mentioned photograph of *A. cloacae,* there is one cell that clearly shows penetration of the faint, outer zone by the flagella all the way to the shrunken mass of the cytoplasm. If this outer zone is the cell wall, and the writer has reasons to believe that it is, then the electron microscope has been instrumental in settling another controversial point regarding bacterial flagella.

GEORGES KNAYSI

CORNELL UNIVERSITY

FLUOROCHEMISTRY

WITH the increasing number of researches and publications devoted to the applications of fluorescence to chemistry, a need is rapidly arising to identify this new branch of science as distinct and apart from related and often confused fields.

Therefore, it seems expedient to propose the name *fluorochemistry* as descriptive of this branch of science. The term fluorochemistry is in order with other terms created to identify highly specialized fields which are still within the boundaries of chemistry and/or physics, *e.g.,* photochemistry, physical optics, and so on.

JACK DE MENT

The Mineralogist,
PORTLAND, OREGON

SINO-AMERICAN SCIENTIFIC FRIENDSHIP

IN the January 3, 1942, issue of *Nature* there appeared a communication from the British Association of Scientific Workers to American men of science, calling attention to the numerous bonds between them and pointing out the necessity for further cooperation between them and, particularly, their Soviet colleagues in order to achieve the goal of "preserving the scientific heritage of the whole world against the barbarism and obscurantism of Fascist ideology." While the sentiments of this message are undoubtedly welcomed and shared by all American scientists and will strengthen our mutual friendship, we think it of the greatest importance to include and reemphasize at this time our continued feeling of solidarity with the scientific and technical workers of China who have given the world such a magnificent example in contributing to the effort of resistance against brutal aggression.

It has been the good fortune of this country that numerous Chinese have come to study with us and that close ties unite many of the educational institutions of China with our own. We have long admired for their qualities of high character, vigorous personality and intellectual ability the Chinese who have been our fellow classmates, students or professional colleagues. Working with them in our institutions here or in those of China we have realized that there is mutual understanding and that their contribution to civilization continues in an undiminished stream. Our esteem has grown even greater during the past years as we have witnessed the courage with which, in the invaded cities under scrutiny of the enemy or under more adverse physical conditions in the free cities which they have reached often only after long and perilous travel, they have persevered to increase the common store of knowledge as well as to aid in the resurgence of their nation.

We are certain that the scientific workers of Great Britain and Russia join wholeheartedly with us in expressing again to our Chinese colleagues the feeling of comradeship which for many years has motivated our relations and will in the future aid us to create a world where all men may work for the common good, free of threats to security and happiness.

MORRIS F. SHAFFER

QUOTATIONS

THE WORK OF THE ROCKEFELLER FOUNDATION IN 1941[1]

DURING 1941 the appropriations of the Rockefeller Foundation amounted to $9,313,964. The income of the foundation from investments during the year was $8,734,992. This income was supplemented by a transfer of $600,000 from the principal fund.

The appropriations were distributed for the most part in six major fields, roughly as follows:

Public health	$2,450,000
Medical sciences	2,120,000
Natural sciences	1,271,000
Social sciences	1,227,000
Humanities	1,020,000
Program in China	154,000

A detailed statement of the appropriations made in 1941 appears at the conclusion of this report. Of the money spent during the year, 74 per cent. was for work in the United States and 26 per cent. for work in other countries.

The war, of course, has radically affected the activities of the foundation abroad. In June, 1940, the foundation's Paris office was closed, and the Lisbon office was closed in July, 1941. There are now no foundation representatives on the continent of Europe, but an office is being maintained in London. Late in 1940 the Far Eastern office of the foundation

[1] Opening pages of the annual report of Dr. Raymond B. Fosdick, president of the Rockefeller Foundation.

was moved from Shanghai to Manila. At the time of the capture of Manila the head of the office, Dr. M. C. Balfour, was in Kunming. Unfortunately, his associate, Dr. Charles N. Leach, and some of the personnel of the Peiping Union Medical College who were on their way to the United States were in Manila when the city fell. The Peiping Union Medical College was closed by the Japanese authorities early in 1942 and the leading members of the staff were interned.

MAKING THE PRESENT SERVE THE FUTURE

Confronted with a world in which ruthlessness must be employed to destroy a far more dangerous kind of ruthlessness, organizations like the Rockefeller Foundation, dedicated to the extension of knowledge, can only reaffirm their undiscourageable belief in the ultimate power of reason. As Alvin Johnson says: "The rules of civilization, wrought out on Sinai and the Areopagus, . . . are prior to the bomber and poison gas, and will survive beyond them." The Bill of Rights will outlast "Mein Kampf" just as the scientist's objective search for truth will outlive all the regimented thinking of totalitarianism. Temporarily eclipsed, the proud names of Paris, Strasbourg, Prague, Louvain, Warsaw, Leyden, as well as of Heidelberg and Leipsic and Berlin, will once again stand for the quest for truth; once again will they be centers of candid and fearless thinking—homes of the untrammeled and unafraid, where there is liberty to learn, opportunity to teach and power to understand.

The task which faces all institutions concerned with the advance of knowledge is not only to keep this faith alive but to make certain, as far as they can, that the streams of culture and learning, wherever they may be located or however feebly they may now flow, shall not be blocked. In line with this latter function, in so far as circumstances and limited funds make possible, the Rockefeller Foundation conceives its principal role.

This concern for the future is a matter of stern, practical sense. The specialized talents and abilities that are meeting this emergency and those that will meet emergencies to come are not produced by feverish last-minute activities. No amount of pressure can suddenly create a supply of thoroughly trained and broadly experienced physicists, mathematicians, chemists, biologists, economists and political scientists. These men represent the trained intelligence without which a war can not be won, or a lasting peace achieved. They emerge spontaneously, unpredictably, but irresistibly out of long, patient and sustained effort. Pure research, the clean urge to gain new knowledge, the sympathetic appreciation of imaginative scholarship even when it seems remote and unrelated—these we must steadfastly sponsor or our vital intellectual resources will fail us in the days to come.

It is true, of course, that in an attempt to maintain long-range programs, aiming at the future rather than at the present, no institution can escape the urgencies of the moment. We are all of us in the war and it is idle to pretend that business can proceed as usual. A substantial proportion of the appropriations of the Rockefeller Foundation has some relation to the present emergency. For example, the foundation is furnishing yellow fever vaccine for the Army and Navy; it is speeding up its research in influenza, malaria and typhus, which have a vital bearing on the war; it has financed the microfilming of countless historical records in England that might be destroyed; it has given aid to the development of brain surgery necessitated by war wounds; it has tried to salvage as much of the scholarship of Europe as possible by bringing outstanding university men to the United States.

All this has to do with war or its results. And yet it is possible to say that this type of emergency help has invariably been related to the far target. In trying to be of service in the calamity that engulfs us all the foundation has endeavored to make certain, in so far as it could, that its work had some constructive reference to the world after the war. The development of brain surgery or of techniques for the control of specific diseases has significance for the future as well as for the present; much of the historical material of England is being opened to the students of other countries for the first time; the deposed scholars of Europe are enriching the intellectual life of America; the natural sciences, whether in physics or biology or chemistry, can and will be used to serve a world at peace as well as at war. In all the reordering of human life and habits which the war makes necessary it is still possible, not only in the field of the physical and social sciences, but in the humanities as well, to make the present serve the future.

THE SEARCH FOR UNITY

If we are to have a durable peace after the war, if out of the wreckage of the present a new kind of cooperative life is to be built on a global scale, the part that science and advancing knowledge will play must not be overlooked. For although wars and economic rivalries may for longer or shorter periods isolate nations and split them up into separate units, the process is never complete because the intellectual life of the world, as far as science and learning are concerned, is definitely internationalized, and whether we wish it or not an indelible pattern of unity has been woven into the society of mankind.

There is not an area of activity in which this can not be illustrated. An American soldier wounded on a battlefield in the Far East owes his life to the

Japanese scientist, Kitasato, who isolated the bacillus of tetanus. A Russian soldier saved by a blood transfusion is indebted to Landsteiner, an Austrian. A German soldier is shielded from typhoid fever with the help of a Russian, Metchnikoff. A Dutch marine in the East Indies is protected from malaria because of the experiments of an Italian, Grassi; while a British aviator in North Africa escapes death from surgical infection because a Frenchman, Pasteur, and a German, Koch, elaborated a new technique.

In peace as in war we are all of us the beneficiaries of contributions to knowledge made by every nation in the world. Our children are guarded from diphtheria by what a Japanese and a German did; they are protected from smallpox by an Englishman's work; they are saved from rabies because of a Frenchman; they are cured of pellagra through the researches of an Austrian. From birth to death they are surrounded by an invisible host—the spirits of men who never thought in terms of flags or boundary lines and who never served a lesser loyalty than the welfare of mankind. The best that every individual or group has produced anywhere in the world has always been available to serve the race of men, regardless of nation or color.

What is true of the medical sciences is true of the other sciences. Whether it is mathematics or chemistry, whether it is bridges or automobiles or a new device for making cotton cloth or a cyclotron for studying atomic structure, ideas can not be hedged in behind geographical barriers. Thought can not be nationalized. The fundamental unity of civilization is the unity of its intellectual life.

There is a real sense, therefore, in which the things that divide us are trivial as compared with the things that unite us. The foundations of a cooperative world have already been laid. It is not as if we were starting from the beginning. For at least three hundred years the process has been at work, until to-day the cornerstones of society are the common interests that relate to the welfare of all men everywhere.

In brief, the age of distinct human societies, indifferent to the fate of one another, has passed forever; and the great task that will confront us after the war is to develop for the community of nations new areas and techniques of cooperative action which will fit the facts of our twentieth century interdependence. We need rallying points of unity, centers around which men of differing cultures and faiths can combine, defined fields of need or goals of effort in which by pooling its brains and resources the human race can add to its own well-being. Only as we begin to build, brick by brick, in these areas of common interest where cooperation is possible and the results are of benefit to all, can we erect the ultimate structure of a united society.

A score of inviting areas for this kind of cooperation deserve exploration. Means must be found by which the potential abundance of the world can be translated into a more equitable standard of living. Minimum standards of food, clothing and shelter should be established. The new science of nutrition, slowly coming to maturity, should be expanded on a world-wide scale. The science of agriculture needs development, not only in our own climate but particularly in the tropic and subtropic zones. With all their brilliant achievements the medical sciences are in their infancy. Public health stands at the threshold of new possibilities. Physics and chemistry have scarcely started their contributions to the happiness and comfort of human living. Economics and political science are only now beginning to tell us in more confident tones how to make this world a home to live in instead of a place to fight and freeze and starve in.

All these matters await the future peace. Nevertheless they constitute the stern realities of the present, for as Vice-President Wallace has said: "From the practical standpoint of putting first things first, at a time when there are not enough hours in a day and every minute counts, planning for the future peace must of necessity be a part of our all-out war program."

SCIENTIFIC BOOKS

TRENDS IN PHYSICS TEACHING. SOME RECENT TEXTS

THE art of teaching physics has developed almost in its entirety without benefit of the specialist in educational methods. For explanation, one need look no further than an outline of the subject itself. Hard work on the subject-matter is necessary on the part of almost any one before he can lay claim even to an elementary knowledge of physical principles. Many difficulties, not the first being those of mathematics, confront the student who desires a sufficiently good command of the subject to be able to understand its applications in engineering, chemistry, medicine or geology, to mention but a few fields in which special applications of physics abound. The result of this has been the development on the part of physics teachers of attitudes and methods which have made little concession to the tendency in some quarters to soften educational programs to the level of the average student.