times during twenty to twenty-two seconds, at first very shallow, the depth and strength increasing up to a certain point, when it would gradually diminish until it stopped. There would then be an interval of eight or nine seconds, when he would again breathe ten times. Rarely it was nine, and still more rarely eleven times. He could be made to breathe during the inter-

val by any irritation, for example, by slapping the face or forcible pressure on the thorax. A loud shout, with a slap on the face, would now elicit a grunt of vexation, the first sign of consciousness five hours after being discovered.

5.30 P. M. The man was more easily roused, and could be made to swallow by pouring the liquid into mouth and holding the nose. When the nose was not held spasm of the glottis followed.

6 P. M. The wife was sitting up, feeling only a little dizzy and confused. Pulse 120; temperature 100.6° F. The man was still in a comatose condition. Pulse 104, and quite good.

8.30 P. M. The woman's pulse was still 120, and by no means full. The man had just been washed and moved, and as a result his pulse was 120, and weak. Brandy, two drachms, and tincture of digitalis, twenty minims, were given. Percussion over the pubes showed a full bladder, and on being roused and made to understand what was wanted he emptied it by his own efforts.

9 P. M. The man's pulse was 100, and of fair strength. Orders were left for brandy to be given through the night p. r. n.

February 19th, 9 A. M. Night report: "The man became conscious of surroundings about 3 A. M. (that is, sixteen hours after being discovered), since which time he has been very nervous. About one ounce of brandy has been taken during the night, and early in the morning a cup of strong coffee." The man was found still in bed. Pulse 96; temperature 99.8° F.; respirations 26. He could hear and understand with but little difficulty. In answer to a question, "How do you feel?" he whined, "I don't know." When undisturbed he lay with the eyes closed, apparently asleep. A very troublesome cough was present, and the chest was filled with mucous râles. The woman's pulse was 100; temperature 98.4° F.

5 P. M. The man was sitting up. Pulse 100; temperature 101.8° F.; respirations 28, and of good character. The cough was still troublesome. There was no dullness on percussion over the lungs. Large moist râles abounded. Both patients complained of ringing in the ears.

The treatment, in all the cases, was fresh air and alcoholic stimulants. In one case the pulse would not respond to the brandy, and tincture of digitalis was added. This seemed indicated by the hot, moist skin (dilated arterioles?), as well as the quick, weak pulse. Its action was marked and most happy. Artificial respiration was resorted to in one instance, but I think unnecessarily.

Comparing the two sets of cases: there were in both unconsciousness and loss of sensation and voluntary motion, violent vomiting and purging, a quick and weak pulse, rapid and stertorous breathing, an abnormally warm skin (not at all like the hot, dry skin of fever), pupils at least slightly dilated. In one case the breathing was blowing as well as stertorous. A characteristic of the first set of cases was violent headache. It was entirely absent in the last. Convulsions may have occurred in the man and wife. I should think it very likely from their position when found, and the pretty good evidences of their having moved about after purging took place. I cannot but think that hysteria was an important factor in the production of the rigors in the niece, as well as the convulsions and the coma that followed the administration of

one twelfth of a grain of morphia in the mother. They are both nervous people.

I regret that the temperature in the last two was not taken while they were unconscious. It was slightly above the normal after consciousness returned.

The cause of the first set of cases was the worn-out condition of the partition separating the fire from the air-box containing the air passing to the rooms above. Whether the coal-gas went up the chimney or through the registers depended on which way the draft was the stronger. On the night when the poisoning occurred the door in the furnace flue was accidentally left open, reducing the draft up the chimney to little or nothing. The result has been detailed.

The cause of the other cases of poisoning was an insufficient draft to the chimney when the wind was in a certain direction. A "parlor stove" was left with both the back-dampers closed.

In both cases the smell of coal-gas was noticed when the families retired.

For some of the post-mortem appearances I am indebted to two cats. These were placed in a wooden box, in the cover of which was a pane of glass, that they might be observed. By means of a Davidson's syringe coal-gas was pumped into the box from the reservoir of a self-feeding coal-stove.

The first cat was sick before the experiment began. During the afternoon she vomited two quite long worms. At 9.50 P. M., when she was placed in the box, the pulse was 144, the respirations 60. About 10 P. M. the bladder was evacuated; the pupils were noticed as very widely dilated; the pulse and respirations became very frequent. Ten minutes after, she apparently died, with hardly a struggle.

Fifteen minutes after death. No cyanosis; pupils widely dilated; mouth slightly open and tongue protruding. The blood was bright red and fluid. The left ventricle was firmly contracted, the right soft and flaccid, but not dilated. After opening the thorax the right auricle beat rapidly and sharply for a full minute, after which it beat slower and slower until it stopped. No part of the head presented anything abnormal, not even enlarged blood-vessels. The stomach and small intestines contained only a little mucus; the large intestine was packed, from valve to anus, with hardened feces. This abnormal degree of constipation may explain the absence of purging. Rigor mortis came on in less than half an hour after death.

In the second cat, at the beginning of the experiment, the pulse was 130, respirations 24, and purring. The gas was introduced at 9.15 P. M. The cat soon fell quietly asleep, and at 9.35 P. M. she could not be roused by pounding or shaking the box, though when loudly called would start up for an instant.

9.50 P. M. Pulse 180; respirations 144. There was a copious movement of the bowels.

9.55 P. M. Pulse 220; respirations 156.

10.10 P. M. The cat was perfectly insensible; mouth open; tongue lolling; respirations very shallow and irregular; pupils widely dilated; eyes partly open; conjunctivæ still sensitive. The cover of the box was taken off, so that the chest might be examined. Sibilant and large mucous râles were found. The pulse became very irregular, jumping about between 160 and where it could not be counted. (This must have been beyond 240, for that could be counted by moving the finger every fourth beat, and having another count the finger-beats.)

At this stage of the experiment a high wind sprung up, and all my coal-gas went up chimney. The cat soon became conscious, and, barring a little weakness, was apparently as well as ever in less than an hour.

The experiment was concluded the next day. 3.03 P. M. The gas was again introduced. 3.05 P. M. There were a few squalls, probably from fear rather than distress. 3.08 P. M. A movement of the bowels occurred. This might have been due to fear. 3.10 P. M. The cat became too weak to stand, and lay down on the side voluntarily. 3.12 P. M. There was a sudden contraction of the muscles. I could not determine whether it was an attempt to get up or really a convulsion. It was momentary, and not repeated. 3.14 P. M. The conjunctiva no longer sensitive; pupils enormous; iris a mere ring; pulse 156. Each inspiration was a jerk resulting from a sudden spasmodic contraction of the diaphragm, and recurring regularly every three seconds. The cover was taken off the box and fresh air admitted. 3.18 P. M. Respirations 40, and quiet, with an occasional sigh. I find no note of the pulse. 3.20 P. M. The conjunctivæ became sensitive, as well as the small hairs on the end of the ear. The gas was again admitted. 3.27 P. M. Breathing 104. 3.30 P. M. The cat suddenly got upon her feet, struggled blindly for a time, and at 3.32 died. Autopsy at ten P. M. Mucous membrane of lips and tongue a light red. Ramifications of the small vessels on the under side of the tongue plainly visible. Care was necessary in cutting through even the skin, for the smallest blood-vessels would bleed. Both arteries and veins contained fluid blood, which was lighter in color than arterial blood usually is. The right heart was flaccid and very much distended. The left heart contained blood and was quite soft. Lungs collapsed and very much congested. Froth, but no blood, came from the smaller tubes on section. The stomach was very much distended with gas, which had the characteristic odor of coal-gas. In cutting through the skull the vessels of the diploë bled profusely. The vessels of the arachnoid were more prominent than usual, and looked as though formed in red sealing-wax. There was no capillary congestion. The brain was, if anything, lighter in color than usual.

Some of the blood kept in an open dish was found fluid at the end of two days. The blood globules at the end of the first day (they were not examined before) were so broken up as not to be recognizable.

These cases and experiments are by no means conclusive, and I offer the following as only possibly true:—

The fatal effects of coal gas are probably from the carbonic oxide contained. Carbonic anhydride is irrespirable only, carbonic oxide, poisonous. The color of the blood after death showed the presence of carbonic oxide. To destroy life carbonic anhydride and sulphurous anhydride would have to be in larger quantity compared with the amount of oxygen present than generally found in poisoning by coal gas.

The primary action of coal gas is (if we except the fact that carbonic oxide changes the properties of the blood globule) on the nervous system. This is suggested by the occurrence of vomiting and purging in addition to the rapid pulse and breathing, coma, dilated pupils, etc.

The presence of the same relative amount of coal gas in the air inhaled, affects different persons differently. This is shown by the cases.

The length of the period of unconsciousness depends more on the time occupied in breathing the coal gas than on the degree of unconsciousness produced. This is suggested by a comparison of the cases with the cat in the second experiment.

Or it might have been due to the difference in cerebral development.

NOTE.—March 13th, I was called to the man spoken of in the second set of cases. Two years ago he had had a slight attack of hemiplegia (right) from which he recovered in a few weeks. He has not felt quite as well since that time. I had not seen him since his recovery from the effects of the coal gas, but his wife told me that he had been very rapidly losing his memory. I found him with most of the early symptoms of general paralysis, and March 14th he was admitted to the Butler Asylum.

The following is an incomplete list of articles bearing on the subject:—

Cases: Parker, *American Journal Medical Sciences*, October, 1850. Cotting, *Journal*, March 20, 1856. Williams, *American Journal Medical Sciences*, July, 1862; Williams, *British Medical and Surgical Journal*, January 11, 1862. Bloxam, *American Journal Medical Sciences*, April, 1862. Meldon, *New York Medical Journal*, November, 1866. MacLagan, *Edinburgh Medical Journal*, January, 1868. Turner, the same, March, 1871; Turner, *Medical and Surgical Reporter*, xv. 4. Klebs, *Virchow's Archiv*, xxxii., p. 450. Marten, *Casper's Vjhrschrift*, xxv., p. 97.

Cases of poisoning by illuminating gas:—Cameron, *Dublin Medical Journal*, 3 s., ci., p. 425. Art., *Report on Public Health*. Morris, *Maryland Medical Journal*, vii., p. 341.

Poisoning by vapors of lime kiln:—Draper, *The Journal*, March 21, 1878. Experiments: Demarquay, *Medical Times and Gazette*, August 19, 1865. Coathupe, *American Journal Medical Sciences*, August, 1859. Leven, *Journal Anatomy and Physiology*, May, 1870. Addis, *Medico-Chirurgical Transactions*, xlv., pp. 99 and 137. Huxley, *Medical and Surgical Reporter*, January 28, 1871. Gamgee, *New Sydenham Society's Biennial Retrospect*, 1868. Eulenbergh, the same. Pakrowsky, *Virchow's Archiv*, xxx., p. 525. Klebs, the same, xxxii., p. 450. Hoppe-Seyler, *Med. Centralblatt*, iv., p. 4. Zuntz, *Pflueger's Archiv für Phys.*, v., p. 584. Podolinski, the same, vi., p. 553; Podolinski, *Archiv Gén. de Méd.*, August, 1870. Faure, the same, p. 557. Grchant, *Compte Rendus Académie des Sciences*, xci., p. 858. DeBoyer, *La France Méd.*, xxvii., p. 747.

Apparatus for detecting the presence of carbon monoxide, that is, coal gas:—

Boettcher, *Medical Record*, September 1, 1877; Boettcher, *Medical and Surgical Reporter*, January 30, 1869.

RECENT PROGRESS IN GYNÆCOLOGY.

BY W. H. BAKER, M. D.

EXTIRPATION OF THE CARCINOMATOUS UTERUS THROUGH THE VAGINA.

THE operative procedure as adopted by Schröder and described by him in a paper presented to the German Gynæcological Society at the fifty-third annual meeting of German Naturalists and Physicians, held in Dantzig,¹ consists in inserting a Muzeux forceps into each lip of the os and drawing the uterus downward. The vagina is then cut through round about the portio vaginalis, which is often much thicker than is generally supposed. The separation of the bladder from the cervix may be accomplished without difficulty, the connective tissue between the two organs being loose and easily separable. The bladder escapes upward, which greatly protects the ureters from injury. The posterior surface of the uterus must next be freed.

¹ *American Journal of Obstetrics*, January, 1881.