

lines of cupric oxychloride, and of atacamite, but noticeably broad, were found for these cements, indicating that cupric oxychloride had been formed in appreciable amounts, but in very small, almost colloidal, particles. The amount of this compound is probably somewhat greater in the aged cement than in the unaged material. On the other hand, it is evident that cupric oxychloride has not formed a complex compound with magnesium oxychloride nor entered appreciably into solid solution in it.

It has been observed that the formation of the new phase takes place at the expense of the copper particles and that it cannot proceed in the absence of oxygen or of water vapor. Exposure to sunlight appears to retard and strong ultraviolet light prevents its formation.

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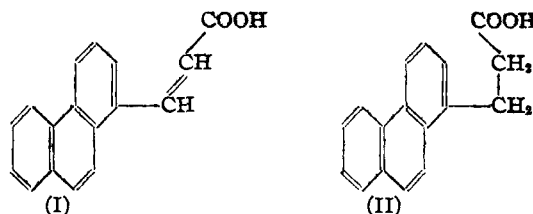
### Rapid Synthesis of $\beta$ -(1-Phenanthryl)-propionic Acid

By SAMUEL NATELSON AND SIDNEY P. GOTTFRIED

1-Phenanthraldehyde, prepared by the method of Bachmann,<sup>1</sup> was converted rapidly in good yield to  $\beta$ -(1-phenanthryl)-propionic acid after the method described by the authors for a similar series.<sup>2</sup> 1-Phenanthraldehyde, which condenses with acetic anhydride and sodium acetate in extremely poor yield after the usual Perkin reaction, condenses almost quantitatively with malonic acid, with the elimination of carbon dioxide. The  $\beta$ -(1-phenanthryl)-acrylic acid formed (I) may be

- (1) Bachmann, *THIS JOURNAL*, **57**, 1383 (1935); **58**, 2097 (1936).  
(2) Natelson and Gottfried, *ibid.*, **58**, 1432 (1936).

reduced to yield  $\beta$ -(1-phenanthryl)-propionic acid (II).<sup>3</sup> This acid has been prepared before by Bachmann<sup>1</sup> by a more tedious route in an attempt to synthesize 3'-keto-1,2-cyclopentenophenanthrene.



Ten grams of 1-phenanthraldehyde is mixed with 4 g. of malonic acid (excess) and 0.5 cc. of pyridine. The mixture is heated on a water-bath for thirty minutes, when effervescence ceases and the whole mass solidifies. The  $\beta$ -(1-phenanthryl)-acrylic acid, formed in almost quantitative yield, is washed with dilute acid to remove the pyridine and is recrystallized from acetone, m. p. 259°. This acid dissolved in dilute potassium hydroxide, is reduced with an excess of 3% sodium amalgam to yield 9–11 g. of  $\beta$ -(1-phenanthryl)-propionic acid (II), m. p. 187–188° (from acetone). It seems curious to the authors that reduction at the 9,10-positions of the phenanthrene nucleus was not brought about by the sodium amalgam.

(3) In a private communication, the authors have been informed by Bachmann that he corroborates these observations and has also successfully applied this series of reactions to several phenanthryl aldehydes.

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## COMMUNICATION TO THE EDITOR

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### SYNTHETIC VITAMIN B<sub>1</sub>

Sir:

In our last communication [*THIS JOURNAL*, **58**, 1504 (1936)] we reported synthetic vitamin B<sub>1</sub> chloride melting at 232–234° rather than at 246–250° as previously given for the natural product. We have, however, using our previous method but by a different choice of solvents for purification, obtained, in good yield, synthetic vitamin B<sub>1</sub> chloride which agrees in every particular with the natural vitamin. We owe thanks to Dr. G. A.

Stein of the Merck Laboratories for his collaboration in this matter.

A low melting point has also been observed in the bromide. In both chloride and bromide the low melting point is associated with a much greater solubility in alcoholic solvents. Both low melting salts are obtained from methanol solutions by addition of ether. However, when recrystallized from methanol by addition of ethanol or from water by addition of ethanol, the higher melting forms have been obtained. The discrepancies in melting

point and solubility are not paralleled by detectable discrepancies in composition, absorption spectra or physiological potency. Crystallographic and polarographic examinations have revealed a number of interesting features which, however, do

not permit us to draw any final conclusions. The matter is still under investigation.

MERCK RESEARCH LABORATORIES  
MERCK AND COMPANY, INC.  
RAHWAY, NEW JERSEY

R. R. WILLIAMS  
J. K. CLINE

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## NEW BOOKS

**The Chemistry of the Colloidal State.** A Textbook for an Introductory Course. Second edition. By JOHN C. WARE, Sc.M., Ph.D., Consulting Chemist. John Wiley and Sons, Inc., 440 Fourth Avenue, New York, N. Y., 1936. xvi + 334 pp. 96 figs. 15.5 × 23.5 cm. Price, \$3.75.

This second edition, like the first, is clearly written in a style suitable for students who are not interested in a too mathematical discussion of colloid chemistry, and it should therefore find a place in colleges where such courses are taught.

The following additions have been made: A new chapter of six pages on Intermediate Cases—Soaps; one-half page on Edible Jellies; three paragraphs on emulsions; four pages on the precipitation of substances in the colloidal state; two paragraphs on the electrical character of interfacial phenomena; nine lines on the plating of rubber; nine lines on the Donnan equilibrium, and two pages on surface tension lowering. There is an over-all increase of twenty-one pages.

One is at a loss, however, to see how the author's statement that the text has been largely rewritten is justified. Many of the chapters are practically unchanged and there is no change in the figures. Also, the statement in the Preface that the space given to adsorption has been doubled actually finds little support, as twenty-eight pages are devoted to this topic in the first edition and twenty-nine in the second edition.

A. L. ELDER

**Principles of Biochemistry.** By ALBERT P. MATHEWS, Andrew Carnegie Professor of Biochemistry, University of Cincinnati. William Wood and Company, Mt. Royal and Guilford Avenues, Baltimore, Maryland, 1936. x + 512 pp. 15.5 × 24 cm. Price, \$4.50.

A teacher for forty years who has "a profound respect and affection" for the "earnest, hard working and lively young people" who are his pupils should know their needs. And when he has in addition carried on continuous productive research in the field in which he teaches, he should be in a position to write a textbook which gives his students the information they need in a form at once interesting, critically accurate and up-to-date. This, we believe, Professor Mathews has accomplished in his new book.

The material is treated under the usual headings of Glucides, Lipides and Protides (the newer names for the

familiar Carbohydrates, Fats and Proteins; then the Special Chemistry of Important Tissues, Vitamins and Hormones; and Energy Metabolism. In each case, the material selected is such as to give a clear and accurate picture to the student of both the chemistry and physiology of the material under discussion with relatively little of that rounding off of debatable topics which is necessary in the interest of clearness.

In the opinion of the reviewer, it is to be regretted that the author has, after due consideration, omitted almost all references to the literature because the student has not time to consult the original literature. This is conceded; also that only a small percentage of the students would do so if they had the time, since it is easier to accept authority than to try to get at the truth of the matter from published work. Nevertheless, the medical school is the last place where the student will get formal assistance in arriving at a critical view of what is going on in his field of interest, and, if he wishes to keep up with the advance of medicine during his lifetime, he should acquire the technique of critical reading before he leaves school. However, this is a minor point and detracts little, if at all, from the general excellence of the book.

W. R. BLOOR

**Analytische Chemie der Edelmetalle.** (Analytical Chemistry of the Noble Metals.) By Dr. ALFRED WOGGINZ, Lecturer at the Technical Institute of Vienna. Ferdinand Enke Verlag, Hasenbergsteige 3, Stuttgart W, Germany, 1936. xi + 141 pp. 14 figs. 16.5 × 25.5 cm. Price, RM. 13; bound, RM. 14.80.

The above book is essentially a compilation of the scattered information on the analytical chemistry of the noble metals. Fifty pages are devoted to silver, thirty to gold, and forty-five to the platinum metals. Under each of these headings the subject matter is presented similarly, being divided into a brief introduction of history and occurrence, followed by a discussion of analytical reactions, methods of detection and of determination, and procedures of separation, including those applicable to certain technical products. In addition, six pages are given over to tables of a number of physical properties. The book also contains an author and a subject index, and a list of works consulted. It is clearly printed on a good grade of paper.

The sections dealing with silver and gold appear to be quite complete, but that dealing with the platinum metals