obtained if one uses commercial preparations of trypsin instead of crystalline trypsin. That certain commercial preparations of trypsin contain a protease which has different chemical properties from crystalline trypsin prepared according to Northrop[5] can be demonstrated.

Since pancreatic trypsin-inhibitor has an effect on trypsin which is markedly greater than that on chymotrypsin, one could use this inhibitor to distinguish between trypsin and mixtures of trypsin and chymotrypsin. With this in mind it has been shown[6] that a given amount of pancreatic trypsin-inhibitor which markedly inhibits crystalline trypsin has much less effect on trypsin, Fairchild. It is probable that most commercial preparations labelled trypsin are mixtures of trypsin and chymotrypsin.

It has already been proved that heparin has no inhibitory effect upon the protease activity of chymotrypsin.[2, 7] Obviously, then, one can not use an indefinite mixture of trypsin and chymotrypsin[3] to study the effects of heparin on the inactivation of pure trypsin.

Since both chymotrypsin and trypsin are inhibited by blood serum, the above facts may not effect any physiological conceptions of anti-proteolytic activity. A calculation of the relative anti-proteolytic effects of heparin and blood serum indicates that it is hardly likely that the anti-tryptic action of heparin is an important factor in its physiological action. The anti-proteolytic effects of serum is so powerful that for many years it has been customary to use diluted solutions of the serum when testing any anti-protease effects on blood. A ml of heparin solution containing 4 mg of heparin has no more inhibiting power than 0.1 ml of ordinary serum. One would have to assume the presence of about 100 grams of heparin to explain the anti-proteolytic action of serum as being due to this compound, and a similarly large amount if it were due to a substance like pancreatic anti-trypsin. This is probably not the case.

The reported observations of the difference between crystalline trypsin and trypsin, Fairchild, need in no way invalidate past and future work with the latter preparation. We should, however, distinguish between crystalline trypsin and other proteases. This would be especially true in those experiments in which blood clotting is an important factor.

M. K. HORWITT

PLASMODIUM VIVAX CHESSON STRAIN

AN infection of *Plasmodium vivax* was diagnosed in a soldier at Harmon General Hospital in August, 1944. The history of the patient indicated that the infection was contracted in New Guinea during 1944. It was carried on our records as v–1027–N.G.

On August 25, 1944, transmissions by *Anopheles quadrimaculatus* were begun. Observations indicated that this *vivax* infection in man reacted differently to certain drugs than did the St. Elizabeth strain of *P. vivax* which has been extensively used for drug testing. This and other characteristics suggest that it might be a strain distinct from some of the American malarias.

As there are indications that this new strain might be widely used for experimental procedures, it seems desirable to give it a definite designation. The strain is given the name of the patient from whom it was obtained. It, therefore, is designated as the Chesson strain of *Plasmodium vivax*.

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REACTION OF VITAMIN A WITH SUPER-FILTROL

I HAVE read with interest the article under "Scientific Apparatus and Laboratory Methods" entitled, "A New Reagent for Vitamin A," by Arnold Lowman in the February 16 issue of SCIENCE.

Because I am interested in both adsorption and the determination of vitamin A, it occurred to me that the phenomenon of color formation might be due to an impurity which reacted with the vitamin A in the fish oils and which was subsequently adsorbed by the Super-Filtrol. Mr. Lowman's observations were repeated and found to be correct. However, it was also found that when a fish liver oil was added to a suspension of florisil (Floridin Co., Warren, Pa.) no color was formed. When one ml of antimony trichloride in chloroform was added a blue color similar to the one described by Mr. Lowman was formed and immediately adsorbed on the florisil. This was similar in all respects to the super-filtrol preparation. It was also found that when a mixture of florisil and antimony trichloride in chloroform was evaporated to dryness and carefully dried it would react similarly to Super-Filtrol with vitamin A.

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BIOLOGICAL RESEARCH AND PUBLICATION

THE article by Professor Weiss, published in SCIENCE of February 2, is very interesting, but I think too

[5] J. H. Northrop, "Crystalline Enzymes," Columbia University Press, 1939.
[6] M. K. Horwitt, Elgin Papers, 4: 102, 1941.
[7] M. K. Horwitt, *Jour. Biol. Chem.*, 156: 427, 1944.

vague. What is biology? It is the science of living things. The world is populated by millions of kinds of plants and animals. Our purpose is to ask what they are, and what they do. Also, what they were, as indicated by the study of fossils or inferred from their structure and relationships. There is no reason why we should not, on this basis, recognize a framework into which all biological research may fit, and a plan of publication which will assemble all the data in a pattern approximating to the facts of nature. Only approximating, because our knowledge is defective, and in part must always remain so, and our judgments are not all sound. But with such a framework, the scientific worker may sense the meaning of his work, and its contribution, small as it may be, to the great system. Sometimes, as in the case of Mendel's peas, work done on one species will throw light on all species, or may at least have wide significance. Provision should then be made for the synthesis of results, and their publication in an adequate manner.

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SCIENTIFIC BOOKS

ELLIPTIC FUNCTIONS

Jacobian Elliptic Functions. By ERIC HAROLD NEVILLE. 332 + xvi pp. 33 figures. Oxford: Clarendon Press. 1944. $7.50.

IN this book the author has reworked his lectures into a careful and logical presentation of the subject, elliptic functions regarded as a branch of the theory of functions of a complex variable. The reader is assumed to be familiar with the elements of the theory of functions, but not necessarily with doubly periodic functions, the general theory of which is developed from the Weierstrass point of view in a fifty-page introduction. With this as a basis, the author constructs functions on lattices with two simple poles in each cell, develops their general theory, and later specializes the discussion to Jacobi's functions sn u, cn u, dn u, and the nine related functions introduced by Glaisher, or rather the generalizations of these with complex parameters. This development avoids the artificiality, if also the brevity, of the treatments based on theta functions which here are introduced near the end of the book. On the other hand, most brief treatments from the lattice point of view which make any reference to elliptic integrals and the inversion problem for complex parameters are logically incomplete, and the overcoming of this difficulty is the main virtue of the treatise under review. The author has introduced several convenient bits of notation which make for an efficient wholesale derivation of formulas, and has usually indicated the alternative classical notation, and also pointed out that for deriving a particular result first principles are usually more convenient than the generalized notation.

The text is followed by 57 exercises with notes. These are in part problems, and in many cases additional results and alternative proofs.

While the treatment has made contact with applications, these are not discussed as fully as the basic theory. For example, while the reduction of integrals of the first kind is briefly sketched, such details as the specification of constant factors are omitted. The author gives some sporadic references of a historical nature, but has not arranged these so as to be of much help to a reader who needs to be oriented in the literature of the subject. There is no index.

Thus this book is not suited to the reader who merely wishes to locate some particular result for a specific application. However, it will interest the pure mathematician as a systematic discussion from a unified point of view. Like their tolerance for pure science, the press work and typography of the Clarendon Press give no evidence of wartime deterioration.

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INDUSTRIAL PSYCHOLOGY

Handbook of Industrial Psychology. By MAY SMITH. 304 pp. Philosophical Library. 1944. $5.00.

THIS is an excellent book for executives or others who wish to learn quickly what industrial psychology has to offer toward improving the effectiveness and happiness of workers. The fact that most of the investigations reported were conducted in England does not materially affect their applicability elsewhere. The author's aim is to indicate practical applications and also, as she says, "to humanize industrial psychology, which sounds absurd, but which is necessary." She has done well both in factual reporting and in commenting wisely, with frequent touches of humor.

The first chapter sketches the origins of industrial psychology and particularly the impetus given it during the last war when efforts to increase the output of munitions workers by merely increasing the number of hours worked soon proved futile despite the patriotism and best efforts of the workers themselves. This experience prompted scientific investigations supported by the government, first by the Health of Munitions Workers Committee and subsequently by the Industrial Fatigue (later Health) Research Board.