

It is becoming more and more difficult writing about scientific research in developing countries like Pakistan. The gap of knowledge in widening and the economic problems are looming large. In such a situation the ideals bear little relation with ground realities.

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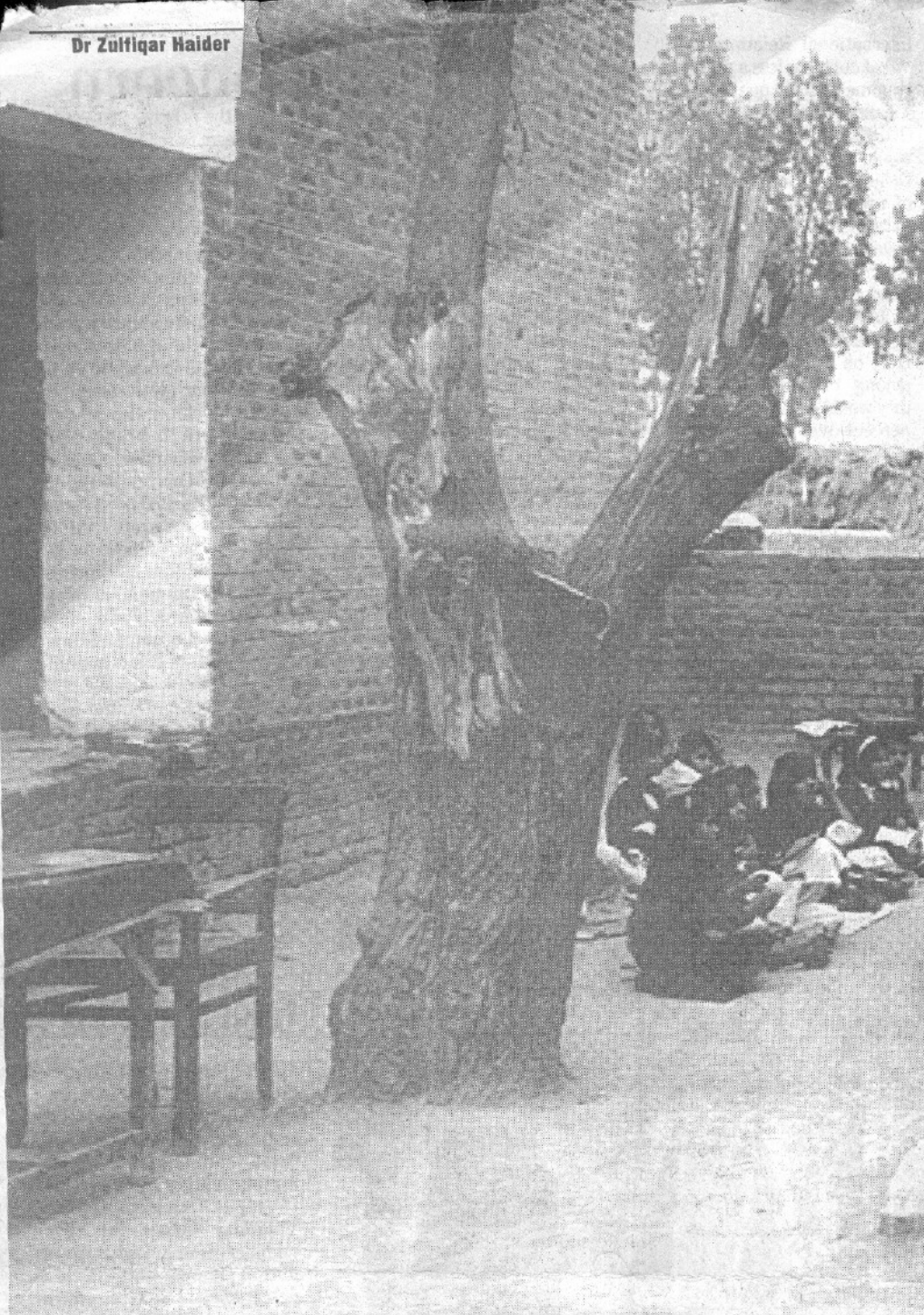
Science culture

One of the great stumbling blocks in the development of science in Pakistan has been a lack of science culture. As a result, the Pakistani nation and its successive governments failed to realise the value of science as an instrument for economic and national development.

We have a profusion of forums for projection of poetry and literature. There is hardly any in the scientific disciplines. While one does not deny the immense value of literature and art to enrich our otherwise drab lives, science has never been addressed to as a source of inspiration. In other words, there is hardly a 'Halqa-e-Arab-e-Science' (a scientific circle) in our midst.

For a great part, the historical legacy of this subcontinent has a role to play. The Afghan and Moghul Kings who ruled for nearly 700 years were only interested in building monuments either for their loved ones or to commemorate some landmarks in their personal lives. They built no institution of great learning worth the name. Its effect on our mental and moral fabric has been devastating. This led to the growth of unethical traits of sycophancy, intellectual dishonesty, oppression of thought process and corruption instead of intellectual integrity, sense of inquiry and liberal thinking. These traits are now firmly embedded in our matrix and run through it like a central cord.

Given the historical backdrop, bureaucracy has reigned supreme, calling all the shots and setting trends for the value system. The name of the game is status quo and personal advancement at the cost of the weak and undefended. Most of us are not aware of the thrill, awe and exhilaration of scientific



Science and bio research in Pa

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element who observed the clearing of bacterial colonies in the vicinity of fungal growth. This observation was to change the practice of medicine in the years of follow when about a decade later chain and flory through their basic, experimental and clinical studies established its structure and efficacy.

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enrich our otherwise drab lives, science has never been addressed to as a source of inspiration. In other words, there is hardly a 'Halqa-e-Arabab-e-Science' (a scientific circle) in our midst.

discovery. There are few pleasures to match it and to quote Faiz the great poet, '*or bhi gham hain zamaney main mohabbat key sawa*' (there are other sources of ecstasy part from fulfillment in love).

In a letter written by Ronald Ross in 1898 to his mentor Patrick Manson (of malaria fame) on his discovery of malarial parasite in the mosquito. He wrote, "My one wish is that you were here to share with me the pleasure which I experienced yesterday and today which comes but to a few men." Ross was the first winner of the Nobel Prize for medicine in 1902. Both Ross and Manson are considered to be founding fathers of tropical medicine.

The road to discovery

It may be of interest to allude to some of the ways in which great discoveries have been made at least in medicine. Knowledge in built up of small pieces with an occasional quantum leap which changes the whole scenario, suddenly opening new vistas. Even Newton when asked as to why he is so great, replied: "I am not great, but I am standing on the shoulders of giants."

Creation of new knowledge needs inspiration, dedication and above all a keen sense of inquiry and observation. Claude Bernard put it like this: "Seeing what every body has seen and thinking what nobody has thought." A classical example is the discovery of penicillin by

structure and efficacy.

Equally fascinating is the acumen and vision shown by Fleming to have preserved the sample which one of his French counterparts, did not having observed a similar phenomenon two years earlier, and could have possibly shared the distinction. Above all it highlights the contribution of a multi-disciplinary approach without which in the words of the Nobel committee 'Penicillin would have remained a fairly unknown substance, interesting to the bacteriologist but of no practical importance'.

The saga of discovery of DNA structure is a scientific thriller. Early attempts were made by X-ray crystallography by Franklin and Wilkins Dr Watson while attending a conference saw Wilkins showing the slide of DNA photograph. Back in Cambridge working along with Cricks they developed a model of DNA structure which was to become a break through in biological sciences. This also bring into focus the benefits of purposeful scientific interaction by prepared minds working in an environment

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Scenario of bio-medical research in Pakistan

As far as scientific research is concerned, Pakistan has not yet transcended its infancy even after a lapse of 52 years. The founding Fathers of various scientific institutions had the vision to establish nuclei of various Science Organizations but the environment for them to flourish was lacking.

The Pakistan Medical Research Council (PMRC) established in the last 1950's has made many experiments with itself with only a minimal success. One of the drawbacks of research organization in Pakistan is their overloading with bureaucracy with no role for active scientists in policy making. The PMRC shared these drawbacks and languished because of very limited output from few research workers who in turn had no career structure.

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+Tech News - Nov 4

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PMRC was able to conduct and coordinate one landmark study on the Health profile of Pakistani Nation done in collaboration with the US Public Health Service and Bureau of Statistics. It was long over due and provided useful data for health planning. It also raised many new questions which need to be addressed by a number of research groups.

The Medical Institutions rely mostly on the work done by Post graduate students. This work is sporadic and lacks continuity and those who undertake it do it for the first

the concept of group research in same areas of national problems. It was hoped that the active voluntary collaboration of experts in a given area will help identify useful themes of research and bring together human and material sources to fill the lacunae in expertise to break the isolation. Two groups ie hepatitis study group and Trace Elements in health and disease continued their work for five years.

However, there are limitation to this exercise due to changing commitments and constraints, paucity of funds

They forget that technical knowledge is not easy to buy in the world supermarkets. Science of today in technology of tomorrow and blind reliance on imported technology in everything is going to be expensive in the long run.

Besides there is something called the national honour and there is a sneaking contempt for the third world countries. As an example, Prof Salam quotes a remark made by another Nobel laureate from the west, who said this, "Do you think we have an obligation to aid, feed and keep alive those nations who have never created or added an iota to man's stock of knowledge." The following suggestion are tentatively made to promote scientific research in the Biomedical field:

1) A declared commitment on the part of the establishment to promote science and technology for national development in all field. There are many examples in history in which

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rely mostly on the work done by Post graduate students. This work is sporadic and lacks continuity and those who undertake it do it for the first and last time. The lack of research tradition is apparent from the fate of a research unit set up 25 years ago in a premier medical institution. It was a victim of neglect and now much to everyone's relief, has been finally disbanded presumably due to lack of any scientific program. Yet, in this milieu of indifference there are a few dedicated teachers who try to induct the young students in research on their own initiative. On a few occasions that I had the privilege to attend their seminars, I came back impressed by the enthusiasm and confidence of the students and young doctors. Thus, there is always hope for the future.

Research groups

Some years ago, the author in his short term capacity as head of the former Institute of Experimental Medicine, tried

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However, there are limitations to this exercise due to changing commitments and constraints, paucity of funds and lack of a coordinating institution.

Specialised institutions

Sophisticated institutes like the cardiovascular institutes, are making excellent contribution in providing service facilities. They have access to vast clinical materiel and potential for research with needs to be encouraged.

The future.

Thank God we are beginning to be aroused from our slumber and at least hear about the role of science and technology. If this country is to make any progress in any field of human endeavour, be in industry, economies, agriculture or medicine it must do away with view of the sceptics and extremists. For far too long, we have heard that any effort to develop science is futile and we can rely on imported technologies.

on the part of the establishment to promote science and technology for national development in all field. There are many examples in history in which a firm national resolve has changed their destiny. One of the oaths that the Japanese Emperor took in 1869 was that, 'knowledge will be sought and acquired from any source with all the means at our disposal for the greatness of Imperial Japan'.

2) Creation of centres of excellence in the fields of national interest. These centres should be linked with post graduate and university centres, to allow wider dissemination of expertise and cross fertilization of ideas. For far too long research has been isolated from teaching. If possible academic chairs can also be created. It may be worthwhile to mention that centre for cholera at Dhaka has become a world leader in its field. It is pertinent to mention that not so long ago the World Bank announced a programme to establish centers of scientific excellence



in the developing world. These centres are proposed to be set up around small nuclei of world class local researches and offer long term financial and technical support to ensure high quality research (Lancet 1999 April 3 correspondent column)

3) The need to develop an Institute of Biological Science to support clinical research in disciplines like genetics, immunology, cell biology, epidemiology, microbiology etc.

I remember a plan was submitted by PMRC more than two decade ago but was shot down. One should not be overawed unduly by our weakness in basic sciences. According to some authorities it takes one or at the most two generations to develop and bring the level at par with international science.

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generations to develop and bring the level at par with international science.

4) More Medical or non-medical PhD's in basic medical sciences may be inducted in medical colleges. Non-medical scientists in related disciplines should be represented in medical research organizations.

5) The PMRC should redefine its role to begin with, it can organize research groups to take up the questions arising out of its well conducted study on National Health Profile.

6) Recognition of Researches: One of the great drawbacks of research in Pakistan has been its total lack of recognition and at times positive discouragement and contempt. This can only be reversed by science culture.

I may sound idealistic and far removed from reality. However, I would end on an optimistic note. Pakistan is a nation with a predominance of young people with plenty of untapped potential particularly in the vastness of our rural areas. All we need is a sincere leadership and with a population of 130 million this is not too much to ask for after half a century of our existence.