Some Advances in Medicine which
Revolutionised the care of the Sick

by Miss C.I. Abana

1. The founders of the Germ Theory of disease or Bacteriology were Louis Pasteur and Robert Koch.

Louis Pasteur, pioneer of modern theory of preventive inoculation against disease, born at Dole (Jura) 1822, was the son of a local tanner. Awakening to the call of study he acquired an interest in chemistry and graduated from Paris in 1847. He was Professor of Physics and Chemistry and then the Dean at the Faculty of Sciences at Lille 1847-1857, and Director of Institute of Paris 1854-1895.
In 1855 Pasteur found certain rod-shaped organisms in the blood of animals suffering from Anthrax. In 1864, he proved to the world, by his experiments on yeast cells in wines and beers, that spontaneous generation does not occur and that all microscopic life comes from a parent germ.

In 1878, he first proved that some bacteria cause disease in plants, again in 1879 he demonstrated that bacteria were the cause of puerperal fever. After many experiments in 1882, Pasteur developed a method by which animals could be made immune to anthrax; in the same year he successfully vaccinated fowl against chicken cholera.

Louis Pasteur is memorable for his work on molecular symmetry, fermentation, diseases of wine, silkworm, virulent diseases (anthrax and chicken cholera), and preventive vaccinations particularly of hydrophobia and anthrax.

Though of a peasant origin, the man himself was a gentleman, one who never inflicted wanton or needless pain upon others. His humanity was that of a rare and noble kind, a nature of the deeps of absolute and inextinguishable being. Deeply religious, intensely serious, Pasteur's was a sensitive nature and he suffered unduly in his life from the capricious cavillings of lesser men.

His last years were crowded with honours from all parts of the world, and after his death in 1895, an appropriate mausoleum for his remains, copied from the tomb of Galla Placida at Ravenna, was built in the Pasteur Institute by his family.

Robert Koch. Robert Koch (pioneer in the development of the correct knowledge about specific infectious diseases), born in 1843 at Klausthal Hanover, he was educated in the gymnasium of his native town and took his medical degree at Gottingen in 1866, where he was profoundly influenced by the teachings of Jacob Henle, whose theory of contagion in 1840 may have started Koch upon his life-work in science.

When he was district physician at Wollstein, he began with anthrax and worked out the complete life history and sporulation of the anthrax bacillus. About a week later, he gave a three-day demonstration on his culture methods and results, which was the greatest bacteriological discovery yet made and was immediately published.

The memoir demonstrated that the anthrax bacillus is the cause of the disease and that a pure culture grown through several generations outside the body can produce it in various animals. Koch's results were violently opposed by Paul Bert, but completely confirmed by Louis Pasteur.

In November 1877, Koch published his methods of fixing and drying bacterial films on cover slips, of staining them with Weigert's anilin dyes, of staining flagellae and of photographing bacteria for identification and comparison.

In 1878 appeared his great memoir on the etiology of traumatic infectious diseases in which the bacteria of six different kinds of surgical infections are described with the pathological findings. These memoirs elevated Koch to the front rank in medical science.

In 1881 Koch stated that a microorganism can cause disease only if:—

1. It is always associated with the disease.
2. It can be isolated in pure culture.
3. It will produce disease when inoculated into a healthy susceptible animal.
4. It can be obtained from the inoculated animal in pure culture.

These are called "Koch's Postulates."

When Koch presented his important paper upon the method of obtaining pure cultures of organisms, Pasteur is said to have rushed forward with the exclamation "C'est un grand progress."

In 1882 the Tubercle Bacillus was
discovered by using special culture and staining methods. At the same time, sterilization by dry heat was introduced by Koch and his assistants.

In 1883 Koch visited Egypt and India, discovered the cholera-vibrio and proved its transmission in drinking water, food and clothing. He also discovered the Koch-week's Bacillus in infectious conjunctivitis for which results he obtained a donation of 10,000 marks from the Prussian State. (German coin corresponding to a shilling or twelve annas a mark.)

In 1891, he founded an Institute for infectious diseases in Berlin, in 1892 fought cholera epidemic in Hamburg. In 1893, he wrote the important paper on water borne epidemics, showing how they may be largely prevented by proper filtration. In 1896, Koch also made valuable studies in blackwater fever, tropical malaria, plague, horse-sickness, trypanosomiasis (sleeping sickness) and recurrent fever, also established methods of controlling typhoid which has been adopted almost everywhere.

Koch received the Nobel Prize, in 1905. At the head of the sleeping sickness campaign, he visited Africa in 1916.

Dignified, modest and fair-minded in character, altogether one of the greatest men of science Germany has produced, Koch died of heart failure on 27th May, 1910 at the age of 67. His body was cremated, at his own request, and his ashes deposited in the Institute which he had founded.

2. Asepsis. The advance in medicine through Asepsis is due to Joseph Lister, born April 5th, 1827, at Upton, Essex. He was the son of a London wine merchant, graduated in medicine from the University of London in 1852, was advised by his teachers to follow surgery under Syme in Edinburgh. In 1860 he became a professor of surgery in the University of Glasgow, where he made his greatest contribution to science.

Early in his hospital experience, Lister had been deeply impressed with the high mortality from such surgical pests as septicaemia, pyaemia, erysipelas, tetanus, and hospital gangrene.

Although he constantly employed methods of keeping wounds scrupulously clean, in his own statistics of amputation, he found 45% fatal cases. They were the days of "laudable pus." In 1860 his attention was accidentally drawn to Pasteur's Germ Theory to prevent the development of micro-organisms in wounds, and perceiving that heat sterilization would avail nothing here he turned to chemical antiseptics such as zinc chloride, zinc sulphite and carbolic acid. He boldly applied the antiseptic principle to such conditions as abscesses and all manner of operations, doing as much to extend the domain of surgery as any man of his time.

Modern surgery, it is true, has become almost entirely aseptic in the sense of discarding strong antiseptics in the dressing of wounds. Antisepsis is now the main safeguard of the woman in child birth, Dettol being the most modern antiseptic.

Joseph Lister, after holding very prominent positions in King's College London, was the first medical man to be raised to the peerage in 1897. He had a winsome personality and gentleness that made him greater. He cherished the love of truth which guided him to the end. That such a man dowered with God's gift of genius should rise to lofty heights and achieve great things was inevitable. When his body was laid to rest in Westminster in February 1912, England had buried the greatest surgeon of the day.

3. Anaesthesia. The anaesthetic effects of aether had been pointed out by Dr Charles Jackson, to William Thomas Green Morton, born 1819, of Charleston, Massachusetts,
Becoming interested, Morton pushed enquiries further and discovered that
ether sulphuric was also an anaesthetic. He then persuaded Dr. Warren of Massachusetts to try this
new anaesthetic in surgical procedure without disclosing the name of the
drug. In five minutes, a superficial
tumour was removed from just below
the left jaw. When the patient came
back to consciousness, he exclaimed
"Gentlemen, this is no humbug."
Since then, the anaesthetic was used
with success. On November 10th,
1846, the discovery was announced to
the world by Henry J. Bigelow in
Boston Medical and Surgical Journal.

It was due to the high character
and repute of such men as Warren
and Bigelow that ether anaesthesia
was taken up all over the world
and became a permanent part of operative
surgery.

Morton tried to patent the drug as
Letheon but through squabbling with
Jackson about their respective legal
rights he did not announce it as ether
sulphuric until 1847.

Sir James Simpson. Sir James
Simpson born at Bathgate, Scotland
in 1811, became professor of obstetrics
at Edinburgh in 1840. He acquired
a great practice through great ability
and a fascinating appearance.

Simpson used ether in midwifery
practice for the first time in Great
Britain, but on 4th November, 1847,
he was led to substitute chloroform
the great discovery of Leibig and Guthrie
and was much impressed with its ad-
vantages over ether in obstetrics that
he published his results a week later.

The effect of these discoveries
upon medicine and surgery was re-
markable in many ways. The sur-
geon in pre-anaesthetic days had to
rush through an operation at lightning
speed and under great disadvantages
occasioned by struggles and distress
of the patient, could now take his
time and perform new operations
impossible under old conditions.

The lying-in woman was enabled
to confront the fierce pangs of labour
with a few whiffs of chloroform. In
these fields anaesthesia was in the
memorable phrase of Mitchel the
"Death of pain".

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school, Vellore (Surgical Nursing)

4. Radium. Marie Sklodovski,
born 7th November, 1867, in Warsaw,
Poland, was the youngest of the five
children of Wladislaw Sklodovski a
professor, and Madame Sklodovski,
a musician and a very accomplished
wife.

Receiving her education first in
Poland, a very powerful sense of
vocation summoned Marie to study in
Paris at the faculty of Science in the
Sorbonne. In Paris she lived through
years of poverty and solitude, and
passed first in the masters examina-
tion in physics in 1893, and second in
mathematics in 1894. While here,
she met a man whose genius was akin
to hers—Pierre Curie, born in Paris,
May 15, 1859—a scientist of genius,
a Frenchman on the staff at the Sor-
bonne, Making important discoveries
in physics in Pêizo—electricity—a
great scientist very nearly unknown
in his own country, but already highly
esteemed by his foreign colleagues.
At the age of 35, he was still a
bachelor.

On July 26, 1895, Marie Sklodo-
svki married Pierre Curie—their
happiness was unique. Of him she
wrote "He was all I could have
dreamed at the moment of our union
and more, my admiration for his
exceptional qualities on a level so
rare and high constantly increased
so that he sometimes seemed to me
like an almost unique being, by his
detachment from all vanity and from
those pettinesses which one finds in
one's self and in others and which
one finds with indulgence, though not
without aspiring to a more perfect
ideal."
Irene, their first child, was born on 12th September, 1897, a future Nobel Prize winner.

Curiosity—a marvellous curiosity, the first virtue of a scientist—was developed in Marie Curie to the highest degree. Studying together compounds of Uranium and Thorium, they found spontaneous rays were emitted. On 12th April, 1898, a distinct name of radio-activity was given, as they were endowed with particular radiance. Henri Becquerel, a Frenchman, was also studying Uranium at this time.

The two brains and four hands of the Curies now sought the unknown element from tons and tons of the pitch blende, reddish in colour from Belgium. By July 1898, the discovery of one of these was made and Marie called it Polonium, after her native land, Poland.

In 1902, forty-five months after they announced the existence of a new element, Marie Curie succeeded in preparing a decigram of pure Radium, which is a metal having the highest atomic weight 225 (Gold 197.2).

On December 6, 1904, another plump baby girl was born—Eve Curie—the author of the biography of Madame Curie.

Meanwhile, the incredulous chemists of whom there were still a few, could only bow before the facts and before the super-human strivings of a woman who proved that radium existed. Radium, discovered in France, rapidly conquered foreign countries. Letters came with requests for information from the greatest men in science from Germany, Austria, Denmark and England. The discoverers of radium were lavish with explanation and technical advice to their colleagues.

Science has analysed the properties of radium and discovered that it gives off Alpha Rays a, Beta Rays β, and Gamma Rays γ. The Alpha Ray is a definite form of energy, but is stopped by a piece of paper, the Beta rays are more penetrating than the Alpha and are very caustic and destructive in effect. 1 mm. of Platinum plate stops 99% radiations. Gamma rays are just the same as X-Rays with a very short wave length and are very penetrating. They are equivalent to X Rays from a million volt machine 1000 kilo volts. The gamma rays are the most wonderful of the three and have a tremendous power of penetration and travel at a speed of 185,000 miles a second. They therefore, have a marvellous effect upon malignant growths. Radium melts its own weight of ice, one gram of it in complete disintegration evolves 2,900,000-00] calories of heat; the first product is a gas called Radon, the same amount has a potential energy of 300 tons of coal and the penetrating power as great as some of the naval guns. This precious metal is not to be compared with rubies and diamonds. It is a hundred thousand times as valuable as gold. A hundred tons of pitch blende yield only 18 to 20 grains of radium.

According to the eternal laws of physics and chemistry, radium is also destroyed and requires 2500 years to reduce itself to lead its final product. The last and the most moving miracle of radium is that it can do something for the happiness of human beings, and Henri Becquerel discovered the clinical use of radium in the destruction of cancer cells. Deep X-Ray therapy is also used, discovered by Wilhelm Conrad Roentgen.

Marie Curie had resolved to face love, maternity and science, all three, and to cheat none of them. By an all-mastering passion and will power she was to succeed.

At the time the fame of the two scientists was spreading world-wide, Pierre Curie was lost in a street accident. On April 19, 1916, he went out into a downpour of rain and walked towards the Seine to meet his colleagues. The street was hopelessly encumbered, Pierre Curie with
the uneven step of a man in medita-
tion turned into a path of excited and
plunging animals pulling a wagon.
The scientist slipped on the wet pave-
ment and fell beneath the feet of the
powerful horses. He was still alive and
unhurt, for his body passed the horses. A
miracle was possible, but the left back
wheel of the wagon encountered the
teeble obstacle, the human skull, and
crushed the brain of Pierre Curie, the
brain of a great scientist.

When her life’s companion was
taken from her by death, in spite of
grief, distress and physical illness,
Marie Curie continued alone the work
that had been begun with him and
brilliantly developed the science they
created together. She resolved her
life into a kind of perpetual giving.
To the war-wounded, she gave devoted
work and her health suffered. Later
on, she gave advice, her wisdom and
all the hours of her time to her pupils
who came to her from all parts of the
world—the future scientists.

In Madame Curie’s personality the
rock-like foundation of character and
the steadfast seeking after true knowl-
edge was combined with an unselfish
readiness to give all and take nothing.
Neither fame nor adversity could
change the exceptional purity of her
spirit. She rejected money, comfort
and a thousand advantages that genui-
nely great men may obtain for their
immense contribution to human wel-
fare. She did not know how to be
famous.

Her health and strength were failing
due to an aplastic pernicious anaemia
of rapid feverish development. The
bone marrow did not react probably
because it had been injured by a long
accumulation of radiations. On July
4, 1934, she died at Sancenlanoz.

There all in white, her face at
peace, as grave and valiant as a
knight in armour, she was even in
death the noblest and the most beau-
tiful thing on earth. Her rough hands
callosed, hardened, deeply burned by
radium, were stretched out on the sheet,
still and motionless, those hands which
had worked so much!

On Friday, July 6th, 1934, the
coffin of Madame Curie was placed
above that of Pierre Curie and into the
open grave of the couple of immortal
fame her brother and sister, Joseph
and Bronya, threw a handful of earth
brought from her beloved Poland.

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Elizabeth Mary Newman (1855-1932)
Pioneer Nurse in Kashmir

Elizabeth Mary Newman was
born on April 27th, 1855. While she
was still a child her father was in-
jured in a carriage accident and was
paralysed for the rest of his life. At
the age of thirteen Elizabeth was
taken out of school to help with the
nursing of her father. For seven
years she gave herself in unwearying
devotion to his care. The doctor
attending was so impressed by her,
that he urged her mother to send her
to a hospital for nurses’ training. So it
was that in 185 she entered the
Homoeopathic Hospital, Great Ormond
Street, London, as a probationer.
She excelled at her work, to such an
extent that when a nurse was wanted
to attend in the Royal Family Eliza-
abeth Newman was the one chosen.

While Miss Newman was matron
of a nursing home at St. Leonards-
on-Sea, Dr. Fanny Butler visited her
and persuaded her to come to Kash-