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approved by the undersigned organizations:
"External cardiac resuscitation is a proved and accepted life-saving technique and should be applied as an emergency procedure by properly trained individuals of the medical, dental, nursing and allied health professions and of rescue squads; and the undersigned urge that training procedures for respiratory and closed-chest cardiac resuscitation be widely disseminated to these groups."
American Heart Association, Inc.
American National Red Cross
Industrial Medical Association
United States Public Health Service

Reference

Criteria for Significance in Research

The spectacular success of applied research during the war led to a fallacy entertained by many. It is that any problem can be solved by gathering enough scientists and giving them enough money. To solve the problem of the common cold assemble a great institution, fill it with scientists and money, and soon we will have no more colds! It is folly to thus proceed. The great scientific steps forward originate in the minds of gifted scientists, not in the minds of promoters. The best way to proceed is to be sure that really inspired scientists have what they need to work with, and leave them alone.

A man sitting at a desk and thinking is not an expensive proposition. A scientist directing a team and operating an expensive array of apparatus is. The costs of research go up very rapidly when one gets into hardware. When money comes easily there is a tendency to rush into use of complex equipment too fast and too far. We may be making this mistake.

If the country pours enough money into research, it will inevitably support the trivial and the mediocre. The supply of scientific manpower is not unlimited.

In any broad program of research the key word in regard to any one aspect of the program is relevance. It is a good word to have in mind in examining any research program. Competent directors of research know what it means. Probably "conducive to progress toward the main object of a program" is as good a definition as any. Just finding out something new is not by itself sufficient justification for research. It needs to mean something when we find it.

It makes sense to ask a young researcher in basic research what he is trying to find out, what sort of knowledge he hopes to have at the end of his program which does not now exist. Surprisingly often the answer will be hard to extract. But it makes no sense to ask him just how he is going to do it, what it will cost, or how long it will take. If he knew the answers it would not be basic research.—VANNEVAR BUSH. Science 142: 1623, (Dec. 27), 1963.
The Obligation to Study and Acquire Knowledge

Hippocrates, in his famous oath which has been repeated by a hundred generations, did not include the study and knowledge of the doctor. He did not list it among his sacred obligations, such as that of looking after the health and protecting the life of his patients. Nevertheless, Codes of professional ethics from some countries have included this point among the doctor's main duties. But nobody emphasizes it enough; it is never put near the top of the list. Yet I believe that professional ethics must start at exactly this point; in giving the patient the best service that medicine can offer, and repay the trust of the patient with the most efficient methods in existence. The help which the doctor gives should be limited only by the limits of knowledge in his time, and not those other limits, years back in time, set by his ignorance.

This has always been true, but it is much more so today, because today knowledge becomes out-of-date in a few years, whereas in the past it did not do so in a whole lifetime. Not to keep up-to-date, not to be aware of the latest developments, is to deprive the patient of their benefit, and subject him to mediocre and unproductive treatment, when he might have been saved by recently discovered methods.—Dr. IGNACIO CHÁVEZ. "Professional Ethics in Medicine in our Time." Lecture delivered in the Congress celebrating the centenary of the Mexican National Academy of Medicine. Universidad Nacional Autónoma De México, México, D.F., 1964, p. 5.


The Mother of Invention

Necessity is not the mother of invention; knowledge and experiment are its parents. This is clearly seen in the case of many industrial discoveries; high-speed cutting tools were not a necessity which preceded, but an application which followed, the discovery of the properties of tungsten chromium-iron alloys; so, too, the use of titanium in arc lamps and of vanadium in steel were sequels to the industrial preparation of these metals, and not discoveries made by sheer force of necessity.—W. R. Whitney.
MEASUREMENT OF UNILATERAL RENAL FUNCTION

References

Famous General Practitioners

Edward Jenner (1749-1823) was born on 17th May, 1749. His father, a Gloucestershire clergyman, died while Edward was young. . . . At the age of twenty he came to London to be the pupil of John Hunter. He lived for two years in Hunter’s house in Jermyn Street and became Hunter’s close friend and favourite pupil. . . .

John Hunter continually made use of Jenner, whom he frequently asked to provide animals or other interesting objects of natural history, and set tasks of observation or experiment. Jenner’s observations on the habits of the cuckoo were remarkably acute and accurate. They were published in 1787, and his account of the way in which the young cuckoo expels the other nestlings was by many regarded as so improbable that he was accused of inventing it. To those who understand the conscientious accuracy with which Jenner carried out all his observations it seems strange that he should have been accused of falsehood, and it is satisfactory to know that the accuracy of his observations has recently been confirmed. In 1788 Jenner . . . was elected a Fellow of the Royal Society. Up to this time he had been practising without possessing any formal degree or diploma, but in 1792 he obtained the degree of M.D. St. Andrews, and from that time onwards gave up the practice of midwifery and surgery.

During the course of his practice Jenner had frequently heard it said that dairymaids who had suffered from cow-poix did not catch the smallpox. At that time smallpox was still a national scourge and killed or disfigured very many people. Inoculation from an actual case of smallpox had been tried as a prophylactic but had proved too risky a method of protection. Jenner conceived the idea that one might protect a person from smallpox by purposely infecting with cow-poix, that is, by vaccination.

It was in 1796 that he put his idea to the proof. On 14th May in that year he vaccinated a lad (James Phipps) with serum taken from a vesicle on the arm of a dairymaid (Sarah Nelmes) who was suffering from cow-poix. Two months later, on 1st July, he inoculated James Phipps with smallpox contagium, and, as he had hoped and expected, the disease did not “take.” This convinced Jenner of the efficacy of vaccination as a protection against smallpox and in 1798 he published a treatise on the subject.—Zachary Cope, Kt. Some Famous General Practitioners and other Medical Historical Essays. London, Pitman Medical Publishing Co., Ltd., 1961, p. 2.


Lord Joseph Lister

Lord Joseph Lister (1827-1912), the first medical man ever to be elevated to the English peerage, opened the door to modern surgery through his discovery of antiseptic procedures. Until the 1860's surgery had proceeded slowly—despite the earlier discovery of anesthesia—because of the gangrene and blood poisoning that usually accompanied even the setting of a compound fracture. Lister's history-making and successful operation was performed while an assistant pumped a spray of carbolic acid throughout the operating room, an innovation based on Lister's theory of airborne infection. The success of this technique enabled Lister, and other surgeons, to perform operations that had been unthought of until then. His revolutionary procedure paved the way to modern heart and brain surgery.
Residuary Problems

The theory of deficiency disease introduced to pathology a principle as wholly new as did the microbe. Like that it involved an immense change of scale and the demonstration that what might be called the naked-eye view of the constituents of the living body was inadequate. But the new principle was of a different kind from that necessary to found bacteriology. No pursuit of the old climatic and sanitarian theories of disease with whatever thoroughness could have led to the doctrine of microbic pathology without the revolutionary inquiries of Pasteur which disclosed an unsuspected mode of existence. On the other hand dietetics failed to disclose the vitamins because inquiries had not been exact and exhaustive enough. The problem of the vitamins was in fact a residuary problem. The dietetic field had been harvested and even gleaned except for what seemed a few inconspicuous remnants that for a long time it was agreed to ignore. Yet it was these very residues that were to yield the richest harvest of all. This peculiarity makes the solution of the vitamin problem of special interest to the student of scientific method.

The economic value of working-over rejected residues has often been proved by the mining engineer and the metallurgist.

These lessons may usefully serve as metaphorical injunctions in the prosecution of scientific research itself. Time after time it has been shown in the latter activity that the humblest residual phenomena have concealed great secrets.—The Collected Papers of Wilfred Trotter, F.R.S. London, Oxford University Press, 1946, p. 130.


**Famous General Practitioners**

It is not sufficiently realized either by doctors or by the lay public, that many of the great advances of medicine during the past century and a half have been directly due to the acute observation, masterly deduction, and in some instances accurate experimentation of general practitioners.

Immunity, bacteriology, tropical medicine, epidemiology, orthopaedics, cardiology and even neurology have benefited by the work of such men.—ZACHARY COPE, KT. Some Famous General Practitioners and Other Medical Historical Essays. London, Pitman Medical Publishing Co., Ltd., 1961, p. vii.
On the other hand, it is not greatly inferior to a number of other qualitative and semi-qualitative single electrocardiographic items that arouse the "index of suspicion" of the clinician confronted with his patient and the electrocardiogram.

References


Each Hour of the Working-day

Let no youth have any anxiety about the upshot of his education, whatever the line of it may be. If he keeps faithfully busy each hour of the working-day, he may safely leave the final result to itself. He can with perfect certainty count on waking up some fine morning to find himself one of the competent ones of his generation, in whatever pursuit he may have singled out.—WILLIAM JAMES, The Principles of Psychology.

The Learning Process

The child grows, but is still an experimenter: he grasps at the moon, and his failure teaches him to respect distance. At length his little fingers acquire sufficient mechanical tact to lay hold of a spoon. He thrusts the instrument into his mouth, hurts his gums and thus learns the impenetrability of matter. He lets the spoon fall, and jumps with delight to hear it rattle against the table. The experiment made by accident is repeated with intention, and thus the young student receives his first lessons upon sound and gravitation. There are pains and penalties, however, in the path of the enquirer: he is sure to go wrong, and Nature is just as sure to inform him of the fact. He falls downstairs, burns his fingers, cuts his hand, scalds his tongue, and in this way learns the conditions of his physical well being. This is Nature's way of proceeding, and it is wonderful what progress her pupil makes.—John Tyndall, Fragments of Science, vol. 1, p. 253.

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with a radiographic density and these electrocardiographic changes is essential, since this is a surgically curable lesion.

References

No university is worthy of the name, that does not do everything in its power to promote original research in its laboratories. It is the duty of the university to see that its professors and teachers are not overburdened with routine teaching, but are given time for investigation and provided with research laboratory facilities and the necessary funds for this purpose.—E. RUTHERFORD.

The Teacher

The really great school and college teachers are not primarily teachers of biology, English or economics. They are teachers of young men and women. Their success can be measured by the degree to which they correct, humanize and enrich the student’s perspective, and give him wider interests, new horizons, enlarged frames of reference, and those sounder habits of working and thinking which make it possible for him to discover the relevant facts in any field, and on his own reach valid conclusions.—Christian Gauss.
gated with modern angiographic technics and (2) has recently acquired greater importance after the growing interest in the roentgenographic and hemodynamic studies of the coronary circulation, especially those involving coronary blood flow recording via coronary sinus catheterization.

References

Ultimate Purpose

Our present era is characterized by something new in the life of man, and that is the impact of science and applied science or technology on our lives. However, our ultimate goal is not science, just for science's sake; our goal is a higher degree of culture and civilization. We should realize that science is not the measure of civilization—science and technology are merely tools, not ends in themselves.—Gaston F. Du Bois.