dangers of distributed control as against centralized control, of cooperative arrangements against an attempted compulsion. It is because of the unlimited powers of the centralized control proposed in the Kilgore Bill, irrespective of the details of its sections, that so clearly defines the issue.

Reviewing the five objectives of the Senator's article in SCIENCE, there appears to be no valid reason why an already existing independent scientific agency of the Government, namely, the National Research Council, can not or could not bring about the objectives for which the Kilgore Bill was proposed. The Executive Order of President Wilson creating the National Research Council on May 11, 1918, so specifically directs. At the risk of repetition, and for the purposes of comparison with Senator Kilgore's five objectives, we quote:

The duties of which [the National Research Council] shall be as follows:

(1) In general, to stimulate research in the mathematical, physical and biological sciences, and in the application of these sciences to engineering, agriculture, medicine and other useful arts, with the object of increasing knowledge, of strengthening the national defense, and of contributing in other ways to the public welfare.

(2) To survey the larger possibilities of science, to formulate comprehensive projects of research and to develop effective means of utilizing the scientific and technical resources of the country for dealing with these projects.

(3) To promote cooperation in research, at home and abroad, in order to secure concentration of effort, minimize duplication and stimulate progress; but in all cooperative undertakings to give encouragement to individual initiative, as fundamentally important to the advancement of science.

(4) To serve as a means of bringing American and foreign investigators into active cooperation with the scientific and technical services of the War and Navy Departments and with those of the civil branches of the Government.

(5) To direct the attention of scientific and technical investigators to the present importance of military and industrial problems in connection with the war, and to aid in the solution of these problems by organizing specific researches.

(6) To gather and collate scientific and technical information, at home and abroad, in cooperation with governmental and other agencies, and to render such information available to duly accredited persons.

One can not review the history of the establishment of the National Research Council and escape the conclusion that the intent of such an agency was to accomplish the very purposes for which presumably the Kilgore Bill originated, but purposely avoiding the objectionable defects which are so flagrant to those who have opposed the proposed legislation in S. 702.

Until, therefore, the National Research Council is proved to be ineffective and void of any means of making itself so, the wisdom for further congressional acts for such a purpose will remain open to question. Were the Kilgore Bill to be passed as is, the only amendment that would appear to be consistent with such action would seem to require that with the passage of this act the National Research Council and possibly even the National Academy of Sciences should thereupon become dissolved. In times of such national emergency as confronted President Wilson and President Lincoln, one has difficulty in believing that it was the intent that these institutions were to be perpetuated primarily for honoring distinguished scholars with membership, however creditably such honor could be bestowed. In conclusion, why the Kilgore Bill?

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SCIENTIFIC BOOKS

CYTOLOGY

Fundamentals of Cytology. By LESTER W. SHARP. 267 pages. 6 × 9. 176 illustrations. New York: McGraw-Hill Book Company, Inc. $3.00.

PROFESSOR SHARP, whose "Introduction to Cytology" received a deservedly warm welcome (there were three editions between 1921 and 1935), has in the present book essayed to bring the subject to the level of the college student who has only an elementary course in botany and zoology as a background. Sharp is exceptionally skilful in presenting and clarifying complex issues and if any one is equal to the task, it is he. That he has not been completely successful in his attempt is due to the fact that in the present state of confusion and clash of opinions some aspects of cytology can not possibly be given a portrayal that is both elementary and fair. The book comprises six chapters devoted to more general aspects and to the extranuclear elements of the cell, and eleven on the cytology of reproduction and genetics. This is a distribution that well reflects the status of our information concerning the cytoplasm and cytogenetics, respectively, especially if cellular physiology be not stressed.

In the chapters on the cytoplasmic components of the cell there is a great volume of information and, indeed, the treatment is often more like a condensation than a simplification. The instances where Sharp has attempted the latter, as in the case of chondriosomes

and Golgi material, are not always entirely successful, but in the present state of confusion of those particular subjects that is hardly to be wondered at.

The difficulty is at least as great in dealing with cytology in its bearing on genetics. In some aspects, as in the chromosomal variations of structure and number and of hybridity, the book is concerned with aspects which for the present are generally accepted. In presenting them to the student, Sharp is at his best. But in the basic mechanisms that underlie chromosomal behavior, the difficulties of elementary presentation become almost insurmountable. To be sure, by soft-pedaling and ignoring the dubious parts of the evidence, these sections could be written so as to give a logical and well-rounded account. Many geneticists conceive of the cytological background in this way, and several books on genetics and cytology have so treated it. Generally, Sharp, too, sketches his preliminary outlines in this fashion, but he is too good a cytologist to let his case rest on such a treatment and thus often follows it up with the doubts and faults that lurk behind the beautiful story. The chapter on chromosomes is an illustration of this and though to a working cytologist it seems like an excellent, brief survey, one wonders what an elementary student's attitude may be about the number of chromonemata, coiling, heteropycnosis and salivary chromosomes, when he gets through with it. It is for this reason that it is to be regretted that Sharp did not expand the conclusions which terminate about half of the chapters, for it is there that his skill in outlining basic concepts is especially evident.

The criticism sometimes made of Sharp's earlier book that zoological cytology does not meet with as adequate consideration as botanical cytology, will likely be made here also. In a way, the illustrations reflect this unequal distribution, for there are 115 figures of botanical against 54 figures of purely zoological subjects. But aside from the fact that Sharp is himself primarily a botanist and quite naturally more at home in his side of the field, it might be pointed out that especially in the cytogenetics of the last ten years the animal cytologist has definitely fallen behind his botanical colleague in furnishing the evidence that is advancing our knowledge. However, this does not altogether explain the somewhat uneven judgment employed in listing reference works to animal cytology. Thus the chapter on animal reproduction, perhaps the weakest in the book, is supported by twelve references. Of these, six are on protozoa, and though this group has admittedly been somewhat neglected by both zoologists and botanists, that seems a little disproportionate. Of the remaining six references, Hegner's 1914 book certainly does not meet the demands of 1943, and Agar's and Doncaster's treatises, both published twenty-three years ago, can hardly be expected to give an adequate survey of the modern status of the subject.

As already indicated, many aspects of cytology are at present in that state of flux which betokens progress. This renders it almost impossible to reduce it to simple outlines and by the same token makes it very difficult to present it justly to a student with only an elementary background. If the attempt is nevertheless to be made, Sharp's book will prove of great help.

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QUANTITATIVE ANALYSIS

Elementary Quantitative Analysis. By CARL J. ENGELDER. Third edition. viii + 283 pp. 15 × 23 cm. New York: John Wiley and Sons, Inc. 1943. $2.75.

THIS book is designed for a short course in quantitative analysis. It is divided into four sections: "Fundamental Principles of Quantitative Analysis"; "Volumetric Analysis"; "Gravimetric Analysis"; and "Systematic Quantitative Analysis."

The section on fundamental principles introduces the student to the subject and includes discussions of the scope and theoretical basis of quantitative analysis, preparation of sample, mathematical operations, errors and precision, reagents and the analytical balance. This entire series of discussions occupies less than twenty-six pages.

The section on volumetric analysis includes a chapter on theory, apparatus, technique and calculations, and chapters on neutralization methods, redox methods and volumetric precipitation methods. Both the normality and the titer methods of expressing solution strength are discussed with emphasis on the latter method. The chapter on neutralization methods includes the preparation of standard acid and alkali, using sodium carbonate as the primary standard; the determination of sodium carbonate in soda ash, the strength of potassium acid phthalate solution and the strength of oxalic acid solution; and the theory of hydrolysis, indicators and differential titrations. No mention is made of the removal of carbonate from standard alkali. The redox chapter includes experiments with permanganate, iodine, dichromate and ceric sulfate. The precipitation methods include the determination of chloride, silver thiocyanate and cyanide. Throughout the section, the author encourages the use of two burettes with a resultant jockeying back and forth in finding end points.

The section on gravimetric analysis gives procedures for chloride, iron, sulfate, calcium, magnesium and phosphate. The theory of gravimetric precipita-