As stated in the author's foreword, "This book on the Vacuum-Tube Voltmeter is intended as a practical exposition of the numerous types of such measuring devices, with the direct intention of providing a source of information for the engineer, student and serviceman, so that if he desires to compare different types, establish their principles of operation or construct them, all the facts are available from one source."

The book provides a very valuable contribution for the aforesaid purpose. It is simple in language and direct in attack, so that the instrument to be discussed is presented with the minimum of preamble. The book is practically free from mathematical equations, and in that sense is very elementary. Nevertheless, a certain amount of previous knowledge is necessary if the reader is to get the maximum of value from the work, since the significance of many of the features rests largely upon such knowledge. While the author has done what is reasonably possible within the wide scope of instruments discussed to point out pitfalls, and to state why certain situations must be avoided in certain cases, the subject of high frequency oscillations in particular is a field in which it is frequently necessary and always desirable for the investigator to have intimate knowledge of the characteristics of his circuits before assuming what will happen when any additional measuring device is incorporated with them.

While the book is intended in part for one who has no great knowledge of circuit theory, the present reviewer feels that one of its greatest uses will be for the investigator in physics who, while well equipped in a knowledge of handling circuits, is nevertheless unfamiliar with the special technical devices employed. Such a physicist will find in the book a wealth of information which may save him the labor of redevising circuits for his special needs. He can pick out what he wants, and his theoretical knowledge will then permit him to examine the instrument in all details relevant to his own particular problem.

The contents of the book may be gauged by the chapter titles, as follows:

Chapter I. Fundamentals of Vacuum-Tube Voltmeters.
Chapter II. Diode Vacuum-Tube Voltmeters.
Chapter III. Triode Vacuum-Tube Voltmeters.
Chapter IV. Slide-Back Vacuum-Tube Voltmeters.
Chapter V. Rectifier-Amplifier Vacuum-Tube Voltmeters.
Chapter VI. Tuned Vacuum-Tube Voltmeters.
Chapter VII. Audio-Frequency and Logarithmic Vacuum-Tube Voltmeters.
Chapter VIII. Vacuum-Tube Voltmeters for D-C Voltage, Current, and Resistance Measurements.
Chapter IX. Design and Construction of Vacuum-Tube Voltmeters.
Chapter X. Calibration and Testing of V-T Voltmeters.
Chapter XI. Applications of V-T Voltmeters.

Chapters I–VIII inclusive each contains descriptions of several different types of instruments adapted to various needs, with a general review of the underlying principles. Chapter IX, as its name implies, contains a special discussion of the elements which demand consideration in order to produce an instrument which will record what it is intended to record. Chapter X deals with a variety of matters concerned with the necessity for and means of carrying out continual checks on the instruments, and Chapter XI contains several examples of typical fields for the use of the instruments.

W. F. G. SWANN

BARTOL RESEARCH FOUNDATION
OF THE FRANKLIN INSTITUTE,
SWARTHMORE, PA.

REPORTS

STATEMENT BY THE BOARD OF DIRECTORS OF THE AMERICAN CHEMICAL SOCIETY

BECAUSE of efforts to compel chemists and chemical engineers to join labor organizations in order to obtain or retain employment in certain plants, the board of directors of the American Chemical Society has given consideration to the broad problems of employment in the field of chemistry.

So that the position of the society may not be misunderstood, the board of directors issues the following statement for the more complete information of our membership:

The society has taken no stand against "collective bargaining" for professional men when such bargaining is not controlled by non-professional groups and where the bargaining unit is composed exclusively of professional men.

The society condemns no one of its members for joining any non-coercive labor union so long as he does so voluntarily.

The society, however, is unalterably opposed to the forcible inclusion of professional men in bargaining units dominated and controlled by non-professional employes, whether that inclusion be brought about by economic pressure upon an employer, by intimidation of the professional employe or by operation of either state or federal law.

The society will bend every effort to maintain for all its members the "right to work" and the "right to

employment and promotion" on the basis of worth and merit.

Accordingly the board of directors goes on record as opposed to affiliation of its members with any organization that conditions promotion primarily on the basis of "seniority" or that insists that they join any labor organization where they would be in a minority, with no power to protect themselves while paying "protection" thereto as an essential to the privilege of earning a livelihood and with their wage scales negotiated by those whose selfish interest would require that benefits be sought for the larger number of non-professional workers to the detriment of the relatively few professional employes.

Letters from some members, supported by facts and intelligent argument, claiming that conditions during the depression and under the emergency have secured for tradesmen and laborers, under union leadership, advances in income not enjoyed by trained professional men often directly associated with the former have been given consideration.

Already a number of our more progressive employers have made surveys of their personnel and have taken, or propose to take, corrective measures.

In order that some logical conclusion may be reached, it seems wise to consider the distinction between professional and non-professional employes engaged in chemical work in order properly to differentiate between professional and non-professional workers.

At the present time there are a large number of technicians employed in the field of chemistry.

The term "technician" may be applied to routine workers, trained in the laboratory but with no special education or mental proficiency in chemistry and allied sciences. Normally they will be individuals with secondary school education only, or perhaps ones who have failed to acquire a baccalaureate degree through lack of funds, insufficient effort or capacity or attendance at under-equipped educational institutions. These are almost always paid wages on the hourly basis and are often included in labor union agreements. No proper objection can be raised to their inclusion in a bargaining unit composed of employes doing various kinds of skilled, semi-skilled or unskilled work.

The two groups of employes which should not be subjected to forcible inclusion in a heterogeneous bargaining unit are those who have received degrees in chemistry or chemical engineering and are engaged in these fields, either as chemical internes or as professionals.

The term "chemical interne" may be applied to those who are essentially in the final qualifying stage for their life work in the field of chemistry. They have received their baccalaureate degrees with majors in chemistry or chemical engineering, have proved their proficiency not only in chemistry but also in mathematics, physics, modern languages, et cetera. They are acquiring thereby the necessary training and experience to qualify for full professional status or standing. Those in industrial corporations are engaged in professional work on problems confidential to management, whether their work be control, research or development.

The term "professional" should be applied only to those who have the baccalaureate degree or its equivalent by specific accomplishment, and who, having been graduated from institutions approved by the American Chemical Society, have had at least two years of postgraduate training in chemistry or chemical engineering in institutions of like grade or have for an equal period obtained experience in chemical work. For graduates of other educational institutions five years of postgraduate training and/or experience subsequent to the baccalaureate degree should be required. These are the minimum requirements for full professional membership in the American Chemical Society.

The board of directors has heretofore hesitated to make any suggestions on the matter of adequate compensation. On the whole our educational institutions and chemical corporations have realized the value of brains and have compensated employes accordingly. The chemical profession as a whole is on a level with any other profession in material return. There are to-day in our profession, as in many others, individuals whose compensation is high, indeed almost fabulous, and others who are grossly underpaid. There are many who, even in the higher brackets, earn more than their income. There are some, even in the lower brackets, who are not worth their hire, and who should, for their own sakes and for the reputation of the profession, seek other more fitting fields for a livelihood.

In spite of this generalization there has come to the attention of the board of directors evidence that there are to-day many cases where worthy professional men with years of study and training are grossly underpaid and are receiving less compensation than men without any specialized education employed in many of the trades and crafts.

In the opinion of the board of directors, the time has arrived when it must publicly suggest to all employers of chemists and chemical engineers that they review with care their employer-employe relations in this line of endeavor. The American Chemical Society stands ready through a carefully chosen committee on economic status to act in an advisory capacity both to employers and to employe groups of

its members and, if deemed helpful, to publicize its findings. Enlightened management will, it is believed, welcome consultation with such a committee composed of carefully chosen individuals.

As a beginning, the board of directors suggests that all worthy chemical internes and professionals when engaged in professional work be paid on a salary and not on an hourly basis.

The extent of training, experience and capacity, as well as individual personality and merit, are factors that must be considered when employing one to engage in professional work. Bearing these factors in mind, as well as the objects of this society, and the requirements for membership therein, the board ventures to make the following suggestions to employers for their consideration in respect of starting salaries for chemical internes and professionals under present economic conditions, when such persons are employed to do professional work:

A minimum starting salary not less than $1,500 per annum for any chemical interne; and one of not less than $1,800 per annum for any chemical interne of better than average ability or training, including especially those graduated from institutions whose chemical work is of particularly high quality such as those approved by the American Chemical Society; and a minimum starting salary of not less than $2,400 per annum for any individual who has attained "professional" grade as hereinbefore described and, according to the extent of training and capacity, higher starting salary in proportion to training, experience, merit and individual accomplishment.

The foregoing suggestions are for minimum starting salaries only and are not to be regarded as suggestions for maximum salaries or as recommendations for a wage scale. They are made in respect of only those who are engaged for professional work in the field of chemistry and chemical engineering, as the society can not concern itself with problems of employment in other fields.

Inasmuch as technicians normally come under non-professional status, the technician grade does not come within the purview of this organization.

The board of directors recommends to employer and employe alike personal contact and careful consideration before concluding financial arrangements. Also it respectfully reminds both employers and members of this organization that the Employment Clearing House held at the semi-annual meetings of the society affords special facilities for consultation.

The committee on economic status will give its immediate consideration to the whole question of employment in professional work in the field of chemistry.

SPECIAL ARTICLES

P-AMINOBENZOIC ACID PREVENTS THE GROWTH-INHIBITORY ACTION OF SULFANILAMIDE[1]

WOODS[2] discovered that p-aminobenzoic acid counteracts the inhibitory effect of sulfanilamide on the multiplication of bacteria in suspensions. He obtained this effect not only with commercially prepared p-aminobenzoic acid, but also with a substance, extracted from yeast, which appeared to be chemically identical with the acid.

Woods's results have been confirmed by the work of Landy and Wyeno,[3] who found that the bacteriostatic effect *in vitro* of sulfanilamide, sulfapyridine and sulfathiazole on streptococci, pneumococci and staphylococci, respectively, was completely neutralized by p-aminobenzoic acid. The extraction of p-amino-benzoic acid from yeast has been confirmed by Rubbo and Gillespie.[4]

The present report will serve to record the application of Woods's findings to the action of sulfanilamide and p-aminobenzoic acid on a dermatophyte.

METHODS AND MATERIALS

A strain of the fungus, *Trichophyton purpureum* (Bang), was secured from fragments of skin of a patient suffering from dermatomycosis. The organism was cultivated on honey-peptone agar slants for approximately two months, at the end of which time spores were abundant and the mat fairly friable. From this culture a suspension for inoculation was prepared by adding 10 cc of sterile physiological saline solution to the slant, breaking up the mat with a sterile needle and agitating the suspension. The latter was then centrifuged and washed three times, and the final precipitate resuspended in 10 cc of saline solution. The standard inoculum for each Petri dish consisted of one loopful of this suspension.

The spore suspension was inoculated on sterile agar plates, which were incubated at 28° C. in order to obtain optimum growth. The growth-rate of the cul-

[1] From the Laboratory of Surgery of the Yale University School of Medicine, New Haven, Connecticut. The experiments were aided by funds granted to Dr. K. W. Thompson by the John and Mary Markle Foundation and by the Yale University School of Medicine from the Clinical Research Funds.

[2] D. D. Woods, *Brit. Jour. Exp. Path.*, 21: 74–90, April, 1940.

[3] M. Landy and J. Wyeno, *Proc. Soc. Exp. Biol. and Med.*, 46: 59–62, January, 1941.

[4] S. D. Rubbo and J. M. Gillespie, *Nature*, 146: 838–9, December, 1940.