Mathematics-Its 0rigin And Development

Mrs. Rckha Rani Asstt. Prof. in Mathematics
Govt.P.G College for Women,Rohtak

'Ganita* which literally means the sciences of calculation, is the Indian world for mathematics occurring in as early as the vedic period. 'Patiganita' means science of calculation on wooden board and it was used in India from the very early times. In olden times, when paper was not invented, figures were written on dust often called *Dhuti Karan* (Dust work), the Arabic equivalent being 'llam hisab-al-takht' and hisab-al- ghobar' (calculation on dust).

Mathematics constitutes major field of study in the history of human civilization The needs and requirements of the early men made it possible to evolve early mathematics and thus it grew slowly with the gradual evolution of the human society. The modem civilization is highly indebted to indirect contributions of mathematics to exact science, the great progress of which has changed modern life. The most of the inventions of physics are due to those scientists who are really great mathematicians. James Watt who invented the steam engine, was a famous mathematician. The invention of x-rays, ultra violet rays, have been possible only with the help of mathematics. The launching of the space vehicle is due to computational technology developed by scientists of the modern age. Similarly all chemical compounds are found after enormous researches and huge mathematical calculations. The biological sciences are also found to depend on mathematical analysis and treatment. In the field of engineering, mathematics is undoubtedly the foundation on which the modem edifice is built Thus mathematics plays such a vital role in human life that we cannot think of wiping out mathematics from technical literature as well as from the mind of chemists, physicists and engineers.

The early history of the origin of mathematics is not exactly known, but it can be surmised that early men came to discover counting in the course of solving many problems of day to day life. It is seen that eariy mathematics required a practical basis for its development and such a basis arose with the evolution of a more advanced form of society. Thus the priests of prehistoric city temples found it difficult to depend on their memory about the records of quantities of goods

received and given away. This led to the use of measures and the invention of the balance, which was a product of precise measurement It was long with the courses of the great rivers of Africa and Asia early civilizations made their appearance the Nile in Africa, the Tigris and Euphrates in western Asia, the Indus and Ganges in south central Asia and Hwang Ho and Yougte in eastern Asia. Early mathematics made it appearance either in the religious rituals or in the agricultural and engineering pursuits of people living along the courses of these mightily rivers. It could be said that religious rituals formed a part of agricultural and other activities and the two are not exactly distinguishable. We can still find evidence of early mathematic in the papyrus, barks and bamboos, stones, pillars and monuments preserved in different regions of the early civilizations.

The ancient Greek made a distinction between the study of the abstract relationship co~~n~~nect~~in~~g numbers and the practical art of computing with numbers. The former was known as arithmetic and later as logistic. This classification persisted through the middle ages until about the close of the fifteenth century. There were some Chinese mathematical works like ‘magic squares’ of which parts at least were claimed to date from very early times. One of the oldest Chinese mathematical classics were the I-King or book on Permutation.

The development of the ancient Hindu mathematics is very little known due to the lack of authentic records. The earliest history of Hindu mathematics may be found in the 5,000 year old ruins of a city at Mohenjo Daro. The Gupta period proved to be the golden age of Sanskrit renaissance and India became a centre of learning, arts and medicine. Universities were also established during this period. The first important astronomical work, the anonymous ‘SURYA SIDDHANTA* (knowledge from the Sun) was written probably in the beginning of the fifth century. The sixth century work ‘PANCA SIDDHANTIKA’ of the astronomer Varahamihira, based on the early Surya Siddhanta, contained a good summary of the early Hindu Trigonometry. The degree of the influence of Greek, Babyloian, and Chinese mathematics on Hindu mathematic and vice-versa is still an unsettled question.

Mathematics was first introduced in the school curriculum in Greece. Pupils were taught addition and multiplication at the primary stage and astrological calculation was also taught through play way method. Greeks were indebted to Plato for making mathematics popular. Later on mathematics was introduced in Rome for the development of engineering skill. The Romans

did not give stress on abstract mathematics.

The history of mathematics reveals that mathematics was given less stress during the period when bishops were the head of all educational institutions in Europe. Knowledge of numbers was practically not given to pupils in the educational institutions when universities were first established during the twelfth century, mathematics was taught in all schools of Europe. In the fifteenth century, the Matron College under the Oxford University became a centre of mathematical learning, and also at that time mathematics was flourished in institutions of Germany. During this period, mathematics was made compulsory in schools and colleges in Europe.

In the fifteenth century, mathematics found a place in the school curriculum in U.S.A and was given high priority in the educational institutions. In America, algebra was first introduced in school mathematics in 1721 and the school of Yale

The word 'Algebra* has been derived from the Arabic world 'ilmal-Zabr-wal-Muqabulsh'. In Arabic system of mathematics, Algebra was device of solving the sums by force. There sums that could not be solved with the help of arithmetic, were solved with this process. The early history says that algebra as a science did not exist in ancient Egypt. The Babylonian showed a greater facility for algebra than Egyptian, and they could deal with quadratic equations, cubic equations and biquadratic equations. The ancient Greek could solve easy algebraic problems.

The Hindu mathematicians also showed proficiency in the field of algebra. There were four outstanding Hindu mathematicians - Aryabhatta, Brahmagupta, Mahavira and Bhaskara who worked on series, permutations and equations. Aryabhatt and Bhaskara introduced the idea of negative numbers by way of inventing quadratic of two roots — one positive and the other negative root.

The rapid advancement of science and technology demands new and better mathematics and the traditional mathematics has become obsolete. The increasing contribution of mathematics, to the culture of the modem world as well as its importance as a vital part of scientific and humanistic education, has made it essential that mathematics in our school be both well selected and well taught For this purpose, the curriculum of selected and well taught For this purpose, the curriculum of mathematics must be modified according to the greater use of mathematics in

science and technology and in other areas of knowledge.

With the advancement of science and technology in U.S.A., scientist and industrialists do not expect more from the traditional school mathematics, because, they require different mathematics. So the problem of mathematics is probably the most urgent to-day if the educational climate is to improve.

References

> Adler Irvng, The new mathematics, New York John Day 1958.
Aiken, Daymond J., Modem Mathematics Topics and Problem, New York, McGraw Hill, 1959.

> Abbot, R., Exercises in Arithmetic and meansureation.