own experience[4] homogeneous films can be obtained when proteins are spread on a salt solution having the P_H of the isoelectric point of the protein in question (egg albumin $P_H 4.8$). In no instance was it possible to obtain homogenous films—as observed through the ultramicroscope—on a surface of distilled water. Likewise, at salt solutions of $P_H 3$ or $P_H 7$ the protein films contained signs of inhomogeneities. It has been found also that films of egg albumen start to collapse at a pressure of about 18 dynes per cm.

In the light of these observations it seems to be possible that in those cases in which protein layers were built up from films which were spread on distilled water, and compressed to 30 dynes per cm, Langmuir, Schaefer and Wrinch were dealing with inhomogenous and collapsed films whose surfaces were to some extent both lyophilic and lyophobic. This would explain the observation that A and B layers are wetted equally by water and by lyophobic solvents, respectively.

Whereas it was not possible to build up PRAA.. films, it is surprising that the authors were able to build up PRBB... layers. In both PRAA.. and PRBB. . layers the lyophilic $-NH_3^+$ and $-COO^-$ groups of one layer would be attached to the lyophobic paraffin groups of the neighboring layer. On theoretical reasons these groups should exert relatively weak cohesive forces upon each other (ion-induced dipole) which probably could be overcome easily by the attractive forces between water and the lyophilic groups (ion-dipole) when such a polylayer is dipped into water. That the polar groups of proteins do not interact with lyophobic groups of other molecules has been suggested by experiments of the author—to be published shortly—in which the molecules of a mixed protein—fatty acid film occupy apparently the same area which they occupy when the compounds are spread alone. The question arises, therefore, whether or not the PRBB layers likewise consist of inhomogenous protein layers which to some extent are both lyophobic and lyophilic.

HANS NEURATH,
George Fisher Baker Research Fellow

CORNELL UNIVERSITY

A REAGENT FOR VITAMIN B_1

A PRELIMINARY report by McCollum and Prebluda[1] on a reagent for the detection and estimation of vitamin B_1 prompts me to send this note on a reagent for vitamin B_1 which I have been investigating for some time.

An investigation recently completed, and soon to be published, showed that the thiazoles form with potassium iodide a sensitive reagent for the detection of bismuth and antimony. It was also shown that a solution of bismuth iodide in potassium iodide is a sensitive reagent for thiazoles. Since Williams, Clarke and coworkers have shown that vitamin B_1 contains a thiazole fraction, it was suggested by Dr. Benjamin Harrow, of these laboratories, that bismuth potassium iodide be tested as a reagent for vitamin B_1.

This research was begun and a characteristic orange-red precipitate was obtained with the reagent and the following vitamin B_1 products: Fleischmann's yeast cakes, Squibb's malted wheat germ extract (vitavose) and Squibb's vitamin B and G syrup. Fresh orange juice, fresh grapefruit juice and canned tomato juice also gave a characteristic precipitate with the reagent. Certain brands of canned orange juice and canned grapefruit juice did not give the reaction. These products, when treated to destroy the vitamin, gave no precipitate with the reagent unless care was taken to preserve the thiazole nucleus.

The orange-red precipitate formed by the reagent with the above-mentioned products can be filtered, dried and weighed. The weight of the precipitate was found to be proportional to the amount of product used.

This work is being extended further, and complete details will be published later.

BARNET NAIMAN

COLLEGE OF THE CITY OF NEW YORK

THE EFFECT OF TEMPERATURE UPON THE RESPONSES OF PLANTS TO PHOTOPERIOD[1]

To furnish material for further studies of the relation of anatomical condition to blossoming,[2,3] more than 100 varieties of plants, including some monocotyledons, are being grown in different environmental and cultural conditions. The principal variables being used are photoperiod and temperature, although some partial defoliation, girdling, shading and low nitrogen treatments are also included. It appears that temperatures a little above or below the usual range employed in greenhouse culture have been effective in altering the responses of some plants which are commonly considered to have a fixed or definite reaction to relative length of daylight. For instance, poinsettia plants grown in the short days of winter at a temperature of 68° to 70° F. remained strongly vegetative and did not blossom, while plants in temperatures of 60° to 65° blossomed normally and plants in temperatures of

[4] *Jour. Phys. Chem.*, 40: 361, 1936.

[1] SCIENCE, 84: 488, November 27, 1936.

[1] Published with the permission of the director of the Wisconsin Agricultural Experiment Station.

[2] Ocra C. Wilton and R. H. Roberts, *Bot. Gaz.*, 98: 45–64, illus., 1936.

[3] R. H. Roberts and Ocra C. Wilton, SCIENCE, 84: 391–392, 1936.

55° to 57° show only slight tendencies to blossom (January 25). Plants which were moved from 63° (average), after forming blossom buds, to 70° abscissed their flower clusters. Large percentages of the poinsettia plants grown in long days at temperatures of 55° to 57° are producing blossoms. A similar departure from the usual responses to photoperiod occurred in the case of Klondyke cosmos. In previous years *Rudbeckia* plants have never produced stems when in short days but only a rosette of leaves. The plants in a cooler temperature this season are producing typical stems. These show no tendency to produce blossom buds, however; the plants in long days at cool temperature are forming abortive blossoms.

Other plants which have had their customary responses to photoperiod altered by temperature effects are: alfalfa (seed setting), winter barley, castor beans, wax beans, Chinese cabbage, chrysanthemum, white clover, geranium, hemp, Jimson weed, lettuce, pansy, pigweed, spring rye, spinach, stock, timothy and spring wheat.

R. H. ROBERTS
BURDEAN E. STRUCKMEYER
UNIVERSITY OF WISCONSIN

SCIENTIFIC BOOKS

THE LUNG

The Lung. By WILLIAM SNOW MILLER. Charles C. Thomas. Baltimore, 1936. 209 pages. $7.50.

THE many friends and students of Dr. William Snow Miller will be delighted at the appearance of his book, "The Lung." Many have urged that he put into book form the knowledge gained from his long study of the anatomy of this organ. Some years ago the Committee on Medical Research of the National Tuberculosis Association provided funds with the hope that he could see his way clear to doing it. More recently Dr. Lawrason Brown gathered among Dr. Miller's friends funds for the same purpose. Now that it has come, it is beautifully illustrated and full of a wealth of knowledge.

Dr. Miller, as a great anatomist and no less keen historian, has combined these two talents in his book. Possibly the title, "The Lung," is a little too comprehensive, as the volume deals only with the anatomy, histology and architecture of the lung, and not with its living function. Nevertheless, the volume will do much to enable students to understand the fineness and delicacy of an organ which is difficult to visualize in detail.

All those students who have worked with Dr. Miller in his laboratory will miss in the photographs the depth and contrast made possible by the study of his actual models, which are such artistic pieces of work. They will not lack in understanding of the long, patient study of the structure of the lung, which he made by serial section, microscopic study, camera lucida drawings on scale paper to give exact proportions, for they will have seen Dr. Miller at work before finally completing his model with each system colored differently and checked against the serial sections. The skill with which these models have been conceived and executed have done what the author wished them to do—cleared up many vexed questions in lung and vascular architecture and lung function.

One very notable feature of Dr. Miller's work has been his ability to draw upon pathological material to illustrate many of the questions rendered difficult by histological methods alone. In particular is this true in determining the presence of an alveolar epithelial lining. This was accomplished by studying exudates in inflammatory conditions occurring between the basal membrane and covering cells of the alveoli, thus making clear the continuous epithelial covering.

Dr. Miller's work demonstrating the valves of the lymphatic system, which forces the flow in the lymphatics always in one direction, has always been helpful in understanding many pathological conditions. The different currents of the lymphatic flow in pleura and lung and his intimate study of elastic tissue layers has been invaluable also in understanding many pathological conditions.

The problem of anastomosis between the branches of the aortic system and pulmonary artery system Dr. Miller has also clarified. According to Dr. Miller's view, this probably only occurs in the capillary part of the two systems. The question of different blood supply to lymphatic tissue in different animals—for instance, by the bronchial artery in the rabbit and by the pulmonary artery in the guinea pig—probably explains in part the different distribution of tuberculosis in this disease in the two animals.

It would make too long a review to call attention to other interesting structures. It is possible that the book is too technical for many, but every student of anatomy and every clinician should have it for reference and should from time to time study it to clarify his picture of the fineness of this organ.

The historical division of this book every one interested in medical history will find delightful reading, but one thing is sure, that every one who has known Dr. Miller and his lifelong study in this field will be gratified that his knowledge has been put in such a satisfactory volume.

WM. CHARLES WHITE