SCIENCE

VOL. 101 FRIDAY, FEBRUARY 16, 1945 No. 2616

SCIENCE: A Weekly Journal, since 1900 the official organ of the American Association for the Advancement of Science. Published by the American Association for the Advancement of Science every Friday at Lancaster, Pennsylvania.

Editors: JOSEPHINE OWEN CATTELL and JAQUES CATTELL.

Policy Committee: MALCOLM H. SOULE, ROGER ADAMS and WALTER R. MILES.

Advertising Manager: THEO. J. CHRISTENSEN.

Communications relative to articles offered for publication should be addressed to Editors of Science, The Science Press, Lancaster, Pa.

Communications relative to advertising should be addressed to THEO. CHRISTENSEN, Advertising Manager, Smithsonian Institution Building, Washington 25, D. C.

Communications relative to membership in the Association and to all matters of business of the Association should be addressed to the Permanent Secretary, A.A.A.S., Smithsonian Institution Building, Washington 25, D. C.

Annual subscription, $6.00 Single copies, 15 cents

SELECTION AND TRAINING OF STUDENTS FOR INDUSTRIAL RESEARCH[1]

By DR. ALBERT W. HULL

RESEARCH LABORATORY, GENERAL ELECTRIC COMPANY

IN selecting college graduates for industrial research, certain qualities are sought. Not all these qualities are the product of college training, but many of them might be. The purpose of this discussion is to inquire whether colleges could contribute more to this total training.

The qualities which are needed for success in industrial research may be classed in four groups. They are, in order of importance, character, aptitude for research, attitude toward work and knowledge.

CHARACTER

Character is the most important qualification. It is rated first in the hiring and retaining of personnel. I shall not try to define character; the many virtues which it comprises include self-discipline, courage and tolerance, all of which are needed in industrial research. It also includes honesty and generosity. Honesty is more than the negative virtue of not telling lies. Positive honesty is the quality that enables you to say of a man, "I always know just where to find him." It is the basis of true friendship and teamwork, and hence is an essential requirement in a cooperating group. The honesty of research workers, however, must be even greater than this. They not only must not deceive others but must not deceive themselves, for the greatest scientific sin is wishful interpretation of data. It is more common than is generally realized, and is so serious that it can reduce a research worker's value to the vanishing point. The man who is more anxious to prove that he is right

[1] Vice-presidential address before the Section for Physics, American Association for the Advancement of Science, Cleveland, 1944.

making a color with the vitamin, since they are all dehydrating agents of various degrees. In the case of this reagent the dehydration takes place on the surface of the particles because they have an adsorbed layer of sulfuric acid as a result of the leaching process used in their manufacture. Attempts at elution with solvents such as acetone destroy the blue color but yield an orange oil which has a different absorption spectrum from the vitamin.

Complex formation between the reagent (adsorbed sulfuric acid) and the anhydro compound appears to be the most probable explanation of the phenomenon. That such a complex is possible is indicated by the fact that carotene also makes a color even though it is a hydrocarbon.

Interesting possibilities are suggested by the principle of this assay. Not infrequently it is desirable, either for synthetic or analytic purposes, to react two substances which can not be brought into solution in a common solvent. Carrying one substance into contact with another by means of an inert adsorbent might solve such problems.

ARNOLD LOWMAN

CALIFORNIA PACKING CORPORATION,
SAN FRANCISCO, CALIF.

A MODIFIED PETRI DISH FOR CONTINUOUS TEMPERATURE OBSERVATION

IN investigations upon free-living and parasitic Protozoa, I have found that greater accuracy could be obtained in using a modified Pyrex Petri dish for

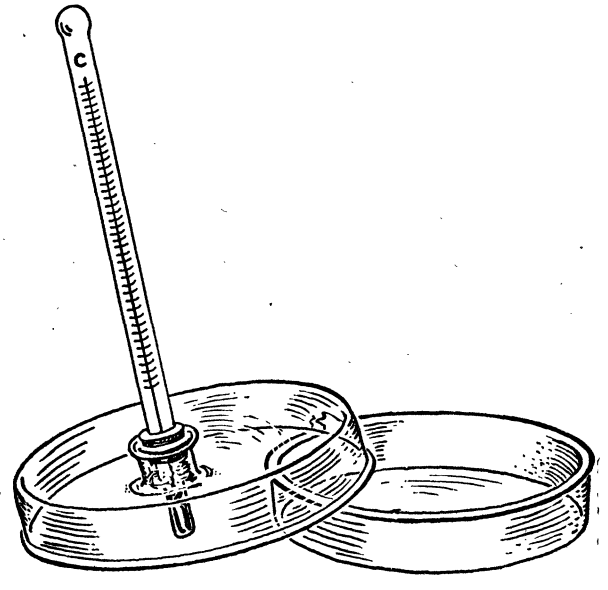

FIG. 1.

controlling and maintaining constant temperatures of culture fluids, stains and various fixing reagents.

The dish (Fig. 1) is a regulation stock four-inch Pyrex Petri dish (bottom and lid) in which a hole measuring approximately one centimeter in diameter is made close to the rim of the lid. A piece of glass tubing slightly larger than the diameter of the hole is then fused over it so that a collar is formed about one centimeter high. A piece of rubber tubing about six millimeters in length is inserted in the glass collar. Then a small clinical-type thermometer is inserted into the rubber-cushioned collar so that the bulb of the thermometer which should be immersed in the fluid comes to rest slightly above the bottom of the dish. Direct temperature readings may now be made of the contents of the dish without removing the lid.

Many investigators in protozoology and parasitology make smeared preparations directly on cover-slips which are then dropped into the heated fixing fluid. With this dish, it is possible to kill and fix the organisms at a definite temperature and still be able to maintain the correct temperature over a given period of time with the lid covered. In staining, it has proved to be extremely useful, especially in the Feulgen test for thymonucleic acid where a given temperature must be maintained for a definite period of time.

The dish should prove to be convenient and useful for protozoologists, parasitologists and those working with small animals where greater accuracy is desired in this phase of technical work. Entomologists may find the dish useful by simply using it as a cover with a stoppered opening through which fluids may be added to developing embryos without removing the lid thereby lessening the possibility of contamination.

It seems likely that with greater emphasis being placed upon research in parasitology and tropical medicine, there will be considerable usage for a dish of this nature.

The author wishes to express his thanks to Dr. James A. Harrison for his aid in construction of the dish.

RALPH WICHTERMAN

TEMPLE UNIVERSITY

BOOKS RECEIVED

HADAMARD, JACQUES. *The Psychology of Invention in the Mathematical Field.* Pp. xiii + 143. Princeton University Press. $2.00. 1945.

HUDSON, RALPH G. *An Introduction to Electronics.* Illustrated. Pp. x + 97. The Macmillan Company. $3.00. 1945.

LYONS, HENRY. *The Royal Society, 1660–1940. A History of Its Administration under Its Charters.* Pp. x + 354. Cambridge University Press. 1944.

MARTIN, RICHARD A. *Mummies.* Illustrated. Pp. 18. 11 plates. Chicago Natural History Museum. 25¢. 1945.

The Abortion Problem. Proceedings of the Conference Held under the Auspices of the National Committee on Maternal Health, Inc. Illustrated. Pp. xii + 182. Williams & Wilkins Company. 1944.

THOMPSON, LAURA and ALICE JOSEPH. *The Hopi Way.* Illustrated. Pp. 151. University of Chicago. $3.00. 1944.