EDITORIAL

Research Philosophy in Medicine

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In medicine, the main pursuit is to preserve health and cure disease. The present state of medical practice suggests that a solution is still far to seek. During its advance through the centuries, however, medicine has always been driven into action and from numerous realm of empiricism has gained useful information.

While it is true that medicine is an art which may have been glorified unduly in the past, it is as much a science as well especially in the present day world. Like any other discipline of science no real progress in medicine has ever been made without research. There can be no progress in medicine when there is a fixed creed. A creed in medicine means that all future practice and treatment shall be based upon certain doctrines, dogmas and rules that have been formulated and beyond which it is heresy.

While philosophy is amongst many things a search for truth; research can be defined as diligent search, experimentation, investigation, inquiry and finally as quest for unraveling the vistas of science. Biologic research and thought have been dominated by aims to analyze and summate. In general, research is undertaken to solve problems. It thereby increases fundamental knowledge, improves practical work, or both. In applied research, practical improvements are the immediate goals, but good research aims in addition for general knowledge. One thus could summarize the general aims of research as: (1) to understand the natural phenomenon. (2) to predict and control and (3) to enjoy fruits of inquiry.

Research in medicine is undertaken to prove new hypotheses to prove or disprove existing ideas and practices in light of new knowledge, to devise new techniques and therapeutic modalities and finally to make the medical system more efficient for patient care. Research thus has two products- its results and its influence on attitudes and thoughts.

Research is often unconsciously associated with laboratories, test tubes and instruments of precision. Much investigation, of course is done in this way and yet research after all chiefly depends upon the state of mind. It is scientific curiosity that pushes us to find how and why the wheels go round, to ascertain the facts and truths of nature as they are and not necessarily as someone else says they are. Research in medicine is in fact undertaken in three main categories:

1. *Biomedical:* dealing with mechanism of diseases;

2. *Clinical:* dealing with clinical status, diagnosis, therapy and prognosis of diseases and

3. *Health Services Research:* dealing with needs for and functioning of health services.

There is no fixed pattern that is adopted in experimental medicine. All methods of inquiry however, imply logic and seek insight, the success of which is determined by information, perspective and power of thinking. A diligent search for truth is usually sought in following manner:

1. *Accumulation of information:* by the scientific method requires repeated observations by one observer. Since only within very narrow boundaries can man observe the phenomena which surround him; most of them naturally escape his senses and independent information is therefore required by others. Since a researcher does not limit himself to seeing; he thinks and insists on learning the meaning of the phenomenon whose existence has been revealed to him by observation. He therefore performs

2. *Experimentation:* the experimental method distinguishes its signs from all other forms: of inquiry, although it shares with them, trial, error and chance success. This method has not been applied successfully to all problems of science. It is especially difficult to study the causes of past events which are unlike events that can be made to occur in the present. Since experiment has been confused quite often with observation, these could be defined in a philosophical sense as “observation shows, experiment teaches”.

An experiment is best conducted by analyzing the observations by synthesis or summation. A control experiment is carried out to change systematically certain conditions of experiment and to note changes and results, while all of the conditions of experiment are kept constant and randomized. The objective is to ascertain the effects of the independent variable.

Finally 3. Reasoning is applied to both ideas and results of experimentation. The development and the communication of ideas are important processes of science and are basic to its progress. Italicize Reasoning may be logical or intuitive.

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Inductive reasoning is a principle method of science, but deductive reasoning may be of use chiefly when there is a well developed body of theory to work from; historically deductive reasoning has been of exceptional use even when the body of information was small. The science of mathematics is a highly developed application of logic. The use of statistical arithmetic permits both logical analysis of data into factors and synthesis into more comprehensive concepts.

Only a few ideas which represent creative thinking are derived by the conscientious application of the processes of logic. Logic is more often applied in the proof of the idea after it has been formed. The individual is usually unable to verbalize the steps by which the concept developed. The idea may appear suddenly and the individual may report that he has no conscious recall of its genesis. From many stand points, intuitive reasoning is a different phenomenon from the conscious application of logic. In this era of creativity, basic to the scientist as well as to art, control is largely lacking.

The principles which govern the acceptability of ideas or results are:

1. *Validity:* A test is valid when it measures the property that is intended to measure. Most biologic tests require the comparison of new test results with a standard. The standard must therefore represent the activity which the test is intended to measure.

2. *Reliability:* Expression of test reliability indicates the internal consistency of the test that is how well it agrees with itself. There are several different ways of measuring test reliability; a test/retest procedure may be followed, which involves repeating the test two or more times with time as a variable; and finally tests of the same function may be carried out by two or more laboratory groups, each following the standard procedure. The validity of a test is limited by its reliability.

3. *Standardization:* This entails setting up of selection criteria, international standards and statistical aids. Units should be defined in terms of weight of the standard, never in terms of biologic response. National and international standards should be set up for many of the tests in common use. Comparison of the substance being bio-assayed with response to the standard must be done with time constant. The experiment must be tailored to the basic purpose of the project; and results weighed in terms of coincidences, errors of the project; and application of results to the population at large and not to the test group only.

4. *Intervention:* effects that is effects which measured after known intervention is undertaken.

Every medical person, whether a general practitioner or a specialist should have some research problem however simple it may be, under consideration. Indeed many of the greatest researches in medicine have been not from research institutions, but by clinicians and often by general practitioners. Koch, for instance, was a Prussian country doctor. Crawford W. Long was a country physician in Georgia. Jenner was an ordinary practising physician.

One could site many more anecdotes how research has helped the medical field, it would suffice to indicate that cardiac patients who only up to thirty years ago had to contend with digoxin and mercurial diuretics now enjoy the benefits of coronary revascularization, various mechanical devices and even transplantation of the badly diseased hearts. Also consider the development of concept system from Aristotle to Majusi and now to artificial hearts of Jarvis.

In short, experimental medicine, as we conceive it, includes the problem of medicine as a whole and comprises both the theory and the practice of medicine. It may involve biochemical and basic laboratory work, but clinical work overshadows. Logic and statistics are indeed applied as proof of ideas but intuitive reasoning retains its place. It does solve problems, increases knowledge and improves practical work.

I conclude by quoting Sir William Osler who said: “It is astonishing with how little reading a doctor can practise medicine, but it is not astonishing how badly he may do it”. Let us follow Dr. Horsley, who said in his presidential address in 1929 that “if every medical man, whether generalist or specialist were to ponder, undertake some problem, no matter how simple and ask counsel from those who can help, it would be a stimulus, a happiness and efficiency to work, which can be obtained in no other way”.

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