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UNIVERSITY OF CEYLON REVIEW

The University of Ceylon was established on the 1st July, 1942, by the fusion of the Ceylon Medical College (founded 1870) and the Ceylon University College (founded 1921). It has at present Faculties of Oriental Studies, Arts, Science and Medicine. Its seat is temporarily in Colombo, but it will be moved to Peradeniya, near Kandy, as soon as its new buildings are ready for occupation. The University has taken over from the Government of Ceylon the publication of the Ceylon Journal of Science, which will be developed as its chief means of contact with Scientists elsewhere as soon as paper supplies enable issues to be published more frequently and regularly. The University of Ceylon Review has been founded in order to make similar contact with scholars in literary subjects, to provide a medium of publication for the research in those subjects conducted in the University, and to provide a learned review for Ceylon. The Review is now published twice a year, in April and in October. From 1948 there will be four issues, in January, April, July and October. The Annual Subscription will be Rs. 5, and a single copy Rs. 2.50.



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*Human Experiments in Chemical Warfare; The Scientist in War and Peace!*¹

THE War and the need to improvise means for directing and co-ordinating war research brought home vividly the fact that, in the Empire, in America and in fact, in most of the freedom loving countries of the World, there was no organisation designed for the continuous support of fundamental scientific research and no means by which society could deliberately utilize the benefits of research. It was apparent that, except for a few government departments and certain industrial concerns, scientific research was a hap-hazard affair meagrely supported by charitable or semi-government organisations, and pursuing gently some objective decided upon only by the whim of the individual scientist. In other words there was no public policy towards science and no social conscience displayed by the Scientist.

For this position the Scientist himself was largely to blame. He objected to the "domination of science by the Government" he said "organisation kills initiative," "planning interferes with free enterprise," "support implies direction and no scientist worthy of his name is willing to be directed by a black coated civil servant." So that whereas, on the one hand, he begged for financial support, on the other, he clamoured for personal freedom in his research.

Then came the War. And, of necessity, the scientists were mobilized and directed to work on problems of fundamental importance to the war effort. Public money in large sums was invested in war research. As far as the war economy allowed, equipment was freely provided. Within reason the cost was not considered, only the results mattered. Committees, sub-committees, panels were set up to co-ordinate and control the research programme and what is more these bodies were largely composed of scientists themselves actively engaged in the research.

1. An abridged version of the inaugural address delivered on 31st July, 1947, at King George's Hall, University of Ceylon, Colombo.

Of course, the scientist was not a free agent. His research problems were *suggested* to him. He could please himself how he tackled those problems, some of which were of a fundamental character and others merely of an *ad hoc* nature. But he was financed by the Government and he was responsible to the Government.

Perhaps the change which impressed the scientist most of all was not his sudden popularity with the government, not the great resources placed at his disposal, but the fact that his responsibility did not end with the completion of his work in his laboratory. For once he had to step outside his laboratory and speak to normal ordinary people; he had to interpret his results to the laymen, to Cabinet Ministers, to Admirals, Field Marshalls, Air Marshalls, to all those non-technical people who were to apply directly the conclusions derived from the results of his work. The benefits derived from intimate discussions on these lines were mutual. The Services soon learned to understand the limitations of laboratory methods while the scientist had to face the difficulties of the man in the field. He had to learn what was practicable to the fighting soldier or the harassed civilian. He had to go back to his laboratory, reconsider his problems and find solutions which our national resources could meet and which the ordinary man could use.

To do this satisfactorily, it rapidly became apparent that in many cases laboratory research was not sufficient. The products of the laboratory had to be tested under conditions which were as realistic as possible. They had to be tried under circumstances approaching those of actual operations in the field. New methods, new techniques had to be devised and a type of investigation loosely but realistically called Operational Research was born. This was the connecting link between the scientist in his laboratory and the man in the field. The scientist was adapting himself to the practical demands of War. His peace-time distrust of direction by the Government was temporarily submerged by his desire to assist the war effort, by his desire to assist his fellowmen.

(Professor Cullumbine then described the type of Operational Research with which he was connected during the War).

The research I have described was performed under the motivation of war and at the direct request of Government Departments. Most of the scientists connected with the work have now returned to their peace-time academic or industrial posts. But I am sure that those scientists who were engaged on full time war research have returned to their civilian occupations with a greater consciousness of their duty towards mankind. After all science exists not for the individual pleasure of the research worker but for the betterment of the human race. As our knowledge and understanding increase, so we shall learn to improve and control the environment in which we live.

There are so many urgent problems to be solved. Can we leave them to the whim of the research worker struggling precariously on grants and charitable or semi-charitable organisations? Can we leave the training and the encouragement of the scientific mind to chance inspiration by some professor working in an ill-equipped University Laboratory? If the State has a policy for the diffusion of knowledge through its Educational system, surely it must have a policy for the advancement of knowledge by research.

If so much can be done under the stress of War, why not try to do a fraction of that in Peace? Penicillin was discovered ten years before the war but it would have remained a curiosity in the medical literature for another fifty years had not the War prompted the Oxford School of Pathology to solve the problem of streptococcal septicaemia. D.D.T. was a commercial product on the market long before the war; only the necessity of protecting our troops in the malarious jungles encouraged a full realisation of its possibilities. But the malarious and streptococcal septicaemia were menacing mankind long before Hitler and Tojo were conceived.

In my experience, central support for research is the lesser of two evils. Admittedly a civil servant or any other lay-official can be aggravating at times, but I have usually found such personalities to be amenable to explanation; especially if the explanation is given in non-technical terms. Nor is direction in itself a bad thing. True a scientist, to get the best results, should be allowed to meander to his goal in his own way and his own time, and freedom to follow interesting bypaths should be granted, but his goal can be fixed.

Ehrlich, the grandfather of chemotherapy, deliberately set out to find a chemical cure for syphilis, and he succeeded. Pasteur, probably the greatest medical scientist, deliberately sought and found a cure for and a protective against rabies and anthrax. Sir Almroth Wright deliberately and successfully sought an effective protection against typhoid fever. Florey deliberately attempted to find an effective means of treating streptococcal septicaemia.

Of course the failures in science always far outnumber the successes. But the failures are never absolute. Scientists are quick to learn from their own failures and from those of others. They leave unprofitable avenues of research and direct their hopes and energies elsewhere.

But as we found in the War, success in the laboratory is only half the story. We must also be successful in the field of everyday affairs. The scientist must be prepared to leave his laboratory and to see that his conclusions are correctly applied. He owes that duty to the public. There is no need for every scientist to become a public crusader. One individual scientist could do little, in this direction but a scientific organisation could do much. An active public

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relations section should keep the ordinary man informed on scientific matters affecting his well-being, should see that he benefits from the results of scientific research and should educate him to support the scientist in his work.

No longer must this work be torpedoed by the false gibe that the world is not morally prepared for the results of scientific discovery. Take the science of nutrition which had made such enormous strides in the last 25 years. Pellagra is a disease due to a vitamin deficiency. The foods which prevent it are known and are widely distributed. The actual vitamin has been identified and known for years, but yet in the U.S.A. in 1943 over 1,300 people died from pellagra and tens of thousands or more suffered from its effects. Why did all this suffering and death occur? Partly because of ignorance and partly because of poverty. Scientists have a pretty good idea now of the ideal diet for everyone. Can't we organise and apply this knowledge that is so vital for the health and prosperity of all people, so necessary indeed, for international peace?

In this organisation of science, the University holds a key position. A University has two main purposes, to disseminate knowledge by teaching and to advance knowledge by research. A University is a place where those who hate ignorance may strive to know, where those who perceive truth may strive to make others see; where seekers and learners alike, banded together in search for knowledge, will honour thought in all its finer ways, will welcome thinkers in distress or in exile, will uphold ever the dignity of thought and learning and will exact standards in these things. Religion may split into sect or heresy; dynasties may perish or be supplanted, but the University will continue and the stream of life will pass through it, and the thinker and the seeker will be bound together in the undying cause of bringing thought into the world.

In these days of broken frontiers and collapsing values, wherever a University stands, the free minds of men, urged on to full and fair enquiry, may still bring wisdom into the affairs of man.

H. CULLUMBINE.