Islamic Scientists' Methods Of Research

The real importance and value of methods of research were only discovered in Europe after the Middle Ages in the 18th and 19th centuries when the fundamentals of scientific evolution were being introduced. Thence forward the Europeans made use of philosophy and science and paid much attention to Islamic thoughts.

They then replaced the old methods of comparison and intellectual deductions by a new method of practice and experience. Later on, they achieved wonderful results and discoveries that we witness today. Generally speaking, a method is defined as a collection of means and ways of the feasibility of an aim and scientific method is the one which makes an exploration achievable.

Descartes has written much about the value and importance of applying the correct method in his books. For instance, in one of his books called *Articles About The Correct Use of Our Intellect,* he wrote that, "In order to solve scientific problems, not only a clear and intellectual mind is necessary, but, more important, is the application of correct methods in using the mind."

Descartes also believed that without comprehensive awareness of the method which we must use, the results of our thoughts are meaningless and the mind just makes itself tired. Without adopting a procedure, no one can research into the truth, because it is a fact that unorganized study and research only cripple our ideas and minds and all efforts will be in vain.

Descartes places much importance on methods and, like Bacon, believes that the great differences which- can be seen between intellects is the result of the various methods that they adopt.

Methods of Thinking

Before the new period of science, the methods which were used by scientists were mostly the methods of comparison and of intellect. They attempted to solve all matters and problems, whether philosophical, mathematical, physical or concerning astronomy, within the framework of reasoning and logic and they

believed all these matters could only be determined in this way.

Method of Experience

By using this method scientific theories can be proved or disapproved, because it includes close observations and repetitive experiments, therefore a definite result can be achieved. In this way usually an experiment is repeated several times, under different conditions.

For example, to know whether heat is the main factor in the expansion of a piece of metal, a scientist can repeat the experiment on different metals, such as iron or copper, and can prove that the main cause of expansion in metals is heat.

How The Method of Experiment Was Founded In The 17th Century

In the Middle Ages, the Church had tremendous power in Europe. Scientific research and discussions and in fact reading any reports of scientists of that era was totally forbidden by Church leaders throughout Europe.

It was also forbidden to reason and discuss, and they wanted human beings to forget that they possessed brains and intellects, and wanted them to convince themselves only by what they could find in the divine book and what they could comprehend with their external senses. But even through this restricted way, science made itself known.

The searchers of the truth thought it was better just to observe nature and its effects. This occupation was not forbidden by the church leaders and therefore was not dangerous, because in their opinion, it was better than attacking Ptolemy's theories. They observed how the matters in nature worked and there was no harm to the church in counting the stars.

Bacon: The Famous English Philosopher's Methods

A young researcher named Francis Bacon used to think that the methods which were taught at that time in the universities belonged to the olden days and that those methods could not convince students. They never spent any time on experiments or observation. Throughout his lifetime Bacon, although busy with various jobs, considered the introduction of new methods of science to be an important duty. In two of his famous books, one which concerned the progress and value of science and another, called *New Organ*, Bacon attempted to attract the attention of people to scientific research by experiment. Bacon's method was to collect as many facts as possible about a given thing, and then evaluate and classify them.

In every case, he conducted different experiments and reached the result in accordance with their

qualities and divided them into different groups in a table called "attendants” and another one of "absents", and he called them the graded table. By this grading, classification and levelling he formed several rules.
