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## ADDRESS ON SEMMELWEIS : A SHORT SKETCH OF HIS LIFE AND TEACHING<sup>1</sup>

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GENTLEMEN, when presiding at our fiftieth annual dinner a few weeks ago, I commented on the fact that the year 1847, which saw the birth of this Society, is memorable for two discoveries which have served, more than anything else, to revolutionise the history of medicine and surgery, viz., the discovery of chloroform-anæsthesia and the first intelligent use of antiseptics, both of these the work of obstetricians. I need scarcely remind you that the former was only one of the many achievements of our world-famous compatriot, Sir James Simpson.

The other important event of 1847 was the institution, on a rational basis, of the aseptic treatment of midwifery, afterwards extended by its author to the aseptic management of surgical operations. This was the work of a Hungarian, Ignaz P. Semmelweis, at that time only twenty-nine years of age, and assistant at the "First Midwifery Clinique" in Vienna. We cannot honour him too highly, and yet he has been allowed to sink into comparative oblivion, though Lister, to his credit be it spoken, has owned that he was forestalled in his work, to some extent at least, by Semmelweis.

The son of a well-to-do grocer in Ofen, Buda-Pesth, he was born on the 17th of July, 1818 ; and having distinguished

<sup>1</sup> A presidential address delivered on January 15th, 1898, before the Anderson's College Medico-Chirurgical Society.

himself at school, proceeded, at the age of nineteen, to the University of Vienna. Here, by the wish of his parents, he began to study law, but soon, happily, after a visit with a friend to the dissecting-room, discovered that his desires lay more in the direction of medicine. This he studied partly in Pesth and partly in Vienna, in the University of the latter of which he graduated in 1844. His industry and ability as a student attracted the attention of two of the most famous of his teachers, Rokitansky and Skoda, men famous to the present day, and through their influence he obtained, in 1846, the post of assistant to the "First Midwifery Clinique," under Professor Klein.

At that time the condition of affairs at all maternity hospitals was most deplorable. Prior to the days of Hippocrates, puerperal fever had been in existence, but then, and for centuries thereafter, it was met with only in isolated cases. With the institution in the seventeenth century, however, of the first lying-in wards, viz., in the Hotel Dieu, Paris, so-called epidemics of the disease began to be spoken of, and these, it was noted, took place almost solely in maternity hospitals. Bad enough before, they became more severe during the present century, and developed to an alarming extent, coincidently with the practical teaching of anatomy in the attached medical schools. In the Midwifery Cliniques in Vienna the mortality was dreadful, more especially in the "First Clinique," which was frequented by the students. Of 4010 patients admitted during the year 1846, as many as 459 died—a percentage of 11·4; while in the "Second Clinique," attended only by midwives, 105 patients died out of 3754 received during the same period—a percentage of 2·7. From 1841 to 1846, both inclusive, the percentage mortality was 9·92 in the "First Clinique," 3·38 in the other. In one notorious month during these years, the mortality reached the horrible figure of over 30 per cent.

Semmelweis was "*Gefühlsmensch durch und durch.*" His sensitive nature revolted at the heart-rending scenes daily witnessed in his wards. His cheeks burned from shame when he heard the offensive but only too apt nickname with which the staff of his clinique had been dubbed by the other hospital physicians,—*Todtenvögel*—Birds of Death. His heart was filled with compassion when he saw the newly-admitted patients wringing their hands and imploring to be dismissed whenever they



found that they had been admitted into the dreaded "First Clinique."

Roused into activity, he set himself seriously to the task of enquiring into the cause of such a sad state of affairs, with the object of remedying it, if possible. Nowadays the explanation seems simple; but to understand Semmelweis' difficulty, we must direct our mind's eye back to the age when Semmelweis lived. For centuries eminent men had vainly endeavoured to solve the puzzle. Theories that the disease was due to metastases of milk, owing to the resemblance to coagulated milk of the fibrinous exudate found on the peritoneum, and to retention of the lochia with the resultant poisoning of the blood by its injurious constituents, had each in its day had its adherents. Scanzoni, one of the great obstetricians of Semmelweis' time, had pointed to the fibrinous exudates upon the serous surfaces, and claimed that the cause of puerperal fever lay in the altered constitution of the blood which determined them. The theory that puerperal fever was miasmatic in origin was very prevalent about that time, and on this account much expense was incurred in renovating, and even in rebuilding maternity hospitals, but all with little or no success—the puerperal "epidemics" were as rife as ever. Those who came nearest the truth were Cruveilhier, O. W. Holmes (1843), Eisemann (1837), etc., who asserted that the disease was of a contagious nature. Denman, at the end of the eighteenth century, was the first to enunciate this theory. But it was through the respiratory organs that contagion was believed by them to gain entrance.

Semmelweis turned the matter over in his mind, while carrying on his observations at the bed-side and in the *post-mortem* room. None of the views then prevalent appealed to him as capable of explaining what he saw with his own eyes. They did not explain why women, who had had a short first stage, were much more often exempt from the disease than those in whom the dilatation of the os had been tedious. They did not explain why the death-rate was so much higher in the First than in the Second Clinique, while the class of patients, the surroundings, and the treatment were the same in both.

The acuteness of his reasoning powers soon enabled him to determine that in the students lay the probable cause; but it was not till the death of Kolletschka, Professor of Forensic

Medicine, from pyæmia, the result of a finger-prick at a *post-mortem* examination, that the full flood of light illumined his mind. He saw that the onset, course, and issue of the disease, with the anatomical characters after death, were identical with those of puerperal fever, and he at once realised that the two diseases were one and the same. He now apprehended fully why it was the cases, which the physicians and students had examined, which were prone to become infected, and why the lingering cases, which were examined more frequently than the others, had a larger mortality. It was the decomposed organic material, the *zersetzte thierisch-organische Stoffe*, conveyed on the hands of the medical attendant, which was the *fons et origo* of the infection.

He immediately set about devising the best means of prophylaxis, and soon began the use of chlorine solution for disinfecting the hands. This he shortly afterwards exchanged for the much cheaper and equally effective chlorinated lime. It was the month of May 1847, when he began the new treatment. In that month 12 per cent. of the patients died, much the usual percentage; but in June the mortality was only 2·38 per cent., and in July 1·2 per cent., while during the following year it was 1·27 per cent. distinctly lower than the mortality of the midwives' Clinique, which remained at about the same level as before. On Skoda's advice, also, he carried out experiments on animals, and found that the decomposed organic material, introduced into their genitals, produced the same clinical and anatomical changes which were found in puerperal fever.

His theory was proved to the hilt, but Semmelweis did not rest content. He continued and amplified his researches. It has been said by Tarnier that he regarded the cadaveric poison as the sole cause of puerperal fever, and that thus "il n'avait raison qu' à demi." But this is not so. Though doubtless his first and main thought, a couple of circumstances soon occurred in the wards which caused him to modify it. A woman suffering from medullary cancer was admitted and examined, and then immediately afterwards twelve others lying in the same ward were also examined; the hands between times were washed only with soap and water. Of these twelve, all, except one, died of puerperal fever. The other case was that of a patient with ulcerating caries of the knee, who had



healthy genitals. Several cases of puerperal fever ensuing in the ward led him to believe, not only that the poison was decomposed animal matter in the widest sense of the term, but also that it may be carried to the patient's genitals through the air, a view still held by some.

It must be remembered that, though Schwann had discovered in 1836 that the microscopic bodies which caused the phenomena of putrefaction and alcoholic fermentation, and which had been in 1680 mistaken by Leeuwenhoek for crystals, were really living organisms, it was many years after Semmelweis' discovery that the laborious and epoch-making researches of Pasteur and Koch showed micro-organisms to be the main factor in the causation of many diseases. Remembering this, the theory of Semmelweis as to the nature and etiology of puerperal fever was wonderfully correct.

A few clear-brained men, like Skoda, Hebra, Haller, Routh of London, and Arneth of Paris, perceived the value of the young obstetrician's investigations and supported his views, but the opposition which he encountered not only from Klein, his chief, who saw in his theory merely a reproach on himself, but also from Scanzoni, Kiwisch, Seyfert, Siebold and others, then in the zenith of their power, and, above all, from Virchow, was overpowering, and caused Semmelweis to flee from Vienna to his native city, Pesth. No words can be strong enough to condemn the action of men like these, who, without putting the doctrine to the test of practical experience, rejected it and scorned its author, and thus, keeping back by several decades the introduction of antiseptics into midwifery and surgery, caused the continuance of great sufferings, and of hundreds of preventable deaths.

Nothing was heard of Semmelweis for many years, but, as physician to the St Rochus' Hospital, and afterwards as Professor of Midwifery in the University of Pesth, he continued the practice and teaching of his theory with similar remarkable results. His enemies, however, maintained their scornful opposition. In the text-books of Scanzoni (1852) and Carl Braun (1857), etc., his views were either ignored or condemned. Michaelis was one of the few who accepted the doctrine in its fullest extent. His belief in it he exemplified in a tragic manner, by committing suicide on the death from puerperal infection of his niece, whose confinement he had attended.

All this time Semmelweis was smarting under the treatment which he had received, and his sympathies were roused to the point of rage at the deaths happening daily among women and infants from a disease which he had proved to be preventable. Yet he lifted neither voice nor pen against the wholesale slaughter. No doubt his life was embittered by the opposition he had received; possibly, also, the political oppression under which he, in common with his fellow-countrymen, suffered may have been partly to blame; but considering that the lives of so many were at stake, his silence was well-nigh inexcusable. In 1861, he at length broke silence by the publication of his work entitled *The Ætiology, Nature, and Prophylaxis of Puerperal Fever*. It was an able work, convincing to those who read it in the right spirit, and must be regarded as one of our classics; but it was received with ridicule by some, and simply ignored by others. The old views as to the causation of the disease were still upheld. Efforts to stamp out the "epidemics" were made again and again, by renovating and even rebuilding the hospitals, but, needless to say, with little or no avail. To Semmelweis' sensitive nature the state of matters became intolerable, and he at length launched into the sea of polemics. His *Open Letters* to Siebold and Scanzoni are full of impassioned and violent utterances, such as "murderer" and "Nero of medicine," and are by many regarded as foreshadowing the ultimate unhappy fate of the author.

Though written with all honesty of purpose, possibly, by the violence of their language, they did more harm than good. Their unhappy author was stung by their being received with contemptuous silence. Disgusted and embittered, he left the practice of obstetrics, and carried his new principles into the field of gynæcology, performing even major operations (laparotomy, 1863). He practised washing his hands with chlorinated lime before operations, and his results were at once gratifying and convincing. With his old industry he began the preparation of a text-book on gynæcology.

But his great mind began soon to become unhinged, no doubt largely due to the treatment which his sensitive nature had received. He lapsed frequently into forgetfulness and even indulged, at all seasons and places, in violent tirades against foes, real and imaginary. He was regarded as eccentric,



possibly insane. But one day the end came, when, to the amazement of his fellow-professors, he drew from his pocket and read the usual form of midwives' oath, instead of the report which he had prepared for the Board. The truth was realised, and unhappy Semmelweis was, in July 1865, admitted into a lunatic asylum near Vienna. Here on the 14th of the following month he breathed his last.

Perhaps it was a part of the irony of his fate that the immediate cause of his death was pyæmia, the result of a puncture of his finger during an operation on an infant. "*Der Feind gegen den er siegreich zu Feld zog, warf endlich ihn nieder, ebenso wie er dort den ewigen Frieden fand von wo er den rühmlichsten, für die Menschheit segensreichsten Kampf begonnen*" (Elischer).

After his death his theory found support among many of the younger men, and, in secret, among many of the older men also; but it was not till Lister, founding his experiments on the brilliant investigations of Pasteur, astonished the surgical world with his researches and successes, that the principles first enunciated by Semmelweis gained universal recognition. In 1891 his remains were transferred to Buda-Pesth, and three years afterwards, in the presence of his widow, two daughters, and a grandchild, his monument, the outcome of subscriptions from admirers in all parts of the world, was unveiled. Thus at length testimony has been given to the greatness of the man.

The following words of Semmelweis are not mere boasting. "When, with my conviction, I look back into the past, I am able to banish the melancholy which overtakes me only by a simultaneous look into that happy future when merely cases of auto-infection will occur both in and outside lying-in hospitals all over the world. Should it not be permitted me, however, which God forbid, to look with my own eyes upon that glad time, yet my dying hour will be rejoiced by the conviction that sooner or later it will irresistibly come."

These are the words of true prophecy, as we to-day can testify. In our maternity hospitals, puerperal fever, in its worst manifestations at least, is all but unknown, though even yet, sad to relate, much has yet to be done with the view of stamping out this dreaded disease. Until medical men, midwives and nurses everywhere thoroughly realise the importance of the

aseptic management of labour and carry it out in a thorough manner, until they realise the danger entailed in every internal examination and manipulation, Semmelweis' prophecy will not be completely fulfilled.