ALTHOUGH many cultures mandate handwashing before religious practices, teaching the habit for general wellbeing, health and hygiene is a challenge. Right from childhood, we are told to wash our hands before and after eating, and at other times; despite the continuous drill, many times we ignore it recklessly. However, when we are posed with unprecedented challenges such as the present health threat from the coronavirus, hand washing holds prominence as a preventive measure.

It is a well-established fact today that washing hands often is a cheap and effective countermeasure to arrest the spread of dangerous diseases. Hand washing is all the more critical in the medical field. Doctors diligently ‘scrub down’ as a part of the protocol before examining patients — yet another fact we take for granted in the present day.

However, is it not appalling to know that about two centuries ago, the medical fraternity in Europe was unaware of the importance of hand washing — which cost precious lives?

This is the story and life events of Ignaz Phillip Semmelweis, a young Hungarian physician who during the mid-1800s, exposed the connection between hand hygiene and disease spread. The remarkable obstetrician introduced the hypothesis of hand cleanliness as a remedy to stop infections from transmitting and mandated hand washing before examining patients. Although his preventive methods saved many lives, his efforts invoked contempt from his peers as his suggestions defied the prevailing beliefs. It took several decades after his demise for clinical medicine to adopt his advice. In recognition of his contributions he is aptly called the Father of hand hygiene.

The Miasma Theory

Until the early nineteenth century, the medical fraternity believed that diseases were caused due to ‘miasma’ — foul-smelling poisonous vapours which carried decaying particles in the air. Anyone who breathed the putrid air was bound to fall sick. Around these times, the rapid industrialisation left many poor in the cities. They lived in narrow, cramped regions, which accumulated filth. People living around these regions inadvertently fell prey to diseases. When the areas were cleaned or general living conditions improved, the number of diseased people reduced, which strengthened their belief in the miasma theory.

It was around the mid-1800s, and times before science knew about bacteria and their capacity to cause illness in humans. Clinical medicine was still evolving; there were sporadic discoveries made across the globe, indicating that minute organisms could invade animal organs, causing diseases.

Around the 1840s, Europe was troubled by many new mothers and their newborns succumbing to a painful disease called childbed disease or puerperal fever. Within three days of giving birth, the women would be ravaged by a deadly infection of their birthing canals. High temperature, severe
pain in the abdomen and intense weakness would eventually kill them (we now know this to be a bacterial infection called sepsis of wounds.)

Two divisions in the maternity ward of the Vienna General Hospital, Austria, were abuzz with activity. Several expectant mothers turned up for assistance to deliver babies or were admitted with complications which required medical help. Some were attended by midwives in one division, while the others were under the care of the doctors. Sadly, despite medical assistance, nearly 10 to 20% of women admitted to the hospital would die of childbed fever.

The surgeons believed that the sickness originated in the bowels of these women. They concluded that as many of them came from miasmatic regions, the foul air they breathed in spread through their bodies.

Savior or Foe?
It was during these times that young Ignaz Semmelweis took a position as an assistant physician in the maternity wing at the hospital. Deeply affected by the significant number of fatalities, and not entirely convinced that the disease was inherent to the women, he began a personal investigation of the cause of their deaths. Semmelweis documented every minute detail of his patients and logically eliminated the unrelated reasons.

One crucial observation strengthened his belief: He noticed that the death rate in the doctors’ care was higher compared to the home deliveries or those involving midwives.

Much puzzled by the situation, Semmelweis began to carefully note down the dynamics involved between the two wards. He noticed that the two divisions were identical in all respects of facilities. The only discriminating aspect was that medical students were additionally examining the women who were under the doctors’ care (as a part of their learning process). He began probing further.

Those were the times when medicine began dissecting the dead bodies to enable clinicians to look inside human organs and ascertain the impact of diseases on them. As per the prevailing practices, the medical students and doctors performed autopsies on women who had died of the puerperal fever the previous day. Then, they went straight to the maternity ward to assist women in delivering their babies. Whereas, in the other ward, only midwives (who were not involved in the autopsies) helped the deliveries.

Seminweis was convinced that somehow the sequence was the cause of the disease and in turn, the high mortality rate in the doctors’ ward. He deduced that the doctors and students who dissected the dead bodies carried some particles of the decaying matter on their hands. Then when they examined the new expectant mothers in the ward, the rotting particles transferred to the women, contaminating them. Much shocked, he concluded that instead of saving, the doctors were ignorantly causing the death of their patients!

Immediate Measures
To immediately correct the situation, Semmelweis ordered the doctors and students to wash their hands in chlorinated lime
Semmelweis continued as professor teaching obstetrics at the Budapest University.

The Tragic End

History is rife with tragic events surrounding people who thought progressively based on scientific observations. Their efforts to bring a scientific opinion to the forefront often ended in contempt. Ignaz Semmelweis’ journey was no exception, meeting with a tragic end.

In 1861, Semmelweis published his observations as *The Etiology, Concept, and Prophylaxis of Childbed Fever*. He distributed it widely among medical experts of Europe and overseas. However, his dogma received chagrin and critique and was undermined by political and institutional authority. Much affected by the adversity around him, Semmelweis suffered a nervous breakdown in 1865 and was admitted to an asylum. Two weeks later, he breathed his last – the combined effect of wound infection and ill-treatment at the shelter.

Delayed Recognition

A couple of decades later, the germ theory emerged, putting hygiene on a strong foothold. Stalwarts such as Louis Pasteur and Joseph Lister and their contemporaries successfully demonstrated that tiny, invisible living organisms cause infections in humans and animals. The world awoke to the microscopic world that was teeming with life, many potentially dangerous to humans. Science quickly discarded the miasma theory and laid the foundation for the modern scientific realm. Sanitation, hand hygiene and sterilisation of medical equipment began evolving as a robust system in the battle against illnesses. Science showed that by practising simple hygiene methods, an antiseptic barrier could be erected between the wound and the germ-laden environment – one of the ways being disinfecting the hands by proper washing. Semmelweis received his due credit, long overdue.

Did You Know?

- It was not until the 1980s that handwashing with soap and water gained momentum as a cheap and effective way to arrest disease propagation?
- October 15th is observed as global handwashing day?
- Any soap is equally effective in killing the germs?
- Cold, warm, or hot, the temperature of the water does not matter as long as you are using soap?